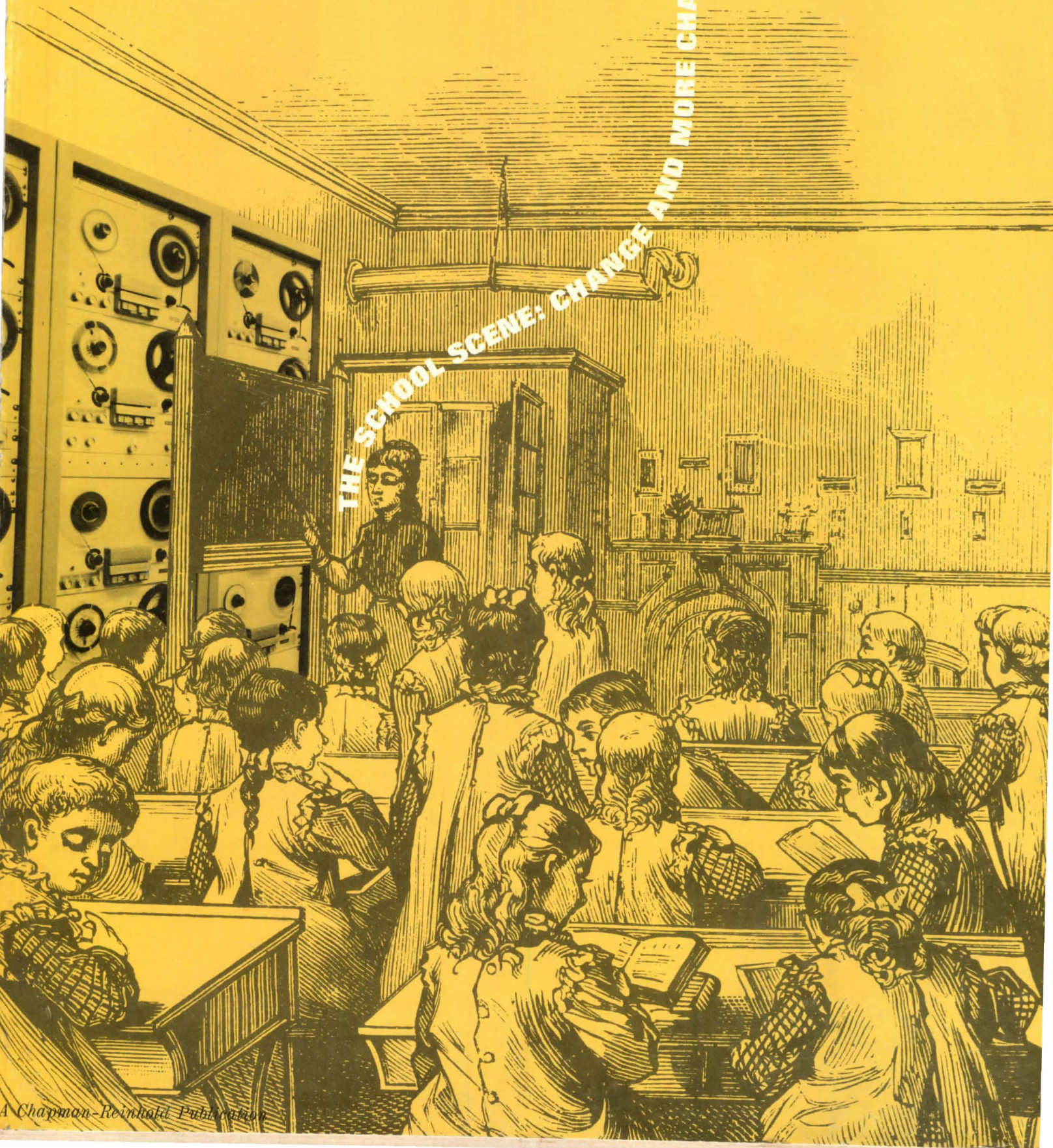
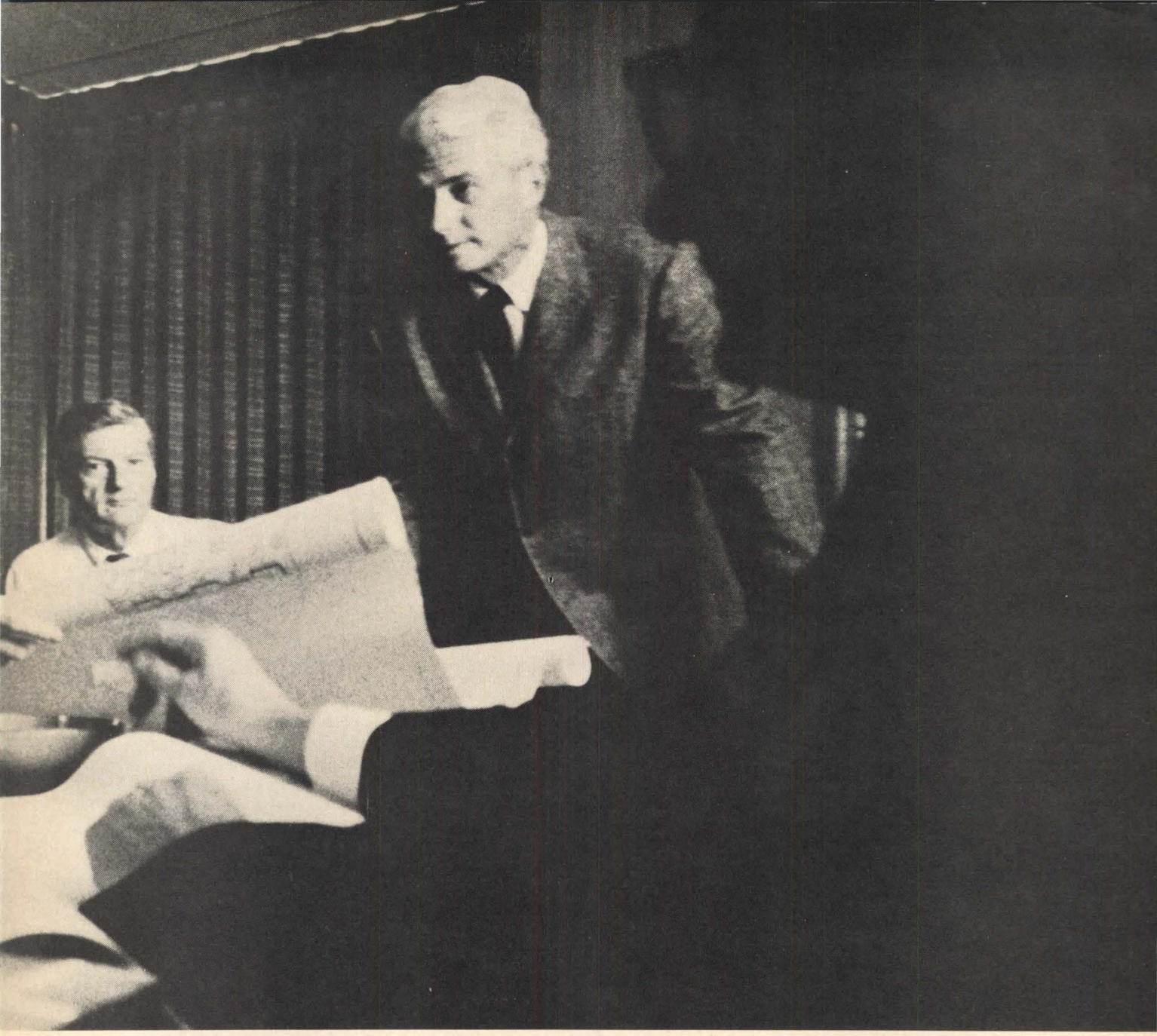
April 1968 **PROGRESSIVE ARCHITECTURE**

THE SCHOOL SCENE: CHANGE AND MORE CHANGE



A Chapman-Reinhold Publication

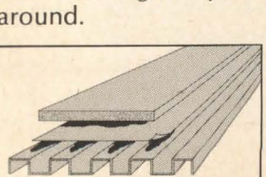
What are you going to do about the roof?



Specify the insulation board that gives you the best possible protection against the most things that can go wrong in a roof. Specify Permalite Sealskin® insulation board.

Here's why: Permalite Sealskin insulation board is noncombustible; lightweight; moisture, rot and vermin resistant; dimensionally stable; and provides for a skin-tight bond to the roofing. It is accepted for FM Engineering Division steel deck class I construction, and UL listed metal deck assemblies construction 1 and 2, and as a listed component of UL roof and ceiling design No. RC 16—2 Hr. rating for precast concrete units.

Include Permalite in your planning... the one roofing insulation board that gives you a bit more than you need all the way around.



GREFCO's Permapak™ System: Insulation board, vapor barrier, cold adhesive – all from one source.

See your Permalite representative, consult Sweet's or write for literature and samples.

GREFCO Inc. / Building Products Div.
333 North Michigan Avenue
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A subsidiary of General Refractories Company

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Sealskin®

RIGID ROOF INSULATION

even a year from now.

Eagle Turquoise

The nation's largest-selling drafting pencils and leads

Eagle Pencil Company Headquarters: Danbury, Connecticut

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VIEWS

One correction in your figures, however, might underscore why, after 13 years of urban renewal, New Haven is

on. Why did you pick on us? Can you tell me any other cities that are handling this difficult situation any better than we

Take out a life insurance policy for beautiful masonry walls

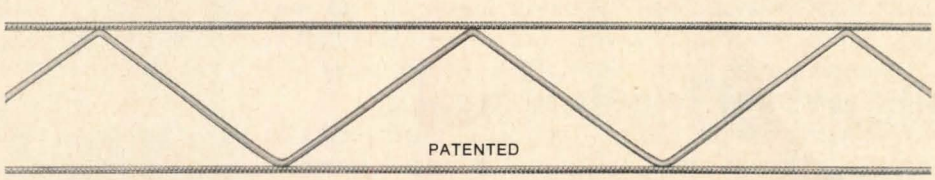
Specify Dur-O-waL® Truss masonry wall reinforcement

Masonry walls are more beautiful, more versatile than ever. And more numerous. Close to 700 million dollars' worth this year. That's a lot of masonry walls. And you can protect nearly every one of them with a Dur-O-waL "life insurance" policy.

All kinds of walls, too—single wythe, cavity or composite. Dur-O-waL Truss not only controls cracking, but also ties wythes in cavity and composite walls. All this from one product.

Dur-O-waL stands back of the policy with material approvals from many national and local code organizations.

Specify the original. Specify the best. Take out a Dur-O-waL life insurance policy on masonry walls. Need evidence? Write Dur-O-waL, P.O. Box 368, Cedar Rapids, Iowa 52406.



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THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

DUR-O-WAL MANUFACTURING PLANTS • Cedar Rapids, Iowa, P.O. Box 368 • Syracuse, N. Y., P.O. Box 628 • Baltimore, Md., 4500 E. Lombard St. • Birmingham, Ala., P.O. Box 5446 • Aurora, Ill., 625 Crane St. • Pueblo, Colo., 29th and Court St. • Toledo, Ohio, 1678 Norwood Ave. • Mesa, Ariz., 213 So. Alma School Rd. • Seattle, Wash., 3310 Wallingford Ave. • Minneapolis, Minn., 2653 37th Ave. So. • Also manufactured in Canada.

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MAHON
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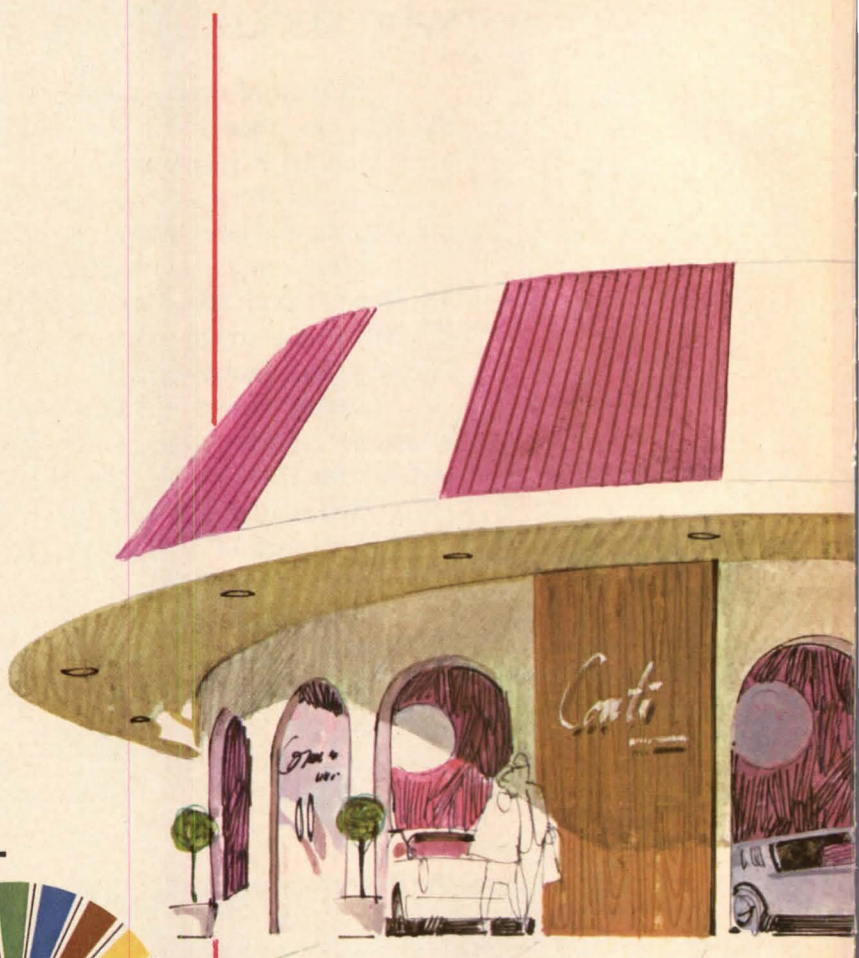
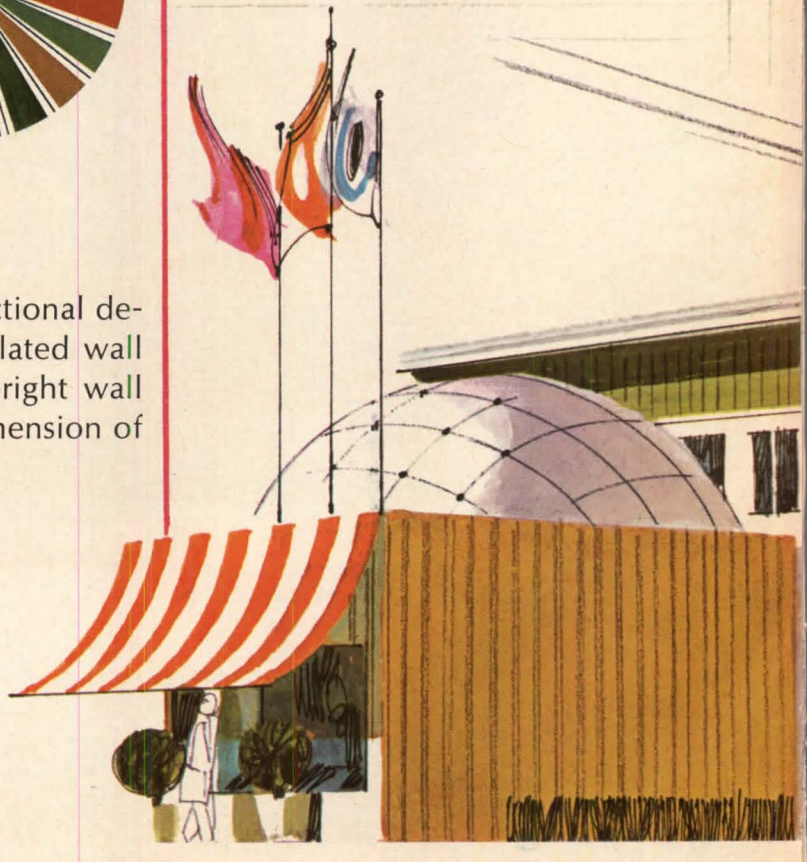
in building
products

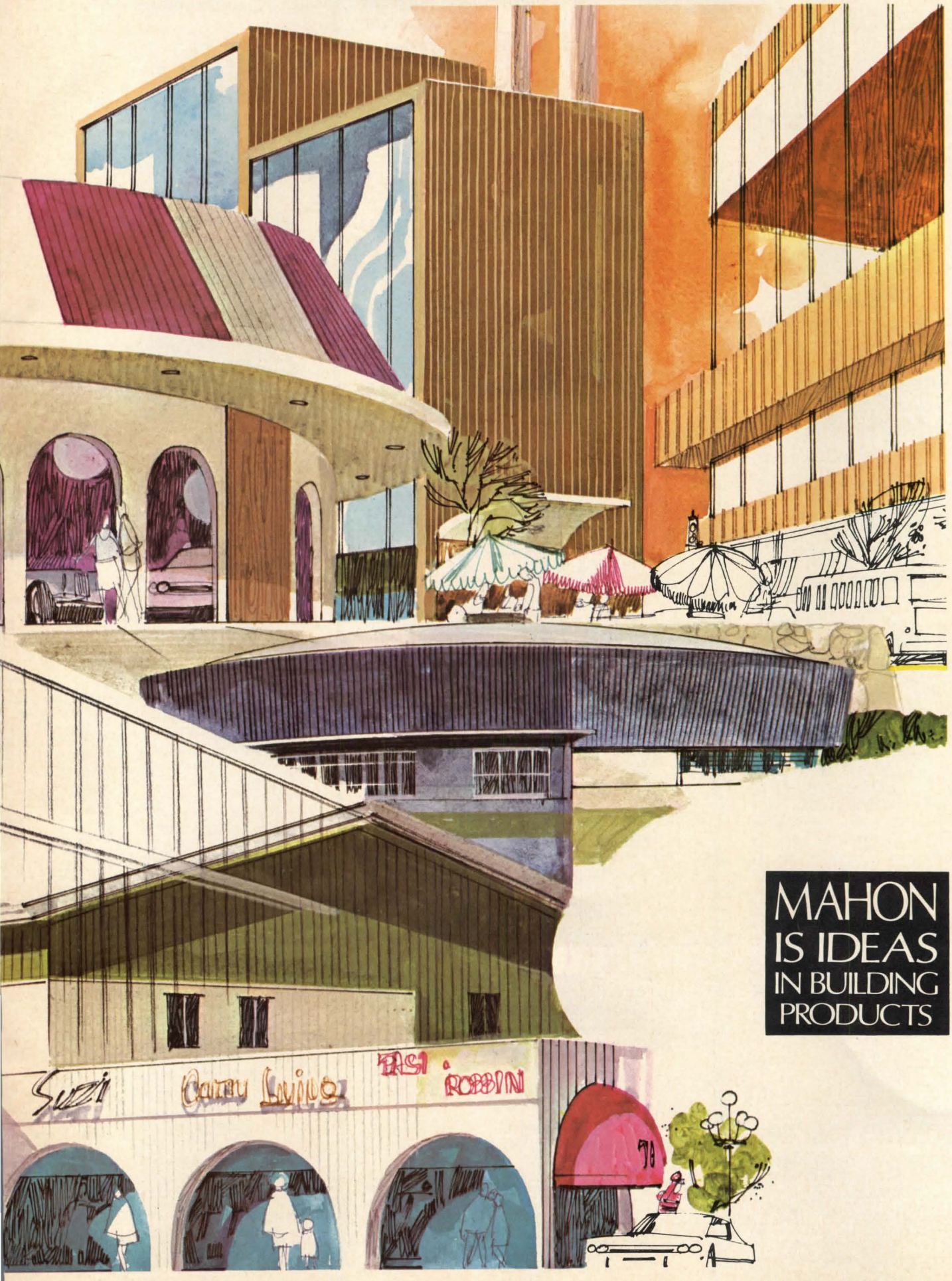
TAKE THE DULLNESS OUT OF FUNCTIONAL with colorful, insulated wall panels from MAHON





Never has it been so easy to take a functional design and lift it out of the ordinary. Insulated wall panels from Mahon—strong, durable, bright wall panels—add the reality of color, the dimension of truth to everything you do.

And when you specify Mahon, you can be confident that you are recommending a superior product that is economical, easy to apply and manufactured to give your buildings many years of lasting beauty. For complete information, write The R. C. Mahon Company, 6565 East Eight Mile Road, Detroit, Michigan 48234.



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Continued from page 12

per cent. As is typical of the Redevelopment Agency, it quotes (under # 7 above) an all-New Haven Negro school population figure (38.2 per cent) in order to refute an argument about the Dixwell *schools.*

(8) Perhaps Adams would refer to the President's National Advisory Commission on Civil Disorders for corroboration of P/A's statement that "some observers estimate unemployment as high as 35 per cent for 20-year-old nonwhites."

Adams' letter, with its misstatements and twisting of facts in support of certain opinions, is typical of the kind of problems P/A faced in attempting to report on New Haven's urban renewal program. If Adams really believes that riots come from nowhere and that his city's programs have not helped cause them, then why has he written P/A a letter attempting to do nothing more than nit-pick, rather than attempting to refute our general point of view? See page 49 of the P/A NEWS REPORT *for a description of New Haven events following the P/A study.* — ED.]

Cheaper Systems

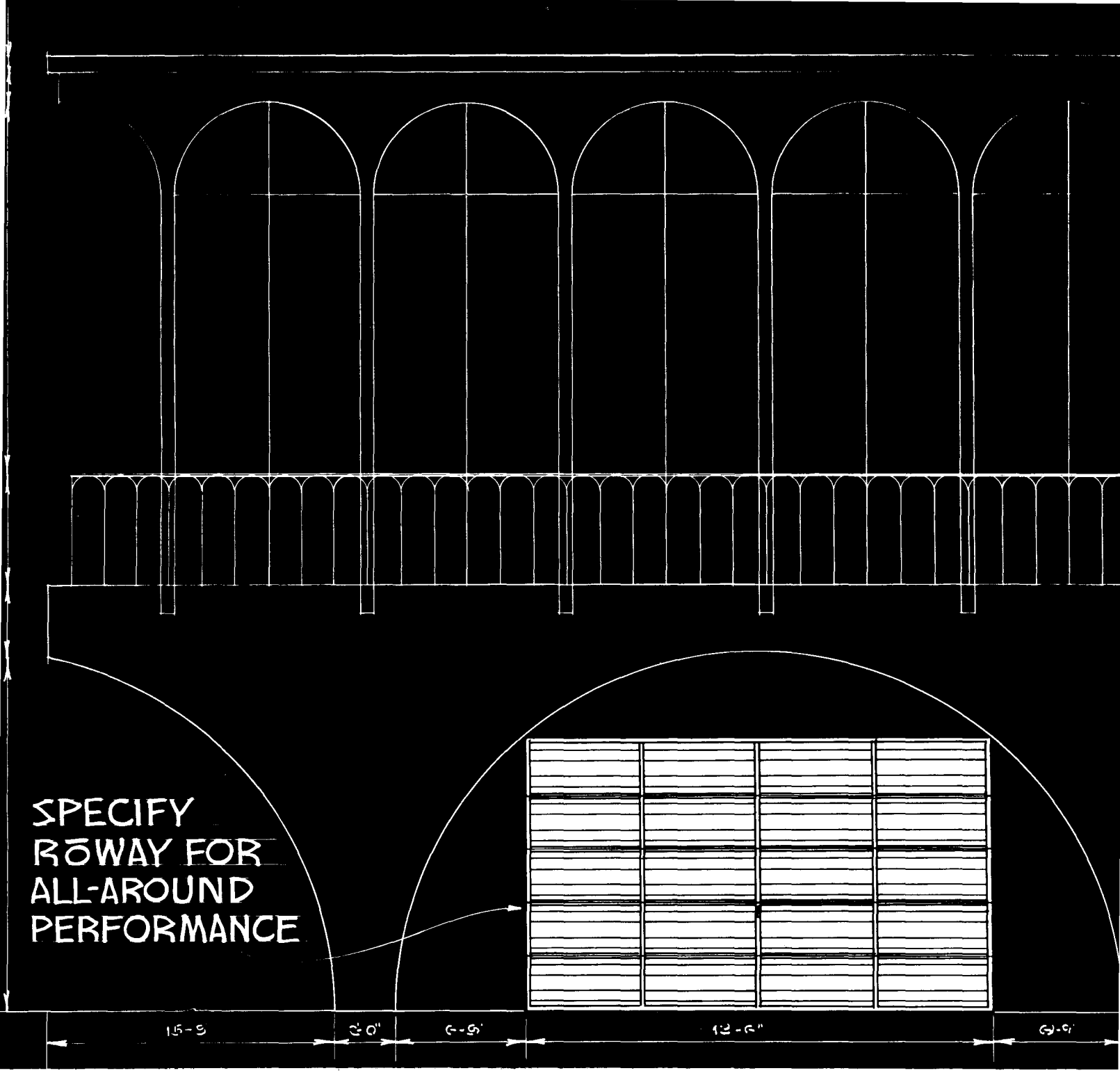
Dear Editor: We read the article "Cheaper Multistory Building in Sight" (FEBRUARY 1968 P/A) with considerable interest. Our own research in the area of system building shows a potential for saving about 7 per cent of the total building cost by using a structural subsystem of mechanically precast concrete load-bearing wall and partition panels.

By integrating mechanical and electrical systems, as is done in Europe, a further savings of 7 per cent appears possible. And the great reduction of construction time results in savings up to 6 per cent in the present money market.

To obtain savings of this order, it will, of course, be necessary to go into complete systems building, integrating all subsystems into an over-all system.

As to the use in the article of the term "open system," we do not agree that hollow core slabs and concrete bearing walls *per se* are part of an open system. They are simply typical uncoordinated building products in no way conceived of as "interface" within a system, which is the basic prerequisite of open as well as closed systems. In the terminology of systems building, the term "open system" refers to components or assemblies (usually multifunctional) that are part of an interrelated, over-all system available in the open market from more than one manufacturer.

IRWIN SPEYER
Aspad, Inc.
New York, N.Y.



DON'T SETTLE FOR JUST ANY OVERHEAD INSIST ON THE BEST... RŌWay OF COURSE

To protect the integrity of appearance and to allow all-around building performance, overhead doors must be selected that will carry out the original intention of the designer.

Accepting just any overhead door may be a sacrifice to design as well as door performance. More than thirty-eight years of service to the architect and specifier have earned RŌWay the reputation for being the reliable of the overheads.

Specify RŌWay and immediately a full spectrum of door materials, designs and accessories open up creative areas of development. And RŌWay distributors are trained to service what they sell.

These are but two of the reasons why you should specify RŌWay for all-around performance.

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Nero hates Pyresote®

It just won't burn. Wood that has been pressure treated with Pyresote is like that. Char a little bit, maybe. But lose its load bearing capacity under fire? Twist or bend in extreme heat? Smoke? Hardly! Pyresote wood is very frustrating... to fire-fanciers. But you'll think it's great. It's accepted by building codes all over the country. And Underwriters' Laboratories lists it, too. Each piece of Pyresote lumber or plywood carries a UL label. You can recommend it for studs, panelling (with or without decorative veneers), party-walls, or any other fire-resistive application. It's easy-as-wood to work with, and economical as well. But don't fiddle-around. Phone or write for descriptive literature today.

(You'll find that termites hate Pyresote, too!)

J.H. Baxter

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These are the commanders.

They're the ones who gave Allied Chemical top command of commercial carpeting.

Allied Chemical commands in commercial carpeting.

6 years ago, Allied Chemical saw the commercial carpet market as a potentially fantastic booming area. Allied Chemical took command immediately with sound product know-how and a total-range market plan. They created a unique new carpet fiber. Not a fiber adapted from residential use, but a round cross-section nylon, specifically engineered for commercial conditions.

Today, 6 years of vital experience with every commander from technologists to the man who actually buys carpeting of Allied Chemical nylon has solidly given ALLIED CHEMICAL TOP COMMAND OF COMMERCIAL CARPETING.

Proven performance commands.

Allied Chemical nylon fiber has proved itself in conditions far more demanding than the most severe lab tests. For 6 years it has stood up where it really counts. In office buildings, cafeterias, supermarkets. In lounges, restaurants, hotels, industrial installations. In day-to-day living where excessive demands are made, Allied Chemical nylon fiber has met every demand. Its color lasts longer, it wears better, it cleans more easily. In short, it performs. Example: This unretouched photograph of the actual carpet that covered the floor of a major pavilion at the New York World's Fair. If you think you may have some special carpeting problem, take another look. 16,000,000 people walked on this blue carpet!

Allied Chemical

In top command of commercial carpeting.

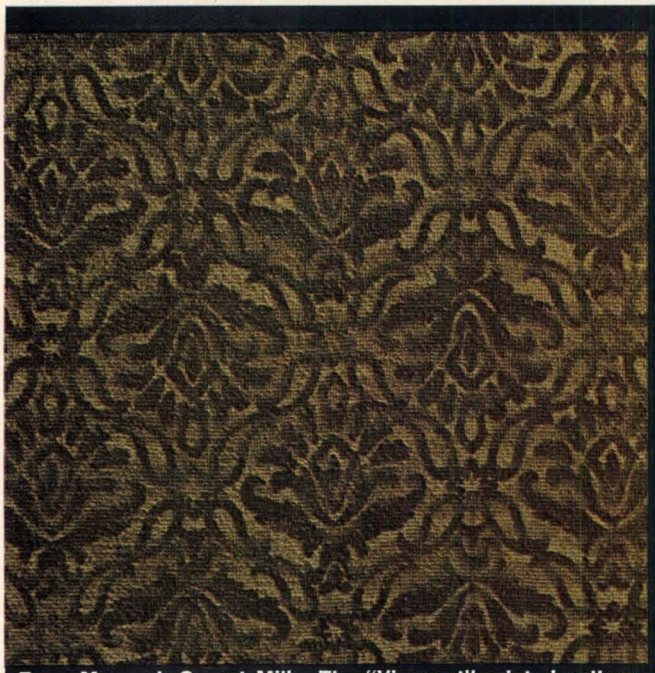
Product innovation commands.

Standing by the dye beck is Lee Rush, technical director at Allied Chemical's Research Center in Petersburg, Virginia. Under examination is a sample of their new tri-dye fiber . . . unique in that it requires only a one-step color bath to achieve a brilliant three-color effect! This is only one of the many new processes developed at the Center which are opening up new styling and performance possibilities for the commercial carpet market . . . another example of how Allied Chemical works consistently toward tomorrow's most contemporary applications.

Allied Chemical

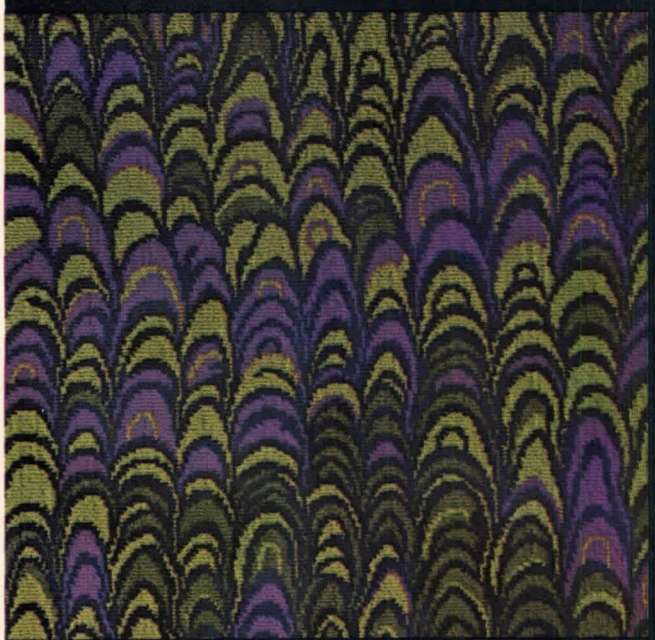
In top command of commercial carpeting.

Design leadership commands.



From Monarch Carpet Mills: The "Viscount" printed pattern.

From Langhorne Mills: Flowered 6-frame woven Wilton carpet.



From Langhorne Mills: A modern flame-stitch 5-frame carpet.

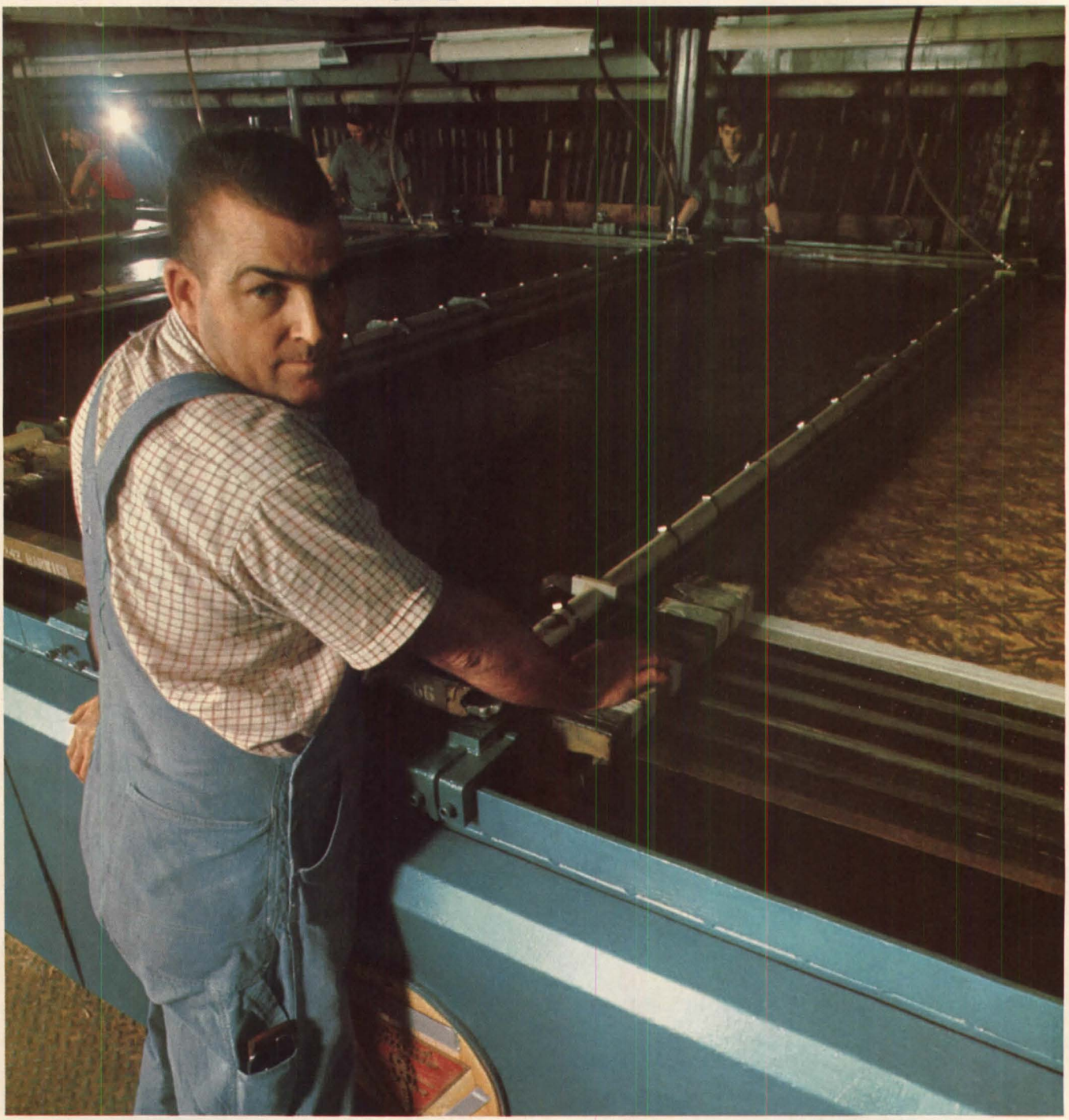
From Hardwick & Magee Mills: Custom-designed in the Aubrey Beardsley style, a striking woven jacquard in black and white.

The incredible versatility of Allied Chemical nylon fiber has made it leap into excitingly fresh new design areas. Color so intense . . . because Allied Chemical's round cross-section fiber has superior dye-affinity . . . methods of creating carpet constructions uniquely different . . . these singular properties have created a totally new arena for non-residential carpeting. Beyond Allied Chemical's own talented design staff, now come the mills themselves with inspired ideas! This is leadership. A fiber so distinctive it is in command of continually new design potentials . . . so distinctive it is commanded by others for creating the best of looks in commercial carpetings.

Allied Chemical

In top command of commercial carpeting.

35 progressive mills command.

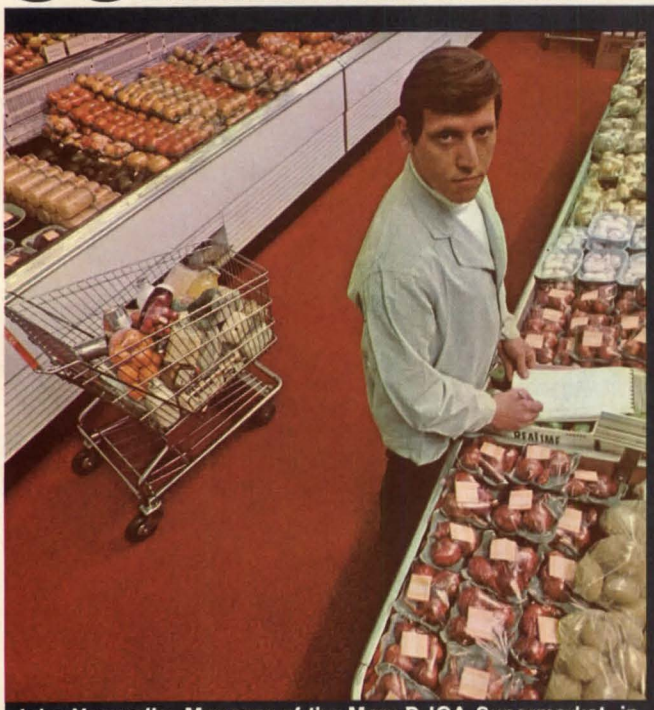


This employee at Barwick Mills, La Fayette, Georgia, is overseeing one of the more recent and progressive developments in the carpet industry. A machine which produces complex 5-screen printed patterns. Barwick Mills is only one of the 35 aggressive mills producing various styles—tufted, woven, printed, dyed—for you to choose from. In fact, because of the limitless capacities of Allied Chemical nylon fiber, these 35 mills produce over 100 fabrics used for commercial purposes!

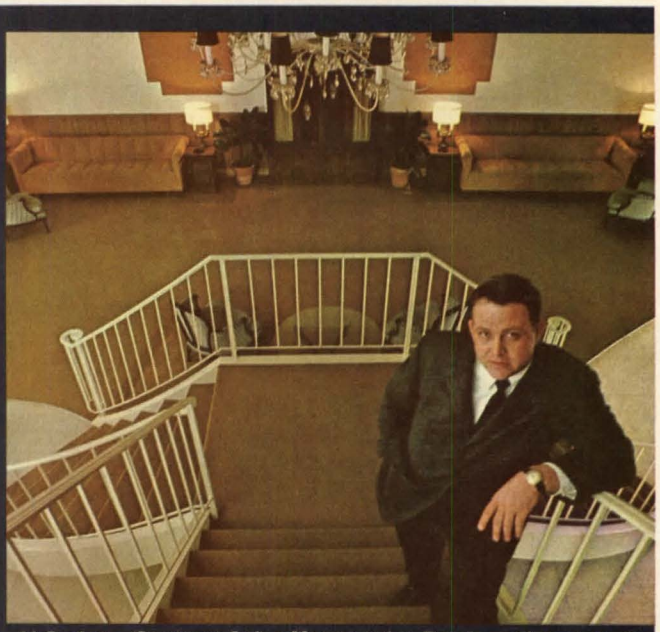
Allied Chemical

In top command of commercial carpeting.

Forward-thinking people command.



John Vacarello, Manager of the Mary-D IGA Supermarket, in Scarsdale, N.Y.



Al Carlsen, Contract Sales Manager for Ray Lang Interiors, in the Ramada Inn, Atlanta, Ga.

Charlie Bellflower, Manager of Davis Bros. Cafeteria, Atlanta, Ga.

Ralph Frost, architect for Lacy, Atherton & Davis, in the Wilkes College Lounge at Wilkes-Barre, Pa.

People with a sound sense of the future choose carpeting made of Allied Chemical nylon fiber. An interior design group chooses it because of its incredible durability against heavy traffic. A cafeteria manager chooses Allied Chemical nylon fiber carpeting because of easy, inexpensive maintenance. Specifiers and users alike choose carpets made of Allied Chemical nylon fiber. They command the best in styling, warmth, color, endurance, maintenance.

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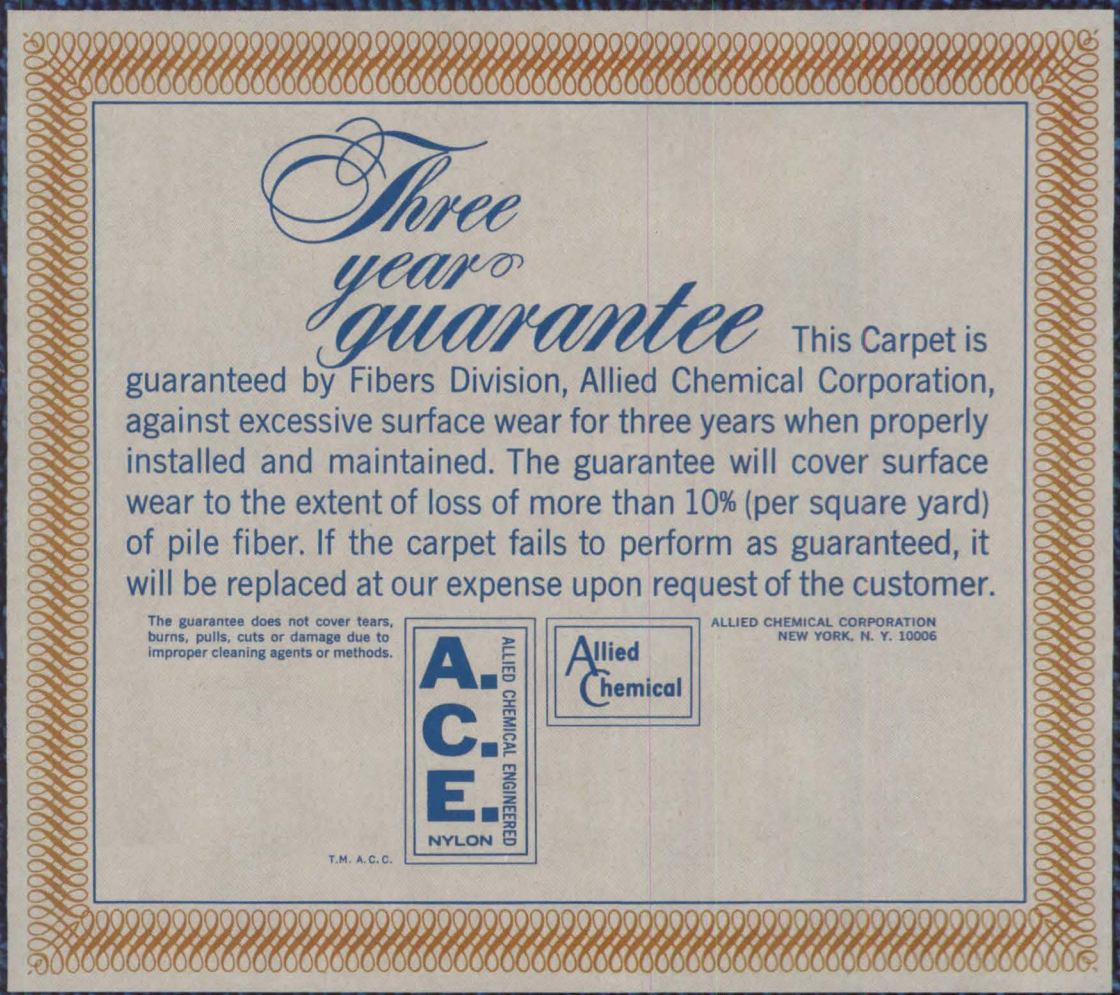
In top command of commercial carpeting.

A.C.E. commands.

Uniquely. Constant testing, proven performance, design innovation, years of total-market experience. All these have led to the A.C.E.® Guarantee.

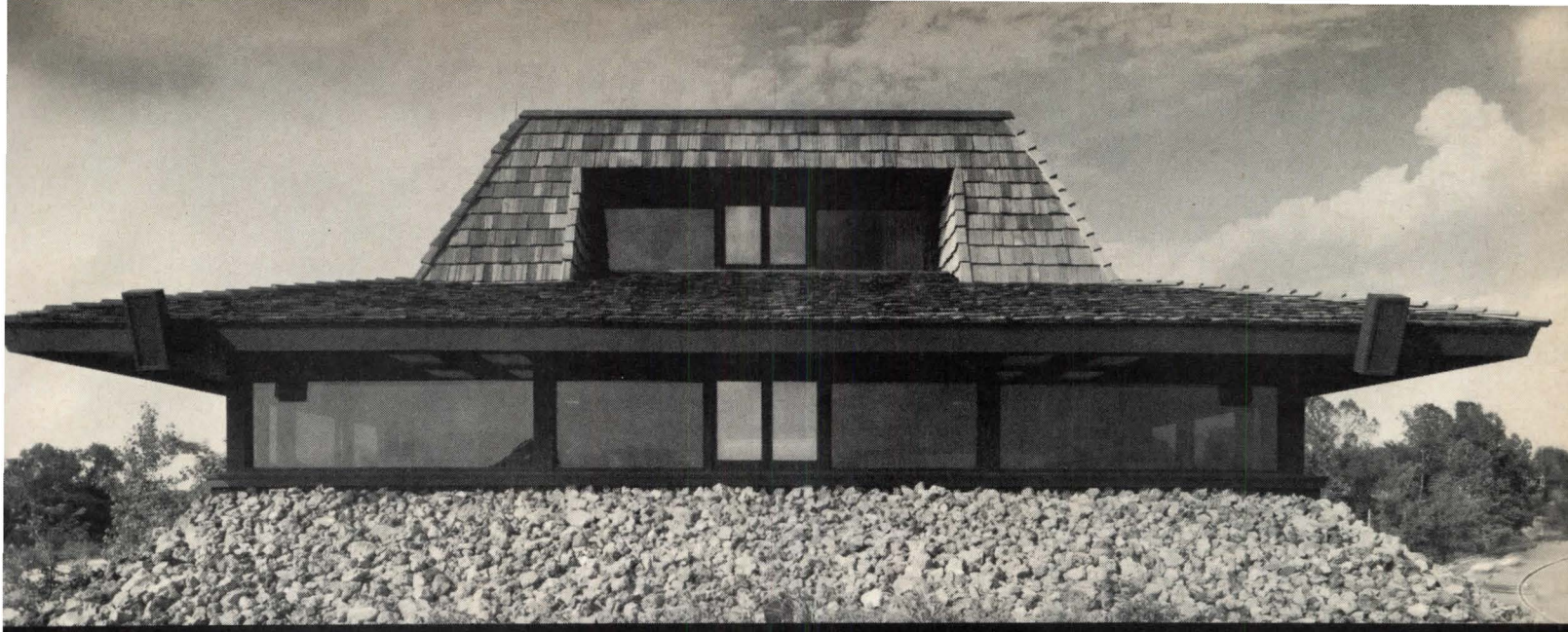


Allied Chemical is the only fiber producer to back its labelled carpeting, the A.C.E. label, with an unprecedented 3-year guarantee. Mill, specifier, retailer are "guaranteed"—because Allied Chemical and Allied Chemical only is responsible for the quality and performance of A.C.E.

Become a Commander. Specify A.C.E.® nylon on your next commercial carpet contract. For more information, write to Allied Chemical Corporation, No. 1 Times Square, New York, New York 10036, or call: (212) HA 2-7300, Ext. A.C.E.

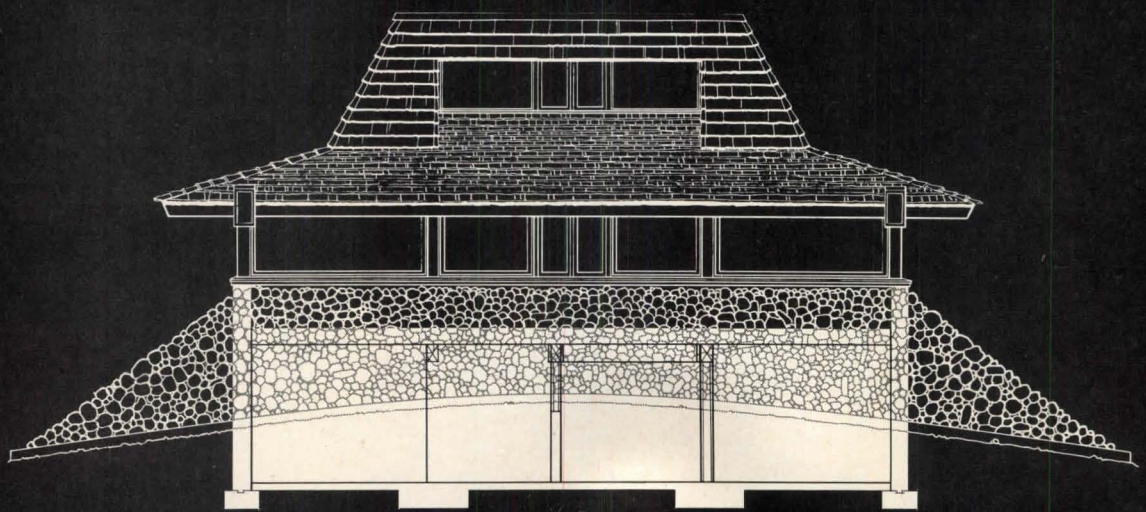
Allied Chemical

In top command of commercial carpeting.



This is an architect's office. Three stories of stone, glass and red cedar.

Three stories?



Architects' office: Collinsville, Illinois Architects: Architectural Associates Incorporated
Certi-Split, Handsplit shakes, 24" x 1-1/4" to 3/4" with 10" exposure.

When Architectural Associates, Inc., designed their new offices in Collinsville, Illinois, their objective was twofold: naturally they wanted their offices to reflect their ability and good taste, but also they needed a maximum amount of floor space—immediately and to provide for future growth.

The solution is a structure that manages to look like a two-story building yet actually has three functional levels. The third, housing the firm's conference room, printing and storage area, kitchen, future drafting area and rest rooms, is completely hidden by what appears to be a stone foundation. This stone fill, combined with the structure's broad, distinctive, handsplit cedar roof, gives the low, contemporary feel the firm was after.

In addition to its design function, the red cedar shake roof adds the desired extra dimensions of pattern and rich natural color plus the practicality of more than adequate protection and insulation.

Perhaps red cedar Certi-Split shakes or Certigrade shingles can help provide part of the answer to your next design problem, too. Why not find out? For details, see our Sweet's Catalog listing 21d/Re, call or write: 5510 White Bldg., Seattle, Wn. 98101. (In Canada: 1477 W. Pender St., Vancouver 5, B.C.)

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Cel-Way: the underfloor electrification system that prevents building obsolescence! Its roomy steel cells and factory-installed inserts can be spaced to fit any building module for widest flexibility of desk or equipment placement . . . for now and for the future. Cel-Way's architecturally-styled fitting supplies all services to any desired location. This fitting pleases owners, decorators . . . fits unobtrusively under a desk pedestal. Cel-Way's pre-set inserts make it easy to relocate services; eliminate messy core drilling in concrete — a process that can cost up to $100 for each change. All things considered, Cel-Way is the most economical and practical in-floor electrification system, for either concrete or steel frame construction.

Check Sweet's 1J/Gr, or write for Cel-Way product manual. Granco Steel Products Company, 6506 North Broadway, St. Louis, Mo. 63147. A subsidiary of Granite City Steel Co.

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Steel

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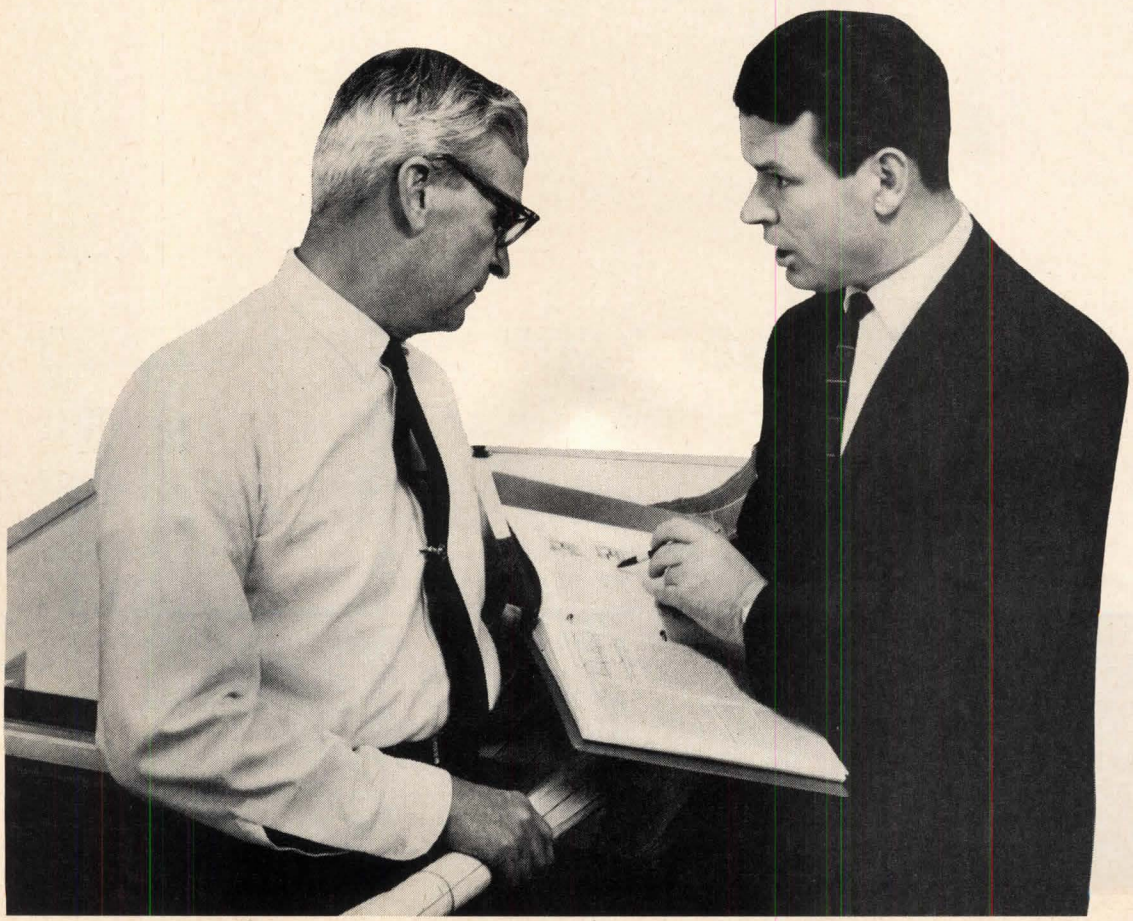
Ready to talk Electric Heat? Talk to an Electrical Contractor.

One reason: the qualified electrical contractor has plenty of experience with electrical heating systems. But that's only part of the story. Electric heat is an electric function and should be the responsibility of an electrical contractor. He's the one man who can furnish, install, connect and inspect electric heating equipment—and see the job all the way through from plans to permit to operating guarantee. So talk to a qualified electrical contractor. Then put the heating specs into the electrical section of your building plan. That way your electric heating system will be furnished and installed by the man able to take single responsibility for the single best heating system.

Your Qualified Electrical Contractor

NECA—National Electrical Contractors Association, 1730 Rhode Island Ave., N.W., Washington, D.C. 20036



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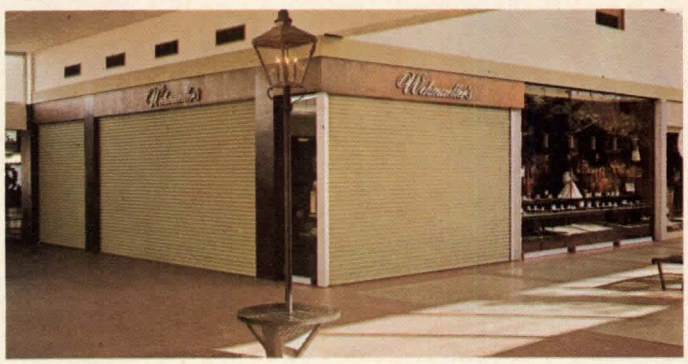
Functional design that has never been excelled —



ROLLING DOORS

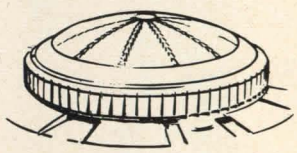
Regardless of innovations in building structures that current economic trends require, Kinnear Rolling Doors play a vital role in building efficiency. Just as they have the past 70 years!

The interlocking slat curtain that coils over the lintel—a principle of operation originated by Kinnear — has proven so practical from every standpoint that it has never been excelled for door efficiency. Just as fundamentally good for nighttime closure of the modern shopping center store (shown above) as for all other categories of buildings for which they've been used throughout the world since their inception. In addition to their inherent weather, fire and theft protective qualities, they're completely out of the way when open. All floor, wall and ceiling space around the door is clear and usable. And their very design makes them especially suited for time-saving electric motor operation.

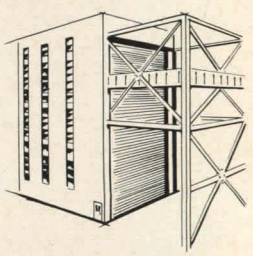
The test of time has proven the durability of the all-steel, extra-rugged—heavily galvanized and paint-bonded — construction of Kinnear Rolling Doors. Even so, every door is REGISTERED—an original Kinnear Service that insures lifetime service and availability of original parts on every Kinnear Door built.

Whether you're designing a fine retail store or a factory building for heavy industry, consider many extra values Kinnear Door efficiency offers you.

A protective closure for even today's most advanced architectural needs . . . . . .



. . . from piers to stadiums



. . . from schools to power houses

. . . from factories to shopping centers

Also manufacturers of Power Operators, Automatic Rolling Fire Doors and Shutters, Rolling Grilles, Rolling Counter Shutters and RoL-TOP (overhead type) Wood or Metal Doors.

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IF YOU THINK GLASS BLOCK STILL LOOKS LIKE THIS

YOU'D BETTER

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Innovations in style and patterns of glass blocks give today's buildings a bright, *now* look. Design flexibility, striking new sculptured effects—just what you'd expect from a modern versatile building material.

Architect James J. Eugenides, A. I. A., used Pittsburgh Corning Intaglio II units to ring the Department of Water Works Building in East Chicago, Indiana, in floor-to-ceiling panels.

PC Intaglio provides plenty of soft daylight for a comfortable working environment. It also screens the harsh surrounding industrial view. Practical considerations of noise reduction, elimination of surface condensation and good insulation made glass block a sound, economical choice for this handsome municipal structure.

Take a fresh look at PC glass blocks: masonry-like Intaglio, exciting new Cameo, colorful Sculptured Glass Modules and many others. Write for our catalog: Pittsburgh Corning Corp., Dept. PA-48G, One Gateway Center, Pittsburgh, Pa. 15222.

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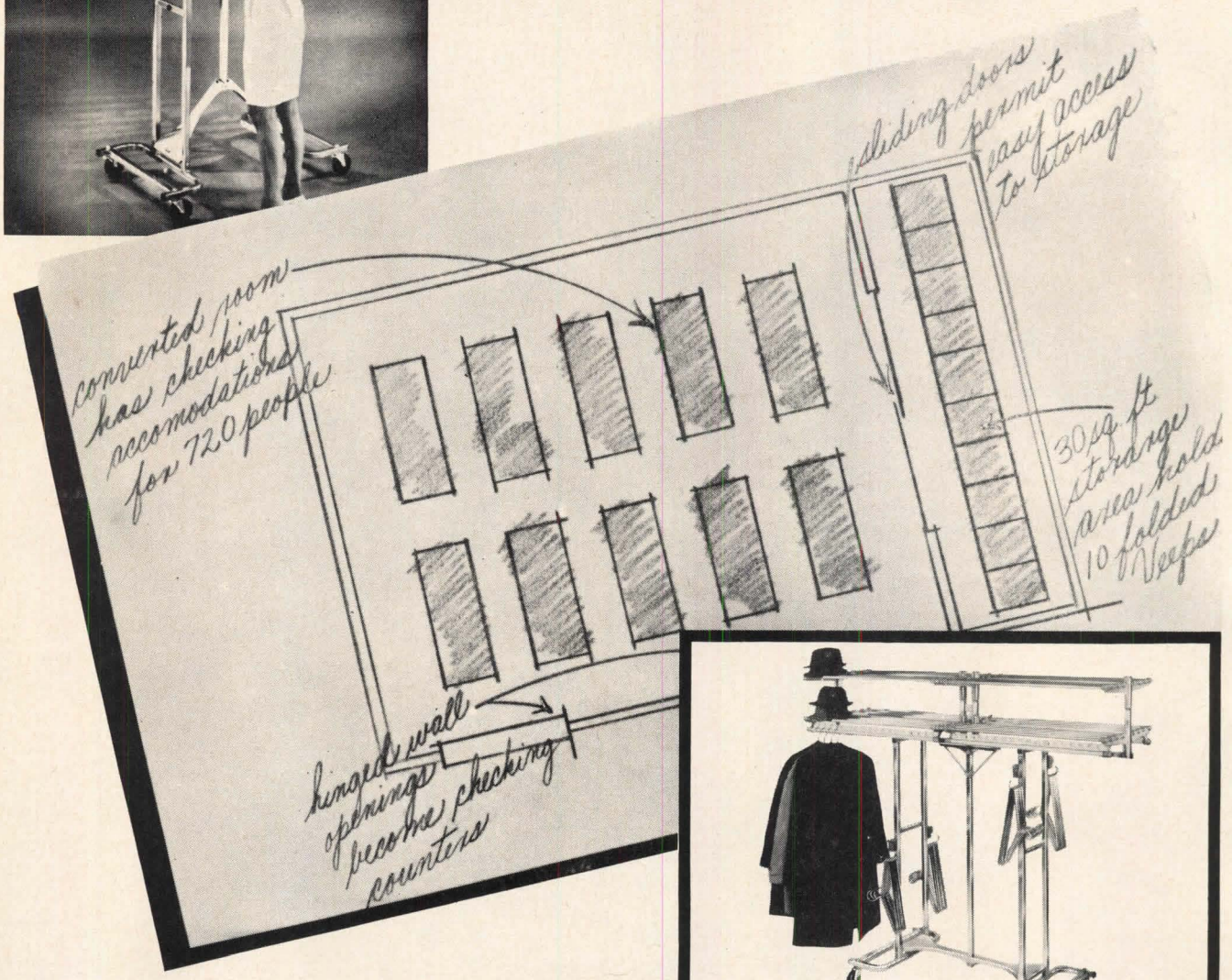
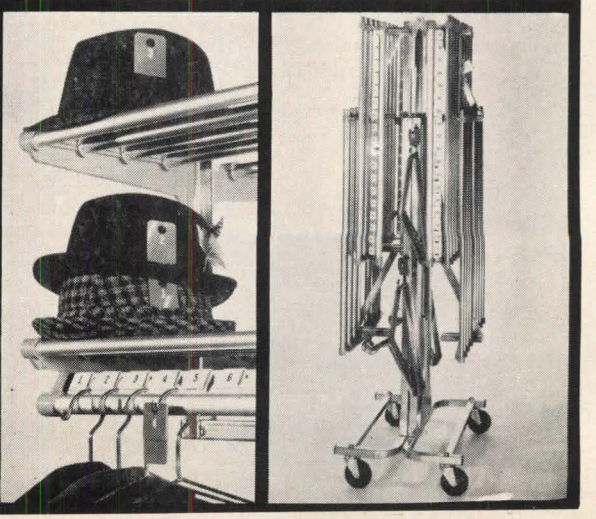
CORNING

"multi·purpose"
CHECK ROOM LETS DOLLARS DO MORE



Two shelf, Model VP400



The VEEP 400 enables you to design in that much needed checkroom without permanently tying up valuable prime access space. Conveniently stored Veep 400's are always ready to turn any available area into an efficient checking facility—instantly—then disappear when not in use. Each unit is complete with its own hangers and numbered guest-checks and is of quality construction—designed to unfold and lock into a rigid trouble-free rack.

The Veep is just one of a most complete line of architecturally oriented coat racks by Vogel-Peterson Co. Write for catalog VP-510

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The Inside Story of Glasweld.

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Economical. Glasweld is simple to install with exterior mastic and mouldings. Large sheets go up quickly. All surfacing can be handled by one trade.

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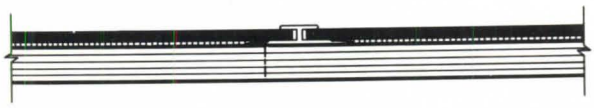
For more detailed information, read our brochure on Glasweld. Call the Architects Service Representative at your nearest U.S. Plywood office for a copy or write:

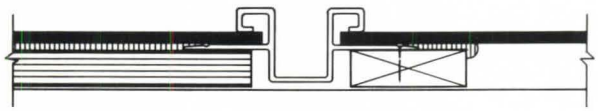
Glasweld Interior Installation Details.

Apply Glasweld to plywood with matching Glasweld moldings and mastic in areas requiring high impact resistance. Moldings are available in plain anodized, Duracolor or porcelainized aluminum to match all Glasweld colors.

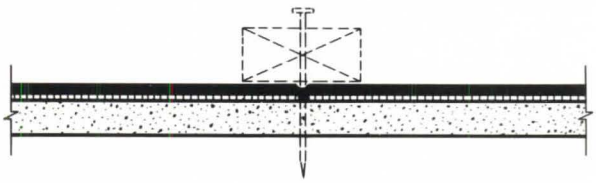


Glasweld can be backed with gypsum board where fire regulations require. (Depending on the construction of the wall, an hourly rating can be secured.) Apply chestnut-size gobs of mastic to the substrate. Trowel, press and seat for adhesion. The "R" series molding shown creates a panelized treatment.

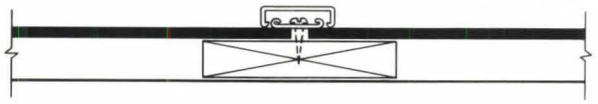
For greater articulation use the "K" series molding. It will create a distinctive scale without increasing overall wall thickness.



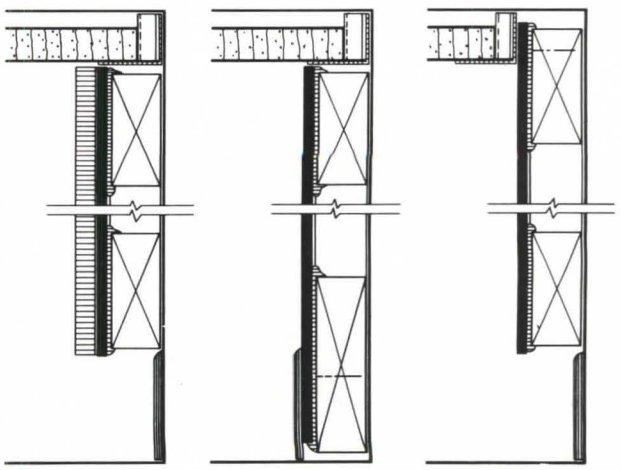
Vertical joints without moldings can be secured by chamfering Glasweld edges with a carborundum flocked steel file. Apply exterior grade mastic to the entire substrate, seat and temporarily block at joint. Fasten top or bottom. Use a grout or sealant at joint.



Where impact is a minimal problem, Glasweld can be mounted on furring strips. Spacing for ⅛″ thickness, 12″ x 120″. Shown here is a snap-on molding which can be used in a matching or contrasting color.



Head and Base Treatments. Where the vertical edges of Glasweld are retained by moldings, panels do not have to be secured top and bottom. Panels mounted without vertical moldings must be mechanically supported top or bottom to prevent slippage due to possible mastic release.



(Scale ⅜″ = 1″)

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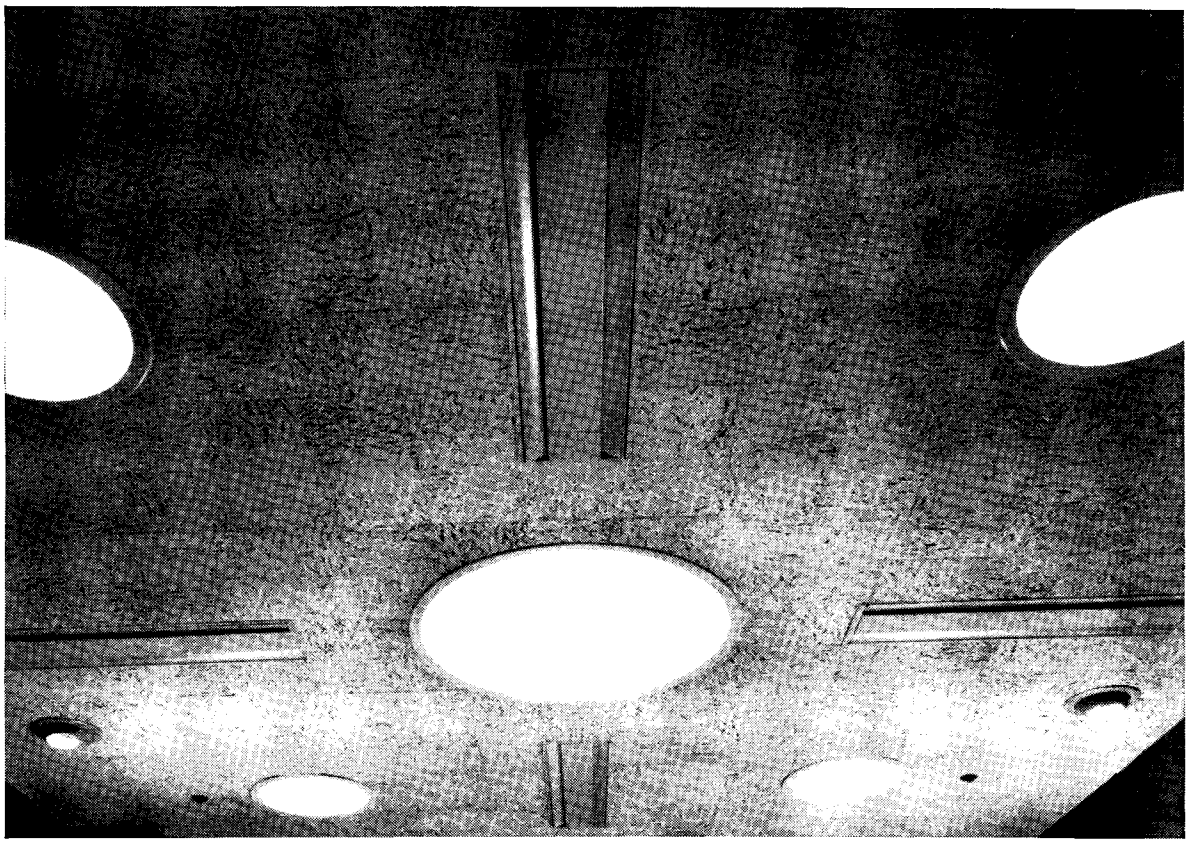

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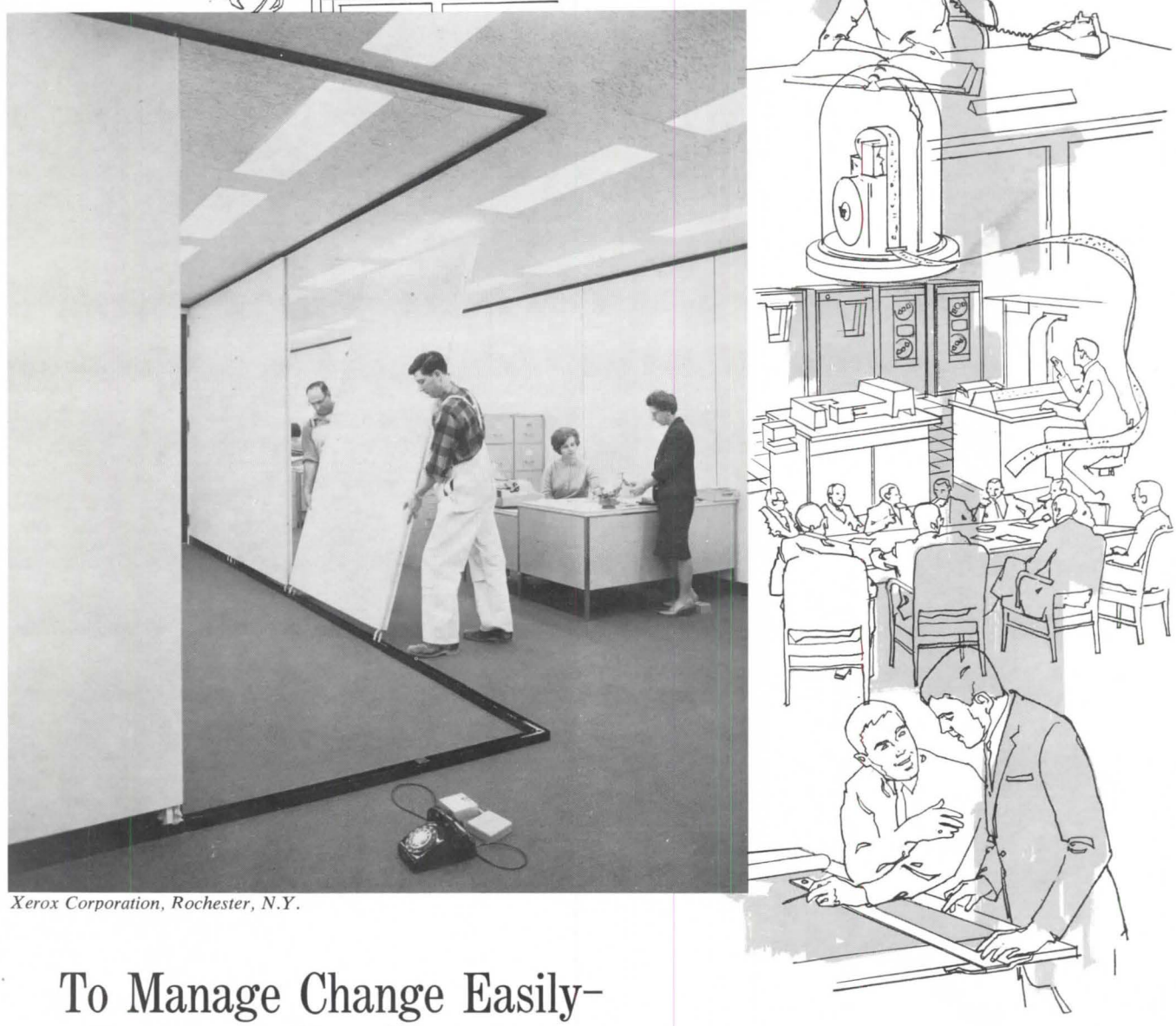

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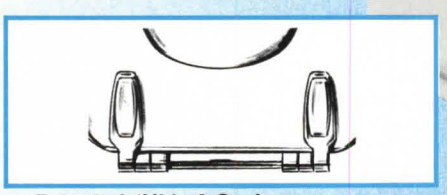

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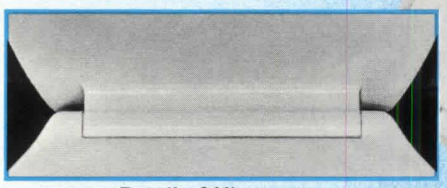

Detail of Hinge area.

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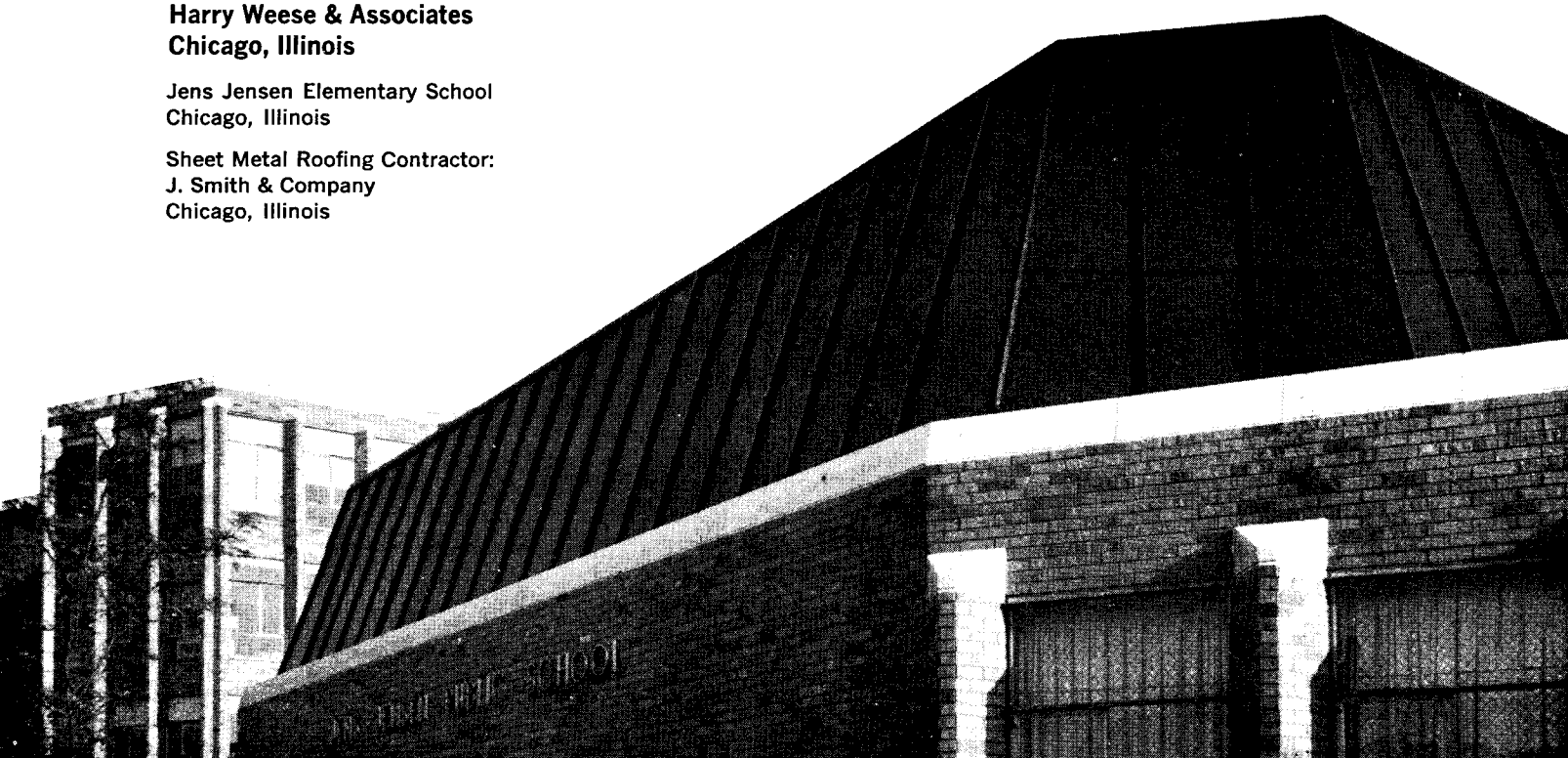


Richard Schultz designs furniture for indoors and out. The same furniture.

Richard Schultz set two goals for this Leisure Collection: It had to work equally well indoors and out. It had to be maintenance free and durable. The result is furniture that is cool to sit on, won't collect rain, dries rapidly and is rust-proof. The construction features aluminum frames coated with textured plastic. Nylon-dacron mesh sling seats with extruded vinyl edge bands. Stainless steel connections. The Knoll Leisure Collection includes lounge chair and dining chair, with or without arms: contour chaise; adjustable chaise; rectangular and square dining tables and coffee tables. In white or beige. Knoll Associates, Inc., Furniture and Textiles. 320 Park Avenue, New York, New York 10022. Knoll International operates in 26 countries.

P/A NEWS REPORT

Progressive Architecture's Monthly Digest of Buildings, Projects, People and Products *April 1968*

DISQUIET IN NEW HAVEN

NEW HAVEN, CONN. Since P/A published its extensive analysis of urban renewal in New Haven and its effect on racial unrest (see JANUARY 1968 P/A), several notable changes have taken place. (1) The Board of Aldermen has tabled the New Haven Redevelopment Agency's plans for State Street after an explosive public hearing, attended by 400 persons on January 24. (2) The city tabled the Model Cities Program, then on March 5 called for a new "Model Cities Agency" to administer the program, not the Redevelopment Agency. (3) The *New Haven Register,* which chided P/A for its criticism of the New Haven police during the city's 1967 summer riots, called for straight talk from the Redevelopment Agency on the controversial Inner Ring Road. The agency says plans for the road do not exist. Agency maps, however, have shown it since 1942. (4) In early February, New Haven aldermen formed a special investigating committee to "evaluate and explore" the Redevelopment Agency's programs and plans.

WHAT'S UP IN POPULATION TRENDS

In 1967, the U.S. birth rate dropped to the lowest level since the Federal Government started keeping track of it. A rate of 17.9 live births for every 1000 Americans is lower than the previous low of 18.4, recorded in 1966, and in the Depression years of 1933 and 1936.

Obviously, the ease and availability of contraceptive devices are being felt in the U.S.; and it seems logical to predict that, as the price of these devices drops, they will attain more widespread use throughout the world, leading to a drop in the birth rate of other already overpopulated countries.

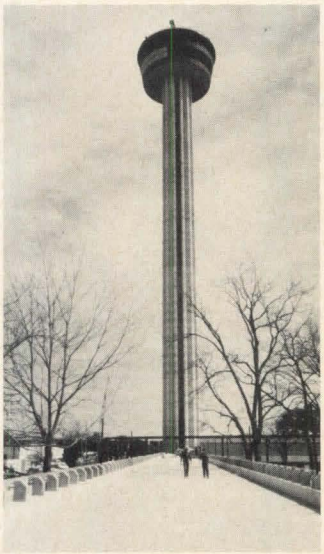
Arthur A. Campbell, however, chief of the Natality Statistics branch of the National Center for Health Statistics, credited the dropping birth rate more to changing childbearing patterns among American women. Today's mother, he pointed out when the statistics were announced, not only has her babies earlier in life but stops having babies in her thirties and forties. Many projections of future population fail to take such changes into account and end up with population figures for, say, the year 2000 that some experts are beginning to feel are far out of line. In a recently published book, *The Year 2000,* Herman Kahn and Anthony J. Wiener argue that, by 1980–85, "if the average family in an underdeveloped country wants to have fewer children, effective birth control techniques will be readily available to them and widely known in their societies." They shy away from predicting how many will actually want fewer children.

It would seem that U.S. women in 1967 actually did want fewer children. Not so, says Campbell. Right now in the the U.S., the women of child-bearing age (15 to 44) represent a smaller fraction (one-fifth versus one-quarter) of the total population than they did a generation ago. Actually, these women are having *more* babies — 88 babies for each 1000 women of child-bearing age versus 76 per 1000 a generation ago. Relatively fewer women are producing relatively more children. At present, the makeup of the population is such that, despite this fertility, the birth rate is dropping. But for the next few years there are going to be an increasing number of women entering the child-bearing age.

How far off population statistics are (most call for a doubling of the world's present population by 2000) depends largely on what happens to the death rate as well as to the birth rate. Currently, the number of births daily throughout the world number 324,000, the daily deaths 133,000 (including 10,000 per day from starvation and malnutrition). As increasingly sophisticated medical knowledge saves more lives for longer periods of time, the birth rate must fall still further just to keep up.

"The long-term goal," write Kahn and Wiener, "will probably be to have women infertile all their lives, and to produce fertility for a specific period by a pill or an injection when it is desired."

HEMISFAIR '68: TOWARD A FAIR DOWNTOWN



Tower of the Americas.

SAN ANTONIO, TEX. Those who still expect Texas to produce the biggest, if not the best, of whatever it is they produce may be disappointed when Hemisfair '68 officially opens its gates April 6. The 622′ "Tower of the Americas" with its revolving restaurant at the center of the 92-acre site will be only the second tallest observation tower west of the Mississippi. But take heart. It will be the tallest permanent World's Fair structure to be erected since the Eiffel Tower pointed its steely finger skyward in 1889.

Photos: J. O. Bragsted

Hilton hotel, two blocks from fair.

Hemisfair '68 is an official World's Fair, accredited by the Bureau of International Expositions in Paris. But when the fair grounds close in October, the buildings will remain. Located just 200 yds from the Alamo in downtown San Antonio, the fair is expected to give the downtown area a dramatic lift, if not while in operation, then after it closes. Already a man-made extension of the San Antonio River winds into the fair grounds and will carry fairgoers in water taxis; a mini-rail system is being installed, and so is a system of elevated walkways. Perhaps the largest physical contribution of the fair will be a $10 million, three-building Civic Center. Also, the $10 million State of Texas Pavillion will become

Civic center and convention center contains 2800-seat theater, 10,000-seat arena, and 200,000-sq-ft exhibit hall.

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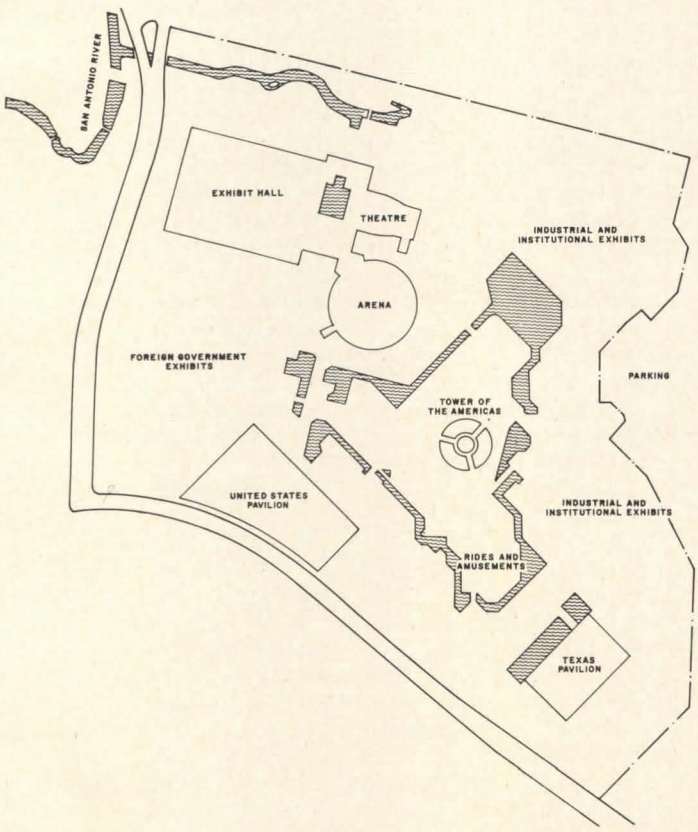
an Institute of Texan Cultures. And a lasting boost may be given to San Antonio by the renovation and remodeling of some 20 old homes on the fair site into specialty restaurants.

Already the effect of the fair is being felt in downtown San Antonio, where some $500 million of new construction is taking place. Only two blocks from the fairgrounds, for example, is the new Hilton Palacio del Rio, 21 stories high, built at a cost of $7,500,000.

Besides the Federal Government, and the States of Arkansas and Texas, 19 private exhibitors and 25 foreign governments will participate in the fair.

Renovated house.

Unfortunately, as the pre-fair scurry of last-minute construction activity reaches a climax, Hemisfair looks as if its architectural contribution will be minimal. But, then, World's Fairs are more than architectural showcases, and if this one can help revitalize a city, it may set a valuable precedent.

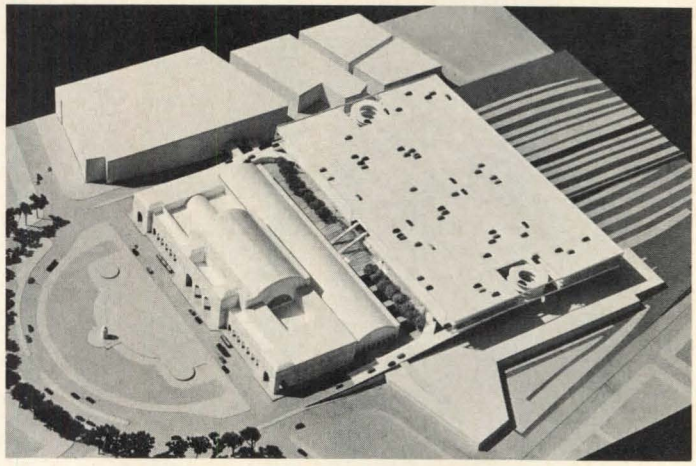


TAKING A TRIP? TRY THE NATIONAL VISITOR'S CENTER

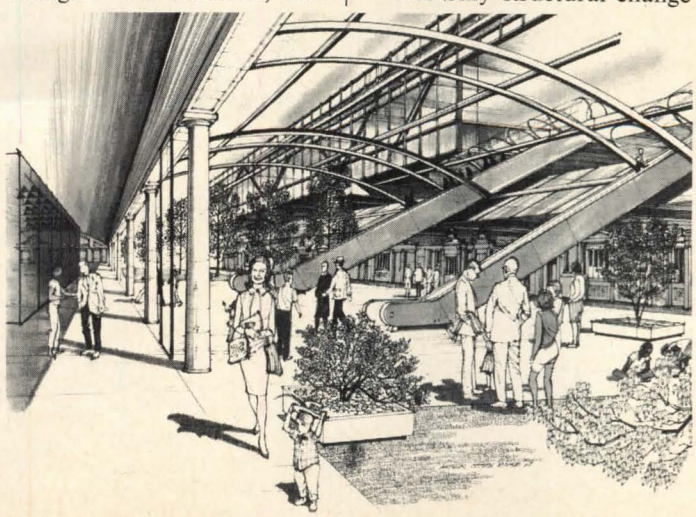
WASHINGTON, D.C. A bill authorizing the transformation of Union Station in Washington into a National Visitor's Center is, as P/A goes to press, on the President's desk awaiting his signature. Presented to Congress last fall, the bill passed both the House and the Senate; and under its provisions the Penn Central and the Baltimore & Ohio Railroads, which own the terminal, would spend $11 million to build a four-story parking structure, capable of holding 4000 vehicles, above the railroad tracks to the rear of the station. In addition, they would put $5 million into refurbishing the station without changing or harming Daniel H. Burnham's magnificent 1902 interior spaces or his handsome façade with its deep arches and Ionic columns. Terminal facilities and offices would be moved beneath the parking structure. Once the old station is outfitted with an elaborate array of sound and sight displays to tell visitors what to visit in Washington and how to get there, the Government will rent the space for not less than $3 million per year.

Washington gets hordes of visitors each year. They pour in by bus from Iowa and Wisconsin and Idaho. They come by train and car and plane to climb the steps of the Washington Monument, to walk through the White House in hushed groups, to visit the Treasury and the FBI buildings. And, mostly, they are ignored and abused. Vice-President Humphrey, who paints a dim picture of his fellow American tourists, says they have trouble finding water fountains in Congressional office buildings, can't find a parking space for their car, have trouble locating a restaurant, and are stranded in a strange city with no official place to get information about what and how to visit. What they very often do get, Humphrey claims, are "parking tickets, a feeling of being strangers and intruders, and above all, shabby, cold indifference to their coming here on what truly is a pilgrimage for themselves and their children."

If the Visitor's Center and its garage are built according to preliminary designs drawn up by Cooper & Auerbach of Washington, D.C., visitors will be able to park in the garage over the railroad tracks. From there, they will move down glass-enclosed elevators into an esplanade between the garage and the old Union Station, listening to a taped description of how to use the Visitor's Center. Just beyond the Esplanade in the old Concourse area will be a 360° movie of the sights of Washington. On either side of this raised circular screen will be two flat-screen theaters, constructed of steel framing and tinted glass panels through which persons passing by can see the film being shown. Also planned is a huge, floor-mounted relief map of the city with lights and sound to point out tourist sights and routes. Upstairs will be restrooms for tourists, a USO facility, and a student hostel.



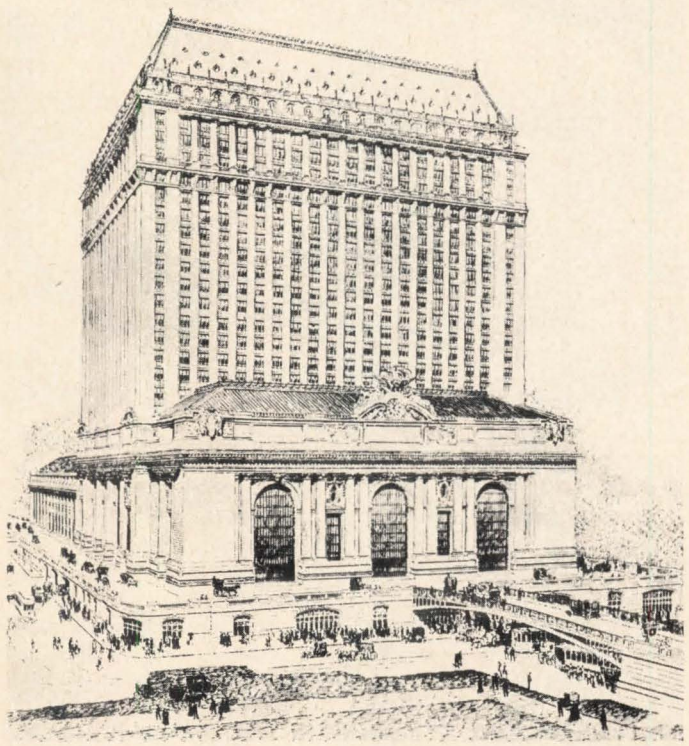
The only structural change



in the existing station will be removal of 64′ at either end of the present concourse to make way for exit and entrance ramps leading to the parking garage. These concourse extensions are not in keeping with the main part of the terminal (its elements have a Doric order, while the rest of the building is Ionic), and there is some speculation that the extensions may have been afterthoughts, put on to handle additional incoming tracks after Burnham completed his design. According to architects Cooper & Auerbach, experts in historic preservation with whom they consulted agreed to the amputations.

Urban planning consultant was Robert L. Playnick; transportation consultant, Alan M. Voorhees & Associates.

GRAND CENTRAL BAUHAUS



1 *Grand Central Station before addition of office buildings above it.*

NEW YORK, N.Y. Marcel Breuer has the commission for an office tower to rise above Grand Central Station. For those who love the grand spaces and the old (1913) façade of Grand Central, it may be a boon that Breuer is to be the one to design the slightly less than 2 million sq ft of space above the station's waiting room. Breuer's client is an Englishman, Morris Saady, who expects to invest between $100 and $120 million in the building. He will pay the Penn Central Railroad a minimum annual lease of $3 million for air rights; under the city's present zoning laws, his building can, if he wishes, go as high as 45 stories. The space Saady will lease above the waiting room is an area of about 146,000 sq ft on the 42nd Street front of the terminal. He will have an air space of some 80′ between his building and the Pan Am building to the north. This distance is at least as much as that across most city streets. But the problem posed is not, of course, comparable to that of building on an ordinary site. For one thing, Grand Central Terminal is a New York City landmark, and under the landmark law its façade cannot be changed. Breuer has stated his intention of preserving the exterior, and as much of the interior as possible, although interior space is not protected by the law. He will have to bring trusses and elevator shafts down into the waiting room. But, with care, even this can be done without desecrating the existing space. A lesser architect-builder team might not even have taken the care to announce a concern for the interior, and would probably have tried to have the exterior restrictions changed.

Photo: Louis Reens

2

Breuer's concern, and indeed one of his reasons for taking the job, may go back to his years at the Bauhaus. It was part of the Bauhaus teaching that an architect or designer should take a distasteful commission and do his best with it, lest someone else botch it. Walter Gropius said as much about his reasons for taking on the Pan Am building with Belluschi.

And now two mammoth skyscrapers — one by the Bauhaus' founder and one by a former pupil — will stand facing one another in the middle of Manhattan, defiantly guarding the air space above Grand Central. Breuer has the more difficult task. How will he produce a Charybdis to go with Gropius' Scylla? Will he be able to preserve the air and light that tenants in the 57-story Pan Am building now have? How will he manage to channel the commuters out of the terminal and into his building without massive pedestrian jams?

In announcing his commission, Breuer was quick to point out that Grand Central Station was originally conceived as a cluster of buildings, and indeed the original competition-winning scheme by Reed & Stem **(1)** showed a 22-story hotel rising above the main concourse. Some maintain that trusses to support such a tower are in place within the arch supporting columns that surround the concourse, but no one remembers now for sure.

Reed & Stem were from St. Paul, and their design for Grand Central was selected over those of Stanford White, who had just designed Madison Square Garden, D.H. Burham, architect of the 1900 Chicago World's Fair, and Samuel J. Huchel, Jr., who had done Philadelphia's City Hall.

Reed was the brother-in-law of William J. Wilgus, the civil engineer who conceived the idea of the new terminal in the first place. It was to replace a station completed only five years previously. But it would bring trains in beneath ground to a fan-shaped terminal and it would straddle

3

Park Avenue — one, as Wilgus conceived it, of a complex of buildings above the tracks. Some thought that the Reed & Stem solution of carrying Park Avenue traffic around the terminal on elevated ramps was Wilgus' idea. Be that as it may, their's was the only solution that handled the traffic without slicing the terminal in two, and their's was the winning submission.

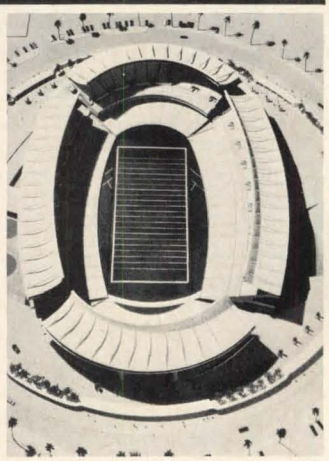
White's multitowered design with a main 40-story office tower rising above the terminal **(2)** looks much like what the Grand Central area may become with the completion of Breuer's commission. The White scheme has the advantage of being designed from scratch, each of its parts relating to and balancing the others. Breuer has the problem of designing in a space that has become cluttered and crowded, like a giant case of milk cartons.

A building too brutal in its façade will congeal the area, like an oversize scab. A building too delicate will merely add to the clutter while becoming lost in it.

Breuer's client wants to make the building a monument. The Grand Central Station area contains enough monuments already to serve a dozen cities the size of Seattle. With care, the area above and around Grand Central can be made to work as well as Rockefeller Center, even though it will never again have the gracious sense of space and light it once had **(3)**.

QUICK-CHANGE ARTISTRY

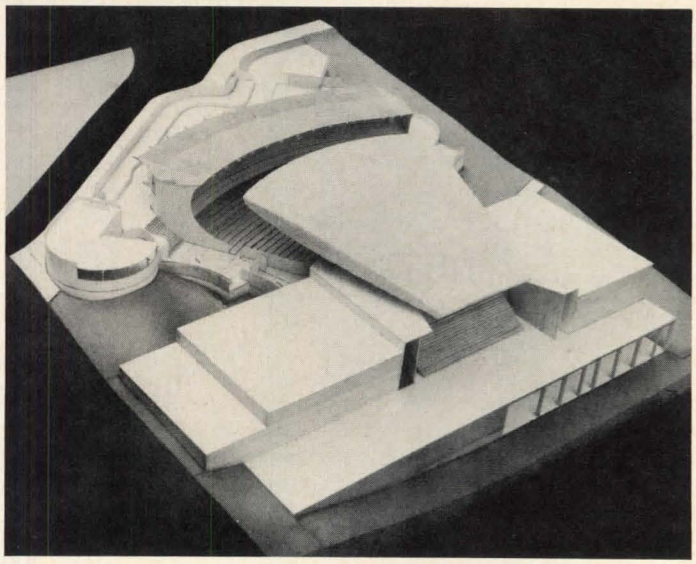
HONOLULU, HAWAII. Preliminary designs by Charles Luckman Associates for a $20-million stadium have received the approval of the City Council and Citizens Committee of Honolulu. After an architectural selection committee had recommended six firms for consideration, the Citizens Committee chose the Luckman office, primarily because of the simplicity of the Luckman proposal for converting stadium seating to suit either baseball or football games.



The approved design in fact allows complete alteration of the stadium's shape by making it possible to move 27,000 seats in 20 minutes. Only the ends of the basic oval will be fixed; remaining sections will be supported on a space frame, which, in turn, will rest on manually or hydraulically operable jacks. An electric motor will transfer the structure's weight from the jacks to railroad-type wheels when a section of seating is to be moved. Structure, ramps, and seats will move outward as a unit from the oval arrangement for baseball to a configuration of broken arcs for football. The design calls for flexible conduit electrical connections and swivel connections for water and sewage disposal.

By late 1969, the first phase of stadium construction should have been completed, with a spectator capacity of 36,000 seats.

ENCORE FOR THE OPERA



SANTA FE, N.M. Western aficionados of the opera are currently paying close attention to the construction of Santa Fe's second opera house. Santa Fe has had its own opera for 11 years — or did, until the building burned last July. Since then, architect John McHugh of McHugh & Kidder, who designed the first one, has been commissioned to provide a larger and more substantial building, and construction is well underway at the original site.

To be built primarily of concrete and concrete masonry, sheathed partly in tiled marble, the new structure will seat an audience of 1356 persons. Dressing rooms, storage space, and stage machinery will be larger and more complex than the provisions in the old building. Estimated cost of the project is $1,337,000. The client, the Opera Association of New Mexico, looks forward to completion of the project in time for the 1968 summer season in July.

ARCHITECTS HAMPER PREFABRICATION SAYS UNION REPORT

WASHINGTON, D.C. Architects must be considered a major bottleneck to the future growth of prefabrication in the construction industry, according to a lengthy report by the Battelle Memorial Institute, released in Washington early in March.

The report was the result of a $66,000 study funded by the AFL-CIO Building Trades Department, which, according to President C. J. Haggerty, wants to know what effect the "talk about prefabrication, about technological advances, new and substitute materials" would have on the construction industry, and particularly on the Building Trades Department's component unions and their future.

Over-all conclusions were that prefabrication would not have a major impact by the year 1975, but that the field would grow as the idea of prefabricating as many building components as possible (either on or off-site) takes hold. One result, said the report, would be "opportunities" for about half of the building trades unions — notably the Operating Engineers, electrical workers, and "threats" to the other half, including painters and paperhangers.

The survey was conducted, according to Battelle, by means of a series of interviews with all segments of the construction industry, including architects and engineers, building material manufacturers and suppliers, and others.

Of architects, the Battelle report had this to say:

"Under the present construction process, the architect has to be considered as a restraint to the future growth of prefabrication. By education, the architect is not oriented to systems engineering, but rather to designing in terms of aesthetics, art, and expressing his own personality. Any change in the area of new products or methods that re-

stricts his freedom to express, or decreases his selection of building components, is a potential 'threat' to his profession.

"To date, most of the architects have readily accepted well-designed preassembled components that lend themselves to design flexibility. But they have not been so willing to accept various types of unit prefabrication, such as the 'pre-engineered' metal buildings and others. This is understandable since there is little architectural input required on these types of buildings.

"The biggest area of potential conflict is represented by systems building. As previously mentioned (in this report), in Europe the successful building systems employ a basic team approach to construction, usually with the sole responsibility for the project being delegated to the contractor. As a result, the European architect is relegated to a much lesser role than he ordinarily has in this country. For this reason, the architects will undoubtedly resist the system building concept in the United States, especially if it is patterned after successful European systems.

"Another potential area of conflict arises from the construction industry's procedure for rendering architectural fees. Since this is geared to the cost of construction, any time a substantial cost reduction is evoked as a result of new methods and/or techniques, the architect's fee is reduced. It will be virtually impossible to optimize a design so long as this procedure prevails."

In answer to press questions after presentation of the report in the AFL-CIO's impressive Washington headquarters, Rolland B. Guy, of Battelle, said that engineers are not mentioned in the report as "constraints" because they are generally more oriented to the systems concept.

The lengthy report (236 pages, plus appendices) is available at cost from Mr. Haggerty's office, 815 16th St. N.W., Washington, D.C. 20006. Haggerty said that his organization plans no immediate action on the basis of the report; it wants to have its component unions study it in detail before deciding what to do. — E. E. HALMOS, JR.

THE VIEW FROM THE TERRACE

ACCOKEEK, MD. From the front porch at Mount Vernon, George Washington could look down across the Potomac River to the hills and forests beyond. Today, some 200 years later, *you* can do the same thing, and chances are good that your children and grandchildren will be able to enjoy the same unspoiled views.

On the afternoon of February 22, Secretary of the Interior Stewart Udall announced the establishment of Piscataway Park, 956 acres of rolling Virginia countryside on the banks of the Potomac opposite Mount Vernon. In addition, scenic easements over 1202 acres of adjacent private properties were obtained. These lands will be protected from the blight of commercial or industrial building.

Acquisition of the land took 20 years, hampered by soaring land prices as private owners jacked up prices for Government buyers. Over half the purchased acres were acquired by three foundations: The Accokeek Foundation, the Alice Ferguson Foundation, Inc., and the Moyaone Association, which turned the acreage over to the Federal Government. One hundred sixty-eight donors provided the scenic easements.

It is hard to imagine Mount Vernon surrounded by a welter of gas stations, diners, used car lots, and souvenir stands. Now, fortunately, if you want that effect you will have to imagine it.

OCTAGON FUND IS OVER THE HUMP

WASHINGTON, D.C. Members of the AIA contributed more than $1 million last year for restoration of the Octagon House and construction of a new headquarters building. According to G. Harold W. Haag of Jenkintown, Pa., a member of the Institute's board of directors, who headed the fund drive, pledges received amount to $1,001,-040.88.

Planning work for the Octagon restoration got under way late last year before completion of the fund-raising campaign, and, by last month, J. Everette Fauber, Jr., who is architect for the restoration, was ready to report on his research.

Also last month, Mitchell/Giurgola Associates were again revising their plan for the new AIA headquarters, working with the AIA Building Committee.

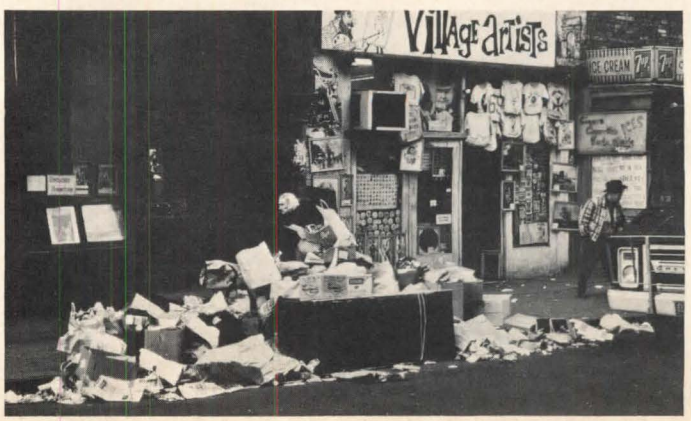
Perhaps the most significant point about the successful fund raising was the relatively low level of campaign expenses, which amounted to only about $25,000, or slightly more than 2%. Fund-raising expenses are usually close to 10%.

EXAMPLE FOR THE KIDS

Photos: Forrest Wilson

NEW YORK, N.Y. Although most everyone knows of man's penchant for fouling his own nest, in some pockets of so-called civilization man seems determined to keep proving the point. My nest is dirtier than yours, he appears to be shouting. But even so, like persons who ignore the antics of a child showing off, some New York City dwellers are yet to be convinced that the city became any dirtier during the week-long February garbage strike than it had been before. "After working for six months in the Bronx," said one Manhattan resident recently, "the garbage strike was nothing."

P/A Associate Editor Forrest Wilson thought that the city at least looked different, if not dirtier, and he took these photos to show his children how not to behave when they grow up.



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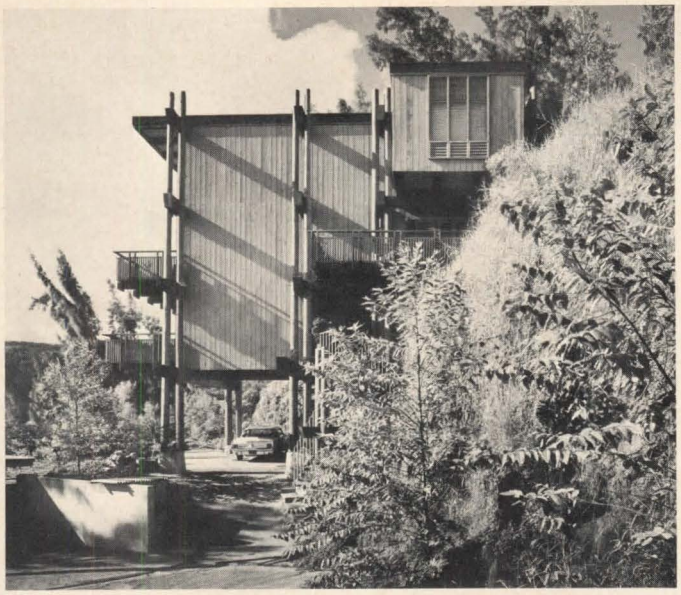

Photo: R. Wenkam

Residence by Wimberly, Whisenand, Allison & Tong. Jury comment: "Straightforward solution to the use of a difficult site."

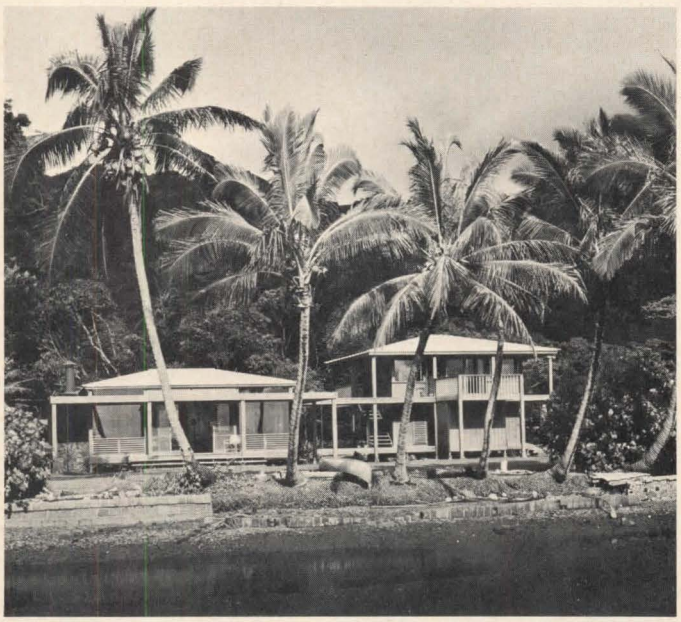

Photo: R. Wenkam

Residence by George T. Johnson. Living-dining area at left, bedroom wing at right. Jury comment: "Simple, crisp detailing without resorting to clichés."

Residence for builder-client by Charles J. Chamberland. Jury comment: "The skillful handling of architectural details gives the basically simple house distinction."

Photo: Walton Tregaskis

Royal Kaanapali Golf Course Club House by Wimberly, Whisenand, Allison & Tong and Vladimir Ossipoff & Associates. Jury comment: "Quiet, open grouping of buildings . . . tasteful and appropriate taking full advantage of the environment."

IT'S HAPPENING IN HAWAII

HONOLULU, HAWAII. The Hawaii Chapter, AIA, awarded five honor awards to local architects at its annual banquet in mid-January. Members of the awards jury were architects Thomas H. Creighton, chairman, J. Hugh Burgess, and A. Bruce Etherington, who gave awards to two residences for private clients, a residence for a builder-client, a golf course clubhouse, and the interior design of a travel agency office. Jury comments are noted in captions.

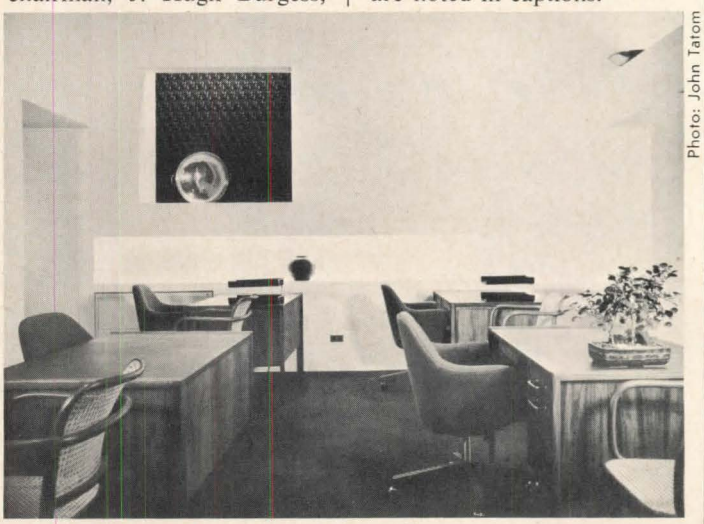

Photo: John Tatom

Interior design of the Castle and Cooke Travel Agency Office by John Tatom, with John Hara, project designer. Jury comment: "High degree of visual interest . . . orderliness and a strong discipline in use of materials and carefully placed artifacts."

LOSING PROPOSITION

SEATTLE, WASH. Proposition 1 on the ballot for metropolitan Seattle voters February 15 turned out to be a loser, despite a 50.7% majority vote in its favor. At issue was authorization of a $385 million bond issue to finance a metropolitan rapid transit system (see p. 49, FEBRUARY 1968 P/A); necessary majority for passage of bond issues in Seattle is 60%.

Proponents of "Forward Thrust," the citizens' group that organized support for the transit plan, and a number of other projects for civic improvement also listed on the February ballot, are not discouraged by the failure of what they consider the most important element of their program. James R. Ellis, president of the group, intends to resubmit rapid transit to the voters at the earliest opportunity, and expects that it will eventually receive the necessary approval. His hopes seem well founded, for the plan has the backing of public officials and politicians, including Mayor Braman and Gov-

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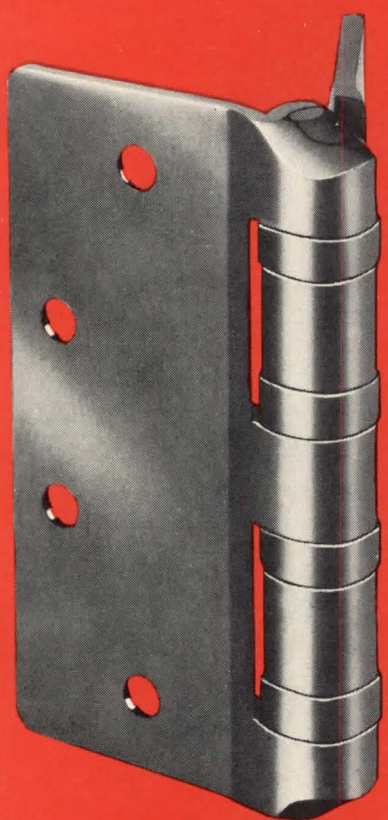

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Less attractive appearance

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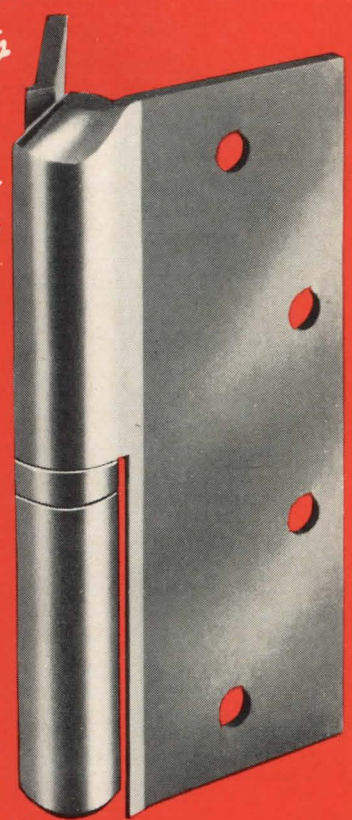
Quiet... smooth, silent oil-impregnated bearing

Slim... straight line design ... smooth hospital tip

Faster installation... separable leaves needs less time, manpower to install or fit doors



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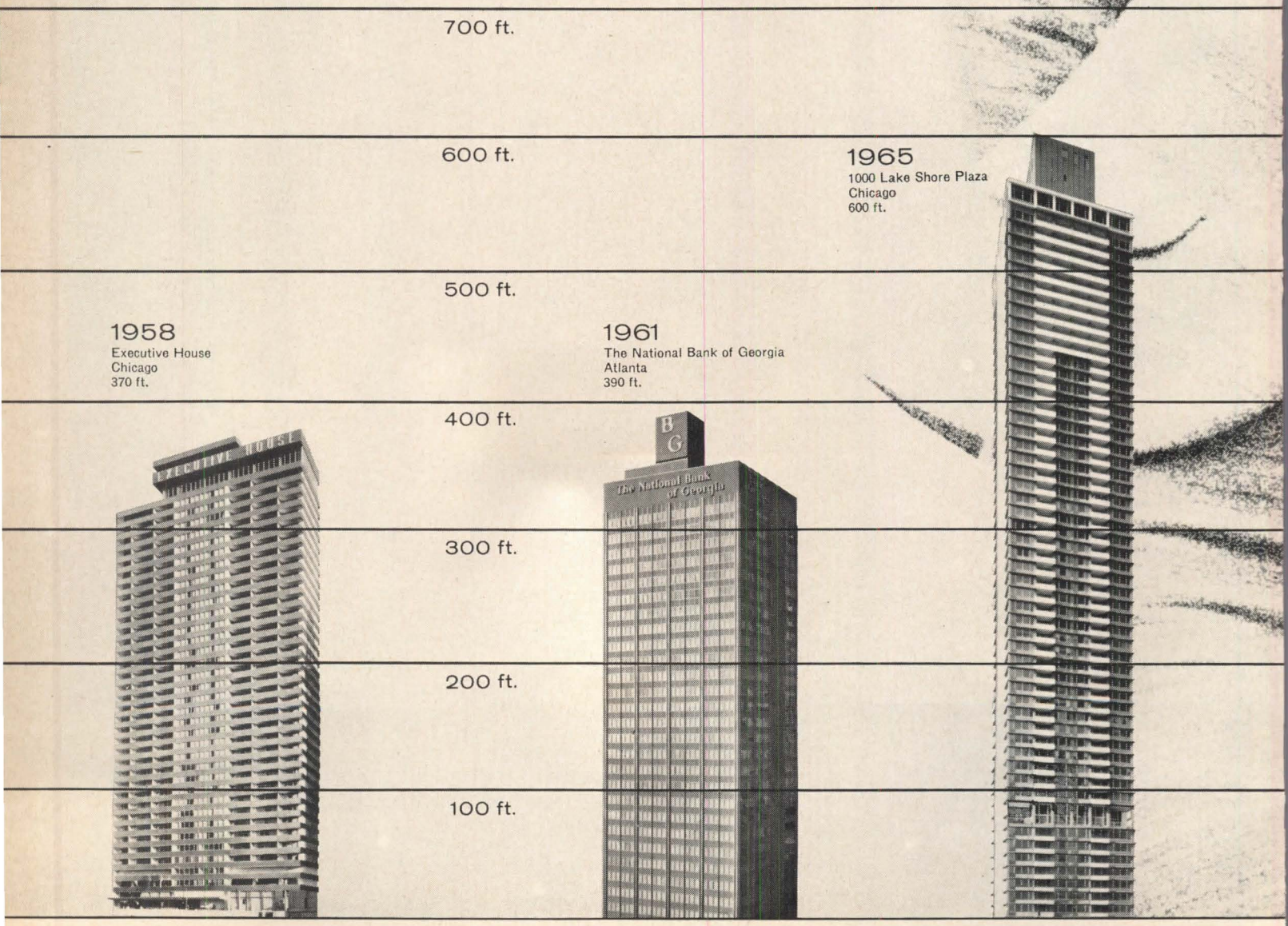

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ernor Evans. And there is a rather impressive precedent: this winter, as voters turned down the transit plan, they finally approved a $40 million multipurpose stadium that Forward Thrust had unsuccessfully pushed for passage in the fall of 1966. Ellis says that no part of the plan for rapid transit will be altered before voters are asked to take a second look.

ALL BUILDINGS ARE BROTHERS

Photo: Toshio Taira

TOKYO, JAPAN. As the International Style office building spreads throughout the world (see following article), only the street signs can give a traveler a clue as to whether he is on the Kurfürstendamm, the Ginza, Michigan Boulevard, or Sunset Strip. The latest, and not, incidentally, the tallest office building to rise in Tokyo is this 18-story steel-and-glass structure designed by I. Ebihara & Associates.

To build 245′ above ground in Tokyo, the contractor had to go 78′ beneath it, because of the twin hazards of soft loam and possible earthquakes. Just beneath the soil level is a layer of gravel. On this, a concrete mat foundation was laid that is claimed to support a total load of 50,000 tons.

Below grade, five basement floors house mechanical equipment, parking space, and shopping arcades.

The building will be known as the DIC Building, after the major tenant, Dainippon Ink and Chemicals, Inc.

TOWERS ON THE VELD

Photo: Gianni La' Magna

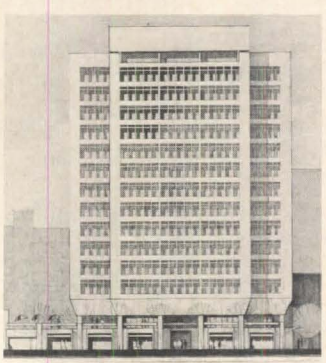
NAIROBI, KENYA. Ten years ago, Nairobi was a quiet West African town, just recovering from what the local residents referred to as the "emergency," the Mau-Mau terror. Since then, Kenya has announced its political independence and has gone through an almost inevitable cycle in which the European settlers are forced to move away and then urged to come back again.

Today, Nairobi is in the midst of a mild building boom; buildings soar toward the sky, far above the red tile roofs of the traditional white stucco, two- or three-story buildings that once gave Nairobi its image as a white hunter's haven.

Two recent Nairobi office buildings were designed by U.S. firms. One, 13-stories, by McMillan Griffis Mileto (above), is owned by the Aga Khan and is now open for business; the other (right), 16 stories, is still in the design stage by Gruzen & Partners, working as associated architects with Dalgliesh Marshall & Associates of Nairobi. Their client is the International Life Insurance Company.

Both buildings make concessions to the Kenya tradition of window space for every employee: the MGM building by using a long narrow shape, the Gruzen building by a cruciform plan. This latter plan may put some workers further from the windows than they would like, but the building is to have central air conditioning and the architects want it to be efficient. It will be the first time central air conditioning has been used in a Nairobi building and the entire machinery will be imported, together with elevators and the structural steel, from Europe and the U.S.

Nairobi is located only 100 miles from the equator; but because of its mile-high elevation, the weather year round is about 70°F. Still, the sun beating through glass windows can make building interiors uncomfortably hot, and for this reason both buildings have well recessed windows. Nairobi also has an abundance of skilled carpenters who can provide good formwork, and the quality of concrete work is relatively high. Consequently, both buildings are of concrete. Both have ground floor arcades; moreover, the Gruzen building has a broad plaza and an open, three-story galleria, with shops, a restaurant, and a bank. The International Life Insurance building, with total floor space of 165,000 sq ft, will cost an estimated $4,200,000, about two-thirds what such a building would cost in the U.S.



TALL TEXAS MONUMENT

DALLAS, TEX. Watch it grow. When completed, perhaps sometime in 1972, the second office structure in Dallas' Main Place complex will stand 45 stories tall above the Texas plains. It will rise on 4 acres opposite a similarly clad granite building, One Main Place, which will open in June. Both buildings are the work of the New York office of Skidmore, Owings & Merrill.

As the architectural profession moves rapidly away from the monumental style of architecture toward the creation of environments, or at least toward the creation of buildings that harmonize with their environments, this type of design is typical of that done in some old-line offices, which are moving, if at all, at a snail's pace from designing single monumental buildings to designing groups of two monumental buildings.

The latest Main Place structure, designed by SOM in association with Harwood K. Smith & Partners, will have almost 2 million sq ft above ground and more than 1 million below. At 625′, it will be — almost anticlimatically — the tallest building in Dallas, and will cost $86 million.

Eventually, Main Place will

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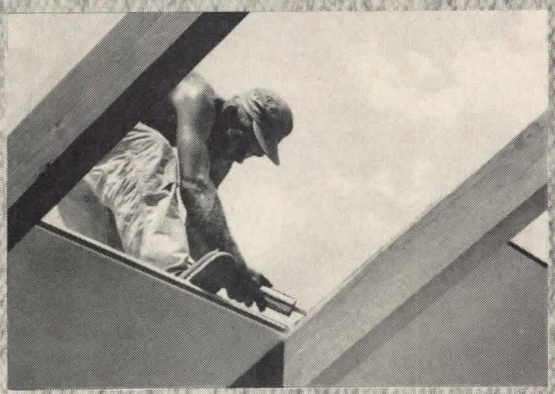
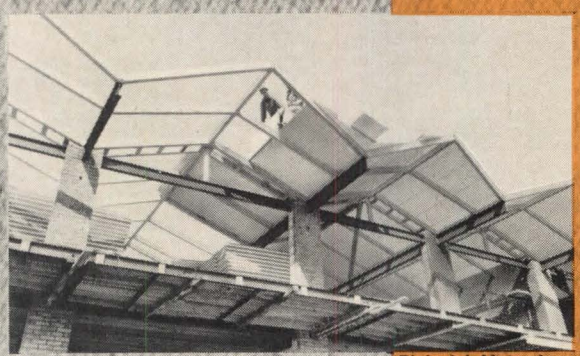
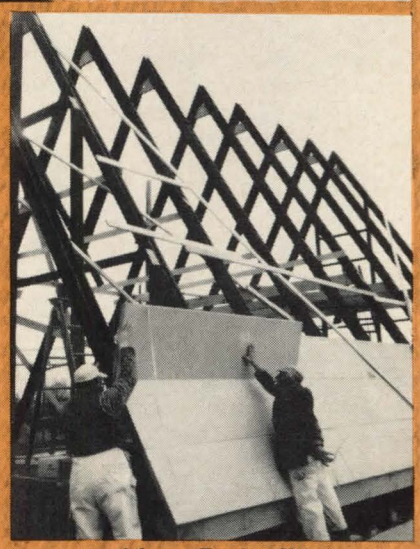


Residence, Darien, Conn.

Charland Manufacturing Co.
Charleroi, Pa.



Pickwick Motor Inn,
Plainview, N.J.



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have four major buildings, all connected below ground. For the tenants (Atlantic Richfield is the first major tenant in the newly announced building), the complex, which will include a hotel and a major department store, will be a prestige location. But what will it be like for the people who work there, and for the city of Dallas?

INTERPROFESSIONAL MEDIATION: A NEW APPROACH

Hoping to forestall the type of interprofessional dispute that winds up in the courts and militates against true interprofessional collaboration, a seven-society organization has now formally approved a mediation procedure and put the plan into full effect.

The new "Procedure for Mediation of Interprofessional Controversies" is designed to end the type of battling that recently resulted in long court actions, before architects and engineers won the right to certification as "land planners" — without special examinations and qualifications — under a New Jersey state law.

It was developed by a special task force of the Interprofessional Commission of Environmental Design (ICED), made up of AIA, Consulting Engineers Council, American Institute of Consulting Engineers, American Institute of Planners, American Society of Civil Engineers, American Society of Landscape Architects, and National Society of Professional Engineers.

In essence, the procedure — now formally ratified by all member societies — is supposed to work this way:

(1) Local chapters or other local groups of any member organization examine the dispute, and, if it deems the matter to be "of sufficient gravity," notifies its own national organization (not ICED), furnishing supporting data.

(2) The national office gets in touch with national offices of other members who might have an interest in the controversy, signalled by its local chapter. These other groups get in touch with their own local components in the area for information, which may then be used in determining jointly (among the national offices) whether the matter actually warrants national mediation.

(3) If this "fact-finding" leads to an agreement by the national offices concerned that mediation is desirable, they will each make efforts to get their local components to request mediation services offered by ICED.

(4) When mediation requests have been received from two or more societies, ICED alerts all component societies of the situation, locality, and other circumstances, and asks each society to name one panelist and one alternate to serve on an "Ad Hoc Mediation Task Force." (A society, if not directly involved, may decline to be represented on the mediation panel.) When all appointments are in, the Chairman of ICED appoints a chairman and secretary for the panel, each from "neutral" organizations, if practicable.

(5) The mediation panel holds investigations, hearings, and so on, presenting reports of each meeting to ICED after each meeting.

(6) The only panel "final report" that will be acceptable will center on one of two elements: (a) a mutually satisfactory agreement, entered into by both or all parties; (b) abandonment of the mission, after all efforts to work out a solution have failed. ICED has no power to take any action of itself, or intervene in any way; but, after receiving the final report from the panel, it may elect to make recommendations for ratification by constituent bodies.

All materials, correspondence, and the like are to be handled as confidential, at least until an agreement is reached, or the mission abandoned.

Commenting on the plan, a statement from ICED said, in part:

"ICED earnestly desires to find a means to minimize interprofessional controversy, and whenever possible, to dissuade court action. The objectives are . . . to work for harmony among the members of the environmental design teams, which by their services to the public are much in the public eye."

THE MIND EXPANDER

VIENNA, AUSTRIA. Chairs are very personal things, so personal that some architects design them to go with their buildings. Other architects, such as Ulrich Franzen, who lives in New York, don't like chairs, "which may be one of my problems," he told a *New York Times* reporter recently. The *Times* quoted Franzen in a brief article called "Man's Four-Legged Friend: His Chair." The *Times*' problem is that chairs aren't necessarily quadrupeds any more. Some, like bar stools, have only three; some, like Marcel Breuer's tubular steel chair, two; and some, like Saarinen's pedestal chair, only one.

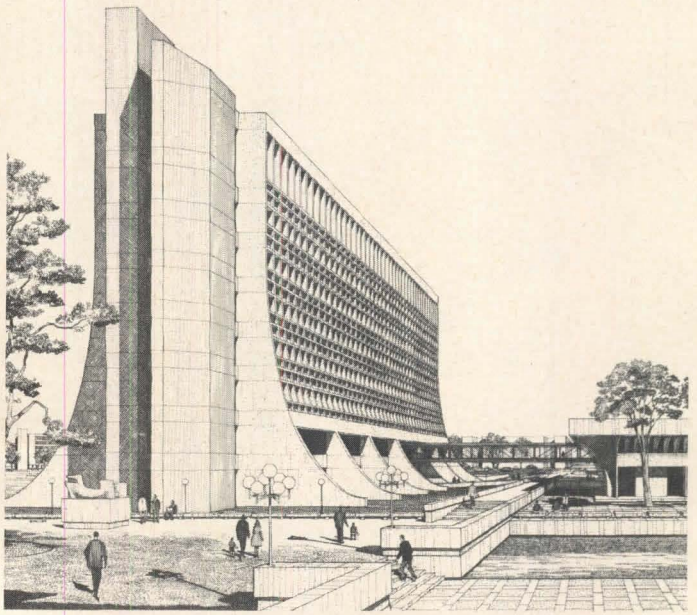
Two Austrian designers, Laurids Ortner and An-An Hareiter, have now designed a very personal chair that has no legs at all to speak of. They entered it in the German furniture competition, Interdesign 2000, where it failed to win a prize but won lots of comment from the press. Looking a little like a throne that might be used by Ming,

Photo: Michael Pilz

the mortal foe of Flash Gordon, the chair is called the "Mind Expander."

Just looking at it does something to the mind. But when you sit in it with a girl, and fasten the seat belt, that plastic bubble canopy comes down over you and a pulsing sound matches the rhythm of your heart. "You are happy about it," the designers explain. It might even persuade people like Ulrich Franzen to start sitting in chairs again.

A PLACE IN THE SUN



MIAMI, FLA. One of 12 prototype centers for the study of child development and mental retardation in the U.S. is being constructed on the campus of the University of Miami. Funds for the project were provided by a U.S. Government grant of $3,054,432 and by private sources, whose contributions equal the amount of the grant. The center will train personnel for dealing with retarded children, conduct research, and treat patients. Schooling, training, and recreation will be an integral part of the center's program. All the diverse activities entailed by the center's aims are to be confined within the 4½-acre site.

Since a large out-patient clinic had to be readily acces-

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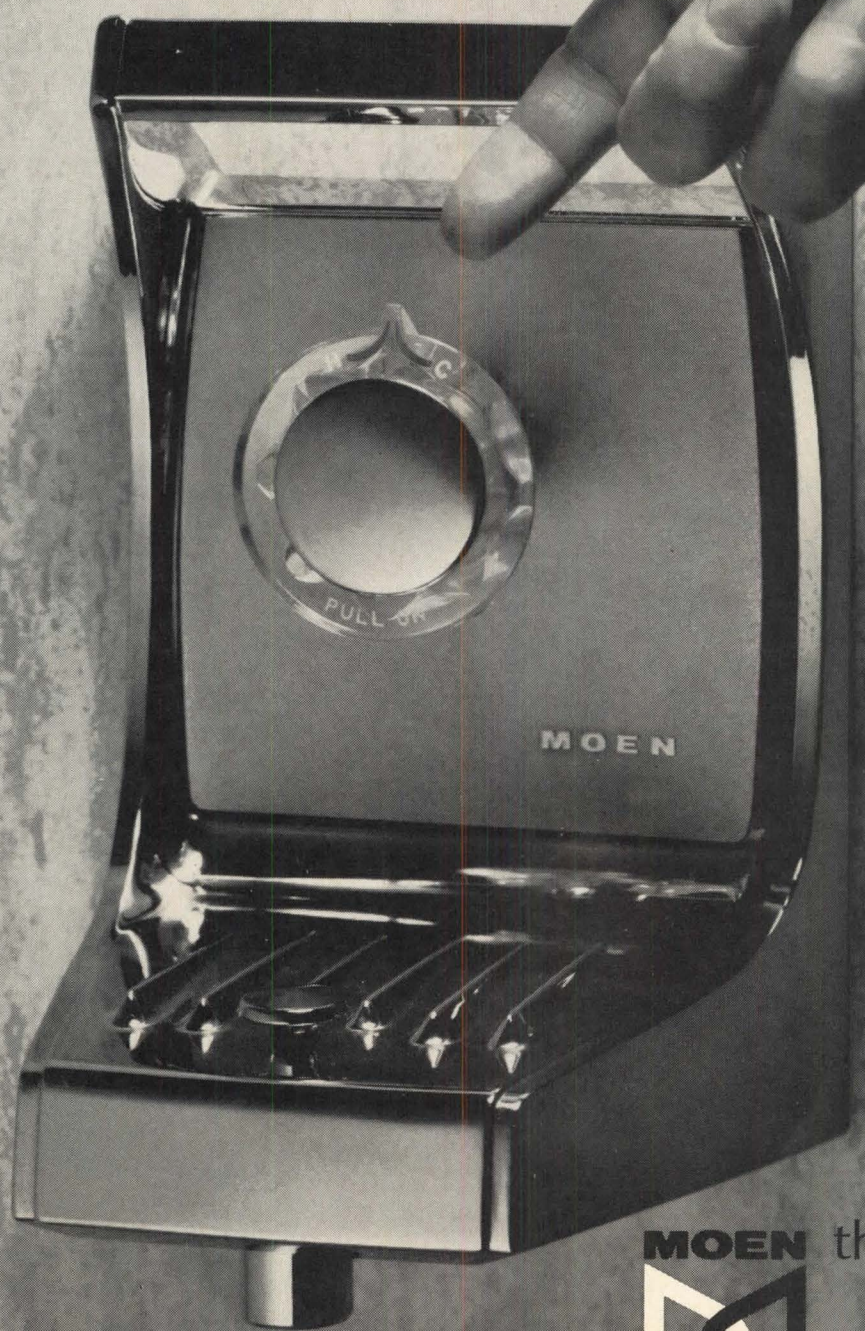


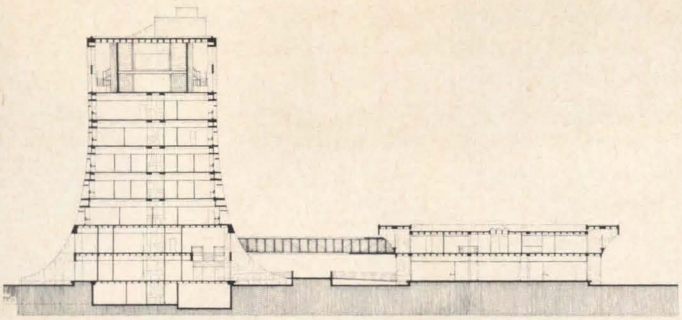
Also see Moen's 8-page catalog in SWEET'S Light Construction File, Sec. 12c/MO and in Architectural File, Sec.25b/MO

MOEN® the faucet that turns people on.

Moen, Elyria, Ohio 44035, a Division of Standard Screw Company, 216/323-5481

S-681

On Readers' Service Card, Circle No. 370

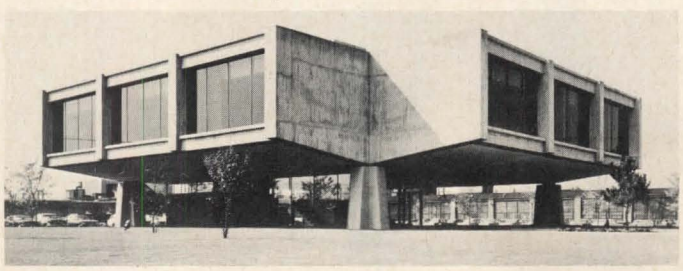


sible, and an administrative area required 13,000 sq ft on one level, while floors of approximately 10,000 sq ft were necessary for flexible office, study, and laboratory space, architects stacked these functions in an eight-story building of diminishing floor sizes. Large fins projecting beyond the lower two stories provide protection from the sun and privacy for patios that open off clinics.

At the top of the tower, which has been designed to allow for future construction of four additional stories, "eggcrate" fins shade setback windows of amber glass. Fins are also a characteristic of the two-story school and in-patient living areas for mentally retarded children. Family dwelling units and wards are located on the upper floor of this structure, with enclosed loggias opening from each unit. Classrooms on the ground floor are designed as multiuse spaces, and open out into an enclosed play-yard. A third element of the complex is a broad plaza that adds to the visual relationship between the two structures. Textured, natural-finish concrete is the major structural material and exterior finish.

The project is a joint venture of Pancoast/Ferendino/Grafton and Watson, Deutschman & Kruse, architects.

STILTED, BUT STYLISH



CHICAGO, ILL. Architects of an executive office building for the Arvey Corporation have conquered an all-too-common site problem in a somewhat unusual manner. The building, which takes in 16,350 sq ft of space, is situated on a triangular lot on Kimball Avenue, adjacent to two expressways and a railroad embankment. By placing the structure on stilts 11′ above ground, designers Fridstein & Fitch gave it a commanding view of the area.

The solution is a welcome contrast to the results one might expect from such a site; picture the low-slung roadside industrial buildings that, seen from the highway embankment, seem to be sinking into a swamp. With its large window areas and angular skylight, the Arvey Corporation's new building gives the impression of a light-box for viewing transparencies. The actual view from within may not be scenic, but will afford a constantly changing panorama of vehicular movement. The gray tinted glass of window walls blends with the structure of board-formed, cast-in-place concrete. Approaching the building, one encounters a broad landscaped plaza that offers a see-through vista between the stilts. A service entrance leads directly to the data processing department, and a parking lot adjoins the building. Interior finish of natural teak wood complements the color scheme of black, white, gray, and teak-brown.

The structure was recently completed and is ready for occupancy.

CALENDAR

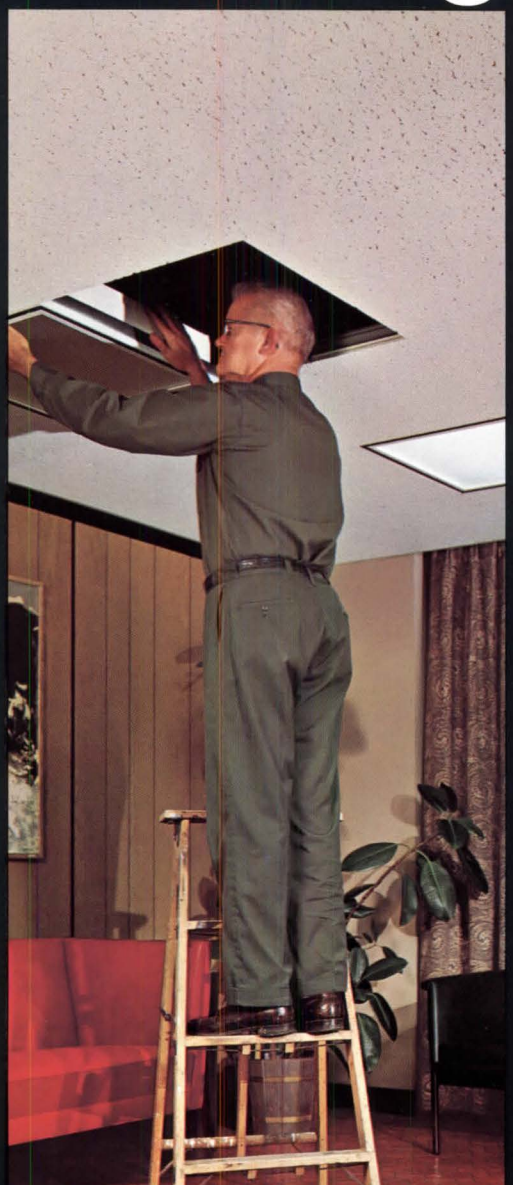
The students of the University of Arkansas department of architecture will present a **Megastructure Symposium** April 19–20. For further information, write to: Richard Dagenhart, Secretary, Megastructure Group, Department of Architecture, University of Arkansas, Fayetteville, Ark. . . . The School of Architecture, Washington University, St. Louis, Mo., will hold a **Continuing Education for Architects Conference on Campus Planning,** April 25–27. Studies of campus planning examples will be presented by Walter Netsch, Ben Weese, and Gyo Obata. Architects who wish to attend are invited to request details from Associate Professor Robert C. Oswald at the University . . . A similar program to the one planned for Washington University's conference is also scheduled for the **Fourth North American Conference of Campus Planning and College Building Design,** to be held April 28–May 1 at the University of Illinois. Master plans of new university campuses in the U.S., Canada, and England will be discussed. For more information, write to: "Architecture and the College," Department of Architecture, University of Illinois, Urbana, Ill. 61801 . . . Technical meetings of the American Society for Testing and Materials are scheduled for May 1–3 **(Acoustical Materials),** May 12–17 **(Mass Spectrometry),** and May 20–24 **(Inter-American Conference on Materials Technology).** All interested persons are invited to attend these meetings; for details, write to: ASTM, 1916 Race St., Philadelphia, Pa. 19103 . . . Headquarters for the **20th Annual National Engineering Conference of the American Institute of Steel Construction,** May 2–3, will be the Sheraton-Park Hotel, Washington, D.C. Reservations can be made through AISC, 101 Park Ave., New York, N.Y. 10017 . . . The **Annual Meeting of the Consulting Engineers Council of the U.S.,** May 7–9, will convene at the Statler Hilton Hotel, New York City. Program information is obtainable from: Raymond J. Rice, Meeting Chairman, 2 Park Ave., New York, N.Y. 10016 . . . The University of Wisconsin Extension will present a seminar on **"Specialized Flooring Systems,"** May 21–22, on the university's Madison campus. Inquiries should be directed to Dwight D. Zeck, Institute Director, 725 Extension Building, 432 Lake St., Madison, Wis. 53706 . . . The **Spring Membership Meeting of the Aluminum Association** is planned for May 22–25 at The Greenbrier, White Sulphur Springs, W. Va. Write for information to: The Aluminum Association, 420 Lexington Ave., New York, N.Y. 10017 . . . **The Fourth Annual Theater, Television, and Film Lighting Symposium,** sponsored by the Illuminating Engineering Society, will be held May 26–28 at the Barbizon-Plaza Hotel, New York, N.Y. For information on the program of technical papers, panel discussions, and a lighting progress show, write to: T. M. Lemons, Sylvania Lighting Center, 100 Endicott St., Danvers, Mass. . . . The **First International Congress on Lightweight Concrete** will be held May 27–29 at the Royal Lancaster Hotel, London W2, England. The congress is under the auspices of the Concrete Society, Ltd. The society's address is: Terminal House, Grosvenor Gardens, London SW1, England.

BUSING THE PUBLIC

HEMPSTEAD, N.Y. Minibuses, capable of carrying 22 persons, are prowling the streets of this Long Island community. Operating with the help of a grant from the Department of Housing and Urban Development, the buses carry as many as 500 commuters a day from their homes to the local railroad station. The fare is a reasonable 25¢ a trip, and at least some of the residents in this area, which previously had no mass transit at all, are finding that the need for a second car is not as pressing as it once was.

The four buses meet every commuter train, then swing in a loop through two areas of South Hempstead, leaving commuters at bus stops near their homes. During the rest of the day, the buses carry housewives, children, and older persons to schools and shopping centers for an off-peak fare of 40¢ The area

We hid the grid.



But not the accessibility.

Or the flexibility.

That's the beauty of it.

Used to be, accessibility and flexibility in a ceiling meant exposed grid work and lay-in panels. If you wanted the appearance of a tight, acoustical tile ceiling, you had to sacrifice flexibility. And to add accessibility you then had to put up with trapdoors and hatches.

But now, there's a new and unique way to handle acoustical tile: the Armstrong Accessible Tile System. You use the same tiles you normally would with a "permanent-type" tile ceiling—only now, tiles can be removed, replaced, rearranged. (A special tool slips between the tiles to release them—quickly, easily, neatly.) The result: complete accessibility.

As for flexibility, you can shift tiles, grilles, and lights—in any modular arrangement. All the parts not needed can be re-used.

With the Armstrong Accessible Tile System everything fits. Today, tomorrow. That's the beauty of it.

Like a closer look at this very accommodating system? Want complete details? Write Armstrong, 4204 Watson Street, Lancaster, Pa. 17604. Or on Readers' Service Card circle No. 300.

CEILING SYSTEMS BY
Armstrong

the buses serve has a population of about 29,000, and, on a recent winter Saturday, about 10% of these residents used the buses to get to the local shopping center to skate, see a movie, or even to shop.

The HUD grant will help support the bus service through June 1969. Until then, it will obviously go a long way toward keeping automobiles off the streets — where they belong.

WASHINGTON/ FINANCIAL NEWS

By E. E. HALMOS, JR.

Housing Bill — Although chances for full acceptance by Congress have to be considered doubtful, in view of monetary problems, politics, and possible riots and demonstrations this coming summer, the President's huge $6 billion Housing and Urban Development Act of 1968 is worth serious study by architects and others in the construction industry.

The program (already before Congress as S. 3029) picks up features of almost every other housing bill that has appeared on the Congressional roster during the past year: rent supplements, added funds for urban renewal and low-income housing, easier mortgage terms, aid to private builders, help for poor families in acquiring their own homes, more money for Model Cities programs. It attempts to enlist the aid of private capital and private talent, doesn't go so far as several bills that would permit the poor to earn "sweat equity" by working on their own homes.

Two other messages — one calling for transfer of urban mass-transit activities from Housing and Urban Development to the Transportation Department; the other for a raise in maximum guarantee on G.I. loans from $7,500 to $10,000 — complete a housing "package" on which the Johnson Administration will stand in this election year.

The program has obvious political and social overtones: It is already billed as a major answer to possible unrest in the cities this summer, and this provides much of its interest, and indicates as well some of the problems it may encounter. Congress wants to find an answer for urban riots, but if "rights" activists push other riots (or if a proposed mass march on Washington this month results in violence), its chances may be killed. Congress is very touchy about being pressured into passing legislation.

In addition, even though outlays in the initial stages won't look too bad on the budget totals, the final cost involved is enormous. Moreover, the total suggested bill of $1,400,000,000 for urban renewal, $2,500,000,000 for Model Cities, the proposals to guarantee "new communities" for private builders up to $50 million each, and $1,200,000,000 for low-rent housing (over six years), is frightening to a Congress that must go home in a few months to face voters' ire over high taxes.

Nevertheless, at least some parts of the program seem to have some prospect — that is, if the Administration does not insist on an all-or-nothing approach. One of these, for example, is a proposal that would allow low-income families to buy homes from private builders, paying a "specified percentage of their income" on mortgages, with the Federal Government paying the rest (including all but 1% of the interest) as a form of subsidy. Another may be the proposal for tax deferrals to aid insurance companies in supplying capital; still another, a plan to authorize formation of privately funded partnerships that would put private capital (on a national scale) into building of low- and moderate-income housing.

These proposals, together with the guarantees to private builders of "new communities," wouldn't cost too much in actual Federal cash, and could well provide a strong stimulus.

Other proposals, which include construction of 75,000 units of public housing, 90,000 rental units for moderate-income families, quadrupling of current appropriations for Model Cities, and a big jump in urban renewal funds, do not seem to have too much chance. Congress has been unhappy with the whole public housing idea for some years, both because of slow progress (some 35,000 units in a peak year) and the typically unimaginative, dull design concepts. The lawmakers also haven't been happy with the urban renewal programs for a number of reasons: They don't like overriding of local political entities, as, for instance, attempts by HUD's planners to force changes in local laws and codes; and they're very wary of direct help to private builders of developments (these activities have been involved in too many local scandals over zoning, building codes, and the like).

One item of interest to architects seems likely to get short shrift: a proposal for a $20 million appropriation for "urban technology and research." Many construction industry groups have argued that there's enough research underway now, and that it is practical work, privately funded, that doesn't need the heavy hand of Government, except possibly to provide coordination.

Over-all, the President's program is ambitious enough: It would call for construction of more than 2,600,000 housing units and apartments each year for 10 years — almost double the rate of single-family housing construction over the past two years.

And it offers some encouragement to architects: a repeated call for consultation with architects and other planners to produce a better environment.

Construction Safety Standards? — Continued hearings before House committees on the subject of "industrial safety" continued to disturb the construction industry, which sees them as an opening wedge to Federal safety standards.

Ostensibly, the concern is with such things as working conditions in factories, safety and installation of gas and fuel pipelines, packaging that might prove dangerous in the home, and the like.

But the probable extension to construction, which, unhappily, boasts the nation's second highest accident rate, is obvious. Federal officials, such as Labor Secretary Willard Wirtz are talking about penalties that include "freezing" contractors out of Government work, jail terms, and fines for "knowing and willful" violations of Federal standards.

Breuer Takes Gov't. Dam Job — In an action believed to be without precedent, the Bureau of Reclamation has engaged an architectural firm to "provide architectural design features" for the new Third Power Plant at Grand Coulee Dam.

The firm of Marcel Breuer & Associates will provide architectural design concepts for the 200′ forebay dam: an extension of the existing structure; the new powerhouse; visitor facilities, and other features. First stage of the powerhouse will be a 20-story structure encompassing an area the size of four city blocks.

The firm's selection was the first outgrowth of the appointment, a year ago, of a Board of Artistic Consultants to advise on the design and aesthetics in planning and construction of major Bureau of Reclamation projects. Design recommendations will be provided by the architect for all parts of the complex — dam, penstocks and anchor blocks, gate deck, elevator tower, and the like — "with particular attention to color, form surface, choice of materials and lighting."

Financial — There was an encouraging note for the housing field in January, according to the Census Bureau, when housing starts jumped off at an adjusted annual rate of 1,445,000 units — up from December's 1,243,000 rate, and substantially above the 1,111,000 rate of January 1967.

■ Over-all, the construction industry wound up 1967 with a total of $74,700,000,000 worth of work put in place — almost no gain over the $74,400,000,000 registered for 1966. There's a sobering note, too: The Commerce Department said that in terms of "constant" (1957–59) dollars, the 1967 figure comes down to about $59 billion.

■ Construction costs continued to climb: Federal Water Pollution Control Administration said its construction cost index jumped a huge 1.9% in January (over December), the highest rise in the three-year history of the index.

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On Readers' Service Card, Circle No. 341

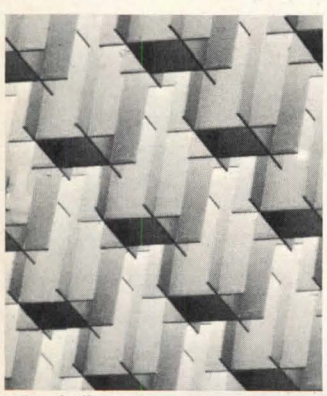
PRODUCTS

CEILING VISIBILITY

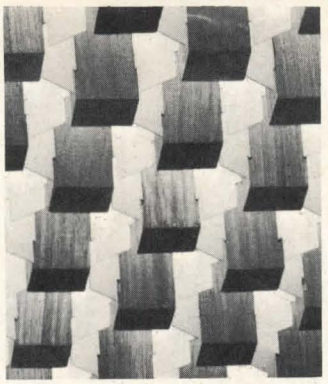
Because a manufacturer believed that architects were confused by the vagaries of terminology in specifying illuminated ceilings, the company devised a methodical, step-by-step process cataloguing its extruded aluminum ceiling patterns that can be simply specified by type and category. Terminology, according to the firm, will aid architects by being more descriptive — e.g., "major profile" and "minor profile" correspond to main runner and cross tee.

Panel widths and lengths are based on multiples of 4′ long fluorescent tubes and rest on visible or invisible grid supports. A "wall profile" intended for wall-to-wall installations and a "perimeter profile" for areas where no ceiling contact with adjacent walls is desired supplement the major and minor profiles, which may also be used for soffit-to-soffit designs. The supports are produced in 11 profiles; lengths are 10′ and 8′, except for the minor profiles, which are 2′, 3′, and 4′ long. When the supports are hung on ¼″ steel rods as recommended, the specifications call for a finished ceiling to be leveled at ⅛″ in 12′.

The patterns are adaptable to irregular designs, and the manufacturer claims 27 options are available for all designs when the choices of area shapes, perimeter terminations, and variety of grid supports are combined. The "shielding elements" or grid patterns have been initially catalogued at 10 designs (2 of which are shown), interlock without clips, and are easily lifted, then slid for access to the plenum. The firm claims a minimum visual cutoff of 45° for any pattern. Finishes: gold, bronze, matte black, white; other colors may be specified. Similarly, custom-designs may be commissioned. Free working drawings and services are offered. Neo-Ray Products, Inc., 315 E. 22 St., New York, N.Y. 10010.



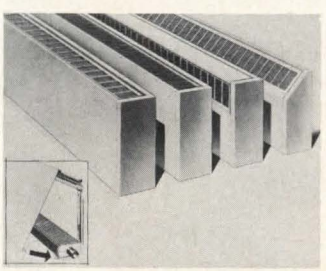
"Quadra"



"Quiet"

Circle 100, Readers' Service Card

AIR/TEMPERATURE



What's in a radiator. Linear styling with fin-tube systems is available in either hydronic or electric radiators. Steel and copper-aluminum fins are used in the units; electric elements use a three-step control option said to offer economy and little temperature variation. Dampers, installed directly on the elements, reduce capacity by 70% instead of the usual 30% attained by grill-mounted dampers, claims the manufacturer. Cabinet surface temperatures are purportedly 90 to 120 F in normal operation. The Trane Co., 206 Cameron Ave., La Crosse, Wis.

Circle 101, Readers' Service Card

DOORS/WINDOWS

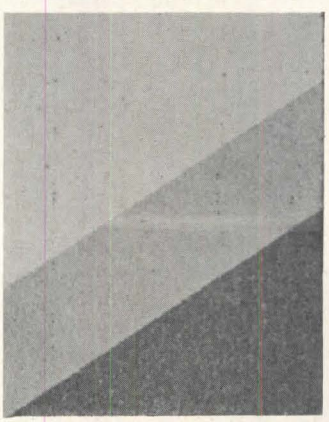
Glare back. More than a tinted glass, "Glare-Check" uses a polarization process claimed to be permanent and unaffected by light or weather. The glass's neutral gray tint reportedly transmits true colors, uses a safety glass type laminate, and comes in thicknesses from ¼″ to ½″. Light transmission: 25% to 45%; the glass can be matched to neutral tinted glass for parallel installations. Polacoat Inc., 9750 Conklin Rd., Blue Ash, Ohio 45242.

Circle 102, Readers' Service Card

Light opposition. "Magic Wand," a hand-operated device shaped like a gigantic swizzle stick, is attached to a rod working the tilting mechanism for venetian blinds. The tilting feature, which may be used in a single unit or integrated for controlling many units, will produce a uniformity of height and angles for the firm's blinds if the latter option is chosen. Aluminum slats are 1″ wide for "Riviera" models and are held in a slender but strong ladder using .45″-diam. cord instead of wide tape. Levolor Lorentzen, Inc., 720 Monroe St., Hoboken, N.J. 07030.

Circle 103, Readers' Service Card

FINISHES PROTECTORS



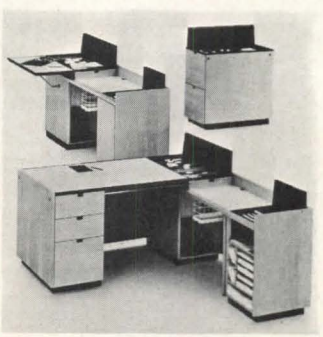
Tile coat. "Epoxy Tile Coat" is made to replace ceramic tile facing on masonry, plaster, and wallboard, according to the manufacturer. Cost is said to be two-thirds that of tile. Impact resistance is 72 in.-lb, and the coating is stable from –10 F to 150 F. Coating thicknesses: 8 and 16 mil. Kurfees Paint Co., Louisville, Ky.

Circle 104, Readers' Service Card

Pollution defense. A clear coating material, "Concrete Barrier," is designed to combat the damaging effects of air pollution, the main cause of cracking, spalling, and dusting of concrete, brick, and mortar, says the manufacturer. The coating waterproofs exterior surfaces and is also a final curing and finishing material claimed to eliminate the need for sealants, hardeners, and dust preventatives. If used on interior walls, the product is said to refract ultraviolet and infrared waves, reducing the fading of painted surfaces, while remaining invisible. Application: 250 sq ft per gallon. National Chemical Corp., 950 Watertown St., West Newton, Mass. 02165.

Circle 105, Readers' Service Card

FURNISHINGS



Merged furnishings. "System" is a series of component office furnishings permitting notable flexibility in horizontal and vertical dimensions through the use of brackets, separate tops, panels, and matched modules. It is possible that a desk be integrally joined to other furnishings of this series. Other features: utilities wiring through pedestals, fastidious detailing, plastic edging, and matte finishes on oak veneer. Massey-Ferguson, 1901 Bell Ave., Des Moines, Iowa.

Circle 106, Readers' Service Card

Nylon vinyl resuscitation. For several years, plastic fabrics have been quietly "breathing." "Comfortweave" does the same, but the manufac-

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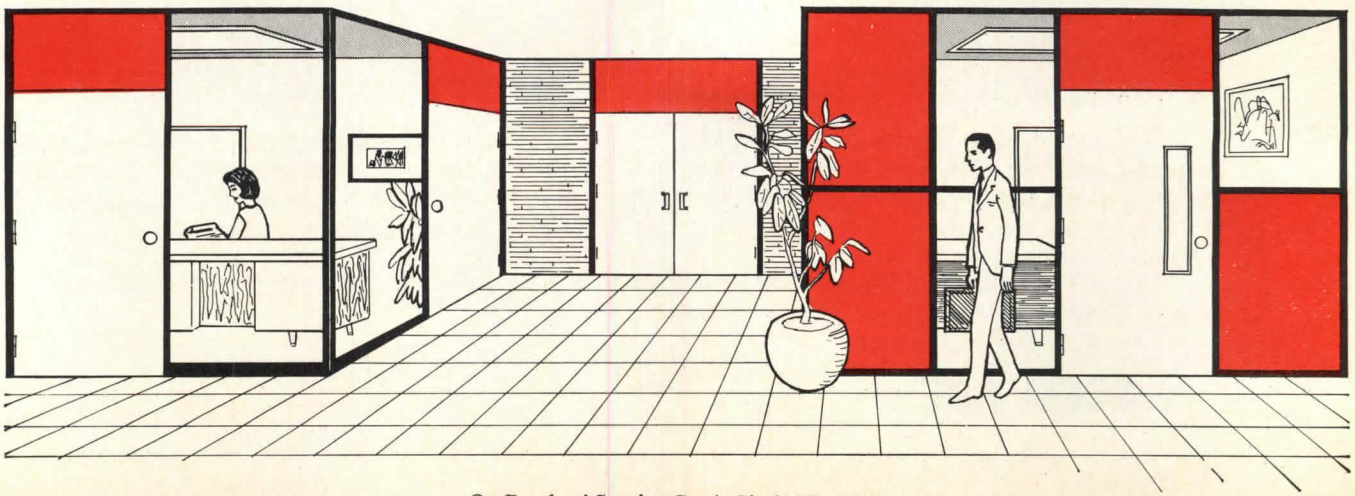


On Readers' Service Card, Circle No. 324

turer claims that this is the first knitted fabric of nylon and vinyl strands to do so. The fabric is soft and has openings over 44% of its surface, a percentage allowing air to circulate freely in upholstering furnishings. The fabric blushes in 14 colors. Ford Fabrics, Mt. Clemens, Mich.
Circle 107, Readers' Service Card

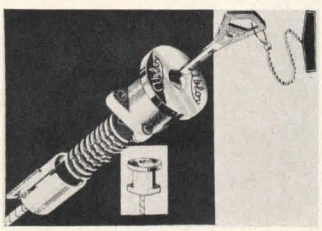
LIGHTING

Floodlights without a glare. Dangerously bright glare spots thrown by floodlights often "blind" people who depend on power-lighting for their safety. This predicament is especially true on the highway or in arenas. Special-purpose velvet-black shields, reflectors and "cutoff tubes" can provide shielding, and help rivet attention on what is being lighted rather than on the source. Manufacturer uses these devices in his "Baffle-Floods" with incandescent, quartz iodine, or mercury fixtures. Stonco Electric Products Co., 338 Monroe Ave., Kenilworth, N.J. 07033.
Circle 108, Readers' Service Card

SANITATION PLUMBING

Kids and lavatories. "Lady Fair" lavatory is shaped like a miniature bathtub and may be used for baby bathing. Among its other uses: a shampoo basin. A flexible hose-spray attachment and more conventional lavatory fixtures equip it for many uses. Kohler Co., Kohler, Wis.
Circle 109, Readers' Service Card

SPECIAL EQUIPMENT



Rotating disc locks. Because these cylinder locks have rotating discs instead of spring-loaded pins, manufacturer claims there is no risk of failure from weakened recoil. There are 4,500,000 combinations possible, set by rotating the discs. And, because a lock picking tool cannot reach the locking bar, the locks are said to be "pick resistant." The Finnish manufacturer, Abby, now makes them available in the U.S. Intertrade Industries, Ltd., 5000 Buchan St., Montreal 9, Quebec, Canada.
Circle 110, Readers' Service Card

Emergency fountain. An eye wash fountain cleans eyes with two separate, steady streams of water, eliminating hand-to-eye motions that consume time. Planned for areas where chemicals and gases are used, the fountain has a large push lever, claimed to eliminate fumbling for controls; an automatic volume regulator assures a constant water flow. Stainless steel. The Halsey W. Taylor Co., 1554 Thomas Rd., Warren, Ohio 44181.
Circle 111, Readers' Service Card

Planters for people. Designed by Elsie Crawford, this glass fiber planter with sculptural seats was honored with a

prize award in the 23rd International Design Awards of the American Institute of Interior Designers. The model shown is 8′ in diameter, 2′-8″ in height, and comes in 20 colors. Architectural Fiberglass, 2020 S. Robertson Blvd., Los Angeles, Calif. 90034.
Circle 112, Readers' Service Card

SURFACING

Velvet touch. With the appearance of suede and the feel of velvet, "Dauphin" is really a knitted, washable nylon tricot "laminated to an expanded vinyl." Marks can be wiped

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a universal

lighting system

PRESCOLITE

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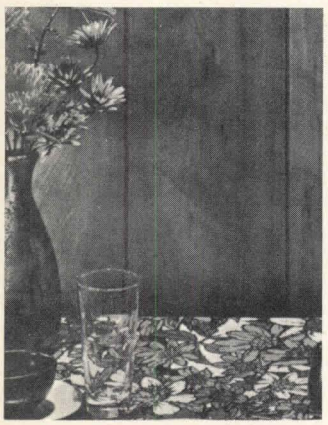
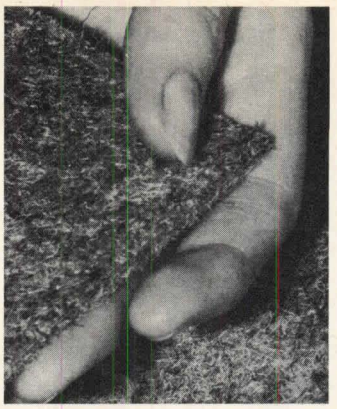
off the durable surface. The 54″-wide fabric may be used for wallcovering and upholstery, comes in stripes and colors. Gilford, Inc., 387 Park Ave. South, New York, N.Y. 10016.
Circle 113, Readers' Service Card



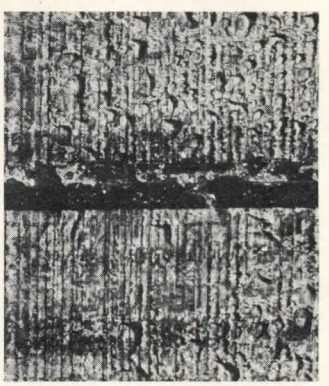
Hardwood panels. Pre-finished with a patented process claimed to put the color into the wood, not just on it, hardwood panels are less likely to show scratch marks. A lacquer topcoat protects the panel from stains, crayons, and grease. The panels are matching companions to "Eagle-Mate" door panels, which are also pre-finished but thinner in over-all thickness and can be used over any kind of door. General Plywood Corp., Louisville, Ky.
Circle 114, Readers' Service Card

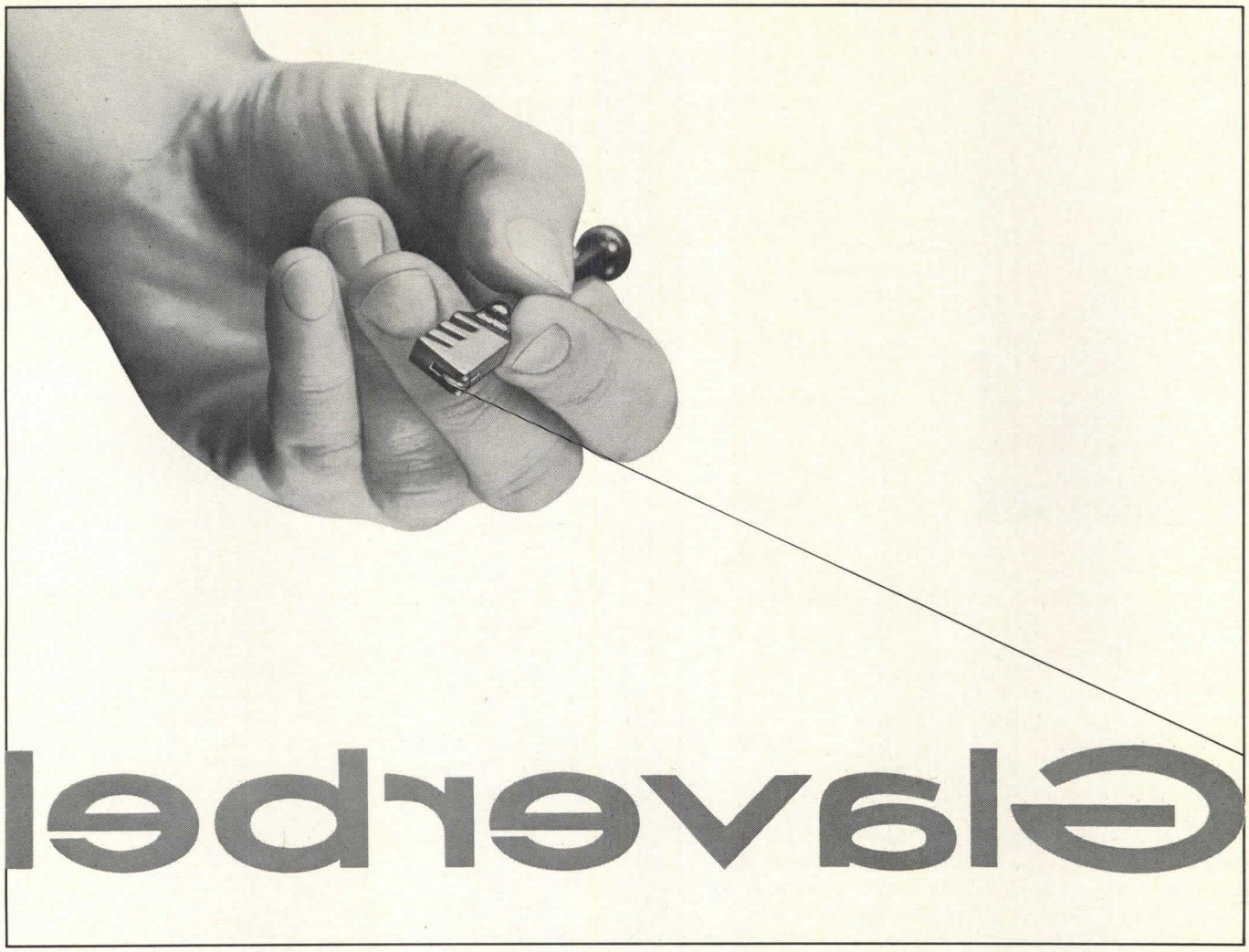
Marble Flooring? No, but manufacturer claims "Mira-Marble" reproduces the texture of natural materials with its deeply embossed designs. A vinyl foam interlayer is added to make the flooring resilient and comfortable under-foot. Comes in 6′-wide rolls and a resin-saturated felt backing that cuts installation time. Available in seven colors. The Ruberoid Co., General Aniline & Film Corp., 1139 Lehigh Ave., Fullerton, Pa. 18052.
Circle 115, Readers' Service Card

Carpet for all seasons. The demands of durability in carpeting have prompted the development of a contract-grade needle-punched carpet, "Four Seasons Conquest," an indoor-outdoor carpet. Nine colors mark the continuous filament Phillips 66 olefin; a foam-backed version for interior use only is also available. Because no natural fibers are used in its construction, the carpet is said not to rot or mildew and may be hosed with water for cleaning. General Felt Industries, Inc., 2323 S. Paulina St., Chicago, Ill. 60608.
Circle 116, Readers' Service Card



Feeling groovy. "Shadow Groove," a redwood panel siding, is patterned with V-grooves burned into the plywood on 3.2″ centers to provide a shadowline that does not penetrate the surface veneer. Designed for both vertical and horizontal installation, the panel siding may be applied directly to sheathing without calking or battens. A clear, water-repellent preservative is applied at the factory, and the textured surface may be painted or stained or weathered. Panels are available in ⅜″ and ⅝″ thicknesses; lengths: 8′–10′ with 48″ face. Simpson Timber Company, 2000 Washington Building, Seattle, Washington 98101.
Circle 117, Readers' Service Card





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See Sweet's Architectural File 4a/GL.

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MFRS' DATA

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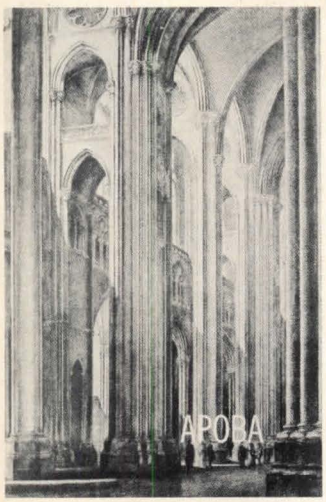
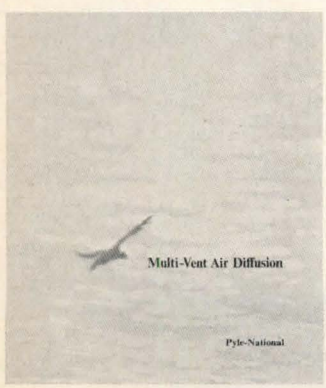


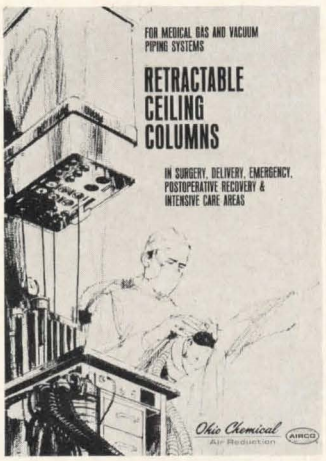
Church acoustics. Premised on the belief that acoustics and pipe organ placement are often afterthoughts in church design, this booklet details how an organ can best be integrated into the plan of a church. Some recommendations: reverberation time of 3 seconds (with all seats filled); close grouping of pipes, choir, and console; no carpeting in choir and organ areas (reversing a fad). Also included are suggestions on remodeling. Although only churches are discussed, the data are applicable to other types of structures. 10 pages. Associated Pipe Organ Builders of America, 1133 N. La Salle St., Chicago, Ill. 60610.
Circle 200, Readers' Service Card

AIR/TEMPERATURE



Air modulation. "Multi-Vent" air diffusers use a low-velocity method claimed to reduce draft and friction noise. A significant savings in fan and duct size requirements is claimed because these diffusers operate at a higher temperature differential, reducing the air volume normally required. High-capacity modular units are also available, as are slot-type diffusers, sound traps, air valves, and unitary panels, which meet Federal Standard 209 for ultra-clean rooms. Application table, details. 8 pages. The Pyle-National Co., 1334 N. Kostner Ave., Chicago, Ill. 60651.
Circle 201, Readers' Service Card

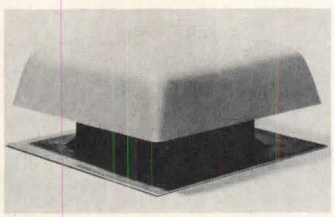
CONSTRUCTION



Life subscription. Medical gas and piping equipment is described in manufacturer's file. Included is the suspended ceiling column shown, which has several gas service outlets, receptacles for monitoring equipment, and a 115-v electrical outlet. The unit telescopes into the ceiling, resulting, according to the manufacturer, in less operating room clutter and more safety by keeping gas hoses and electrical cables off the floor. 49 pages. Ohio Chemical & Surgical Equipment Division, Air Reduction Co., Inc., 1400 E. Washington Ave., Madison, Wis. 53701.
Circle 202, Readers' Service Card

Chandelier of water. "Rain jet" fountains may be installed in pools of your own design, or they may be purchased as completely self-contained units with a glass-fiber bowl. A bowl screen, also of glass fiber, keeps scum and other matter out of the bowl while reducing the noise of droplets. Bowl diameters: 36″ to 94″. Recirculating water may be tinged with color from lights housed in a system included with every fountain. Optimum heights of sprays vary from 36″ to 90″, and several tiers of water come from a single, rotating head. Tables, illustrations. 17 pages. Brochure. Rain Jet Corp., 301 S. Flower St., Burbank, Calif. 91503.
Circle 203, Readers' Service Card

Welding aluminum. More than 10 methods of welding aluminum are comprehensively described. Also included are the more recent developments in ultrasonic, electron-beam, and atomic hydrogen welding. The variety of welding methods (some of which are patented) coincides with the variety of examples, from Mies van der Rohe's Barcelona Chair to hefty structural members. Book contains chapters on the performance of welds, inspection, safety practices and 50 tables of characteristics and properties of alloys; cross reference is simple, assisting designers in promptly selecting methods. 243 pages. Letterhead request. Aluminum Company of America, 612 Alcoa Bldg., Pittsburgh, Pa. 15219.



Award Winner. One of the Pasadena Art Museum's 1968 Excellence of Design Award winners, this "Bermuda-lite Cap" is a ventilator skylight; moreover, the manufacturer says it's the first multipurpose ventilator skylight design that does not sacrifice the performance of either function, and the light distribution is supposedly evenly dispersed. The shell is of fiberglass and has a high strength-to-weight ratio. Other products include a skylight module permitting design flexibility in 2′ increments to any length. The ventilator skylight comes in curb-mount or self-flashing models. Performance data and details. 4 pages. Williams Bermuda Corporation, 914 Westminster Ave., Alhambra, California 91803.
Circle 204, Readers' Service Card

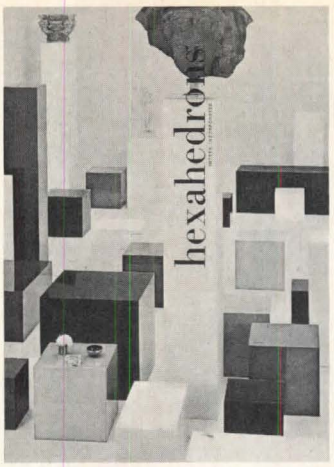
Power of partitioned thinking. Forget the tools, advises the manufacturer, and lock the modular partition components into place. The units come in nine different panel widths and four panel heights, making it possible to assign panel height by corporate status, if desired. A walnut-vinyl laminate bonded to hardboard is available; 10 varieties of colors in steel panel partitions are also marketed and may be mixed with the vinyl-walnut models. Large raceways are claimed to cut wiring costs; glazing requires snap-in vinyl glazing strips, eliminating tools. Options include a panel extension to the ceiling. 8 pages. Weber Showcase & Fixture Division, Walter Kidde & Co., Inc., 1340 N.W. Monroe Ave., Grand Rapids, Mich. 49502.
Circle 205, Readers' Service Card

FLOORING

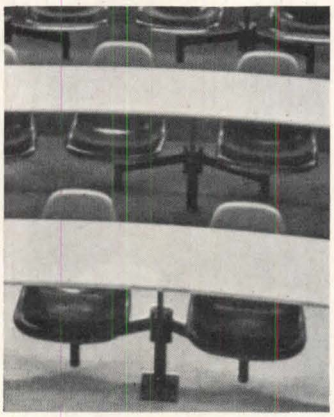
Tic-tac-tile. Floor-tile selection is easier with the current comparison charts. Patterns, dimensions, colors are all listed for vinyl asbestos and asphalt tile manufactured by Amtico, Armstrong, Azrock, Congoleum-Nairn, Flintkote, Johns-Manville, Kentile, and Ruberoid. 6 pages. Asphalt and Vinyl Tile Institute, 101 Park Ave., New York, N.Y. 10017.
Circle 206, Readers' Service Card

FURNISHINGS

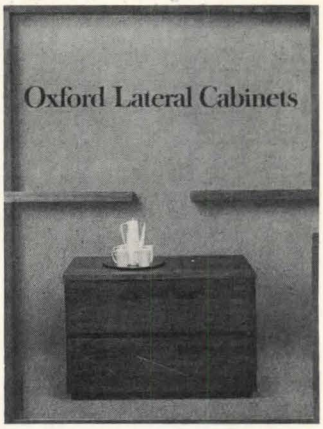
Geometry primer. Hexahedrons may be used for seating, tables, and pedestals, claims manufacturer. As with nearly all primary form furniture, finishes and detailing are crucial, and in this instance the forms are available in several choices: high luster lacquer (16 colors), hand rubbed wood (6 woods), "Micarta" top, (black or white), and



gold or silver leaf. If a Micarta top is selected, the sides may be of selected wood or lacquer; all wood used runs vertically, including those hexahedrons without plastic tops. The bottoms of all models are recessed 2″ for easier handling, and if casters are desired, they are concealed within the recessed base, raising a unit ½″ off the floor but capable of supporting 500 lbs. Tall pedestal units may be ordered with weighted bottoms to prevent toppling. Intrex Div., Habitat, 341 E. 62 St., New York, N.Y. 10021
Circle 207, Readers' Service Card

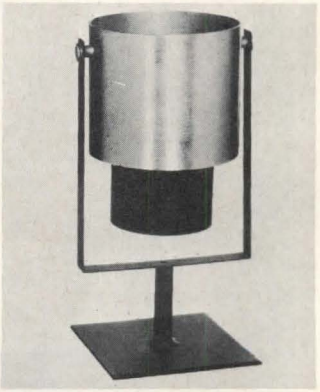


Educational seating, "Herman Miller Is a Ph.D." heralds "PD/3," a seating-table design using laminated continuous tabletops with Charles Eames's PD-3 seat, which is used in pairs, one seat on each side of a shared central stem. The seats swivel 140° on an arm that moves 70°, thus permitting access to both seat and aisle; also available are optional padded models. Anticipating the use of electronic devices, the firm notes that a conduit may be passed up the seats' stems; front-row seats may be equipped with an optional tilt mechanism to eliminate neck-craning. When not in use, the seats automatically return to within 3″ of the vinyl-edged tabletop. Herman Miller Inc., Zeeland, Mich. 49464.
Circle 208, Readers' Service Card



Fling into filing. This walnut filing cabinet and its companion models may promote file-in binges. Also available are metal cabinets with or without oiled or lacquered natural wood edging. File folders are suspended lengthwise or widthwise in four cabinets sized according to specific office material requirements with optional units that may be stacked onto the cabinets or onto shelves. The cabinets are sold in 2-tone combinations or in 12 standard, single colors, and if these are not agreeable, other colors may be specified for special orders. 8 pages. Oxford Filing Supply Co., Inc., Clinton Rd., Garden City, N.Y. 11530.
Circle 209, Readers' Service Card

LIGHTING



Torch power. Designers may choose between the Early American, Mediterranean, and Contemporary torches; they are available in single light and chandelier formations. Mounting systems are equally flexible with options on hanging, post mounting, wall mounting, and free-

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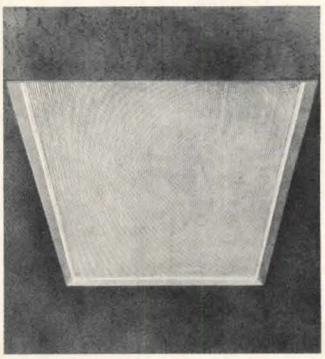
standing. The fuel, allegedly smokeless and odorless, comes in cans designed to be lit after they are dropped into the torch. 4 pages. J.C. Christen Mfg. Co., 59 Branch St., St. Louis, Mo. 63147.
Circle 210, Readers' Service Card



Fluorescent lighting is recessed. Seven lines of recessed fluorescent lighting from "Regressed Prismalux III" (shown) to "Round Dome" are described. Booklet includes photographs, specification features, sketches of interior mechanical arrangement, ordering information, and lighting data for each size luminaire available. 31 pages. Lightolier, 346 Claremont Ave., Jersey City, N.J. 07305.
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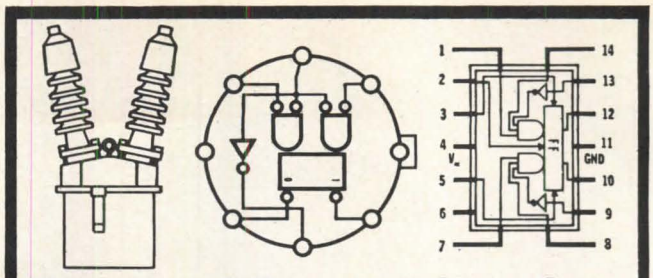

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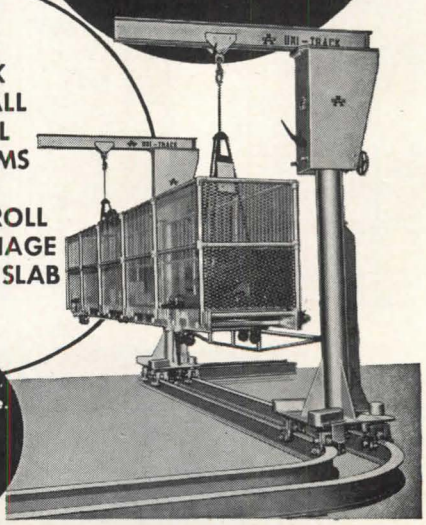

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NEXT MONTH IN P/A

The controversy over the house as a "real" design problem still rages, and architects still design houses. In a sense, the dwelling can be seen as a microcosm of the design process, since the approach to the rationale of its design can encompass many factors, some of which are not ordinarily associated with homebuilding: recreation, sociological problems, client need and influence, advanced—or "retrogressive"—structural techniques, "irrationality" or ordered approach, professional or amateur authorship.

In May P/A, a complete issue devoted to "Dwellings: The Rationale of Their Design," will focus on the mystique of dwelling design through the medium of wide-ranging examples: from a formal solution in Philadelphia to the barriadas of Lima, Peru, where the poor rejected slums and public housing and set up their own sub-cities to live in; from a series of imaginative beach houses by young New York designer Horace Gifford to a serene residence in the Plaka, oldest section of Athens; and from low-rent housing in New Haven, Conn., by Carlin, Pozzi & Associates designed to alleviate racial imbalance, to a lively old age group in Ames, Iowa, by Brooks-Borg Architects & Engineers. In between will be a swinging apartment house in Berkeley, an architect's home featuring a wooden shell of nailed scantlings, a ski lodge on Sugarloaf Mountain, some sympathetic condominiums in Marblehead, Mass., a hilltop aerie in Oakland, Calif., and two "eccentric" houses built by enthusiastic do-it-yourselfers in Woodstock and Scarsdale, N.Y.

This intensive mix of many types of dwellings —and as many reasons and programs for building them — is going to make May P/A the most sparkling treatment of dwelling design of 1968. It will be sumptuously illustrated with four-color, black and white, drawings, plans, sections, and details. Reserve for yourself this colorful collector's issue and 11 more equally stimulating P/A's by filling in and sending in the subscription card at the rear of this issue.

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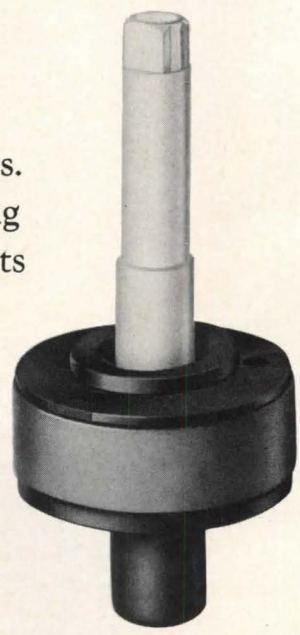

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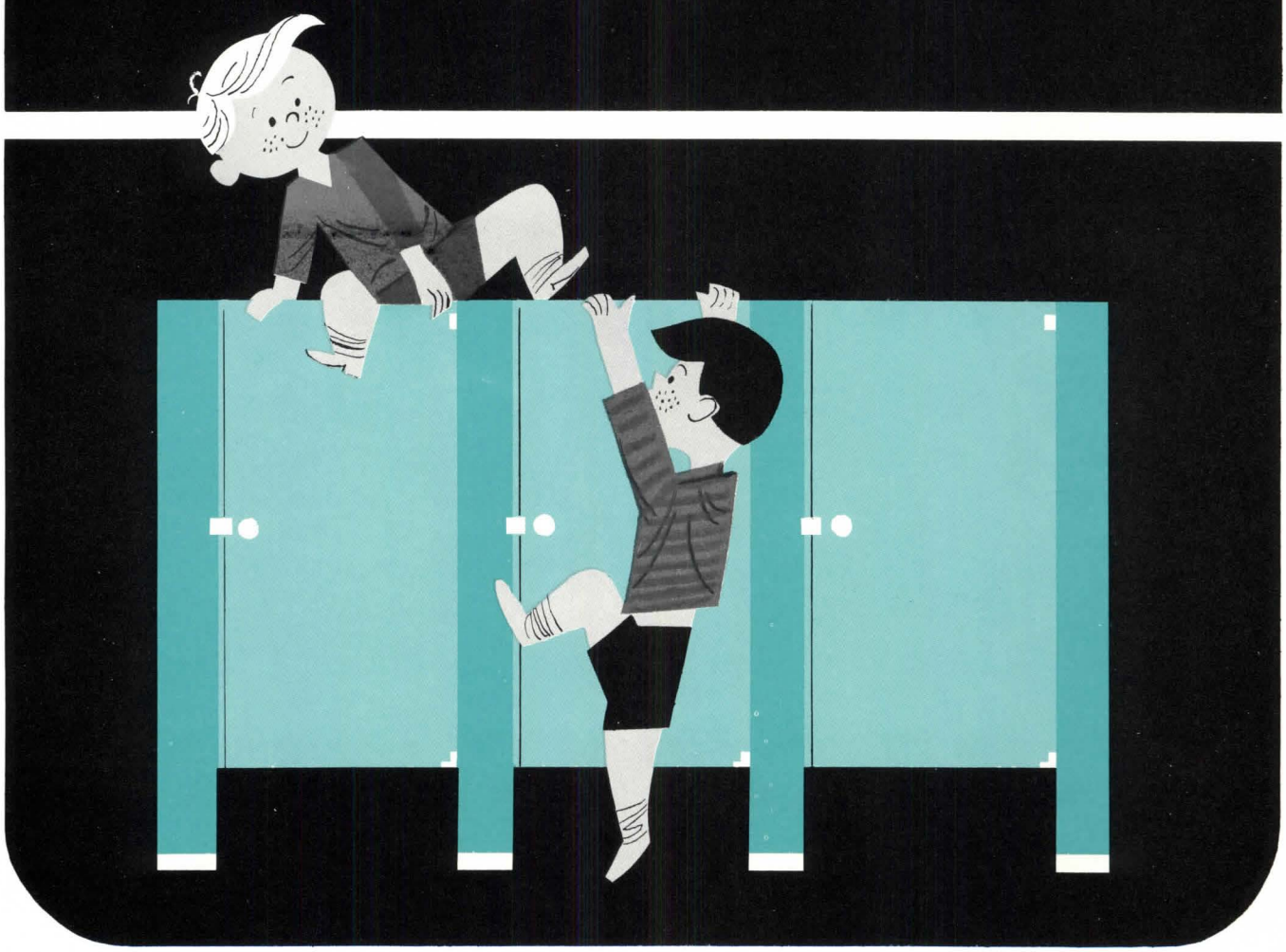

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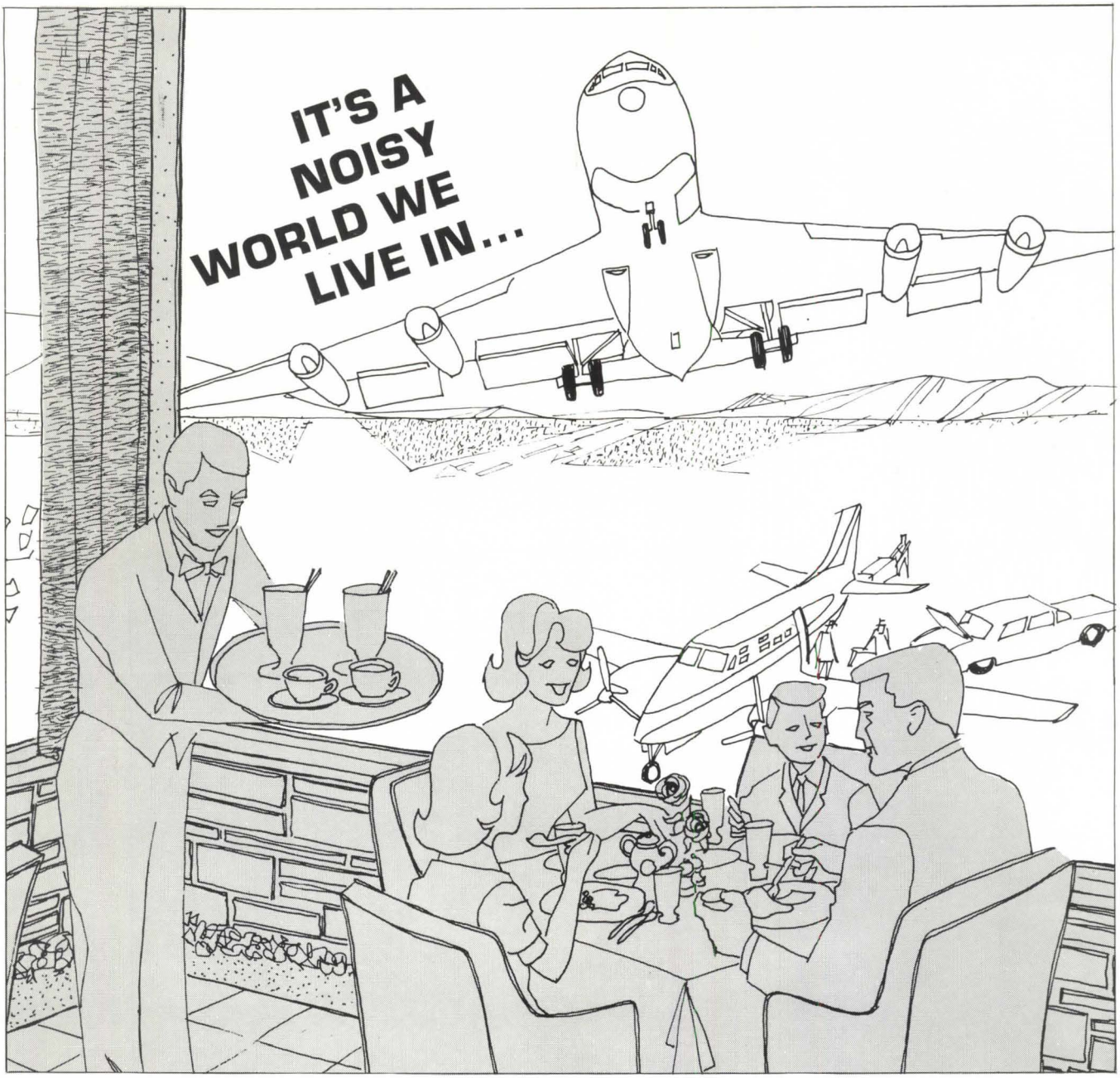

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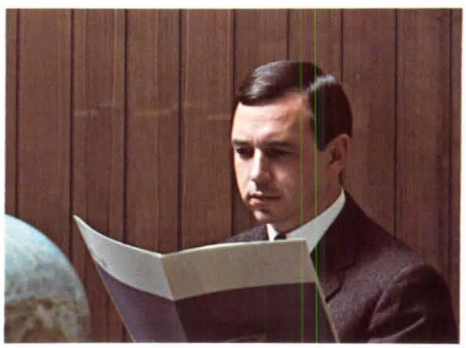
The Decorator Panel

Gold Crest.™ Every 16 inches there a is half-inch-wide channel which can be decorated with colored tape, metal strips, or fabric to compliment room decorations. Choice of Golden Elm, Pecan, American Walnut and Rosewood.



Style IV Black Walnut

The Man's Panel

Style IV.™ The handcrafted look of four-inch planks. Panels custom-matched for grain and color in distinguished American Black Walnut.

Walnut Inlaid with Pecan

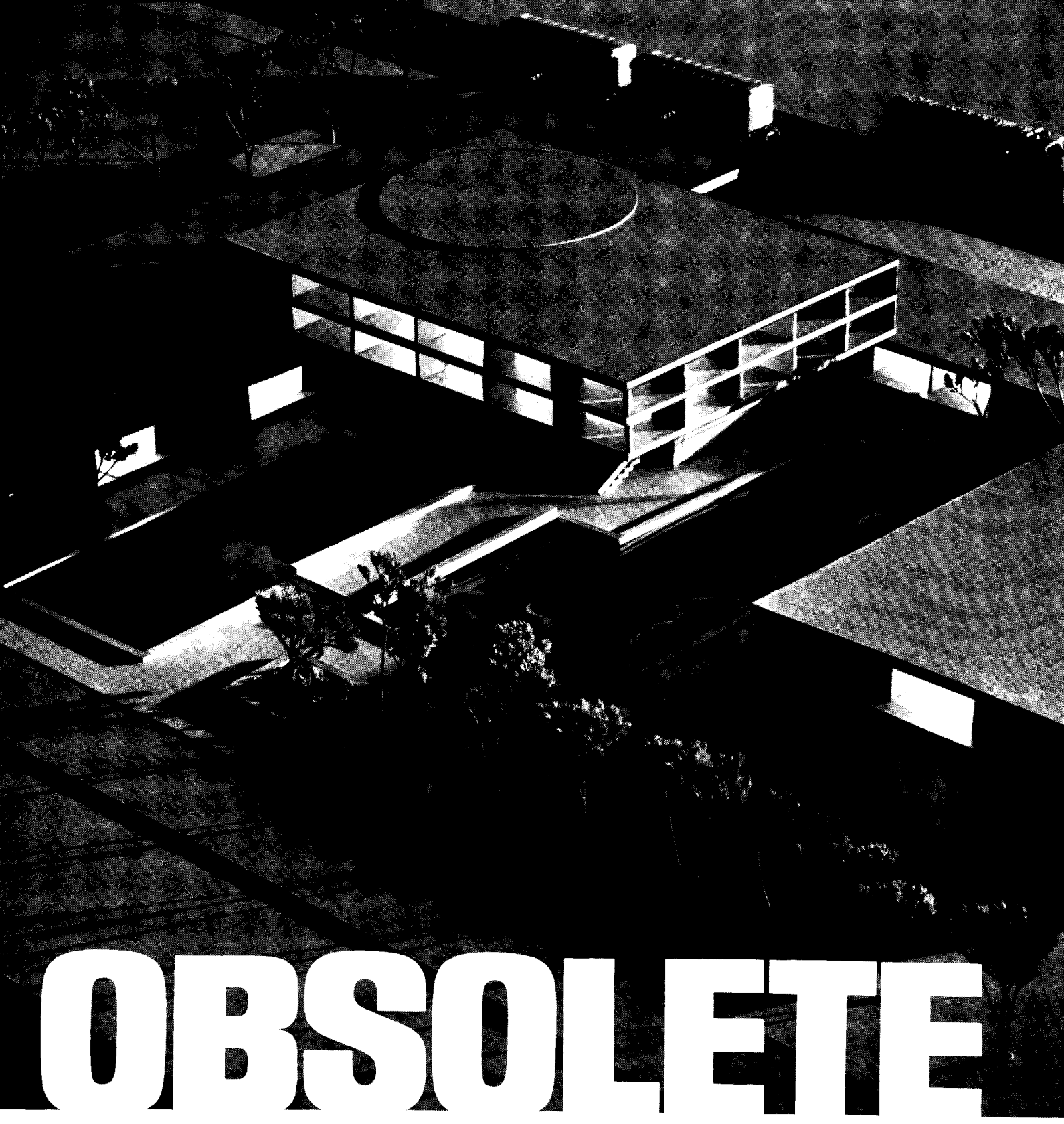
The Luxury Panel

Inlaid.™ Prestige background for any room. Choose Pecan or Elm (in 14¾-inch sections) inlaid with Walnut *strips 1¼-inches wide.* Or Walnut inlaid with Pecan. Elegant custom look.

All these uncommon paneling styles from Georgia-Pacific have this quality "extra" in common: Exclusive family-proof Acryglas® finish makes it easy to take off stains (even grape juice and mustard), spills (bleach and alcohol can't faze it), marks (lipstick and crayon wipe off), and even nail polish remover.

Yet every panel has the rich low sheen look of hand-rubbed oil finish and has earned the Good Housekeeping Seal.

GP GEORGIA-PACIFIC
THE GROWTH COMPANY



OBSOLETE

. . . and the owner hasn't even moved in.

It's not the design; that's as contemporary as tomorrow. It's not the construction specs; they're solid. It goes much deeper than that.

It's the communications planning. For, in this age of fast-moving information, if communications aren't the most modern available, a building's obsolete before it's even begun.

Business of tomorrow is going to depend more and more on the telephone to send information. To get information. Even to sell.

It'll use Data-Phone® service to move data across the country. Teletypewriter and Touch-Tone® telephones to tie into remote computers. Tele-Lecture and closed-circuit TV to train salesmen and inform customers.

Such considerations may or may not influence a building's exterior design. But they will definitely affect capacity and flexibility.

And that's where a Bell System Architect and Builder Service Representative comes in. He can make your next building—and every building—as modern as modern communications can make it. And insure that communications needs of the future fit in without expensive alterations.

Just call 212-393-4537 collect. We will send you a complete list of our Architect and Builder Service Representatives.

BELL SYSTEM AT&T and Associated Companies

Cabin Crafts Carpet passes first year

Color was the first reason why Cabin Crafts carpets were recommended over other brands for the beautiful San Domenico School for Girls in California.

"We were pleased with Cabin Crafts' greater variety of color combinations," says a spokesman for the San Francisco firm of Richardson Contract Furniture Co. "We wanted to create a warm, home-like feeling with these color combinations in carpet

"How quiet it is!" remarked Sister Maurice upon the more recent addition of Cabin Crafts "Cimarron" carpet in the study hall. Students come and go . . . unheard.

at San Domenico school with flying colors.

that still had a good commercial grade of wear."

Sister M. Maurice, O. P., Principal of the School, is most impressed with the acoustical benefits of the carpet and its ease of maintenance. As she says enthusiastically, "The more we can get of it—the better!"

Cabin Crafts offers a complete line of contract/commercial carpets specially engineered for heavy-traffic installations. They're made of fibers that have been proved for durability and easy maintenance, such as Acrilan® acrylic. Cabin Crafts contract/commercial carpets are setting excellent performance records in schools, hospitals, motels, offices, restaurants and other public installations.

For on-time deliveries in any quantity you need—from a school to a skyscraper—specify Cabin Crafts carpets.

San Domenico School for Girls, the oldest girls' school in California, found a new home nestled serenely among rolling hills and valleys. The beauty outside is echoed indoors with handsome, yet serviceable furnishings . . . including Cabin Crafts carpets.

For practicality as well as a home-like feeling of warmth, dormitory living rooms at San Domenico are carpeted with Cabin Crafts "Foothill." This carpet pile is a durable construction of Acrilan® acrylic especially engineered for contract/commercial installations.

Now one year old, the San Domenico School shows by its immaculate cleanliness the importance placed upon maintenance. The installation of Cabin Crafts carpets, even in heavily-traveled corridors, contributes to the ease and economy of upkeep.

For more information or a representative to contact you, telephone Cabin Crafts' Contract Information Services at any of the following numbers: Dalton: 404-278-1100 New York: 212-684-5200 / Chicago: 312-644-2136 San Francisco: 415-861-3144/Los Angeles: 213-627-5888 Dallas: 214-741-6378.

Be sure to ask for the Contract Information Services Manager.

Cabin Crafts makes the Contract Carpet that makes specifying easy.

ACRILAN® acrylic fiber by Monsanto

CABIN CRAFTS

West Point Pepperell®
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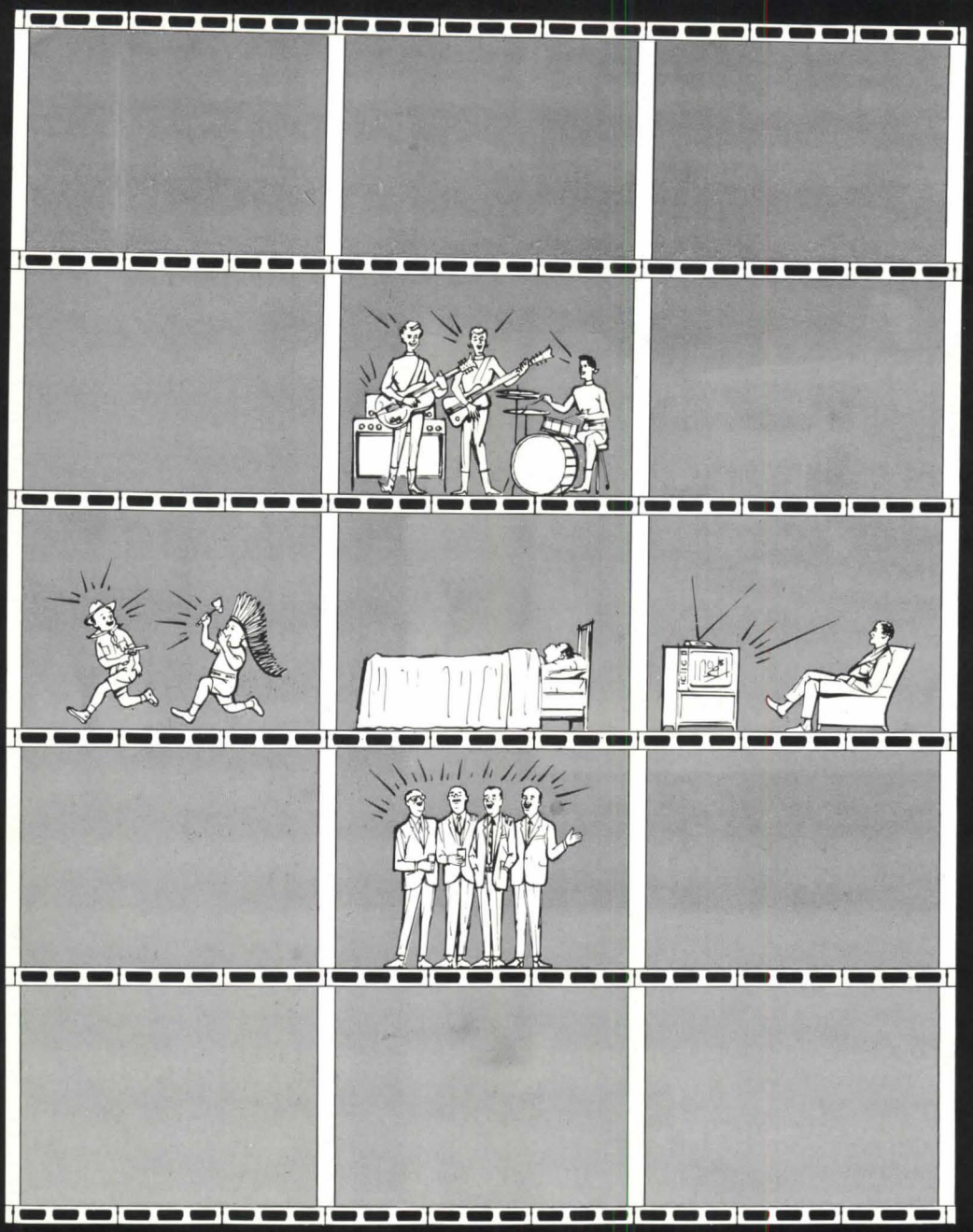
ALL QUIET ON ANY FRONT



Up or down it's quiet because SPAN ✦ DECK® has a built-in acoustical soffit as well as overall density. SPAN ✦ DECK® is a precast, prestressed, hollow-core, concrete floor and roof system. The exposable soffit has a Noise Reduction Coefficient of 0.55* and a sound transmission class of 58. For information, write your nearest SPAN ✦ DECK® supplier or Box 99, Franklin, Tenn. 37064.

* Riverbank Acoustical Lab Test A-62-188

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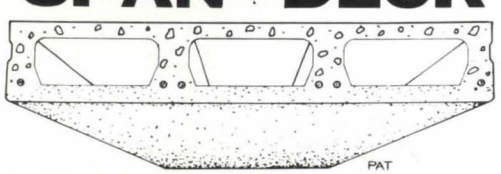
SPAN ✦ DECK®



PAT

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◀ On Readers' Service Card, Circle No. 413

On Readers' Service Card, Circle No. 419

urethane in building

MOBAY

Thin-wall urethane insulation cuts electric heat costs, increases room size, keeps apartments comfortable

A savings of 10% in forecast power requirements was realized in a new, all-electric, air-conditioned, 72,000 sq ft apartment building in Akron, Ohio last summer.

The high insulating ability of rigid urethane foam which was used on the building's masonry bearing walls is credited with reducing the cooling costs, making possible thinner exterior walls that added up to 10 sq ft to each apartment and contributing to the overall comfort of tenants.

Irving Botnick, owner-builder of Hampshire House, the 8-story, 65-unit luxury apartment house, said that the 1″-thick urethane foam insulation provided the same thermal resistance as 2-4″ of other standard insulating materials.

Electric heating and cooling is used in Hampshire House, Mr. Botnick said, for several reasons: 1) The system made possible savings of 35% of the initial cost of any conventional heating and cooling system, 2) The space normally required for a boiler room is utilized for other purposes, 3) Operating on one electric meter, Hampshire House buys the electricity required for lighting and other purposes at a lower unit cost because of the volume rates available to all-electric users and 4) The heating and cooling system is clean, easy to maintain and provides year-round comfort.

Power consumed for lighting and cooling from July 1 to September 30, 1967, the peak cooling season, was 166,000 kwh at a cost of $2994.87 or about 10% less than the $3322.40 estimated for this 3-month period by Ohio Edison Co., prior to occupancy.

The cooling system was so effective, the owner-builder said, that not once during the summer was it necessary to turn on the air conditioning for the lobby and the first-floor office.

The exterior walls at Hampshire House consist of 4″ brick on 8″ cement blocks. The 1″-thick urethane boardstock was placed against the blocks, furred in place by 1″ x 2″ furring strips. The furring was installed over the joints at 4′ intervals, then covered by 5/8″ wallboard attached to the wood furring.

The walls were designed with a "U" factor of 0.10; the urethane has a k factor rating of 0.15 @ 75°F mean and an R thermal resistance, per inch thickness, of 6.67.

"The installed cost of the urethane foam insulation was slightly less than other materials," Mr. Botnick said.

Total installed cost of 1″-thick urethane foam boardstock, 1″ x 2″ wood furring and 5/8″ wallboard was $.45 per sq ft. A closed-cell material with extremely low (.9 perm rating) moisture vapor permeability, the rigid urethane boardstock required no special vapor barrier, such as would be needed with vermiculite and other insulating materials.

Savings made possible by use of urethane foam boardstock in luxury apartment house began at the construction stage, promise to pile up year after year as urethane's excellent insulating ability reduces consumption of electric power.

"We always are ahead when we can handle one material instead of two," the owner-builder said. Further savings were realized because a much smaller bulk quantity of insulation was required with urethane, and this resulted in reduced handling and shipping costs. About 21,000 sq ft of urethane boardstock, in 4′ x 8′ sheets, was used.

"Aside from the various savings realized," Mr. Botnick said, "the greatest satisfaction is that tenants have been pleased with the efficiently operating, comfortable air-conditioning. We expect the same reaction during the heating season.

"If we had used conventional insulating material there would have been a heat transfer through the walls," Mr. Botnick said. "But there is little or no heat loss with urethane. Another factor contributing to the perfect heat seal we obtained is that we were able to insulate to the very top of the joints which cannot be done with blown insulation such as glass fiber or mineral wool. Also, the cellular urethane material was convenient to use during construction.

Designed by Herbert C. Saiger, A.I.D.

SYSTEM '70 THE B.M.O.C.*

New registrants?
Not exactly new. They've been enrolling in large numbers at many schools lately.

What's their specialization?
Student comfort with all the prerequisites . . . versatility . . . ruggedness . . . and beauty.

Quite a few of them, aren't there?
Right you are. Desks . . . chests . . . study carrels . . . chairs . . . tables . . . headboards. In glowing wood grains and beautiful solid colors.

Any "drop-outs" in the group?
Not on your life. These "scholars" will be here a long time. In fact you might say they'll be an institution at the institution.

What's B.M.O.C.?
**The Big Move On Campus—Troy's System '70 architectural dormitory furniture.*

Anything else I should know?
Yes indeed. For all the details, write to ***The Troy Sunshade Company,*** *Division of The Hobart Manufacturing Company, Troy, Ohio 45373.*

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PREFERRED

ERECTA-SHELF® IS PREFERRED BY ARCHITECTS BECAUSE . . .

1 **UNIQUE IN MODULAR FLEXIBILITY, DIVERSIFIED UTILITY!** Available in numerous sizes and combinations, either as stationary shelving or quiet, easy-rolling mobile units. Adaptable to practically any application or floor plan. Shelf spacing is adjustable. Joined by pressure fit, without nuts, bolts and special tools, Erecta-Shelf is easily installed and easy to re-arrange. Can be customized with bins, dividers, shelf markers and other Erecta-Shelf accessories for special requirements.

2 **DECORATIVELY ATTRACTIVE, FUNCTIONALLY MODERN IN DESIGN!** Simple open design, without solid sections to obstruct light and air circulation, improves visibility; contributes to overall lightness, airiness. Shining heavy plate finish with baked-on epoxy coating stays lifetime bright, adds to attractive appearance.

3 **DUST-FREE! SIMPLIFIES MAINTENANCE!** With no place for it to collect, dust and dirt fall through to the floor where it can be easily swept up. Laborious task of removing stored items and dusting shelves periodically is eliminated. No costly hand scrubbing. Where washing or sanitizing is required, units can be easily hosed down or steam cleaned.

4 **EXCEPTIONAL STRENGTH AND DURABILITY! FIRE RETARDING!** Erecta-Shelf's heavily-reinforced exclusive open steel rod construction is engineered for strength far in excess of requirements, lifelong durability, and increased sprinkler effectiveness. Meet the most rigid industry and governmental test standards.

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For catalog, prices and detailed specifying information or assistance, write Dept. EE0423.

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Manufacturers of: Erecta-Shelf®, Sani-Stack®, Metro-Tainers®, Miscellaneous Wire Products.

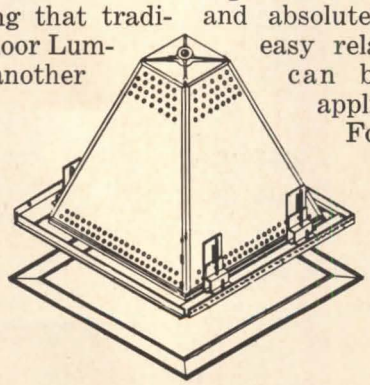
Another great new idea from Wide-Lite...

Efficient mercury vapor lighting's been recessed!

Low brightness, high level illumination was a requirement in the relighting program at the New York Coliseum—the kind of lighting that traditionally has required "Wide-Lite" Indoor Luminaires. But **recessed** lighting was another requirement.

No problem.

"Wide-Lite" Indoor Luminaires now are available with a wide choice of mounting accessories for recessed installations. Their square lens shape is ideal for use in ceilings of all types—plaster ceilings and suspended acoustical ceilings. So the advantages of dustproof construction, longer lamp life and absolutely minimal maintenance, including easy relamping from above or below, now can be yours in recessed lighting applications.

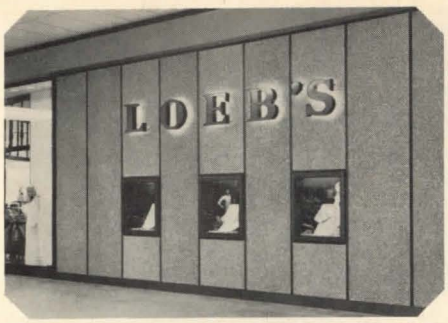


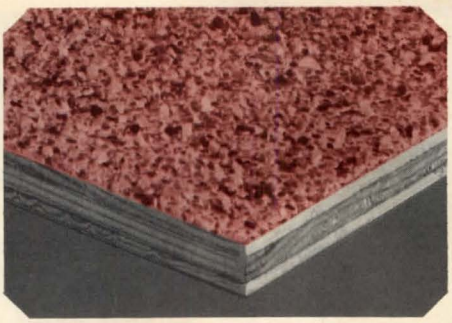
For more facts about unique "Wide-Lite" Indoor Luminaires and our new line of recessed ID mounting accessories, contact your "Wide-Lite" representative (see "Lighting Fixtures" in the Yellow Pages). Or write Dept. 24A-521.

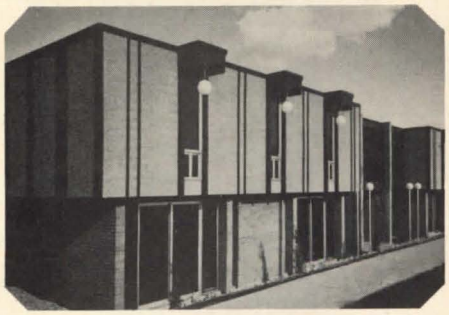
WIDE-LITE.

FLOODLIGHTS • POLES • INDOOR LUMINAIRES • BALLASTS • TRANSFORMERS

Wide-Lite Corporation, A Division of Esquire, Inc., 4114 Gulf Freeway Houston, Texas 77001. Also manufactured in Australia, Belgium, Canada, Mexico and Spain. *Trademark of Wide-Lite Corporation





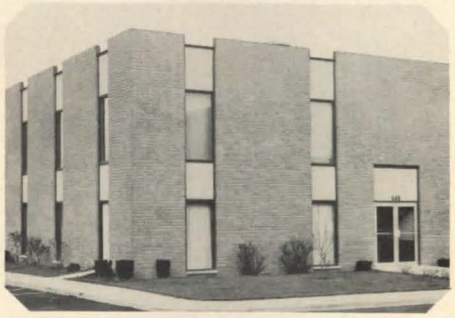


SANSPRAY® FACTORY-FINISHED STONE PANELS

Ready for use as siding, roofing, soffits, window spandrels, interior walls, porch and house skirting, decorative fences, facades, and a multitude of other applications.

LIFETIME EPOXY AND AGGREGATE

Sanspray stone panels combine the benefits of plywood construction with the beauty, durability, and value of stone. A proven product with over 10 years of rigorous laboratory and field testing. Wide selection of aggregate colors and textures to choose from.



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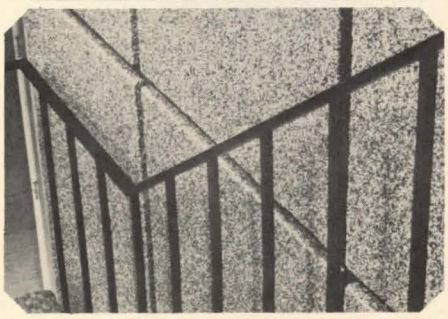
Apply a masonry-type finish at about the cost and weight of frame construction. Easy to nail and saw. Install 32 sq. ft. of finished wall in one application. No subcontractors needed.



NO MAINTENANCE OR PAINTING EVER!

Epoxy and stone surface completely weather-proof. Can be applied year-round regardless of weather.

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☐ Have representative call with samples.
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The Rapidograph H.R.S. **(Humidified Revolving Selector)** makes all previous pen containers obsolete! The H.R.S. is a design marvel that creates one revolving work-center with an entire assortment of the drawing points and line widths you need for your most efficient board work—plus all you require to give your precision Rapidograph points the care and protection they deserve!

This revolutionary pen package accommodates up to 12 Rapidograph drawing point sections, and contains three holders, two Nib Keys for quick point replacement, a plastic bottle for Koh-I-Noor or Pelikan drawing ink, another filled with Rapido-Eze pen cleaner, and a clamp to attach unit to board or table. As illustrated, the H.R.S. also holds your #3060 Rapidograph pocket model pen.

An integral sponge ring maintains a humid interior to keep open pens ready for instantaneous use during work intervals. Base is removable for easy cleaning or replacement of sponge. The H.R.S. is all yours without extra charge when you purchase sets of 6, 7 or 8 Rapidograph drawing point sections. (H.R.S. container without contents, list price $5.) Optional accessories are a purifying moisture-retaining liquid Humectant, and a Hygrometer to measure interior humidity (two models available). See your Koh-I-Noor dealer or write for detailed literature.

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It's so dense, traffic lanes can't form. Dirt and grime can't sink in.

It costs less, too. Per square yard, it sells for a dollar or two less than the industry standard.

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Quiet, warm, comfortable. It's ideal for commercial installations. Schools. Hospitals. Restaurants. Lobbies. Any heavy traffic areas.

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It's obvious. You get more carpet in every square inch of our Executive Line—the most satisfactory contract carpet made. The one that saves you money. Shouldn't you specify Executive Line?

Write for your 3″ x 5″ sample. On request, we will send a copy of On Writing Carpet Specifications and Sweet's File Catalog Number 28E.

ACRILAN® acrylic fiber by Monsanto

Monarch Carpet Mills
CHAMBLEE, GEORGIA

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An entirely new approach to Corridor Lighting—*with* Guth 15·25|25·35 Prismatic Lenses†

†T. M. and Patents applied for.

The status of corridors has advanced *architecturally* in the past 20 years. But lighting-wise they've remained "in the dark!" Light was always concentrated on the floor . . . creating a tunnel effect with "gray" walls and ceiling.

But now – there's a new concept of corridor lighting . . . made possible by the new Guth 15-25/25-35 prismatic lenses.

Those magic numbers mean 15% of the light is distributed* to the ceiling, 25% to each wall and 35% to the floor. The corridor is filled with light. Overall brightness balance is achieved and excessive contrasts eliminated. No more tunnels!

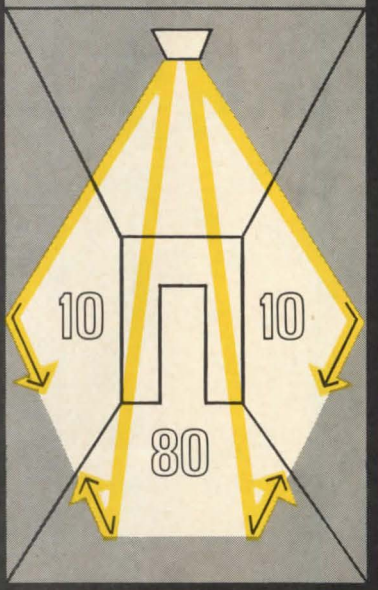
Now corridor lighting is up to date! Ask for Engineering Report #10.

*Direct and inter-reflected illumination

THE EDWIN F. GUTH COMPANY
P. O. Box 7079, St. Louis, Mo. 63177

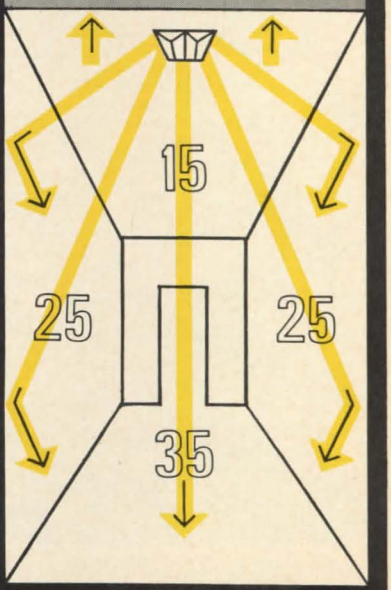
THE OLD WAY

80% of light concentrated on floor. Only 20% to walls. A tunnel effect.



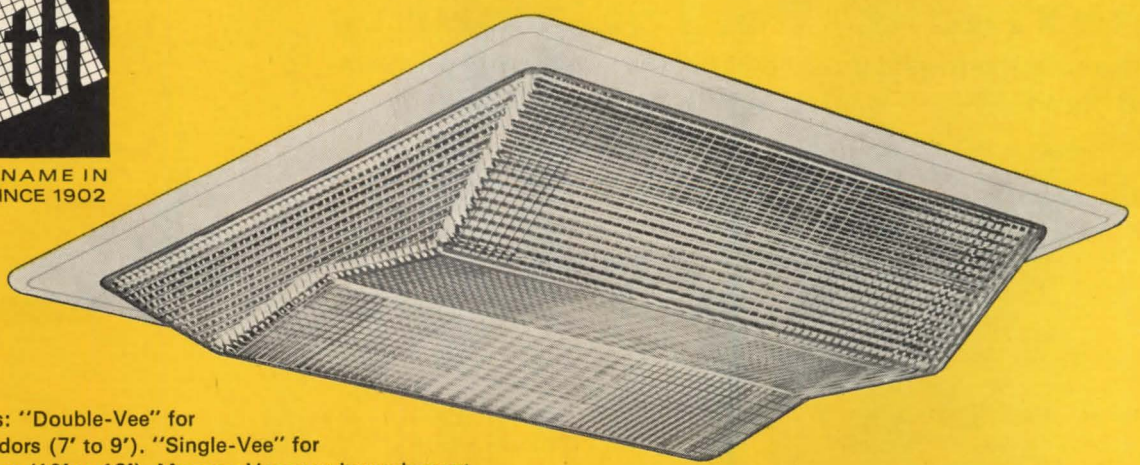
THE NEW GUTH WAY

Light distributed properly to both walls, ceiling and floor.



Guth

TRUSTED NAME IN LIGHTING SINCE 1902



Two designs: "Double-Vee" for narrow corridors (7' to 9'). "Single-Vee" for wide corridors (10' to 12'). Mercury Vapor or Incandescent.

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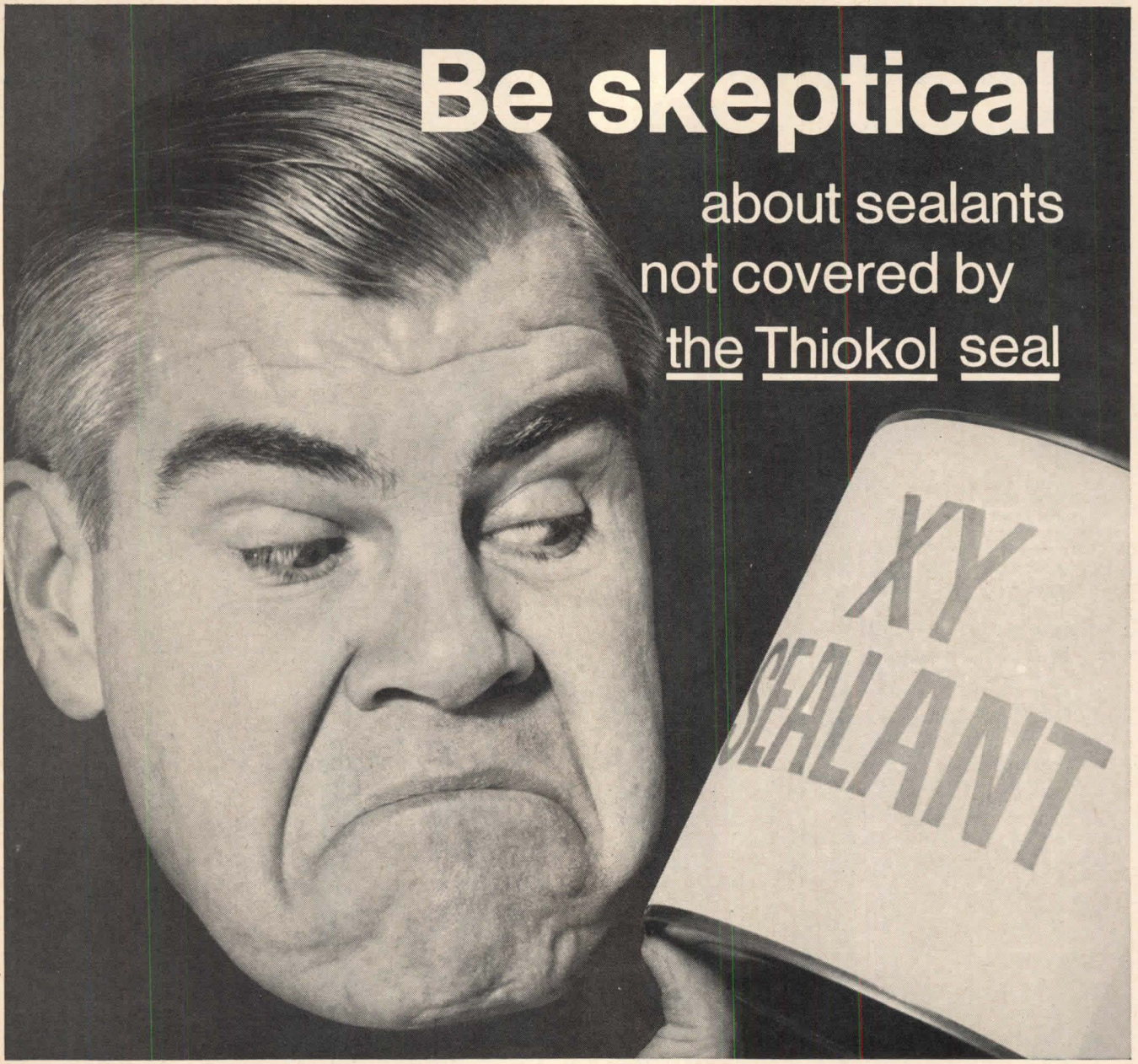

The Thiokol Seal of Security

represents the most advanced sealant quality and performance standard ever written for the building trade.

Unless Thiokol's Seal of Security is on the label, the sealant you choose may not deliver total weatherproofing protection.

The Seal symbolizes a Thiokol leadership program to raise sealant quality... to keep it at a level pacing or exceeding environmental service requirements of structural joints and building materials.

Behind the Seal lies a new standard of excellence for joint sealants established by Thiokol, extending professionally accepted specifications and supported by a monitoring program aimed at continuity of quality. Materials both from production runs and random selection at job sites are lab tested for capability on a regular basis. Only compounds meeting the standard wear the Seal on the label. No program in the industry goes so far to assure consistent high grade product performance.

Be wary of sealants not wearing the Seal. Be wise—make Thiokol's Seal of Security your exclusive guide to long-term weatherproofing for all joints, in all climates, meeting any service condition. For the assuring facts, write Thiokol.

TESTED* AND APPROVED SEALANT BASED ON Thiokol® LP® POLYSULFIDE POLYMER MANUFACTURED BY LICENSEE OF THIOKOL CHEMICAL CORPORATION

*The manufacturer warrants by affixing this label that this product is a duplicate of materials independently tested and approved by, and in accordance with standards established by Thiokol Chemical Corporation

Only in LP® polysulfide polymer is there quality assurance by **Thiokol CHEMICAL CORPORATION**

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Vinyl clad stainless steel console harmonizes with contemporary patient room design in hospitals and nursing homes. Similar consoles of satin finish stainless steel for patients' bathrooms and other washroom areas. Both models constructed of stainless steel throughout for lifetime service.

Recesses in 4″ walls, takes only 1.4 sq. ft. of floor space. Combines all essential accessories in one attractive unit. Reduces installation costs, too. Send for Catalog of Hospital Accessories and Grab Bars. Bobrick: Brooklyn, New York 11210 • Los Angeles, California 90039 • Bobrick-Canada • Bobrick International

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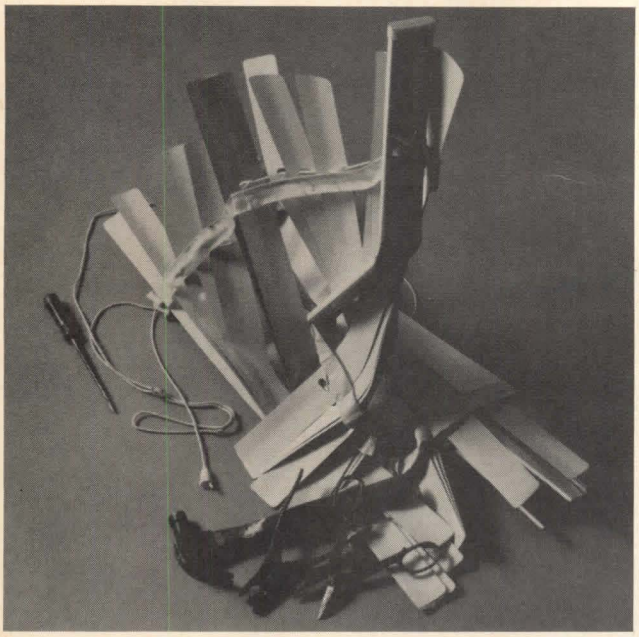
Bargain blinds are good for business.



Guess whose?

With a few thousand windows to treat in a commercial or residential building, even a modest saving per blind can begin to look like a bargain.

Hard to resist.

But when your bargain blinds need *one single repair* within the first five years,[1] they'll not only cost you a lot more than you bargained for...

They'll cost you more than Flexalum®.

The Flexalum Twi-Nighter®guarantee is for five years...for parts *and* service. And it includes tapes and cords as well as all mechanisms and moving parts.[2]

Sometimes it's easy to forget that the fixed labor costs for installing a Flexalum blind are no more than the costs for hanging a bargain blind.

But the bargain blind can end up hanging you!

Drop us a line for full specs, guarantee, and special modifications available for unusual aesthetic or functional purposes. Or, see our catalog in Sweets.

(1) In a survey conducted by Buildings Magazine, two-thirds of respondants reported their blinds needed repairs within the first three years. (2) Any materials which prove defective under normal use will be replaced free of charge, providing the certificate of coverage is filed within 10 days of the installation.

ALCAN ALUMINUM CORPORATION ALCAN* *Building Products Division*
100 Erieview Plaza, Cleveland, Ohio 44114

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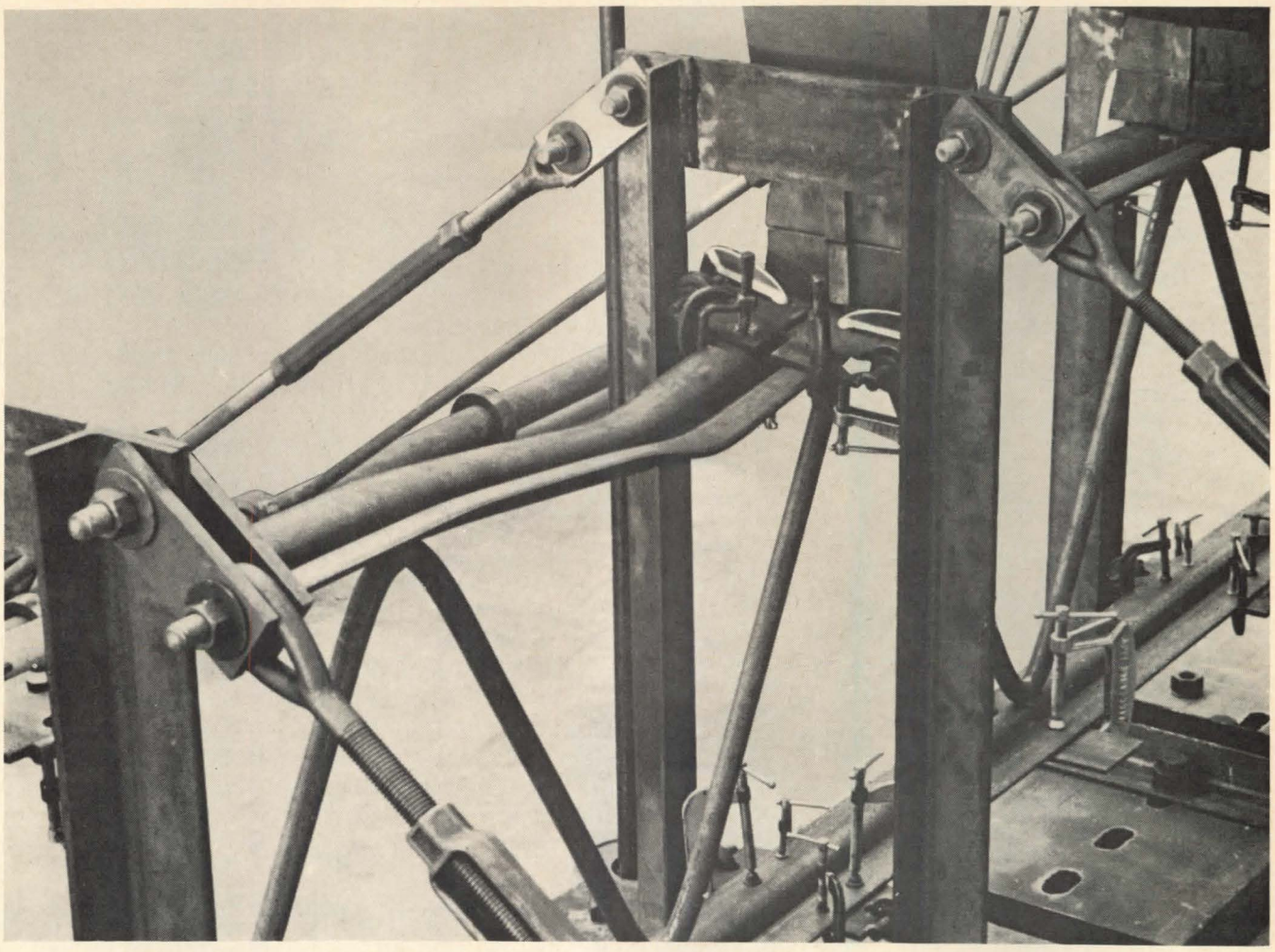

The Cold Hard Facts of Lab Research: Starting Point for Steel Joist Improvement

An aggressive program of research and development by the Steel Joist Institute has played a big role in the continuing improvement of open web steel joist designs and their acceptance by the building industry. For many years the Institute has sponsored R & D projects on steel joists at leading university engineering laboratories.

The photo above is a case in point. In this project, performed at the University of Kansas, tests were conducted to determine the ultimate strength and load-bearing capacity of compression chords in variously designed joists under concentrated and uniform loads. Manufacturers can also have investigations conducted on their J- and H-Series joist designs to determine conformance with SJI standards and specifications. New ideas in joist materials and design are also carefully checked out before standards are established.

The Steel Joist Institute has just published a new edition of the SJI standard specifications and load tables. It's a practical working handbook for anyone specifying or using open web steel joists. Write today for your complimentary copy.

STEEL JOIST INSTITUTE

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*** Another in Art Metal's full line of Mercury Vapor Fixtures**

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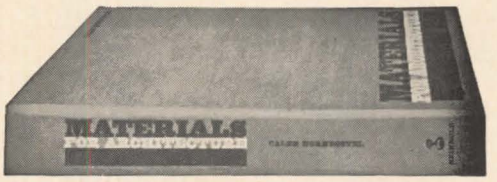
from ABRASIVES to ZIRCONIUM

AN ENCYCLOPEDIC GUIDE



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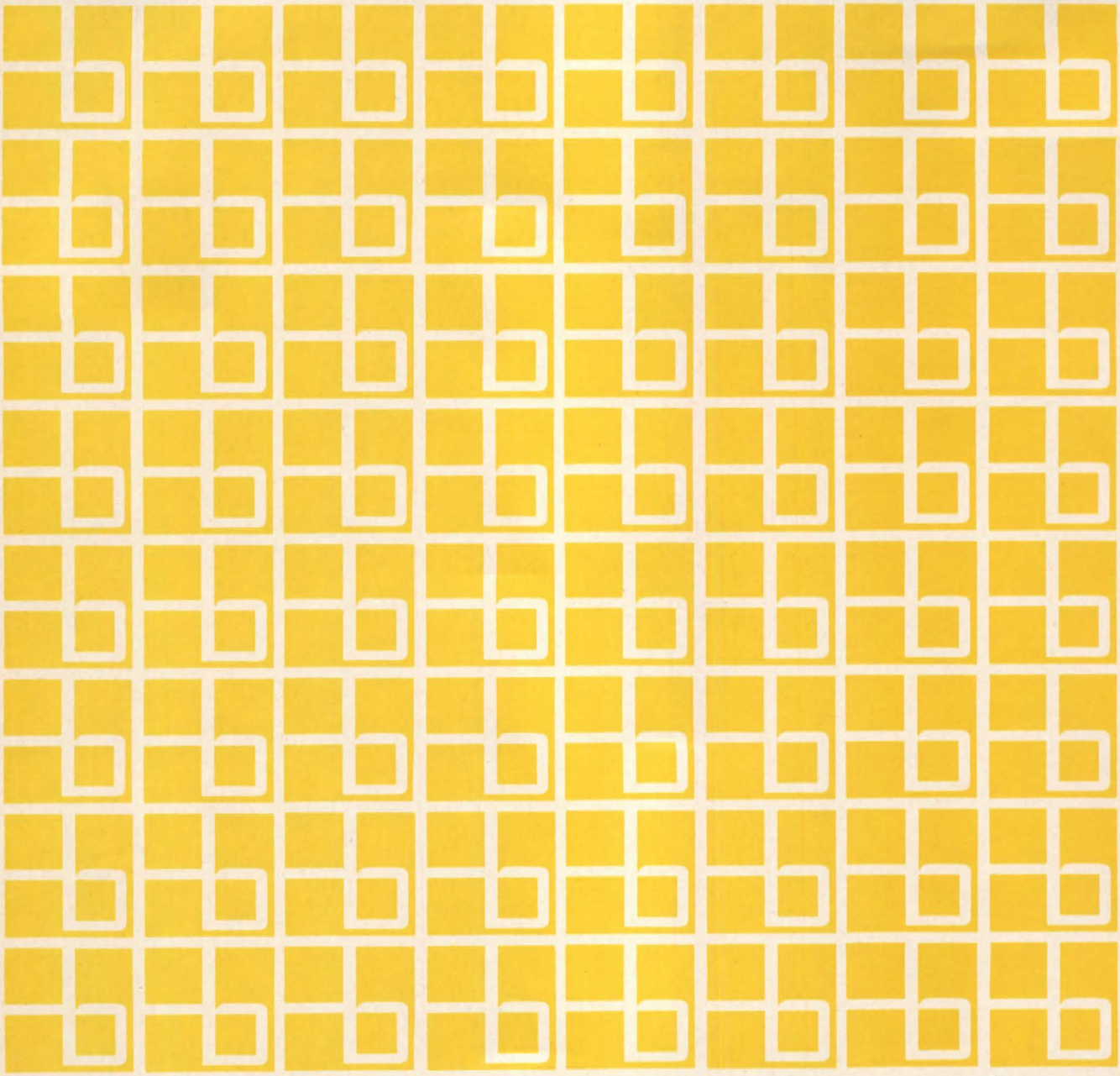

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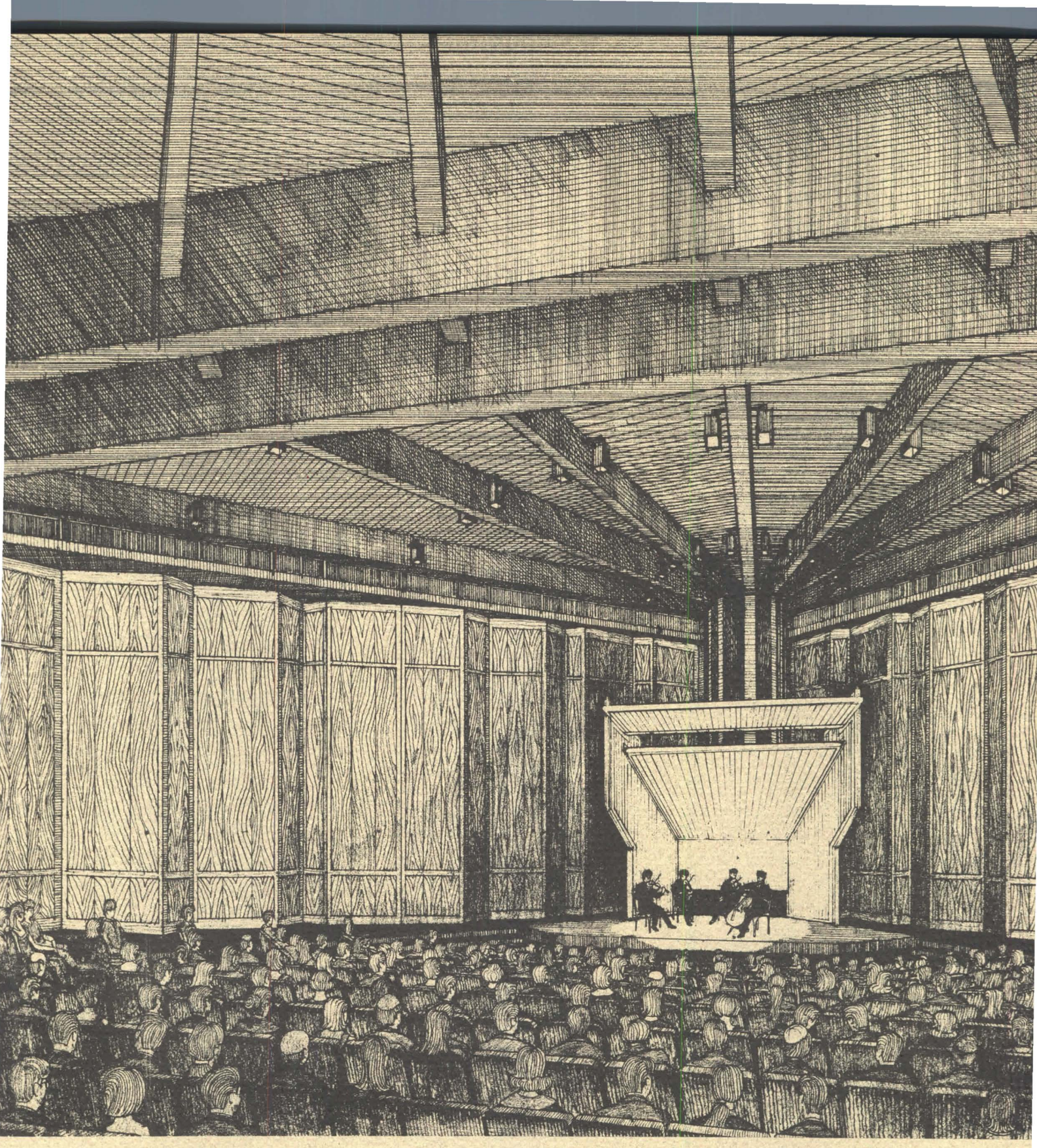
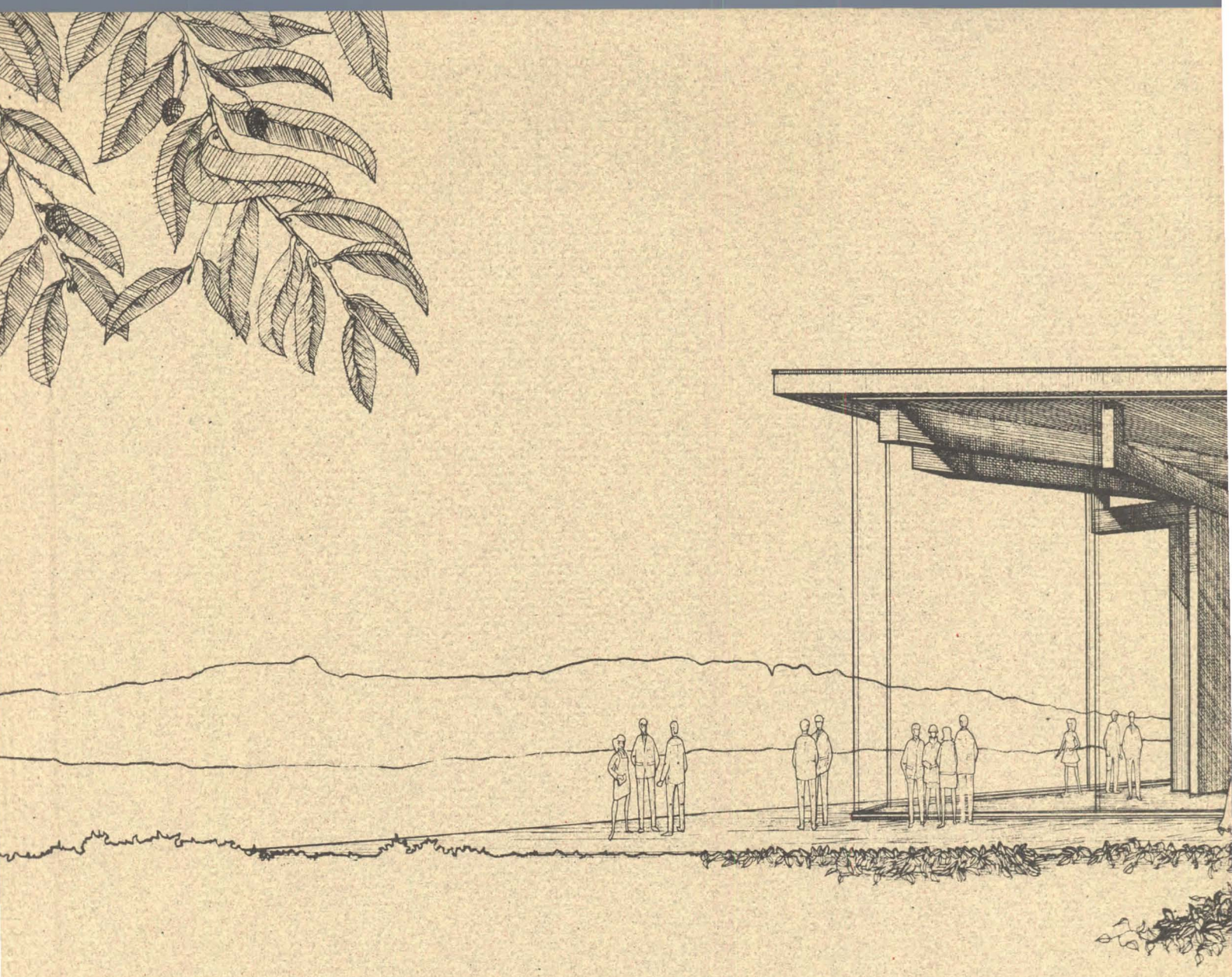
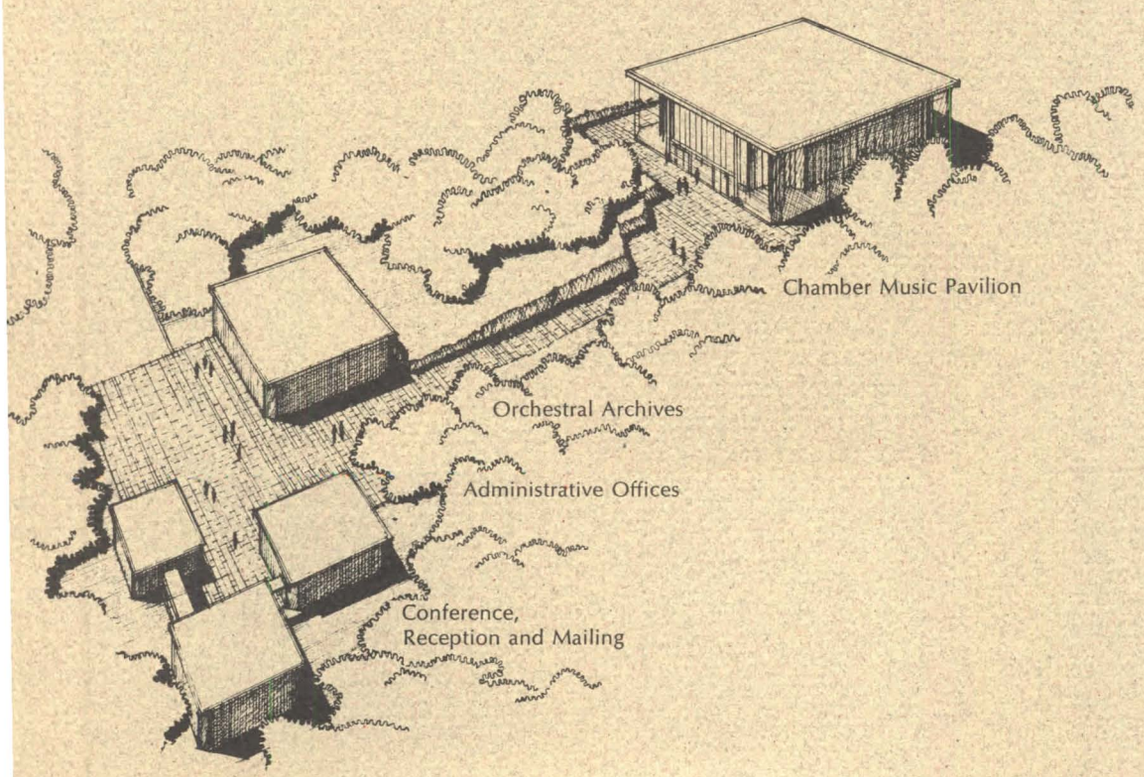


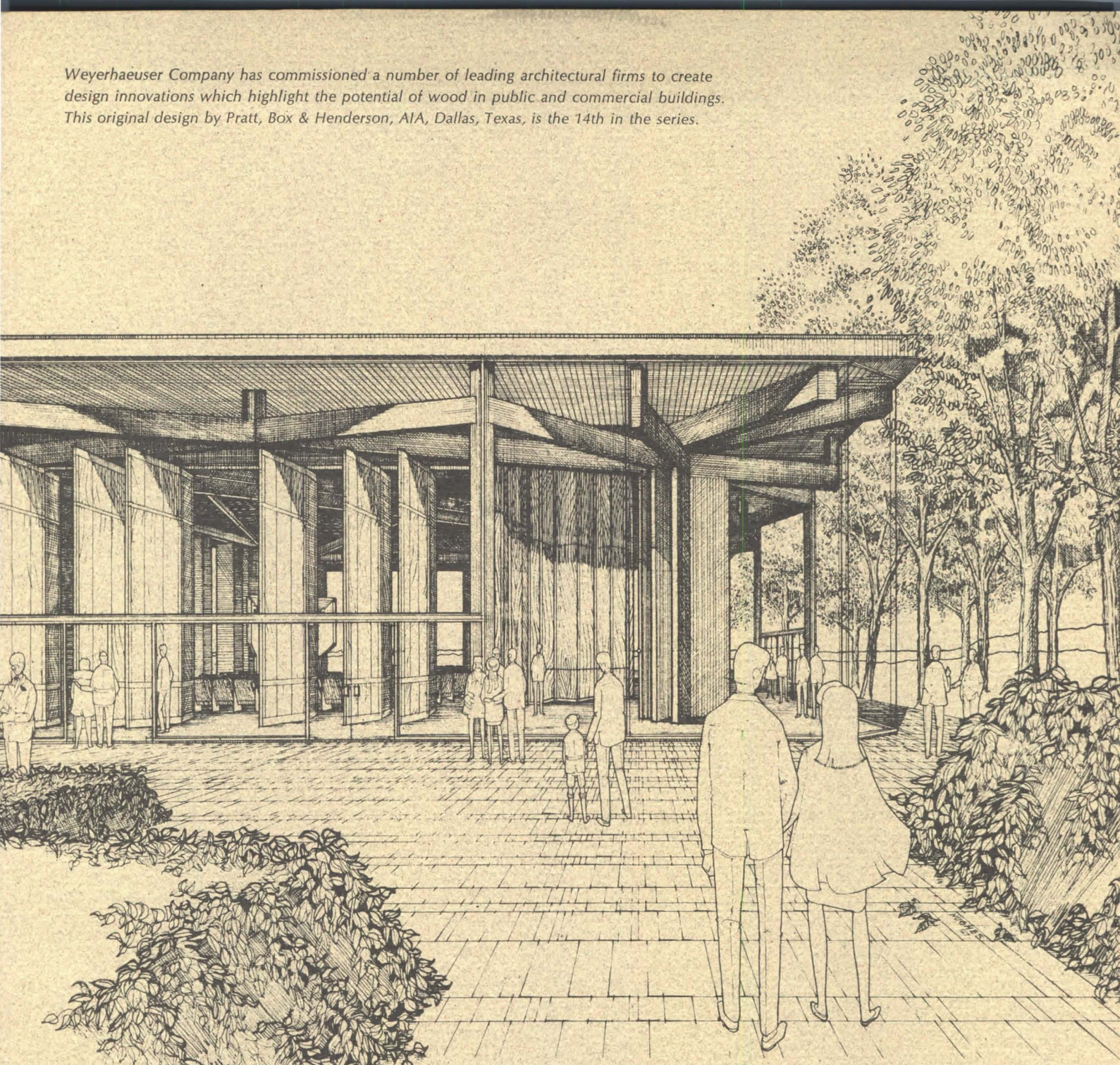
Pratt, Box & Henderson Design
A Chamber Music Pavilion

One of a series of design innovations commissioned by Weyerhaeuser Company




Chamber Music Pavilion
Orchestral Archives
Administrative Offices
Conference,
Reception and Mailing

Weyerhaeuser Company has commissioned a number of leading architectural firms to create design innovations which highlight the potential of wood in public and commercial buildings. This original design by Pratt, Box & Henderson, AIA, Dallas, Texas, is the 14th in the series.



"The concept is a musical instrument to contain a concert."

"Each musical form has its own favored environment—special architecture that traditionally is part of the genre.

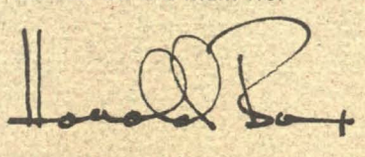
"The concert hall, for example, is so clearly identified with the symphony that it's difficult to form an image of the orchestra without imagining the grand hall in which it performs.

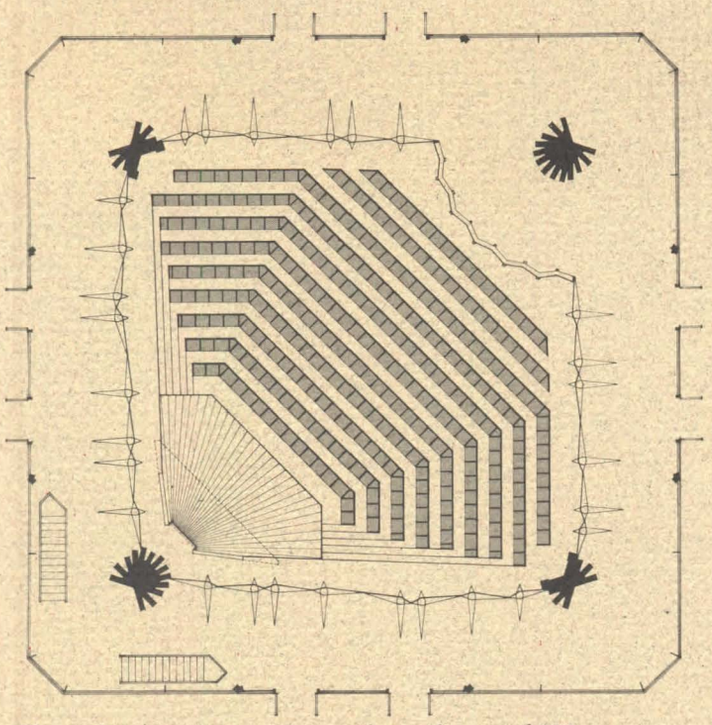
"Architectural precedents for chamber music are less abundant, perhaps because the musical form evolved more for the pleasure of the performers than for an audience large enough to require special structure. Yet today large audiences are popularizing the civilized, refined patterns of chamber music.

"Our solution arises from the music itself: The concept is a musical instrument large enough to contain a concert for an audience of 350.

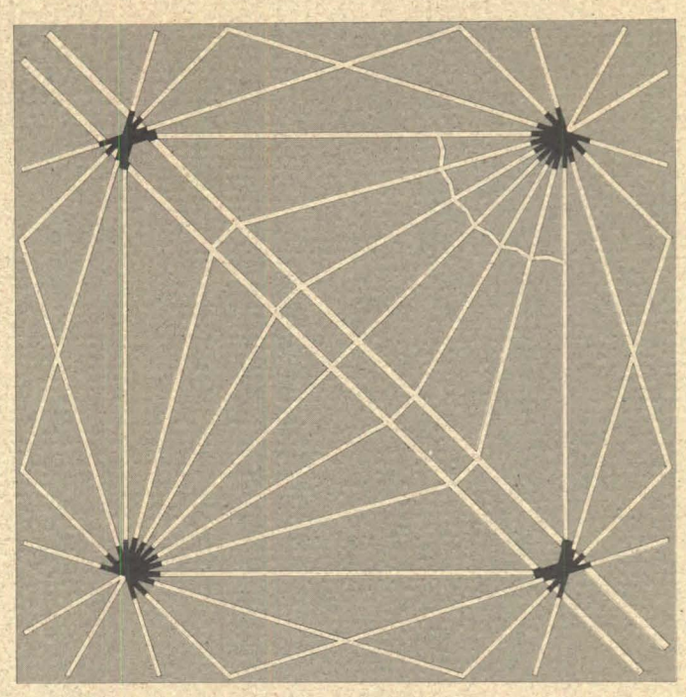
"This architectural instrument is wood encased by glass. Between the glass and the highly-polished wood shell is a lobby with 24-foot-high wood doors that pivot closed for a performance.

"The structure is four massive piers which express the laminated beams they support. Two piers support the diagonal main rib. Opposite piers support radial beams which rest on the main rib."

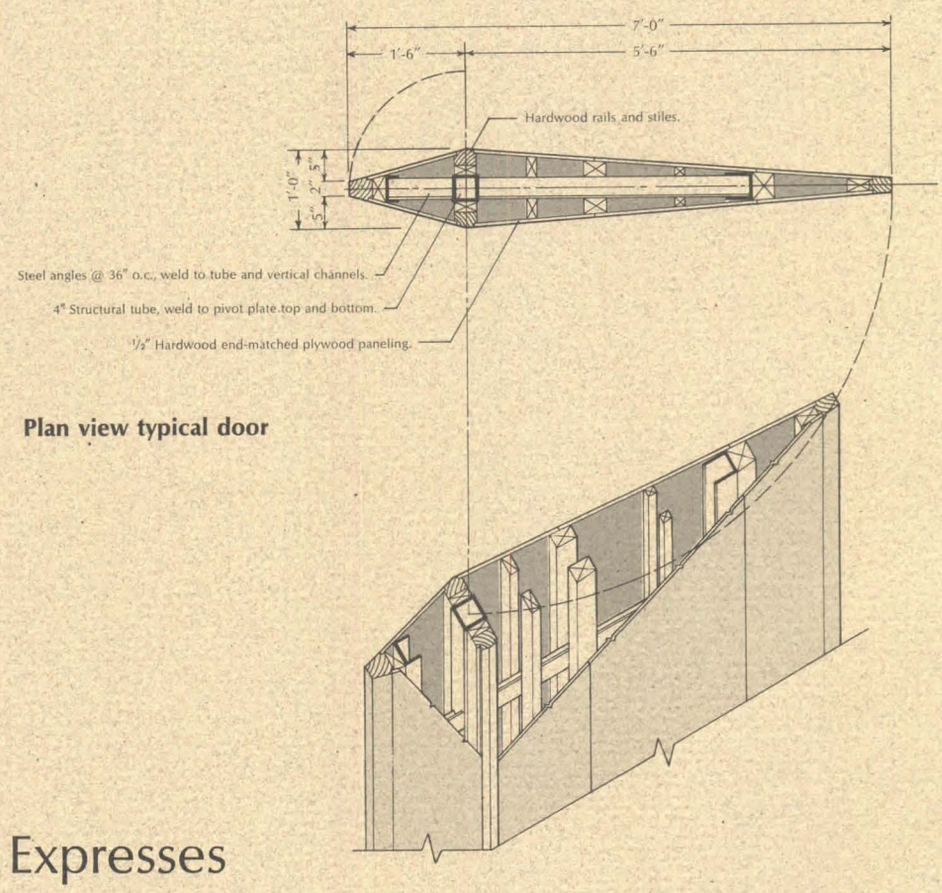




Floor plan / unobstructed view for audience of 350.



Reflected ceiling plan / laminated wood piers and beams.



Plan view typical door

"Wood Structure That Expresses an Art Form."

With great sensitivity, Pratt, Box & Henderson have created an architectural solution that satisfies complicated physical requirements—and at the same time expresses the essence of an enduring art form.

The same words can describe both the music and the structure: refined, cerebral, precise, intricate, charming, filled with endless small delights. The master craftsmen of 17th century Cremona would comprehend this structure—it is in complete harmony with the high skills they used to develop the instruments of chamber music.

Wood in its many forms, and in the hands of sensitive designers, can give rise to dramatic new architectural forms.

At Weyerhaeuser we make every effort to stimulate such creative work.

The Weyerhaeuser Architectural Services Program exists for this reason. Through it, architects and designers have access to the most comprehensive body of technical data available from a single source in the wood products industry.

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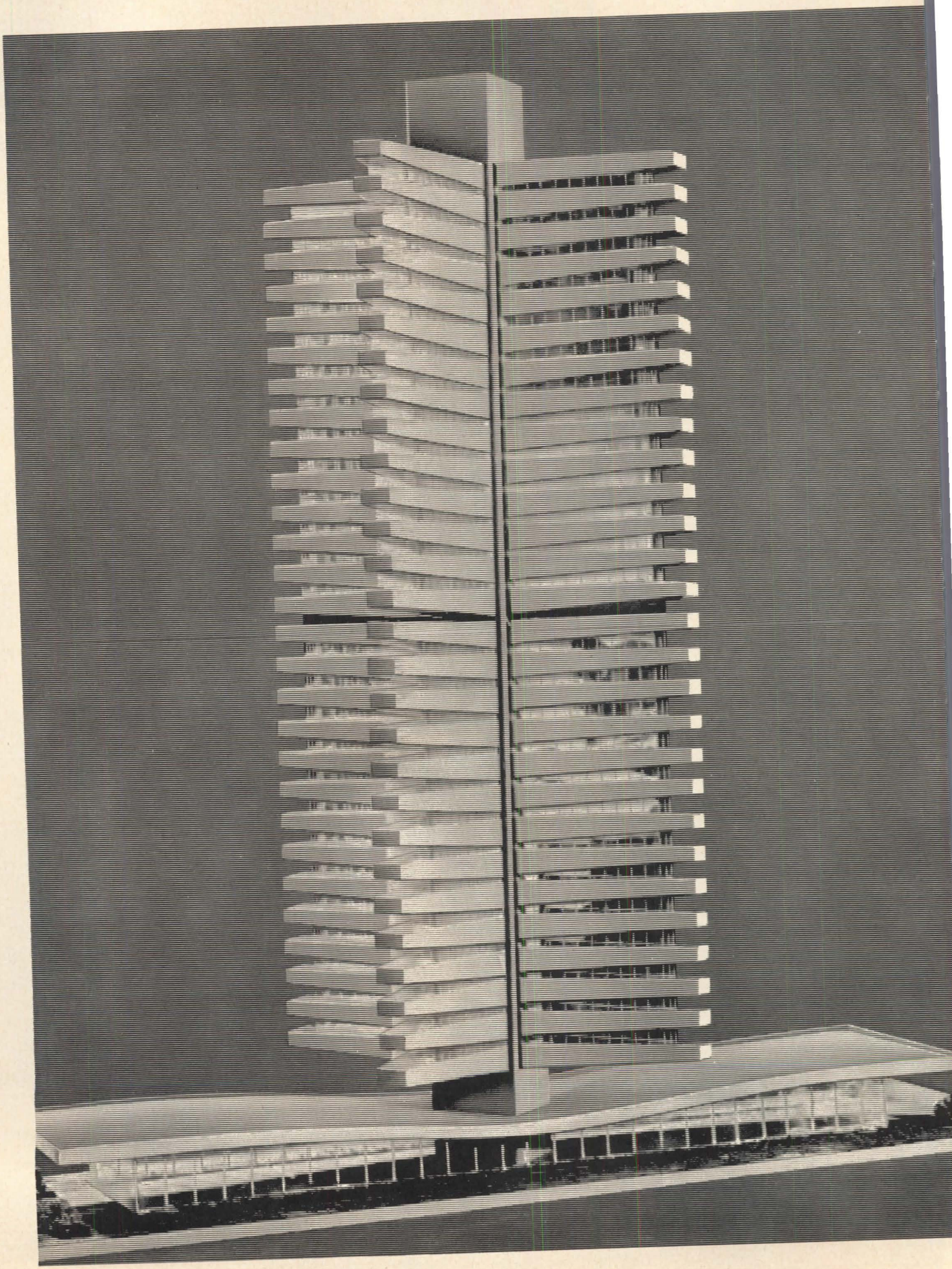

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THIS "TREE HOUSE", with glass-walled "branches" suspended from a center "trunk", offers interesting architectural possibilities, particularly for buildings on crowded, downtown land. With window placement along the entire length of each floor, and with the cantilevered floors tapered to not block daylight, the concept allows outdoor enjoyment throughout the interior space. The "tree house" was designed by Architect Haigh Jamgochian of Richmond, Va., and has been featured in Libbey • Owens • Ford national architectural promotions.

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8:00 a.m. Bill Appleton checks his case of Trend Contract carpet samples, test reports, specifications, and starts to work. Breakfast, and Bill talks motel carpet maintenance. Then he checks tax depreciation figures with the office. Lunch, Bill reviews fiber performance for hospital conditions. He checks an installer. All day long, nothing but contract carpeting. You might not want your sister to marry Bill, but he's a great guy to buy carpet from.

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Belleville, Illinois: Belleville Township High School—East—and Junior College. *Architects:* Hellmuth, Obata and Kassabaum, Inc. Weisentein, Rogers and Hausman. *General and Masonry Contractor:* S. M. Wilson Co. *Wall Construction:* Concrete block and brick with Keywall Multibond (wire mesh) Reinforcement in all courses of blocks

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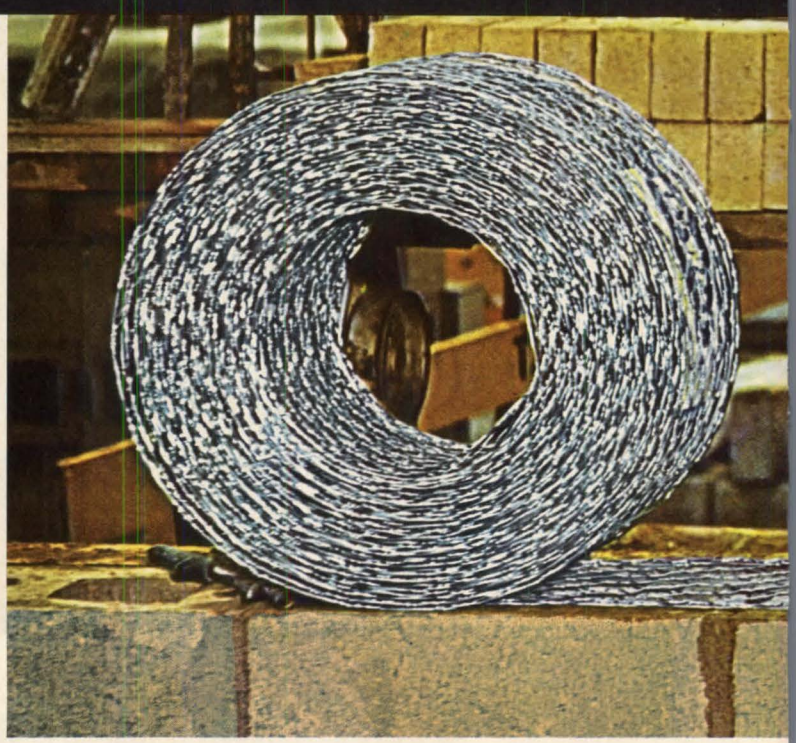
can be matched to the mortar strength to give you better masonry every time

Inner strength to meet your needs



Use Truss-Type Keywall® Reinforcement with high strength mortar

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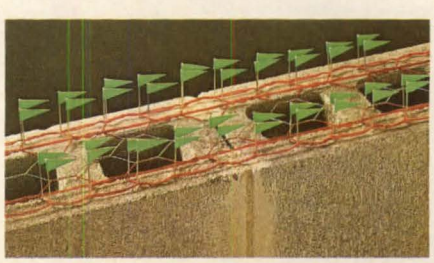
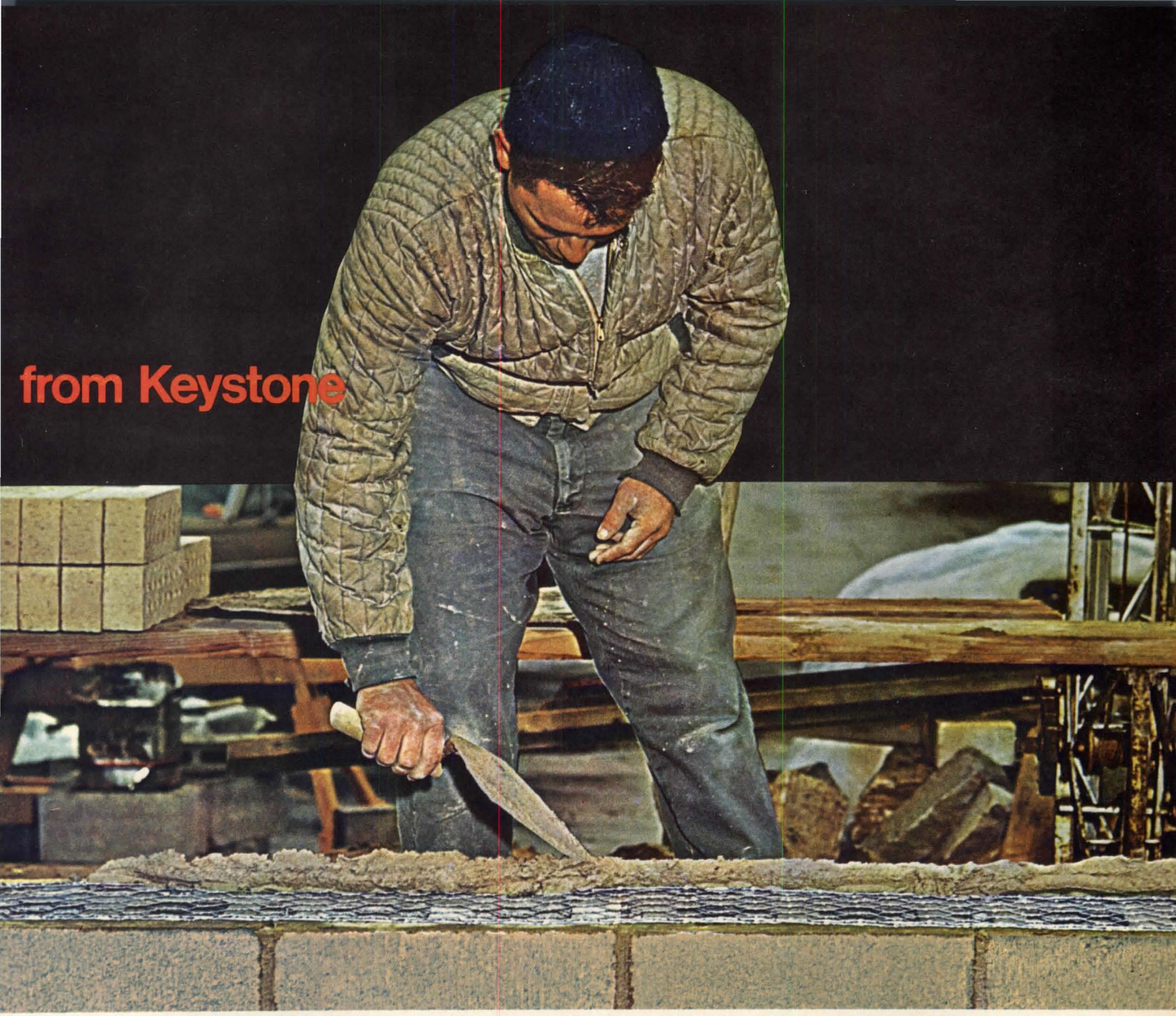


See why Keywall wire mesh is called Multibond. Look at the bonding area (red) . . . and the mortar locks and mechanical anchors (flags). Actually it provides 96% more bonding surface than 9-ga. trusses, 55% more than 3/16" trusses. It's exclusive from Keystone.



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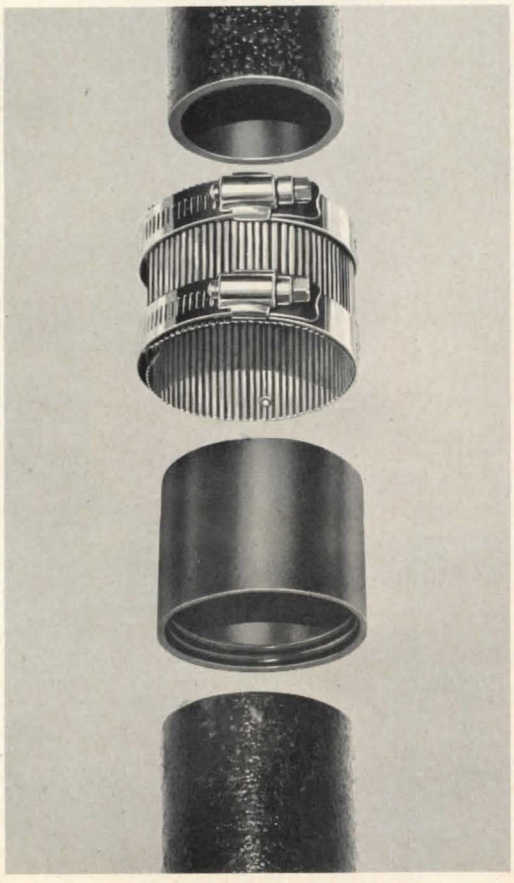

The silencer that seals cast iron soil pipe is made of Du Pont Neoprene

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Ceramic tile by American Olean leads a double life in this urban school

How do you make a busy high school/community center like this one bright, beautiful and varied throughout? And how do you build in the durability to withstand years of round-the-clock punishment?

In this crisp tower—as in so many modern schools—both goals have been achieved by exploiting the full range and versatility of ceramic tile by American Olean.

In the spacious lobby, for example, Murray quarry tile in Fawn Gray is used to create a floor of rich, earthy beauty. Small-unit ceramic mosaics in a blend of subtle grays and blues form a distinctive mural wall and clock face. American Olean glazed tile contributes its crisp look to built-in reception desks.

In the natatorium, walls of blue and green glazed tile form a cool backdrop for poolside activity. And ceramic mosaics in soft whites and grays make up the easy-to-care-for deck and lining of the pool.

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Durability? No matter how much punishment they're exposed to, American Olean glazed tiles, ceramic mosaics and Murray quarry tiles will last the life of the building. And they'll stay fresh and new looking with simple cleaning.

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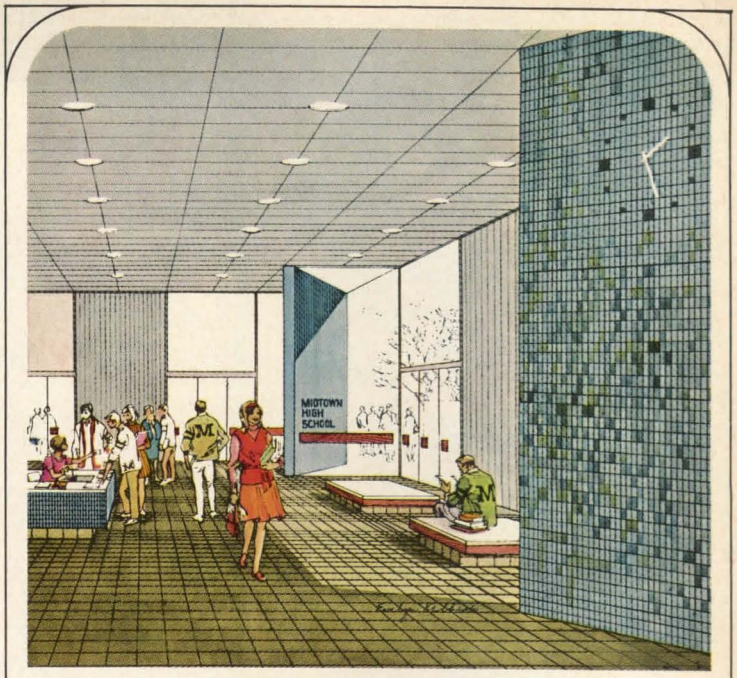
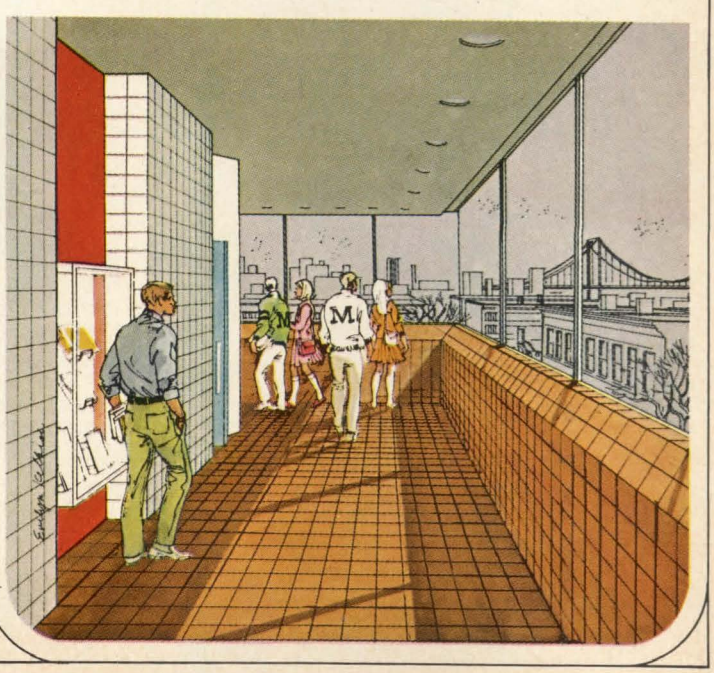
West Coast: Pomona Tile Company

Architect: Edward Kelbish





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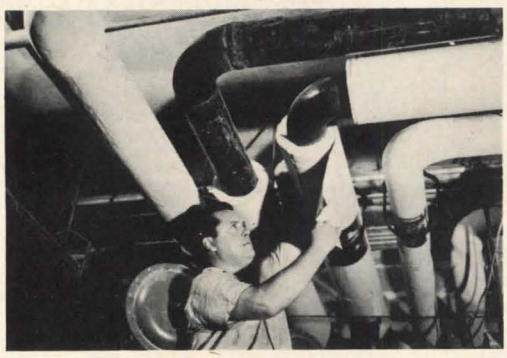

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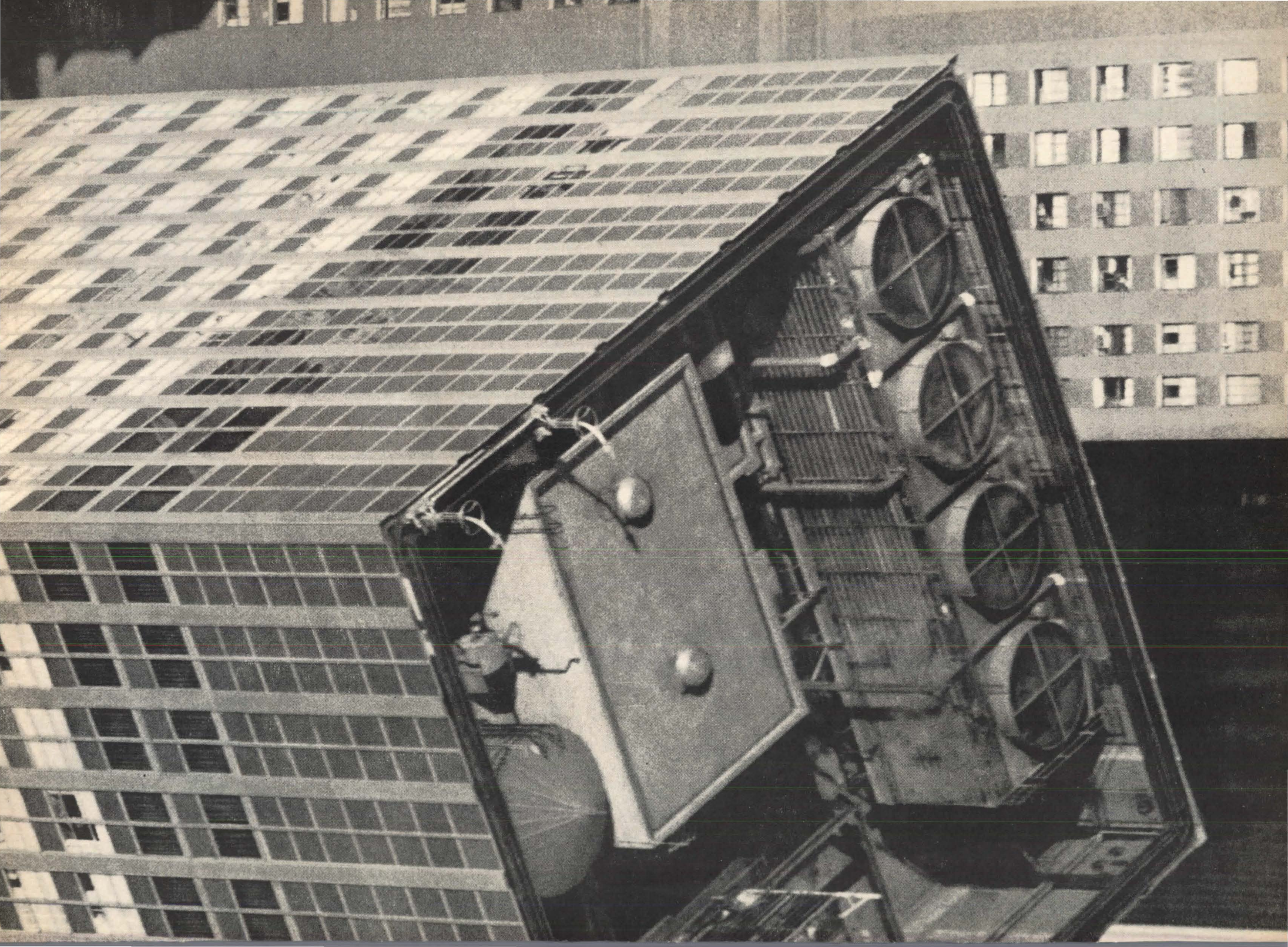

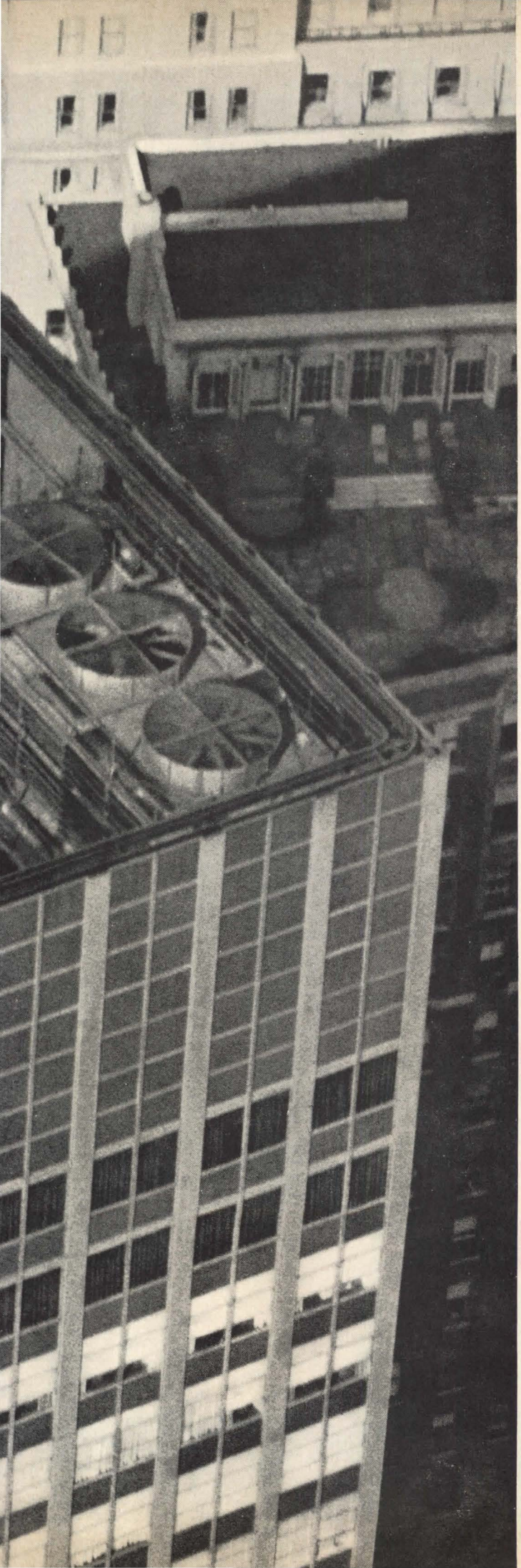

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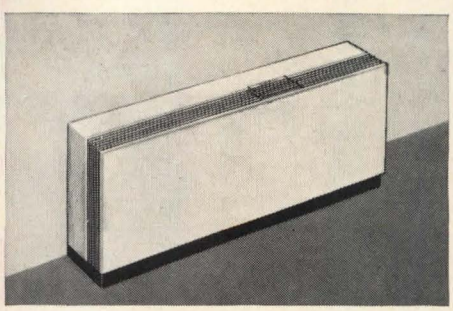
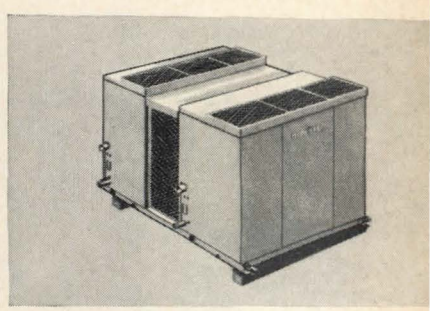


GE Zoneline heating/cooling unit. Room-by-room control. Choice of grilles. Fits over doors or under window seats. Through-the-wall or floor-mounted consoles.



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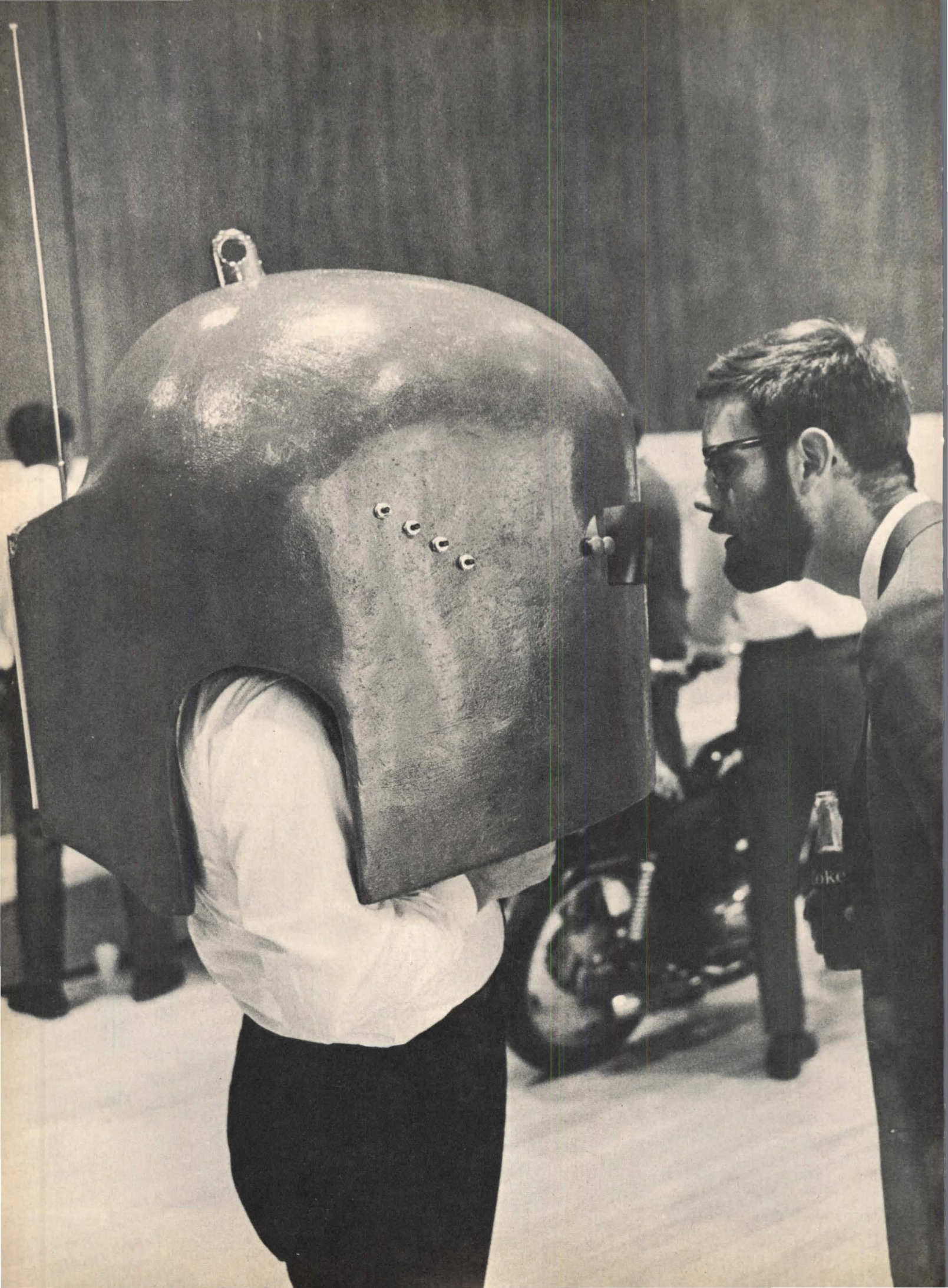
"When are we going to stop playing house in school and become involved in the activities of real life?"

DR. JOHN TIRRELL



EDITORIAL

The American Dream, once upon a time, in seemingly simpler and more believable bygone days, was forged, shaped, molded, and reinforced in the American school. The great melting pot simmered in the classroom more strongly than anywhere else. With the daily recitation of the allegiance to the flag began the life-long pursuit of happiness — a quest for that easily understandable goal of achieving personal wealth within a framework of communal verities and virtues.

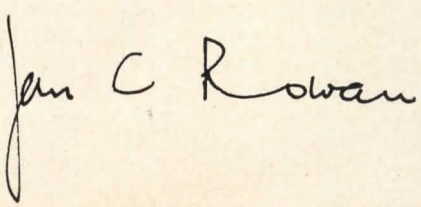
In those days, knowledge meant the acquisition of a few facts. Teachers knew the three R's and were happy with polished apples; Mary's little lamb had fleece white as snow; Dick and Jane hop-a-longed by a twisting stream to the schoolhouse; all in all, education meant that one generation was instructing another generation in what it knew and what values it believed in.

As time went by, a transformation in American schools took place. It was a slow and incomplete process, but one by one the bucolic ideals were thrown overboard. This process still continues. For instance: Knowledge, today, is not the acquisition of facts, but the ability to think and to retrieve facts; teachers are no longer kindly spinsters happy with apples, but a tightly organized force of locals of the United Federation of Teachers; Mary's little lamb's fleece is often not white, but black; Dick and Jane usually go to school by bus, car, or subway, and they do not dream about Spot; education, on the whole, is evolving into an open-ended situation where one generation guides another generation to learn what present conditions are and what the future is likely to be, so that the young can grow into and control conditions to come.

Some of these changes are documented in this issue of P/A. When the one-classroom school develops into a school system of 900 schools with 1.1 million students, as in New York City, profound changes must take place. But there are other changes we cannot document — changes that will be taking place in the distant future. The subtitle of this issue, "Change and More Change," indicates that the continuum of change is the key element in contemporary (and future) scholastic life. Just as in all other areas of human activity, closed-ended solutions in the field of education will not work if education is to be a viable activity of a dynamic man living in a dynamic society.

In this changing scene, can schools again become part of the American Dream, or will teachers keep on striking, pupils keep on growing long hair (or shaving heads, or whatever other forms their protests might take), "educators" keep wringing their hands, bureaucrats keep arguing about allocations, and architects keep on designing obsolete buildings?

In one sense, schools have fulfilled their destiny as part of the traditional American Dream — publishers of textbooks and fabricators of educational tools are fast being bought up by Big Business. Education has arrived on the Big Board, so to speak. But the climate of change and the temper of involvement that prevail in the learning process today set the stage for schools to nourish a different ideal — a new and more contemporaneous set of national values. The primary question, therefore, is not: How can schools again become part of the American Dream? It is: What is the new Dream? ■



THE SCHOOL SCENE

The United States is paying more than $52 billion for education annually, more than $40 billion of that amount for public education at elementary- and secondary-school levels. In coming years, this amount must be increased to accommodate not only more students (the total school age population — 5 through 24-year-old youth — passed 60 million in 1960, and will have passed 70 million by 1970) and more teachers (more than 2 million needed in lower schools by 1970) but also to act as the economically generative force for school systems that will, increasingly, be taking on the attributes and responsibilities of civic leaders, sociological catalysts, and seminal agents for urban rejuvenation, as well as their traditional responsibilities for formal education.

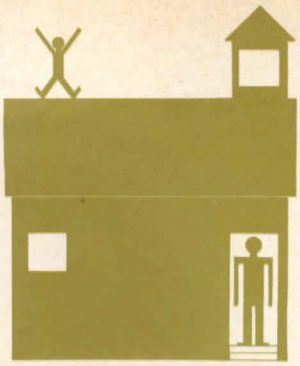
These are imposing and demanding new roles for schools, ones that will require new thinking, new involvement of the educators, the administrators, the students, the community, and the architects, planners, and educational specialists who provide the schools and resource centers. It is no longer sufficient simply to announce a projected program of new, separate school plants, as the New York City Board of Education discovered not long ago (see, "The City As Generator of Urban Form"). More and more, the school must be worked into the community fabric, and must become a contributory member of the community, both to help ameliorate its ills and to enrich it through involvement with its life and culture. Fred M. Hechinger, Education Editor of The New York Times, commenting on the new role confronting schools, wrote that "The mood of American education is like that of the starlet who has been pleading for a dramatic lead and, suddenly thrust to the center of the stage, is paralyzed with fright." There is a feeling that education is being asked to purify all our national problems of racial injustice, violence, poverty, and hatred; to act as a sort of filter through which these impurities might be removed in the process of educating our children and involving their elders in the process.

Whether such a future of increasingly nonpedagogical, nonadministrative educational programming will find easy acceptance with a profession that is not renowned for facile adoption of new methods, techniques and, particularly, new philosophies, still remains to be seen. It is presently true, however, that there are forces at work in the fields of education, architecture, planning, and related disciplines, which are preparing the groundwork for the new child-school-community relationships. That the next few years will see a continually widening spectrum of involvement and responsibility for education cannot be doubted, nor can the fact that these changes will be accompanied by significant changes in the ways we must think and act when planning and designing places for education.

This issue of P/A seeks to document current and future trends and directions in education from many aspects: from the school as a generator of urban form down to the latest thinking in individual, electronic study equipment; from some far-thinking, but not far-out, studies done at an architectural school design seminar to what, if anything, is being done about schools in our new towns; and from the ambitious new schemes for educational parks down to storefront schools and temporary classrooms in other-use buildings.

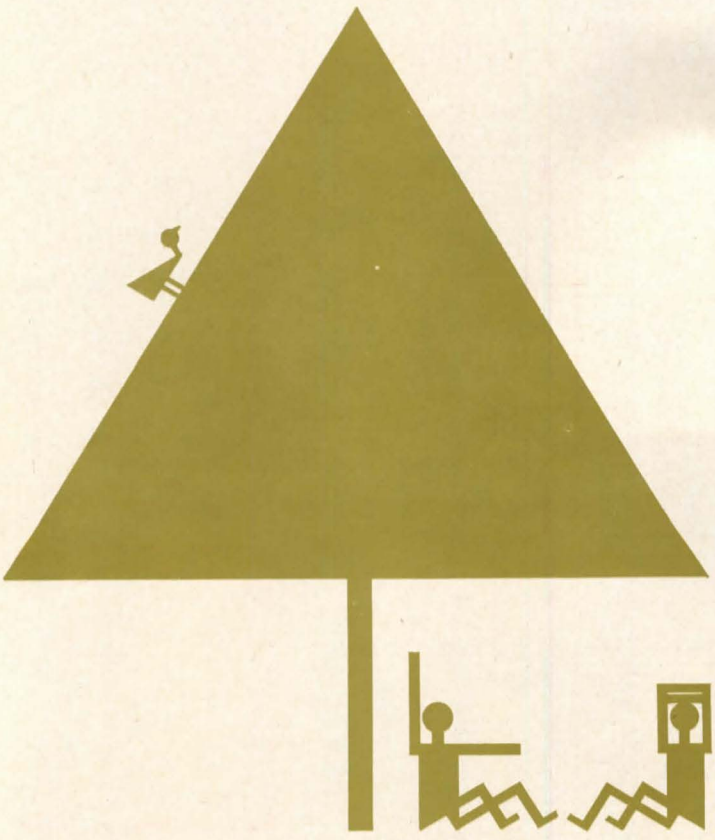
The one unmistakable truth that runs through all the research that P/A's editors have done for this issue is that educational places will no longer be designed as buildings unto themselves, at least not by aware architects and concerned school authorities and interested citizens. The days of the monumental schoolhouse, withdrawn from its community, are fast coming to a close. With the new future for schools come exciting opportunities for architects and planners to design not just part-time shells for instruction, but places that will be vital, full-time, contributory elements in their cities.

(A listing of educational authorities, architects, planners, government officials, and others who have generously cooperated with P/A in the preparation of this issue will be found on p. 264.)

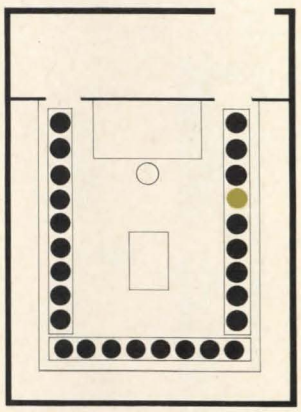


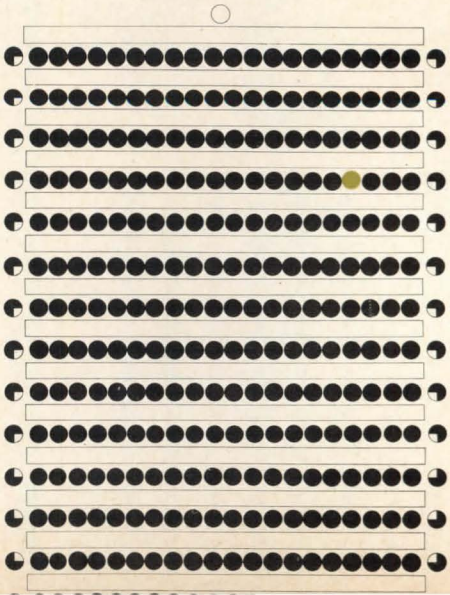
One Room Schoolhouse . . . In the U.S., dominating the school scene for nearly 200 years. Beginning with the first schools in the colonies at about the middle of the 17th Century and continuing to the middle of the 19th. One teacher to as many students as would fit. Square foot on top of round foot, elbow to elbow, knee to knee. The catechism, primer, psalter, testament, and Bible: learning by rote and drill, encouraged by the rod. Heated by wood (supplied by the student), air conditioned by breath and body temperature. The Lancastrian system, beginning around the 1800's lasted for 50 years: 500 students, 50 monitors, and one teacher — an extreme example of the one-room school that paved the way for mass education.

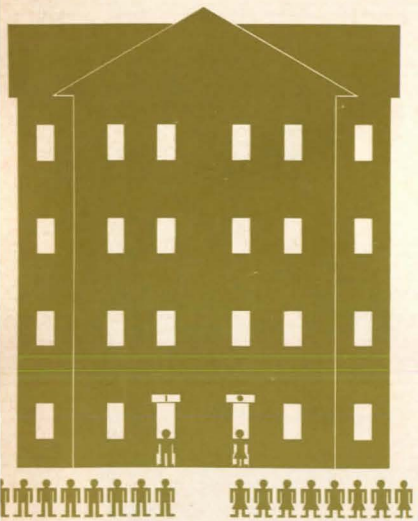
CHANGE AND MORE CHANGE



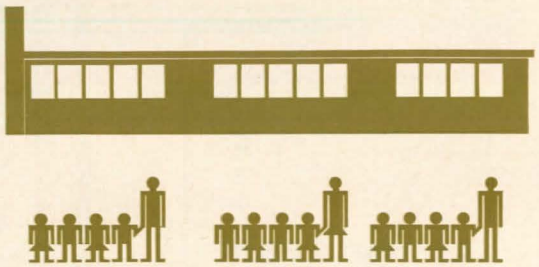
In the beginning, Socrates . . . One student, one teacher, one tree. Square foot per student: the whole wide world of ideas.



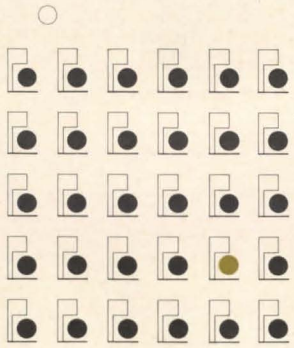




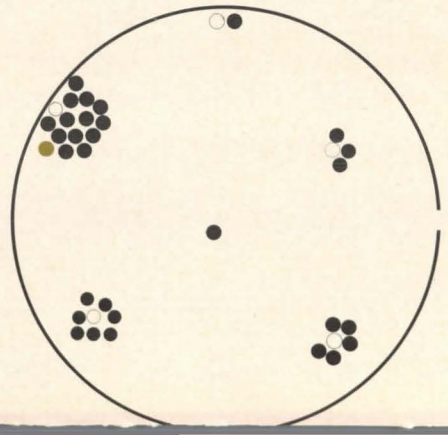
The Classroom and the Graded School . . . Beginning about the middle of the 18th Century. Twelve classrooms, assembly hall, and principal's office. Fifty to 60 students per room, 15 sq ft per student, desks bolted to the floor. Pupil sat passively and watched the instructor write on the blackboard — a sponge soaking up information in preparation for adult life. Fences caged students on a sea of asphalt. Air conditioned by the open window.

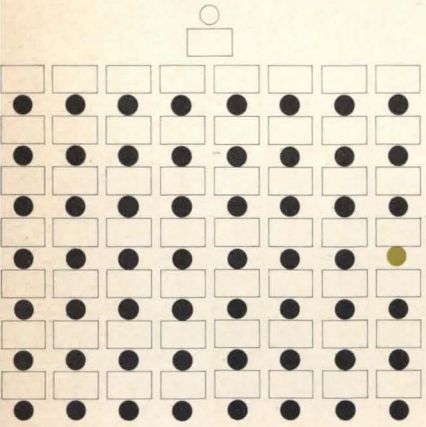


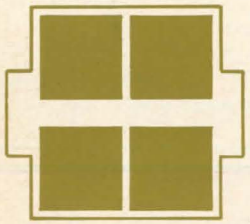
The Individual Classroom . . . Classrooms as separate learning centers beginning around the turn of the 20th Century, gathering momentum in the 30's and 40's, and in full swing after World War II. Series of single classrooms, smaller classes, and specialized subjects for teachers. Square foot per student from 80 to over 100; grounds to match. Education by experimentation and investigation, discussion and evaluation. Kindergarten and high schools and junior high school; music, art, shops. Finger, campus, cluster, and house plans. Air conditioned by the amount of space a breeze could push across (usually) two classrooms and a corridor.

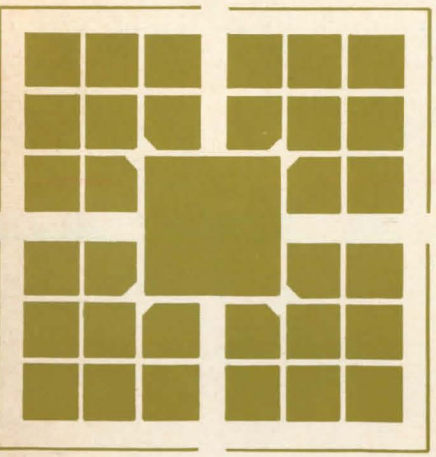


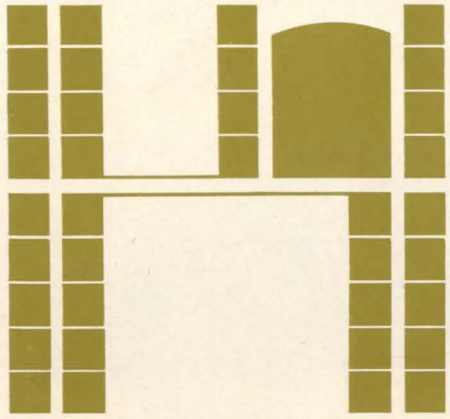
Learning Space and Ungraded Classes . . . The student as individual learner seeking out his instructor and timing his own instruction time. Mechanical aids for finding out facts; personal investigation for students finding out about themselves. Learning as a living experience; functional efficiency. Square foot per student as little and as much as he needs with a few square feet all his own in carrels. Round, hexagon, "hexacome," square serpentine, with funny folded hats. Air conditioned space. Mobile space and temporary space and great plan flexibility.

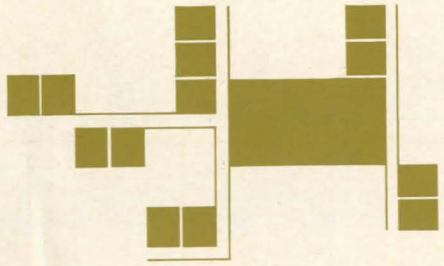


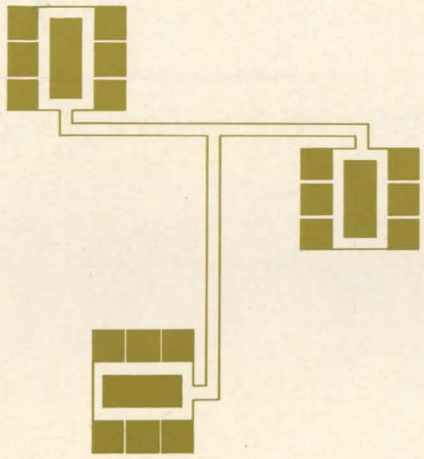












And, again, one "tree" . . . This time, a television mast; square foot per student, the entire wide transistorized, transmitted, telegraphed, televised world. Responsibility for equal learning despite social inequities. Pre-school learning, self-help, and adult education. Education for a lifetime — the total evironment as the school.

NEW TOOLS

EDUCATION'S EMERGING TECHNOLOGY

Realizing that traditional teaching techniques are increasingly inadequate to the demands of mass education today, educators, in an effort to individualize the learning process, are experimenting with new, sophisticated devices that have already begun to alter the character — and hence the planning and design — of the classroom, the library, and the school itself.

Teachers have always used a wide variety of materials and objects to illustrate or supplement their lessons. Educational suppliers' catalogs tempt classroom teachers to order everything the budget will allow, from elastic bands to kitchen sinks, from building blocks to computers. What are they all for, what good do they do? How does the teacher use the innumerable products available, and where does he put them when they are not in use? The answers to these questions must be understood by architects and planners involved in the design of educational buildings.

Educational equipment can easily be classified in several categories according to function. There are materials that assist the teacher in presenting the content of a lesson, objects and devices that allow the student to pursue his education individually, either within a classroom or outside of school, and devices that make available to both teacher and student subjects, which, ordinarily, would remain outside the scope of any one school. Machines are also used to extend the reach of subject matter by duplicating texts, slides, or recordings. And many teaching tools serve a multiplicity of purposes, as when a machine for displaying graphic material is used to project an image created at a large university across the country for a high school class of 30 or 40 students. Today's tools derive importance from the belief that when children are allowed to touch and become personally involved with study materials, they can set their own pace and extract knowledge they are able to relate to their own experience.

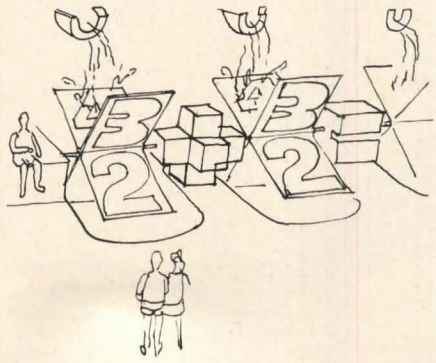
Devices on the market today are not all the result of modern gadgetry and gimmickry, nor are they all, by any means, of recent invention. In the traditional classroom, equipment for presenting lesson material generally consisted of chalkboards, a globe, and a number of large maps attached to moldings above the chalkboards, to be rolled down at appropriate times. In science classes, experiments and demonstrations require special equipment, sometimes very simple, at other times highly sophisticated, depending on the level of study or the nature of the subject itself, and planners recognize the necessity of designing spaces for science instruction to accommodate extra electrical outlets, large counters, storage space, and sinks with running water. But even when no special facilities are provided for the teaching of science, instructors turn commonplace objects into teaching tools for a particular demonstration. A pear becomes the planet Earth, an orange, the sun, and a drop of ink in a glass of water illustrates molecular motion.

Books, of course, have for centuries been the staple teaching tool, because of the many valuable functions they can perform. Books can overcome ignorance on the part of the teacher as well as the student; they can be duplicated and distributed to make exactly similar material available for all students; they allow the student to absorb information as quickly (or as slowly) as he can read; they can be called upon for use at any convenient time or place.

Technological Tools

From the standpoint of the architect involved in school design, books, until quite recently, were undoubtedly the most important educational tools to be coped with (with the possible and limited exceptions of facilities for vocational training, gymnasium equipment, and the science laboratory). Since the 17th Century, it has been necessary to provide storage space for books, both in the space where instruction takes place and in a separate place given over entirely to books and their users.

Within the last decade, however, the physical containers of information and the equipment for producing them have acquired new forms with widely diverging characteristics. Most of the new devices for storing or transferring information are made possible by modern technology — more specifically, by electronics. Today and in the future, educators and designers alike must become familiar with a myriad of devices for producing, displaying, processing, and storing packets of information. Since the use of such tools on a scale suitable for evaluation purposes is just now beginning to spread, the skills and talents of both architects and educators are needed in any attempt to program new facilities that will incorporate the new technology. This is no simple task, for equipment now produced, and gaining increasing acceptance in the schools, ranges in size and complexity from tiny cards that contain, for example, both printed text and a small slide to be viewed on a portable light screen, to extremely sophisticated computers connected to a number of access terminals. Some of this equipment is illustrated on the facing page.

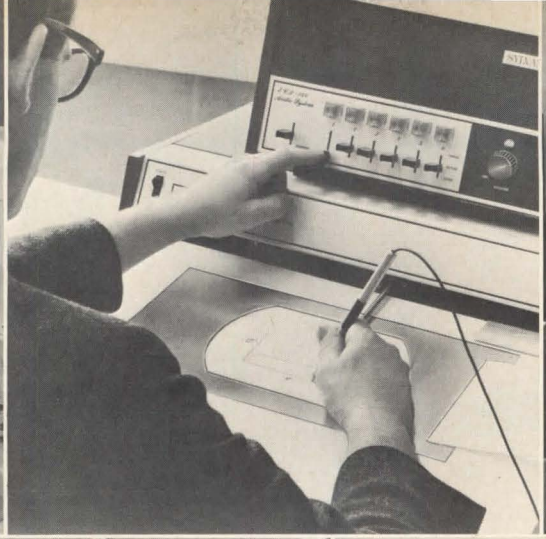


How does education benefit from the installation of expensive, complex electronic equipment? Television, tape recordings of audio and video programs, 8mm and 16mm slides, and language laboratories offer a wider selection of lesson material in more varied forms than the traditional textbook. But they do not replace books or teachers in the learning process; rather, they create an additional fund of material for students and teachers to draw upon. Nor is their importance limited to the augmentation of lesson material.

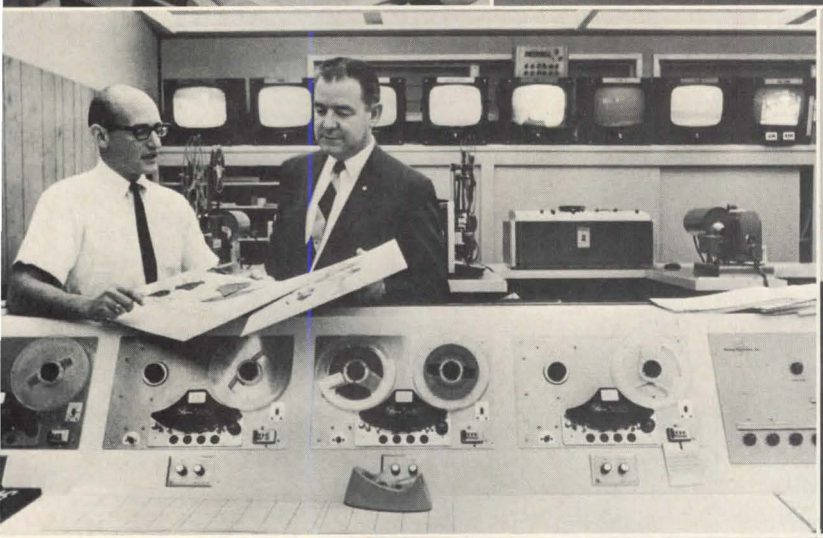
A videotape recording of one lesson given by a truly great teacher can, for instance, be of far greater value than many lessons prepared by poor teachers using traditional methods. Or a teacher can devote a segment of his time to the preparation of one excellent lesson or course to be recorded and distributed, and find himself free to spend his remaining time working with individual students. Information and media storage and transferral systems may be equipped with independent access terminals, so that a student can call up the program, slide, text, or test he needs at any time he is free to do so. Then, of course, he can proceed at his own rate and in his own manner, since he feels no pressure to keep up with classmates. Computers, too, are programmed to offer maximum flexibility in learning rates.

What all these characteristics add up to is the use of impersonal machines and mass media to permit a greater individualization of the learning process than was ever possible before. Of course, the ideal situation would be one in which each pupil would work directly with one teacher at all times, or, perhaps, with various teachers, depending on the subject matter, always maintaining a 1:1 teacher-student ratio. However, it has been estimated that, in order merely to maintain the present ratio of students to teachers in the elementary and secondary schools, approximately half of all college and university graduates from now on would have to become teachers. Obviously, there is no way to insure that this will occur, and little likelihood that it will happen of itself. This situation alone is sufficient to indicate that means must be found to provide opportunities for students to learn without constant teacher supervision. Further, the recognition that education is a continuing process, rather than an arbitrarily determinate number of years spent primarily in institutions for instruction, leads to the realization that students need to be taught how to learn on their own — process, not product; inquiry, not content. Two of the most important requisites for this goal — ordered thinking and a familiarity with sources of information — are natural results of learning with technological tools.

The individualization of learning is an ancient aim of educators, and the invention of the printed book was probably the most dramatic innovation along these lines before the introduction of electronic teaching. When each student had his own copy of the text, it became unnecessary for the pedagogue to read to his students and for them to copy what they

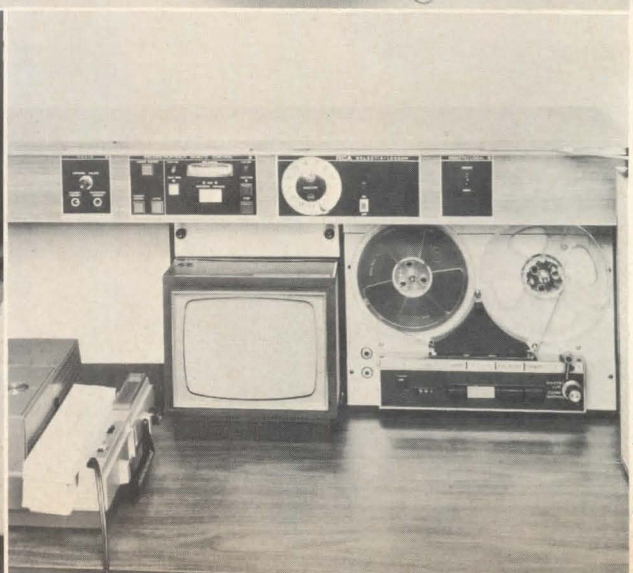


RCA Learning Laboratory (left). Sylvania Blackboard-by-Wire system (center). Classroom station, RCA dial-access system (right).

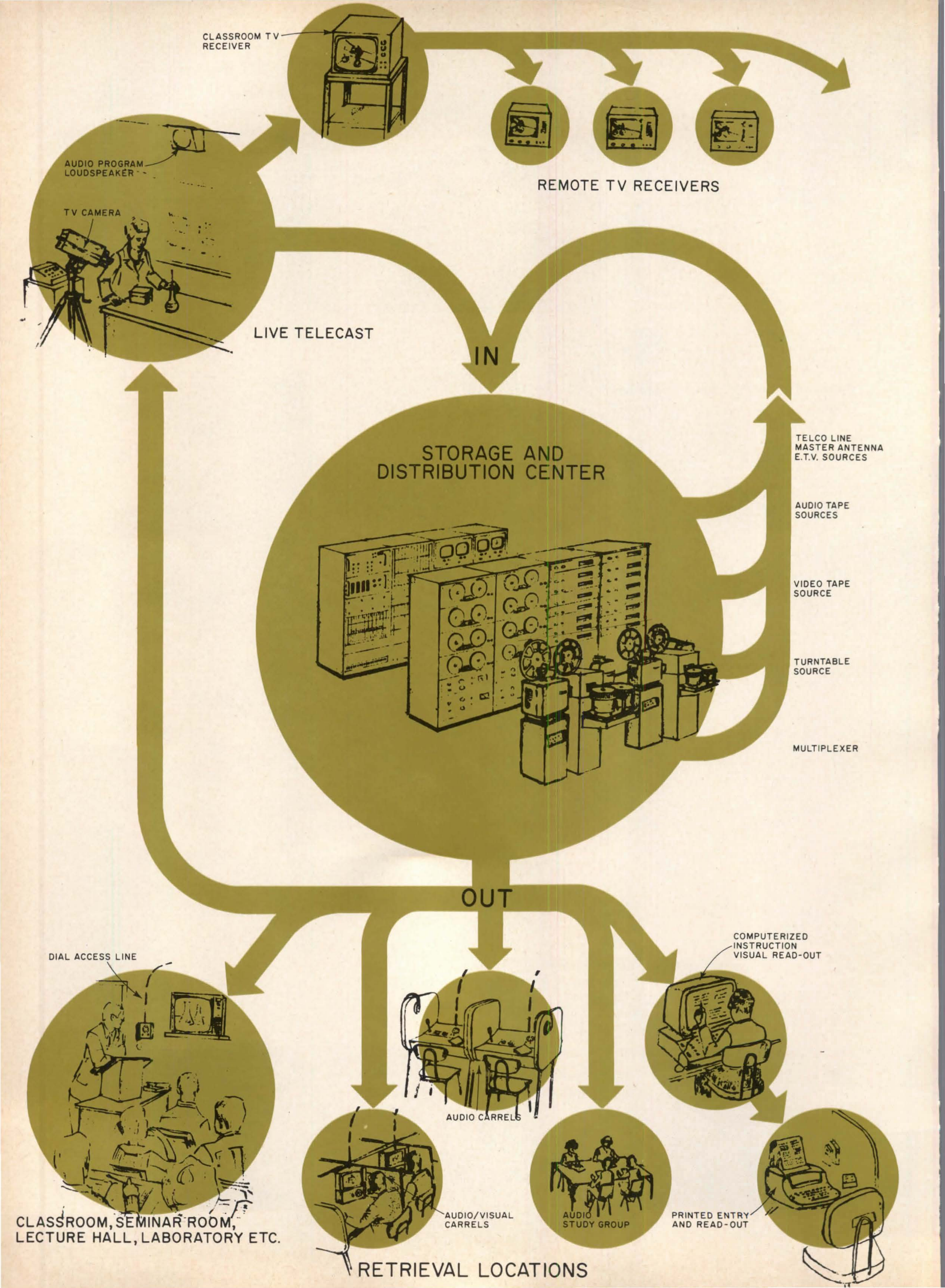


TV production equipment, Beverly Hills Unified School District (left). Raytheon Communicator Console (right).

Raytheon Multi-Media Control Console (left). RCA Learning Laboratory control console (right).



Sylvania Blackboard-by-Wire system (left). RCA dial-select carrel (right).


CLASSROOM TV RECEIVER
REMOTE TV RECEIVERS
AUDIO PROGRAM LOUDSPEAKER
TV CAMERA
LIVE TELECAST
IN
STORAGE AND DISTRIBUTION CENTER
TELCO LINE MASTER ANTENNA E.T.V. SOURCES
AUDIO TAPE SOURCES
VIDEO TAPE SOURCE
TURNTABLE SOURCE
MULTIPLEXER
OUT
DIAL ACCESS LINE
COMPUTERIZED INSTRUCTION VISUAL READ-OUT
AUDIO CARRELS
AUDIO/VISUAL CARRELS
AUDIO STUDY GROUP
PRINTED ENTRY AND READ-OUT
CLASSROOM, SEMINAR ROOM, LECTURE HALL, LABORATORY ETC.
RETRIEVAL LOCATIONS

heard. The teacher then could afford to interpret and explain, rather than merely dictate his lessons. Nor is the application of technology to the learning process a 20th-Century innovation. Medieval scholars were intrigued by the book wheel, a mechanical device that held 10 or more books in place for convenient reference. Another medieval version of the teaching machine was a jousting device that held a javelin. When a page or squire, aspiring to be a knight, charged at it, depending on the accuracy of his aim, the "mechanical knight" either was laid low or turned to administer a forceful blow to the learner. Present methods are gentler, but often similar in principle.

Types of Equipment

Electronic equipment now in use in various school systems in the country and worth considering for use in presently planned programs includes:

- Closed-circuit TV systems, with facilities for local production, a store of video tapes, and appropriately located monitors and viewers.
- Audio tape recorders and players.
- Electronic teaching machines, especially for foreign language instruction. (Audio tapes may be part of such equipment.)
- Open-circuit educational TV networks.
- Facilities for production and display of 8mm, 16mm, and 32mm slides. Projectors of either or both rear and overhead types.
- Computers for programmed instruction or information storage and retrieval.
- Computers for scheduling of classes, resources, and facilities.
- Computers for administrative processing to free teachers from routine function.

Usually, when a system is to make use of more than one type of equipment, it will require an electronic switching device to provide desired access to any one program or tape. Often, access to several types of electronic media is made easily available through a simple set of switches or a telephone dial in an individual student carrel. Public address systems, intercom lines, and even clocks may be tied into each access terminal and controlled from a remote source. Manufacturers offer different versions of individual components or complete systems, and most provide consulting services to insure maximum benefit from any installation. Some will provide planning services for architects as well. Both Raytheon Learning Systems Company and RCA's Instructional Systems Division offer "package" systems of audio-visual and student response equipment. RCA's learning laboratory system for language instruction consists of a teacher's control console, from which 10 different lessons may be fed simultaneously to students at as many as 64 positions. Students may listen, respond, and record their own speech. Teachers can listen to the recitations of any student in the room, and can talk to students who need help with their work. It is also possible for students to carry on dialogues with each other, if the teacher so desires. The equipment has its own power supply, so that it is relatively mobile; it is not tied to the nearest electrical outlets. The only equipment located in student carrels is a simple set of controls for volume, and perhaps for recording and erasing tapes, plus the headset and microphone.

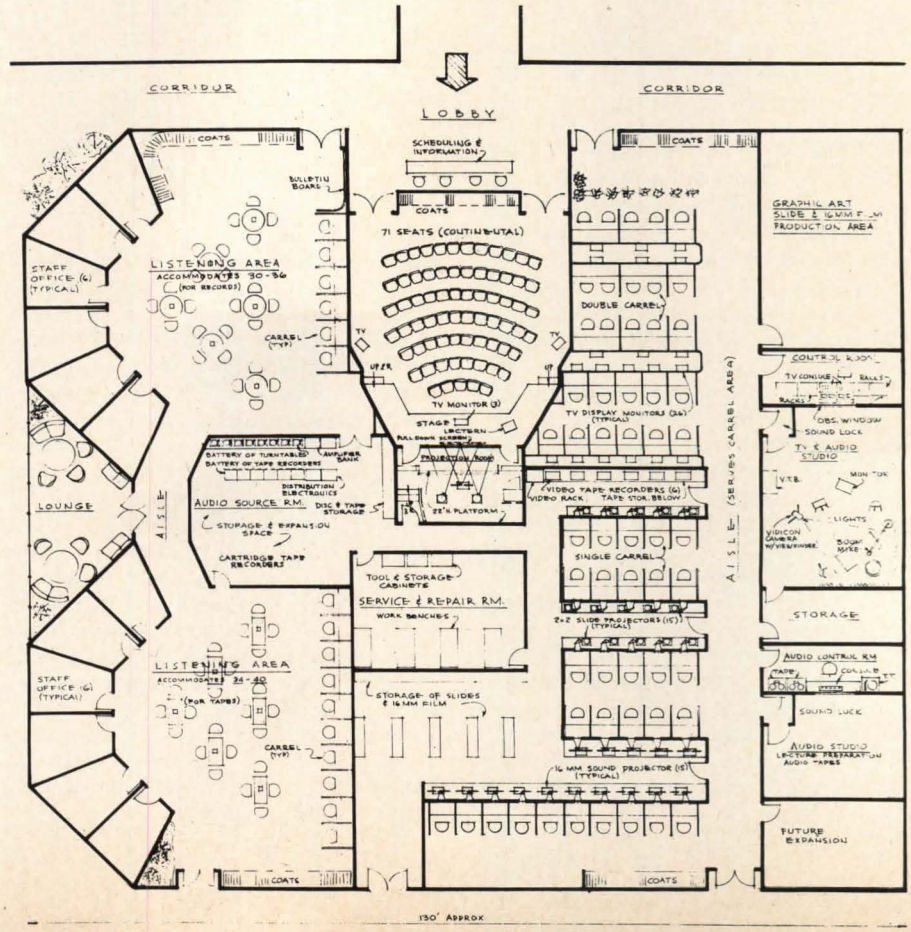
Raytheon produces a "communicator system" — essentially, a closed communications loop. A panel of lights at the teacher's desk and a set of buttons at each student position complete the equipment for measuring, instantly and thoroughly, student performance in response to any lesson. The teacher, upon completing a presentation, asks a series of multiple-choice or true-false questions. Each pupil responds by pushing the appropriate button at his seat. All answers immediately appear as lights on the teacher console and are recorded.

Progress of the class as a whole is measured in percentages by a dial. Elaborations of this type of system are the "multi-media" presentation system, which records response to projected displays and regulates projection, and the large-group response systems, which indicate reaction to presentations of "live," projected, or taped material to audiences of 200 to 1000.

Probably the most widely publicized version of the multi-media approach to education is the "dial-access" or "dial-select" system. There is a great deal of flexibility in components and programming for such systems, but the basic parts are: student position with dial (similar to a telephone dial), from which lessons, programs, and so on, are requested; lesson sources, which store the programs and play them on command; and the control equipment, which sorts requests and keeps track of available lessons. Dial-access systems may permit access to films, tapes (audio and video), or live TV and radio programs. Calls can be made from many locations, providing classroom teacher or individual student with the material he desires at a moment's notice. Hundreds of programs may be on call at any time for a practically unlimited number of callers.

The Beverly Hills, California, Unified School District and the West Hartford, Connecticut, Public Schools currently have or are installing two of the most elaborate and complete dial-access systems in the country. Both systems provide for access to the store of audio-visual material from locations in several schools in the district, as well as a flexible number of positions within a single school. For both school systems, originating equipment and the stored material is located centrally in a new high school.

In West Hartford, the implementation of a dial-access system has progressed slowly, starting with the installation of



Schematic design (facing page) by Hubert Wilke, Communications Consultant, for Educational Facilities Labs, shows distribution of media from central source. Plan at right is proposal for University of Toronto library, designed by Warner, Burns, Toan & Lunde. Here, media access terminals and production facilities are grouped together within the library.

appropriate equipment in several student carrels and classrooms. Materials storage and production facilities were housed in a converted classroom. Later, additional dial-select carrels were installed in 8 more schools. A total of 9 video tape recorders, 22 audio tracks, 2 commercial and/or ETV channels, one film chain (telecasts 16mm film, 35mm slides, 35 mm filmstrips), a microscope chain (a microscope joined to a TV camera for magnification and transmission of microscope slides) are accessible. Dial control plates in prototype carrels have a dial, off-on power switch, audio volume control knob, two headphone jacks, a three-position intercom microphone, and intercom signal lamp. Classroom installations contain 25-in. video monitors, high fidelity sound columns, intercom facilities, and dial plates similar to those in the study carrels.

Working closely with Assistant Superintendent Ira J. Singer, architects McLeod, Ferrara & Ensign recently completed their design of the new high school (see plan, p. 141) that will, when completed in the spring of 1970, house the "media center" and production facilities for the entire West Hartford school system. The center will transmit 120 programs (20 video, 100 audio) to 100 carrels and 50 group stations throughout the building. The same program capacity will be available to other schools through a network of telephone cables.

Another approach to the learning laboratory is offered by the Encyclopaedia Britannica Educational Corporation and is now in operation at Lexington (N.C.) Middle and Senior High Schools. Both the three-year program developed for the middle school and the two-year sequential program for the high school employ textbooks, tapes, films, and filmstrips for a "total immersion" effect.

Teaching With Television

Educational television has proved to be among the most effective electronic means for bringing the best teachers and an almost limitless range of material to large numbers of students. It apparently offers a broader potential than any other audio-visual aid. The widespread acceptance of TV as a teaching tool is attributable to several factors, including: ease of image transmission by air or cable; capability of reproducing images on magnetic tape; relatively high allowable levels of ambiant light for viewing (viewing areas need not be completely dark); capability of bringing current events into the school as they are actually happening; capability of storing entire courses, demonstrations, and programs of general interest in tape libraries; ease of operation and maintenance of receivers; availability of relatively inexpensive equipment; availability of equipment types to suit various needs; and, finally, the practicality of teachers' self-evaluation through replay of video-tapes or monitoring of their own presentations.

Since the first ETV station began broadcasting in 1953, 124 UHF and VHF open-broadcast stations have been licensed. In 1963, the Federal Communications Commission authorized the use of a new broadcast band for ETV; within four years, 82 applications for channels were being processed, and 18 channels were being used in 14 regional systems.

In addition to the open broadcast systems, there are over 1000 closed-circuit systems operating in university and school systems. Together with open systems, they reportedly reached 10 million students in 1966, mostly on the elementary level.

Noncommercial, or publicly sponsored, broadcasting has been plagued since its inception by lack of funds and top-notch personnel. Only last year, hopes were boosted when Congress passed, and President Johnson signed, a bill creating the Corporation for Public Broadcasting; but as yet, no funds for its implementation have been appropriated. And the question of long-range financing of a public corporation that will broadcast, hopefully, material uncensored by the Government, is one that will take great determination and much thought to solve.

In part to serve particular local needs

and in part to compensate for the unreliable quality of broadcast television, school districts find it to their advantage to install their own production facilities. And industry is cooperating with local needs by reducing equipment cost and complexity, and increasing the flexibility of system design for individual needs. In 1965, for example, Westinghouse presented a new package of TV equipment that enables a teacher to control production and transmission while presenting a "live" lesson. A simple set of controls within easy reach enable the teacher to switch cameras, activate slides or tape recordings, or "zoom in" for close-ups of graphics. All equipment can be installed in a studio only 12 ft square.

An experimental adjunct of educational TV is what is known as slow-scan TV or "blackboard-by-wire." By decreasing the number of changes in a TV image per unit of time, images can be transmitted over great distances by coaxial cable, or common telephone wire, at a comparatively inexpensive rate. "Blackboard-by-wire" systems developed by Sylvania are capable of transforming graphics drawn with an electronic pen into signals of voice frequency. At the receiving end, signals are decoded and reconverted into graphic images on a screen. The method, coupled with transmission of accompanying voice or other sound, makes it possible for a professor at Texas A&M University to give an entire course in math or English, complete with graphic illustrations, to high school classes in 15 school districts simultaneously. The system can be set up to record lectures or to store images for recall in the course of a presentation. Unfortunately, although transmission cost is reduced in such a system, the equipment needed to receive it is still quite expensive, and its use will probably remain limited for some time.

Computers for the Classroom

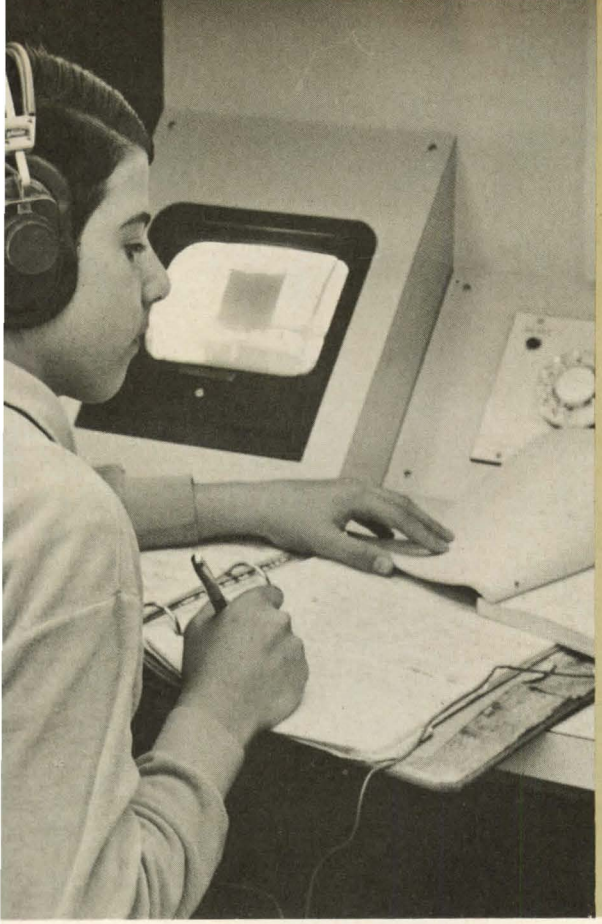
Although the use of computers for education is presently limited, it is likely to increase impressively in the near future; in fact, it will become a necessary part of school facilities where extensive use is made of other electronic devices, of team teaching, and of non-graded classes.

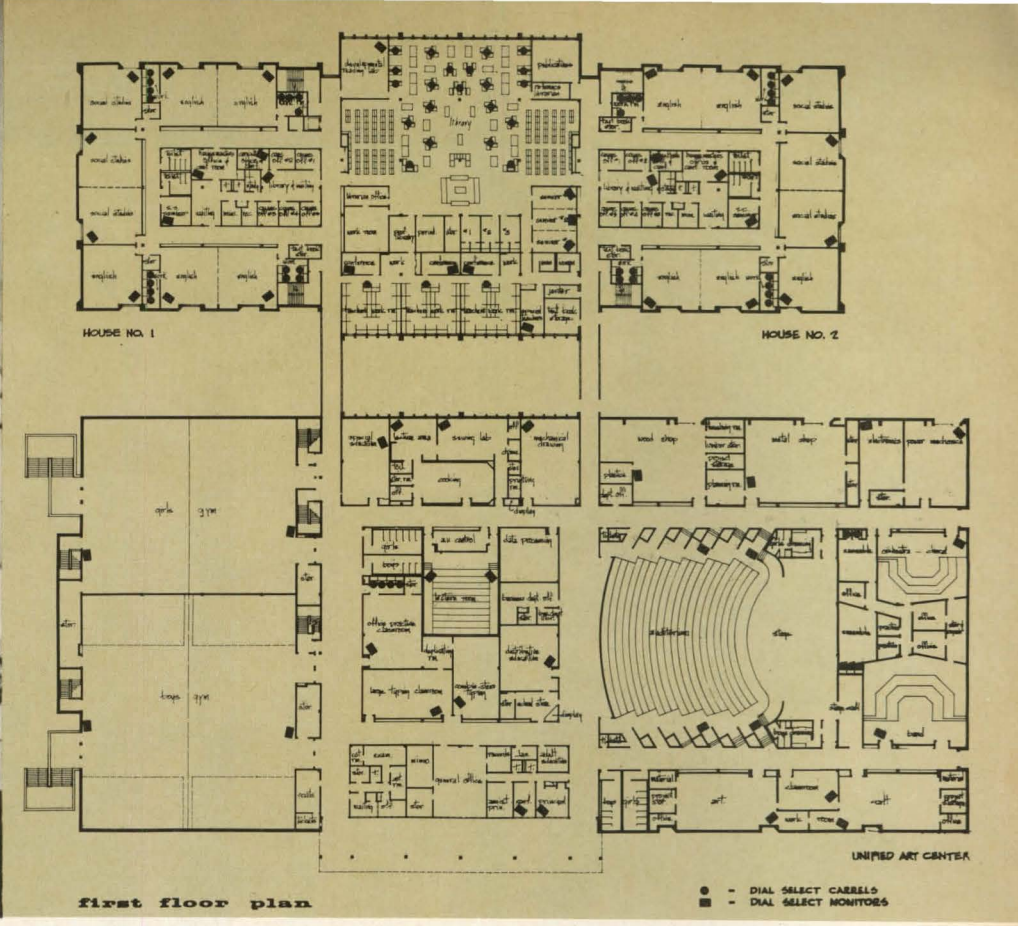
Merely in freeing the teacher from the administrative and routine responsibilities of grading, record-keeping, and so on, that take up 20–60 per cent of the school day, computers can be an inestimable boon. For some of the more complicated systems of electronic teaching tools, a small computer may be necessary to sort requests for information, schedule programs, and maintain a catalog of available materials. And, where flexibility is desired in student time schedules for using materials, computer scheduling of classes can be a practical necessity.

However, the most exciting uses for computers in education are in the field of computer-aided instruction (CAI).

CAI is basically of two types: The first employs a preprogrammed course of instruction or drill, which is fed into the computer for access at the desired time. Students may respond to questions put by the computer by typing out answers or even by writing out their answers with a "light pen" (an electronic device that automatically records the coordinates of points it touches and transfers them into the computer). Computers used for programmed instruction can, at worst, become the most expensive page-turners ever produced, but with proper programming, they can lead a student through a prestated series of lessons without the aid of a teacher, and at the student's own best rate, providing him with immediate rewards for his work.

The second type of computerized in-





Plan of the William H. Hall High School, West Hartford, Conn., by McLeod, Ferrara & Ensign, shows location of dial-access carrels. Photo shows student at work in a typical carrel.

struction is provided by large (usually university-owned) central computers that can store and process great amounts of information and data. Access terminals are on-line (directly connected to the central computer bank), and the system is time-sharing (many users can "talk" with the computer seemingly at once; processing is so fast that no one user is aware that his is only one of, say, 20 people placing demands on the machine). In such a system, students may carry on independent work, making use of the computer's store of information or of its calculating abilities to solve problems in math or science.

Computer-aided instruction is still rather rare, primarily because of costs prohibitive to any one school district. But there do exist examples of experimentation with both types today. The installation of a computer at Dartmouth College several years ago prompted nearby high school students and faculty in Hanover, New Hampshire, to form a Computer Club to explore the time-sharing capabilities of the new machine. Later, computer terminals were installed in junior and senior high schools of the district, and the school system purchased its own computer.

In New York, RCA Instructional Systems people are working with representatives of the Board of Education and local representatives of the Federal Government to install a computerized system for arithmetic drill and review. The central computer, to be housed in a new central facility, will have high-speed lines to "line concentrators" in four schools. Each "line concentrator" is actually a small computer in itself, programmed to interrupt the master program when an individual student needs help or a hint. From the line concentrators, telephone cables lead directly to terminals in 15 schools in 3 districts.

New York's version of CAI is modelled on the system installed in the Palo Alto, California, schools under the direction of Patrick Suppes of Stanford University. The program provides drill on five levels of difficulty, and students may progress in a straight line or be automatically switched up or down according to their success in completing a segment of work. After three units of drill have been presented, each unit dealing with a separate concept, those students who show need for further practice are given a series of review questions in the area of their lowest competence. The computer keeps a record of class and individual performance, which is available to the teacher whenever he requests it. Student terminals (pp. 134–135) are quite simple, consisting essentially of a modified teletype keyboard. Computers can even play educational games.

As new and appropriate programs of instruction are formulated and costs of equipment are reduced, the use of computers will doubtless increase significantly.

Planning for the New Technology

Out of the need to cope with and plan for the vast array of resources available to educators today have grown two innovative approaches to both architectural and educational programming and design. For different reasons, each is particularly suited to dealing with the accommodation of the new technological tools, nor are the two approaches mutually exclusive.

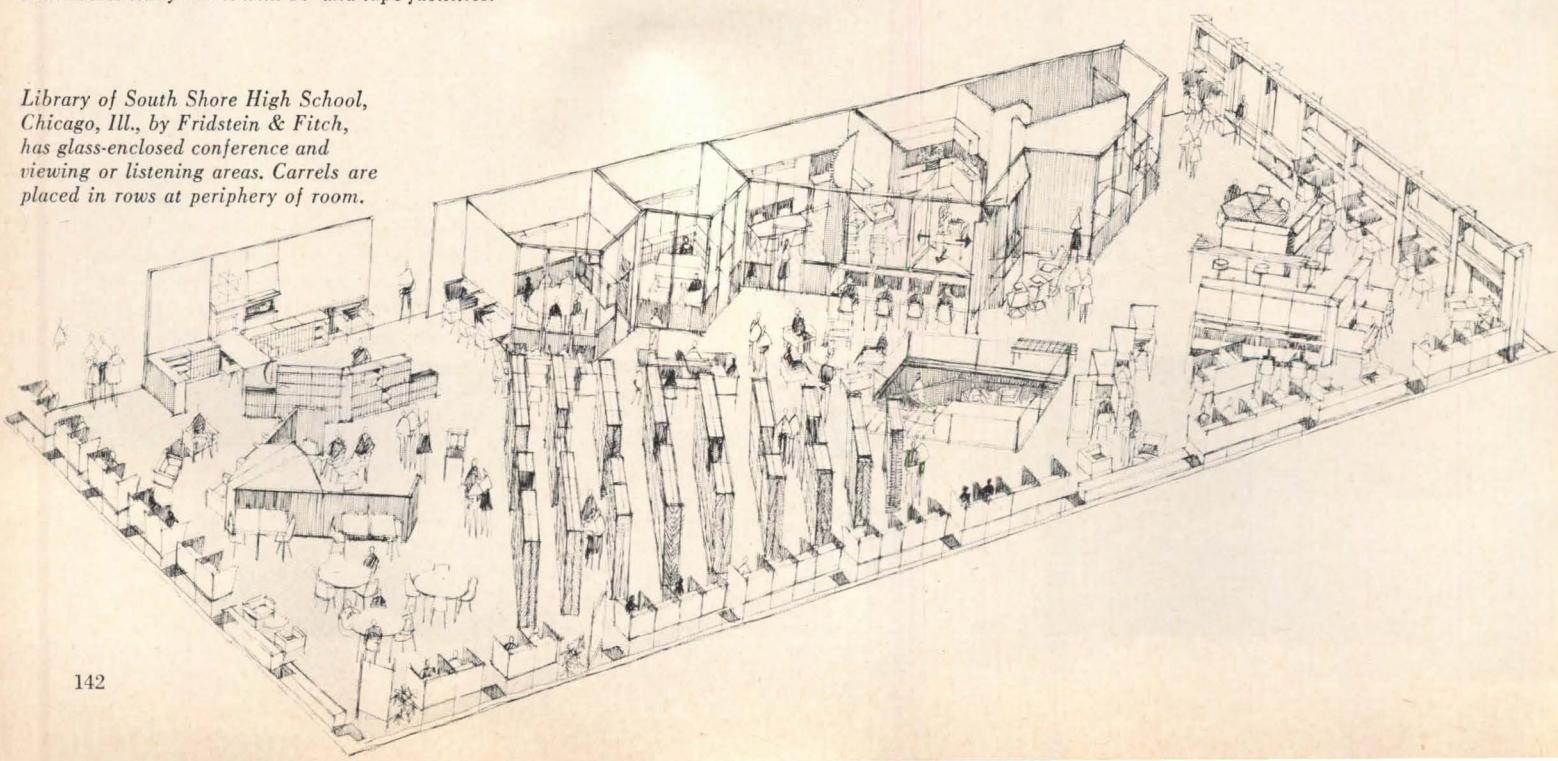
The very nature of the machines to be considered and the number of variables they introduce into a design situation suggest systems analysis as an effective control or sorting method that also takes into account the objectives and goals of educational policy. In educational technology, as in myriad other fields (see AUGUST 1967 P/A), systems analysis facilitates planning for desired performance (of equipment and students) under optimum conditions, with the most suitable means, and at the lowest reasonable cost. Performance design can indicate what types of equipment are most suitable to accomplish specific types of presentations, where equipment should be located for maximum efficiency, which students should be using various types of educational devices at what times, and so on. Currently, Bolt, Beranek & Newman, the System Development Corporation, and the Auerbach Corporation provide systems planning for schools.

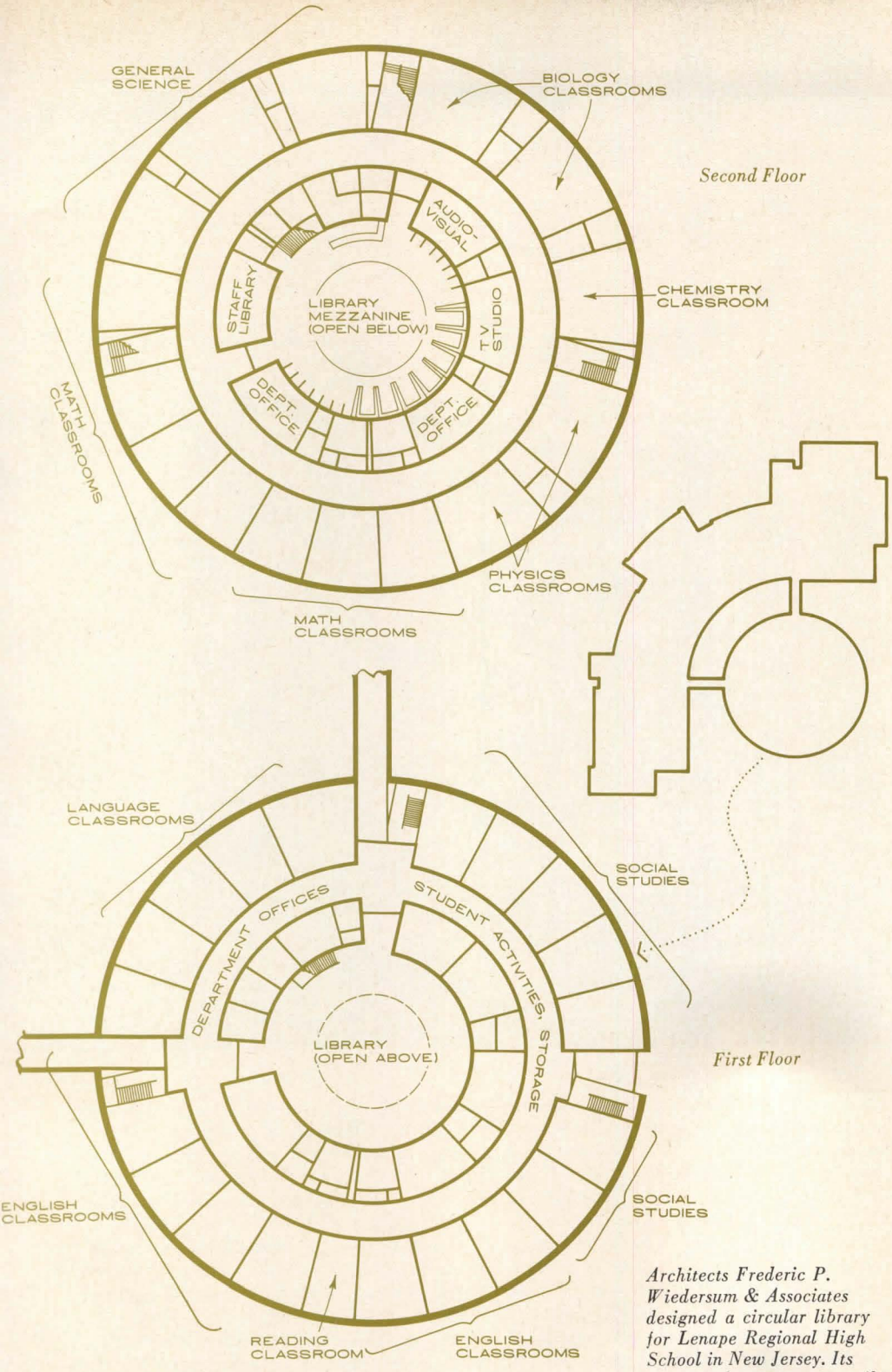
Planning of this type should generally be undertaken at an early stage with all personnel involved in the project on hand to contribute their special knowledge of specific factors to be considered, so that the results of planning will be comprehensive.

With or without systems analysis, no facility for which installations of tech-

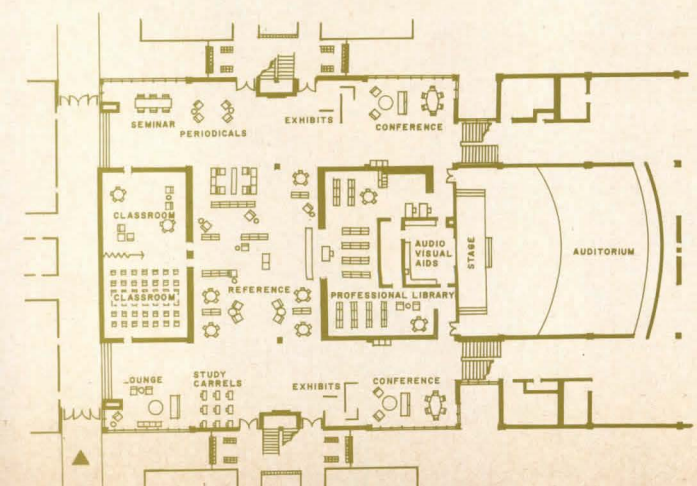
Dial-access study carrel with TV and tape facilities.

Library of South Shore High School, Chicago, Ill., by Fridstein & Fitch, has glass-enclosed conference and viewing or listening areas. Carrels are placed in rows at periphery of room.





Architects Frederic P. Wiedersum & Associates designed a circular library for Lenape Regional High School in New Jersey. Its shape makes resources easily accessible to academic classrooms and faculty offices, but limits expansion.



At Lexington (N.C.) Middle School, designed by Six Associates, audio-visual equipment as well as work and storage space are conveniently near auditorium, but accessible within library. Individual carrels are scattered through open areas.

nological equipment is contemplated should be planned without the close cooperation of educators, administrators, architects, audio-visual director, librarians, and manufacturers of proposed equipment, or, perhaps, an independent consultant. Manufacturers will provide consulting services, but because of the glut of new equipment on the market, an independent communications specialist can be invaluable.

Of first importance in the team method of school planning is the establishment of a working vocabulary of terms, concepts, and goals. Once the educational program has been established and the rationale of supporting equipment, its uses and requirements has been communicated to members of the design team, each can contribute his professional knowledge to the final plan. Team planning is exemplified in the design of Essex County Community College in New Jersey, where extensive audio-visual equipment will be installed. Designers from the architectural firm of Frank Grad & Sons joined with educators and consultants and an independent educational specifications writer in study trips to view existing community colleges, and in brainstorming sessions before a specific design was proposed.

The special competence of each profession is required in planning for the new media, particularly because there are now few standards to consult, few established rules and practices to refer to. At this point, each attempt is still an experiment, and the more carefully it is planned the greater the likelihood of its success in terms of education as well as architecture. And the architect who is a specialist in school design is frequently more aware of new solutions to new problems than the educators themselves. His contribution to the educational programs may go beyond the professional boundaries.

New Spaces

Use of technological tools, combined with modern teaching methods that are particularly compatible with the equipment, has produced a need for spaces, facilities, and even building types, as well as circulation patterns that are new to schools. Not only must architects and educators decide on the best location within the school for independent study carrels (all in the library, at points convenient to group instruction facilities, or both); he must learn to see libraries as resource or materials centers, facilities for housing materials that formerly had no place in a library, and where learning takes place, rather than storing and cataloguing exclusively; he must understand the need for new types of spaces, such as media production centers, preview areas for teachers, teachers' workshops, areas for small and very large-group instruction instead of 30-student classrooms; and he must give form to entirely new building

types including regional resource centers and production facilities.

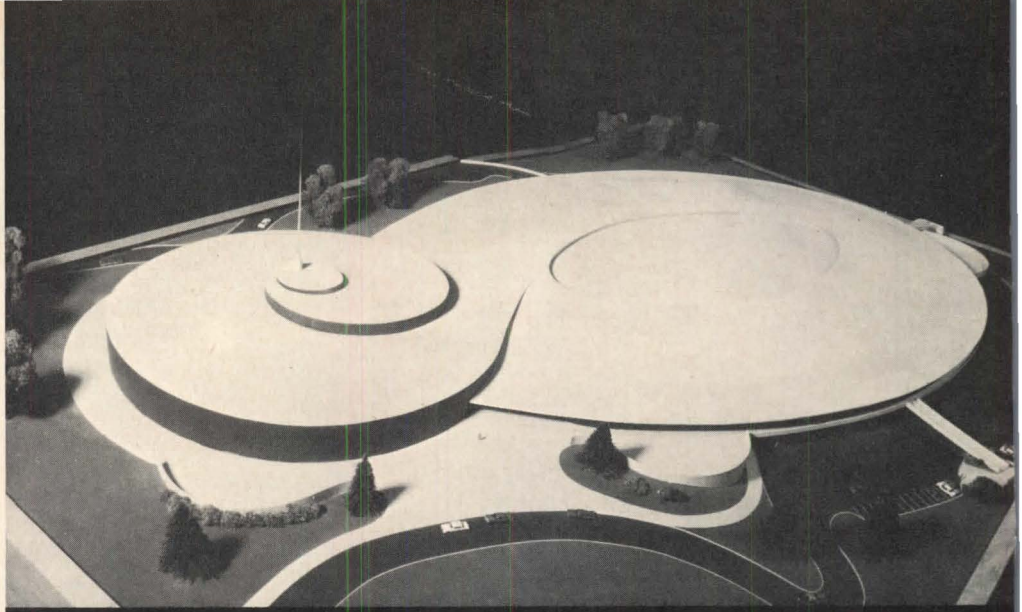
What's in a modern library, and how must it relate to the rest of the school? These things will vary according to the educational program, but generally, school libraries are likely to contain not only books (with no apparent likelihood of a reduction in number in the foreseeable future), but slides, tapes, electronic and "dry" carrels, listening posts, records, film and slide projectors, and so on. As resource centers, such libraries must be ready to accommodate requests for materials and to provide an environment for their effective use. With the greater emphasis on the library as a lively environment for learning, it is often valuable to give it a central location, with related areas or departmental headquarters arranged peripherally. In some cases, audio-visual equipment is to be used within the resource center itself; it is then necessary to insure that lighting can be adjusted independently in separate areas of the center.

On a larger scale, it may be desirable to house major electronic or audio-visual equipment in the library of a central high school or other building, with smaller or less complex materials distributed through the libraries of individual schools in the system. And again, it may be desirable to establish a main resource or production center for a group of school districts, from which materials can be broadcast or otherwise transmitted, borrowed and physically transported, or, if spaces for users are included, viewed or used within the building. Regional centers are gaining acceptance and approval as districts realize the opportunities to be gained by pooling budgets and resources for instructional facilities. A prototypical design for such a center is illustrated on this page.

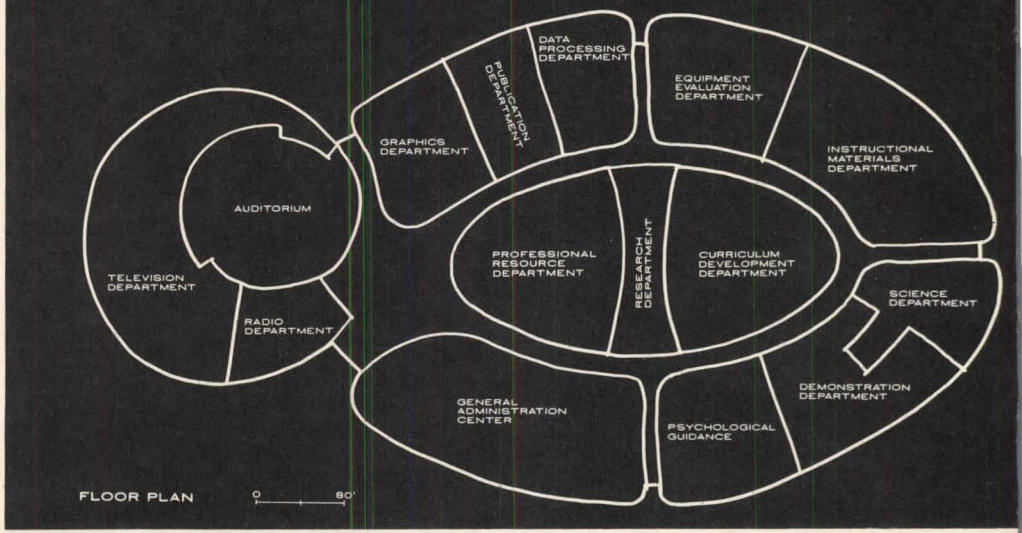
Since programs and equipment for all these facilities vary so widely, there are few rules to follow in planning them. However, there are several basic factors that should influence design, among them:

- Flexibility. (Technological tools are new and still developing. Future needs can be fully foreseen, and even at present it may be desirable to be able to convert large group instruction areas into several small ones.)
- Provision for future expansion. (Usually, it is best to start with a minimum basic arsenal of equipment; more can be added later if the necessary conduits, wiring for TV and audio transmission, and spaces are available. These items can be added later only at greatly increased costs.)
- Ease of access to all facilities for both teachers and students, and a rational relationship of resources locations to other building functions.

What happens when the architect is not aware of the demands of equipment to be installed in his new schcool, or does not have the benefit of knowledgeable consultants? Audio-visual equipment intended for use in a New Jersey school library is difficult to use because all lights in the room are wired to a single switch; lights in the viewing area cannot be dimmed for viewing. The architect's original design called for a floor-to-ceiling window wall, which would let in too much ambient light, and he failed to provide enough outlets for electronic equipment. In a Westchester County, N.Y., school, for which the architects produced an exciting design, much of the expensive equipment is limited in use because of lack of coordination among designers, consultants, and educators. There, clocks are hidden by TV screens, and the location of other equipment is inconvenient.



Prototype of a regional resource center was planned by Jack Tanzman of The Educational Council, designed by architect John Shaver as part of a study undertaken by the U.S. Office of Education under Title VII of the National Defense Education Act.



Impetus for Innovation

What forces have been behind the development of new technological systems for education, and where has the money come from to implement them? Primarily from the Federal Government. Most of the technology that is just now finding a place in the schoolhouse was developed originally by industry in cooperation with the Department of Defense and is now undergoing a process of adaptation to fit the needs of education. In the 1950's, the National Defense Education Act and the National Science Foundation began to bring needed equipment for science laboratories, in particular, within the reach of schools across the country. But the present impetus for research and development of innovative educational tools and their houses stems from the Elementary and Secondary Education Act of 1965. An initial appropriation of $6,100,000,000 for all programs under the Act was distributed in a fashion that placed heavy emphasis on Title II, which provided for development and improvement of school library functions; on Title III, which provides for research and development as well as the implementation of new techniques and materials; and on Title VII, which provides for the dissemination of information and techniques concerning innovative tools and programs. Most of the local projects and programs discussed here benefited from Federal funds and direction under ESEA's Title III; some qualified for additional aid. Under Title

III, studies have been undertaken regarding the feasibility and design of regional resource centers, efforts of private organizations concerned with innovation in education are being coordinated with Federal programs, and, in areas where funds for experimentation or the implementation of programs with demonstrated value have been granted, local offices have been established with Federal money and personnel to direct projects in progress.

In New York, for example, the computerized drill program now being installed is under the direction of Shelley Yumans, local director of Title III projects. Most of the salaries for personnel connected with the project also come from Federal funds. In Lexington, North Carolina, a new middle school costing $1,404,929 and containing $60,000 worth of equipment houses several innovative programs, with help from local, state, and Federal grants. Funds from the National Defense Education Act are now being used, in addition to a $500,000 grant under ESEA's Title III. The library, or learning center, as it is called here, qualifies as a Demonstration School library under Title II of the same Act.

The outlook for future Federal financing is auspicious, for Congress this year approved an extension of ESEA for two years beyond next July 1, with an increased appropriation of $9,300,000,000. Emphasis was again placed on library materials, supplementary educational centers, and innovative programs. However, basic control of funds was shifted from Federal to state and local hands. It is impossible to predict whether this change will delay progress in establishing regional cooperation and some minimal form of national standardization for equipment, or if it will, on the other hand, stimulate progress by letting those who know what is needed run their own show.

What is the Government paying for? Costs of equipment installation and operation vary, and estimates of future costs vary even more greatly. According to Patrick Suppes of Stanford University, an expert on computer-aided instruction, it would cost approximately $2000 per terminal to equip every elementary school classroom with a console connected by telephone lines to a computer located within the school district today. Suppes feels that mass production could lower the cost to $1000 per terminal, including cost of curriculum development and preparation. Another estimate sets the possible cost of providing electronic equipment for one child at $250 per year. In any case, elementary and secondary schools spent $420 million on textbooks in 1967, while in the same time span they spent $220 million on foreign language carrels, scientific apparatus, closed circuit TV, computers and audio-visual materials such as tapes, records, film strips, and films. Of this amount, about $10 million was spent on computer-aided instruction.

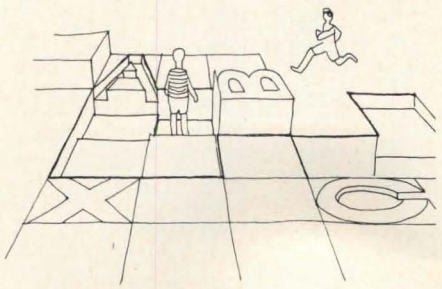
Mass production will, no doubt, bring about a reduction in cost of equipment, and, indeed, the cost of much new equipment has been substantially lowered in the last decade. In 10 years, typical electronic data processors became 10 times smaller (and easier to use), 100 times faster, and 1000 times less expensive to operate.

However, mass production is dependent upon a market that knows what it wants and needs.

Evaluating Effectiveness

Electronic tools for education depend upon a technology adapted from defense and aerospace industries, and only now are manufacturers and educators beginning to evaluate the effectiveness of the adaptations. As Evan Herbert of the Auerbach Corporation puts it, "Industry simply does not know what educators want, and educators are just beginning to understand what they think they need."

At present, there are few guidelines for industry or educators to follow. Each experiment, each installation must be closely watched by both. RCA is watching its computer installations in Palo Alto and New York for possible future



modifications and new developments. One of the subsidiary advantages of the new tools is that they usually keep a record, on tape or film, of the uses to which they have been put. Teachers and administrators can evaluate teacher's presentations and class response, simply by playing back a tape.

The effectiveness of equipment further depends, of course, on its proper use. Manufacturers cannot expect teachers to operate complicated control panels or to move heavy equipment. If there is a question of learning a difficult set of instructions, or of running back and forth to a resource center far down a hall each time he needs a slide or projector, the teacher very often will not bother. Manufacturers' specifications are frequently disproportionately difficult for non-technology-oriented teachers; a full-time audio-visual director to act as liaison between teachers and production personnel is usually a necessity.

When users do not understand the equipment they are working with, the system breaks down. This means that teachers must be trained in the operation and, to some extent, the maintenance of new equipment. Ordinarily, one or more rooms near a school's library, resource center, or audio-visual room are devoted to in-service training in teacher's techniques. Or, the training facility may be located in a district or regional center. In any case, the most difficult problems seem to be (1) finding time for the teachers to learn, and (2) making the new machines attractive to those who will use them. These problems must be solved *before* a system is actually put into operation, and, preferably, before equipment is purchased. A reputable firm of consultants or manufacturers will have difficulty advising administrators on the equipment to be purchased if it cannot rely on the cooperation and understanding of users. New programs can be made attractive to teachers when there is enthusiasm and knowledge to look to on the part of backers in the school or district administration, and when teachers are themselves involved in the program from the very start of planning.

Finding time for training is a different story. In New York, a series of courses was arranged to train teachers to work with the new computer system; at almost the last minute, district superintendents refused to allow teachers to attend the courses during class time, unless substitutes were found to take care of the children whose teachers were involved. And evening classes are, evidently, impractical. Teachers are simply too busy with other things, are not paid for extra time, and do not show up for instruction. And in some districts, unions prohibit mandatory attendance of teachers at sessions outside of school time.

Government funds, too, are often as much a problem to schools as they are an aid. Local administrators, anxious to take advantage of any state or Federal funds available, will often work up a hastily conceived program for presentation in order to get the funds; they will then go out and invest in expensive equipment, making little or no provision for its proper use or its integration into the total educational philosophy of the schools.

Of course, effectiveness of machines is also closely tied to the material that is fed into them. Here, the medium is definitely *not* the message; hardware is of no use without high-quality "software" — texts, programs, slides, and so on. And today, although quite a few publishers are in the business, and several manufacturers of heavy equipment have merged or formed associations with publishers to provide the necessary software, there is a dearth of quality in the field. For this reason, it is almost a practical necessity to include software production facilities within the school or district itself.

All of these problems are attributed to the experimental nature of technological tools for education, and to the relatively early stage of adaptation from other industries. At the present rate, and with continued Government support, one can expect solutions to most of them in the near future.

ASSAULT ON THE SCHOOLHOUSE

OVERTHROWING TRADITION

The traditional schoolhouse is under fire: from urban dwellers, who demand more control in its administration; from educators, who, acting on new educational philosophies and methods, threaten its traditional form; and from behavorial scientists, who are forcing the architect to re-examine his role as school designer.

Photo: Wide World Photos

The masonry schoolhouse fortress, armed with basketball hoops, surrounded by a sea of asphalt, is under assault. Condemned by both integrationists and black separatists for opposing reasons, it paradoxically emerges as the ultimate weapon to be wielded against the social evils that beset our cities.

Racism prevents the public school from meeting the challenge of 30 million school children desperately in need of special teaching assistance, asserts noted Negro psychologist Kenneth B. Clark. He charged that "white officials had altered the public schools from an instrument of realizing the American dream of an upward social, economic, and political mobility to a blockage against the masses of Negro and lower status minority group children."

Clark's accusations were backed up by a recent article in *The New York Times* by sociologist Herbert H. Gans, who questioned whether the middle class was more civic-minded than their non-middle-class neighbors. Their civic organizations tend to defend middle-class interests, not necessarily the over-all public interest. Moreover, many who live in the suburbs still exert political influence in the city because of their work or their property holdings. They see to it that urban power structures still put middle-class interest first. The frequent refusals of city hall to provide adequate antipoverty funds and public housing attest to the power wielded in the city by the middle class, argues Gans.

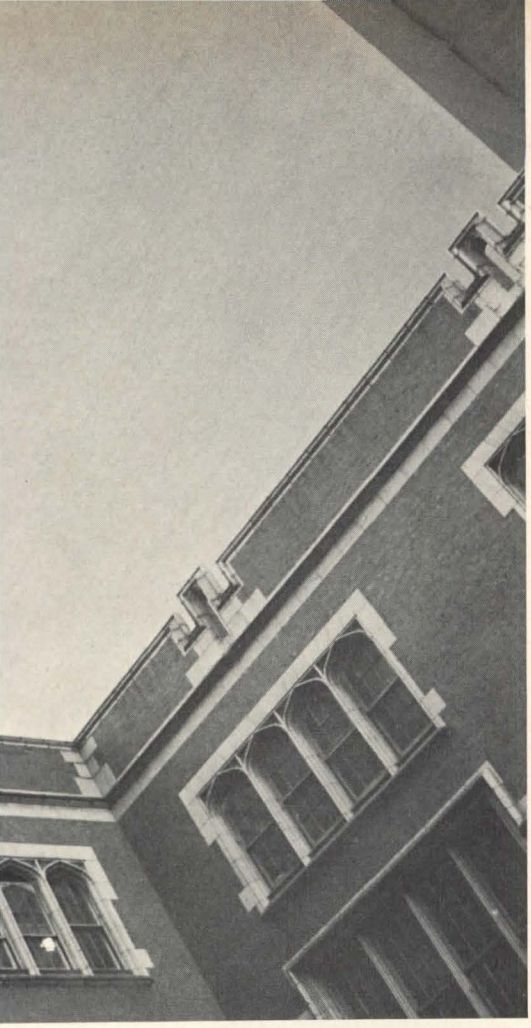
He also charges that the contention that the suburbs rob the city of its tax-paying, civic-minded middle class is fallacious. Actually, maintains Gans, the middle-class families are often a city tax liability. They demand and receive more services, particularly more schools, than their taxes pay for.

It is questionable that, on the whole, suburbanites contribute sufficiently to city taxes to keep the city operable. To compound this injustice, suburban, state, and Federal politicians often vote against antipoverty efforts and other Federal funding that would relieve the city's financial troubles in the same way that they consistently vote to prevent residential integration, observes Gans.

As a result of this dog-in-the-manger attitude of the middle class, it might seem advantageous to some Negroes to have a predominantly black city. They would inherit what good housing there is in the city left by the fleeing whites, and would take over political control, assuring them a more sympathetic response from city hall.

The Negro cannot flee the city. He is forced to remain close to urban transportation. This mobility is a form of job security.

Harold Gores, President of EFL, who has for years been fighting for school boards to build educational plants that



A study in contrasts: A central city commercial high school surrounded by skyscrapers as against the relative tranquility of a suburban Board of Education.

Photos, except as noted: Forrest Wilson

meet city problems, told P/A that, in his opinion, things are changing. He observed that, up until 1962, the schoolhouse was the same as it was in early America. "When everyone was poor, this was not so bad. When the poor shared the great melting pot American dream, these schools were not contested."

"The very poor are no longer ready to accept these conditions. They have ideas of their own," points out Gores. He cited a civil rights group that is converting an abandoned supermarket to a school for drop-outs. This group does not want the traditional school that will remind its occupants that they have already failed. They are molding the educational facility to their specific need. They recognize that these have little relation to the traditional schoolhouse.

In contrast to this reasonable approach, Gores cites a Federal program for drop-outs, which spends hundreds of thousands of dollars to stuff kids into an abandoned school built in 1892. This, says Gores, is a self-defeating project.

"What is needed is a lively container," he points out. "A drop-out does not want the same type of building from which he has already retreated. Have a school like a living room, not like a kitchen." Gores thinks we have been building "kitchen schools" too long. "Now the mood is turning to living rooms. The objective is to pitch the learning environment ahead of the kid. Draw him up with it. Use the school to challenge the ability of the ghetto to destroy the student."

Education for Survival

"The Negro woke up one morning and found he was obsolete," one Negro leader has commented. Education is more than a cultural luxury. It is a weapon of survival in a society that is becoming increasingly complex, with a shrinking market in unskilled jobs. Schooling is essential for employment. The white middle class knows this, and has usurped the best school facilities. The Negro is trying to wrest some of this essential educational survival equipment from him.

New York City's current decentralization program is backed by many civil rights groups. Ghetto residents feel that they have no control over the existing school system and *do* have the poorest schooling of all city residents. Discouraged over the progress of integration in providing them with adequate educational facilities, they contend that, with more control, the situation would be improved.

One of the major reasons why ghetto residents seek control of their own schools is the teacher. To the ghetto community, the teachers seem, in most instances, to be perpetuators and outposts of a middle-class society that has little sympathy with their problems. "Community participation," comments Ronald Shiffman, Assistant Director of Pratt Institute's Center for Community Improvement, "has become crucial in the growing trend toward interaction between low-income communities and Government philanthropy, educational institutions, and so on. But in this context, community participation must be freed of its affluent, 'middle-class' orientation and definition, if it is to become meaningful and effective."

The Teachers

It is generally recognized that those who need education the most invariably get the least experienced teachers. The proposal of Federally financed "service stations" to supply teachers to ghetto areas was motivated by the need to find a way of breaking the vicious circle of teacher staffing of slum schools with the least experienced teachers and then losing them to the "good" white schools as soon as they have served their time. Economist John Kenneth Galbraith has proposed a corps of "national teachers" who could be rushed like the Marines into underprivileged neighborhoods.

The president of the New York Teachers Union has said that minority group militants are aiming to replace 50,000 or 60,000 teachers in the city's schools with other people. "God knows where they will find them," he commented. The teachers' fears might not be unfounded. Isaiah E. Robinson, who heads the East Harlem Parents Council, told an audience that included a number of teachers, "Our community will decide who'll administer and what the program will be." He said further than community control over schools held the implied threat that, "many of you [teachers] will lose your jobs."

It is difficult to see how teachers will lose their jobs in a sellers' market. However, some may change their place of employment. Shiffman noted that Father John Pewis of Independent School Board 17 returned from Puerto Rico to New York with about 20 teachers he had recruited on the island.

The form of the school may not undergo drastic change under community control, although its garrison might be replaced. The ghetto community seeks to secure the "fort" before changing its design.

Is the School Itself the Central Problem?

If the ghetto children gain the schoolhouse, will it insure them equal education? James S. Coleman, author of the controversial report, "Equality of Educational Opportunity," thinks not. In the publication *The Public Interest*, he says that the physical and economic resources going into the school have very little relation to the achievement coming out of it. It is Coleman's finding that variations in teacher salaries, library facilities, laboratories, school size, or form guidance facilities, and so on, had little relation to the achievement of the student. If it were otherwise, the problem would be simply a matter of rectifying all of these conditions, he noted. The evidence "does not allow such simple answers," says Coleman. The educational "resources" provided by a child's fellow students are more important for his achievement than are the resources provided by the school board.

Coleman found that ghetto students mixed with middle-class learners who were highly educationally motivated turned in a better performance than those segregated with others like themselves who came from homes lacking strong educational motivation.

Integration is unquestionably an essential step in the direction of educational improvement, but Coleman thinks that the solution is much more complex. The difficulties of any solution, he feels, "derive from the premise that our society

is committed to overcoming not merely inequalities in the distribution of educational resoures . . . but inequalities in the opportunity for educational achievement. This is a task far more ambitious than has ever been attempted by any society . . . not just to offer, in a passive way, *equal* access to educational resources, but to provide an educational environment that will free a child's potentialities for learning from the inequalities imposed upon him by the accident of birth into one or another home and social environment."

If Coleman's contention is correct, the annexing of the ghetto school by its surrounding community will pose special problems. Middle-class children will have to be brought in. It should be noted that there are probably not enough of them to go around.

The Decaying City

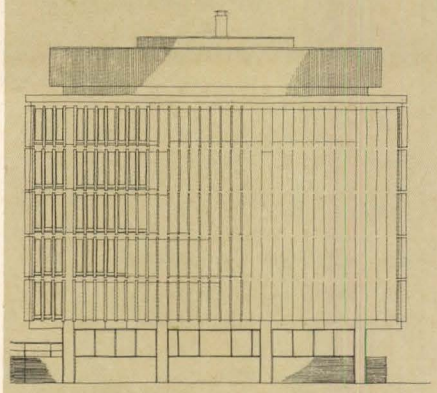
Urban housing, which is umbilically linked to the urban school, is in a constant state of decay. The city's answer to the problem of rotting ghetto housing has been the housing project, which, in the opinion of Dutch architect N.J. Habraken, is no solution at all: "A town is always composed of some areas which are new, some which are old, and the standard of our dwelling depends on where we happen to live. But the developers never catch up; it will always be possible to note a housing crisis in some part of the town. . . . It becomes evident that the system, which . . . is an emergency measure, is itself instrumental in always causing a state of emergency . . . resulting in a continuous game of musical chairs in which the population must move from area to area to be in the best housing, among the latest ideas, devices, and amenities. The town dweller is becoming a nomad, like primitive people who exhaust the soil and then migrate to other regions." Slums, according to this analysis, are inherent to the city's composition and are tied to the advances of our technology.

The crisis of the city school and its integration into the community is therefore one of continuous change in adapting to the changing housing patterns of the city.

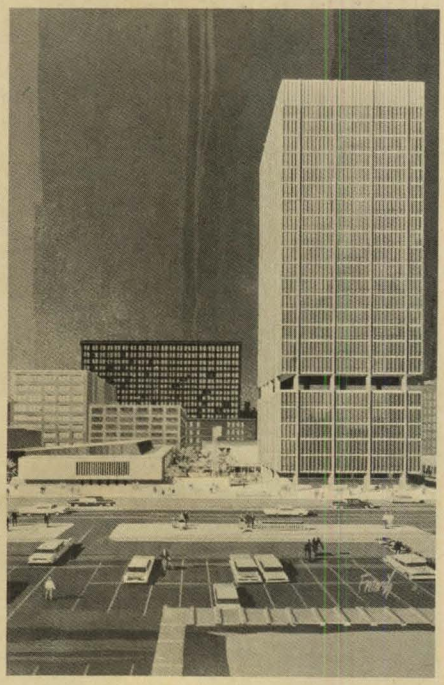
The School as a Plant to Revitalize City Growth

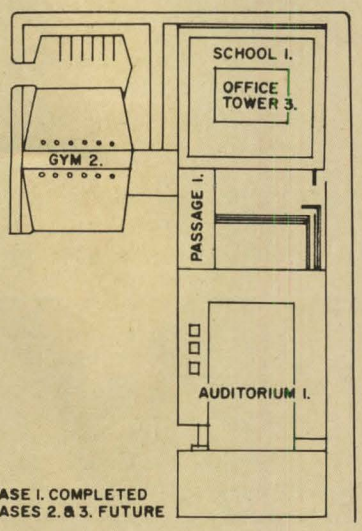
People follow good schools. "The good school is the principal factor in attracting and holding citizens," comments Dr. Benjamin Willis. "Put an Einstein in the ghetto school to attract the suburban child back to the city," says Dr. Max Wolff.

"Face the fact that the suburban school is more appealing than the city school," notes architect William Brubaker, of Perkins & Will. "This is the reason that

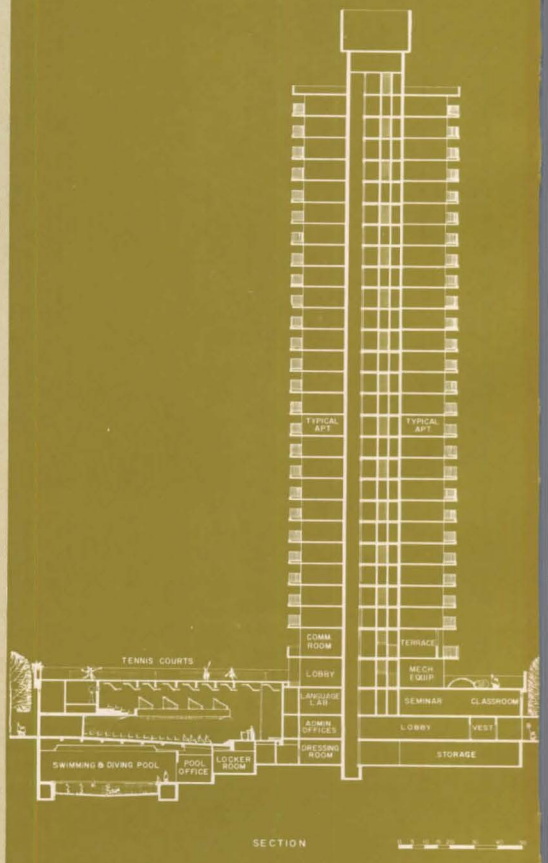


Phase 1 of combined school and future office tower has been completed in downtown Chicago. William C. Jones Commercial High School plans to add a 15-story office tower in its third phase. Architects: The Perkins & Will Partnership.

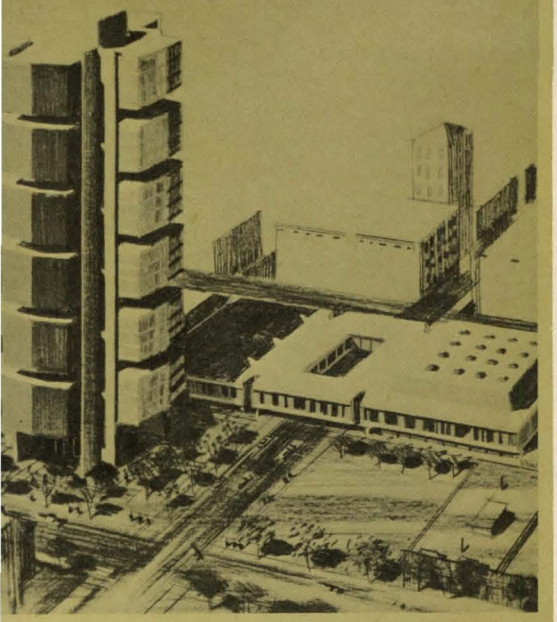




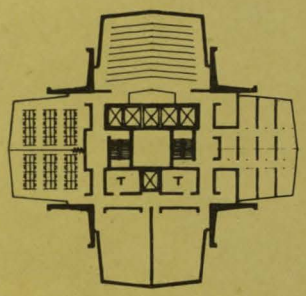
PHASE I. COMPLETED
PHASES 2. & 3. FUTURE

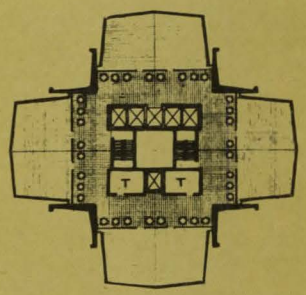


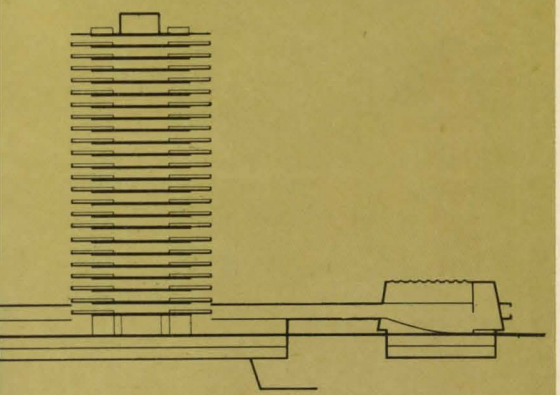
Two-hundred middle-income apartments to be erected in the air rights over a private boys' school in New York City. Architects: Brown, Guenther, Battaglia, Galvin.

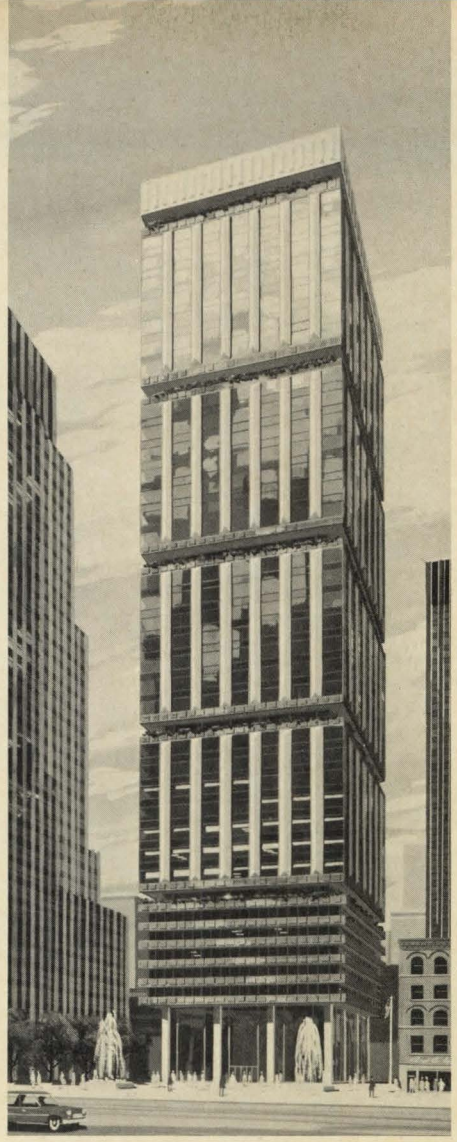


Study for high-rise urban school. Six four-story schools are stacked in tower. The connecting low-rise structure, bridging street, houses gym and auditorium-community center. Architects: The Perkins & Will Partnership; Charles Brubaker, Designer.

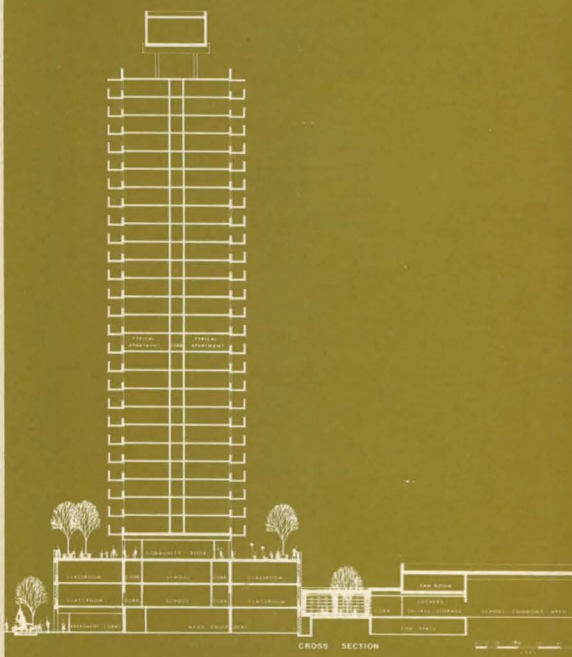




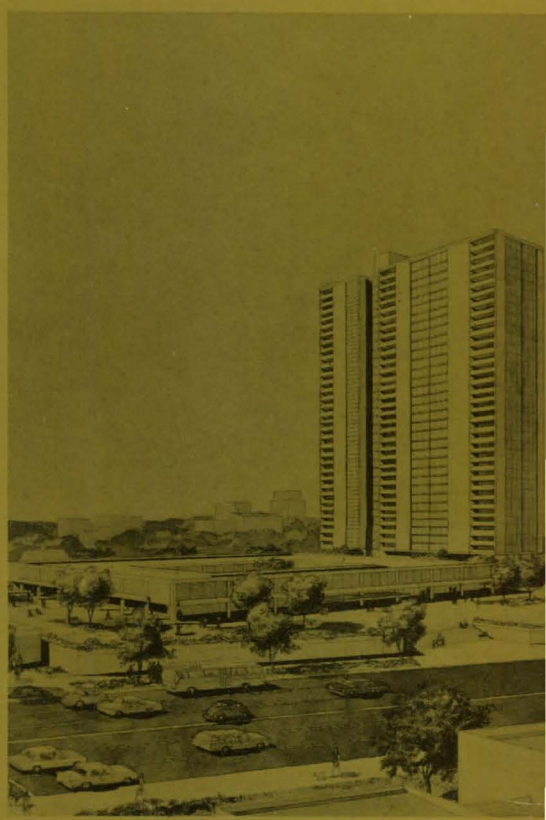




Study for utilization of air space over an existing high school in New York City. Architect: Thomas F. Galvin.



The first air-rights school under construction in New York City is a 1200-pupil elementary school topped by 400 cooperative apartments. The school was financed by the New York City Educational Construction Fund; apartments were financed under the Mitchell-Lama program. Architects: Brown, Guenther, Battaglia, Galvin.



people move to the suburbs." But he adds that the cost of rebuilding urban school systems to satisfy the needs of our citizens far exceeds current financial programs, even though the survival of the city depends heavily upon the ability of the city schools to attract and hold people.

The Money-Making School

One answer for the urban school, which tends to be located on sites that are fast disappearing and are generally cramped, difficult to find, and expensive, is the air-rights school. These money-making schools are being planned and built. Among the more noteworthy of these undertakings is the New York City Educational Construction Fund, a public authority created last year to finance construction of public schools built in combination with residential and commercial facilities. It will use the income from privately-owned facilities built above schools for debt service on its bonds and notes.

The agency's director, Daniel Z. Nelson, points out that the use of air-space above schools solves two common urban problems. It accelerates school construction delayed by financial limitations, and at the same time promotes economic growth restricted by lack of commercial and residential sites.

The potential for the ghetto especially stirs the planner's imagination. He sees that the combined occupancy concept applied with social skill could become a way of advancing racial integration by attracting whites into segregated, non-white areas for schools, jobs, and housing in the same complex.

Under the New York City Educational Construction Fund, schools will be operated by the Board of Education but owned by the Fund. The facilities above the schools will be operated and owned by private enterprise. The possibility is also being explored that money earned by the Fund could also be plowed back into educational facilities by financing non-money-making school ventures.

The Fund will provide most schools at little or no cost to the city. It will receive payments for the use of air rights over the school in the form of either annual income or capital, depending on whether air rights have been leased or sold; in addition, it is authorized by statute to receive payments equivalent to the normal real estate tax on the nonschool portion of the building during the 40-year life of the debt of the school. User lease payments that are rentals for the schools will be required only when a decision has been made for social or other reasons of public interest to undertake a combined-occupancy structure unable to support the debt service of the school.

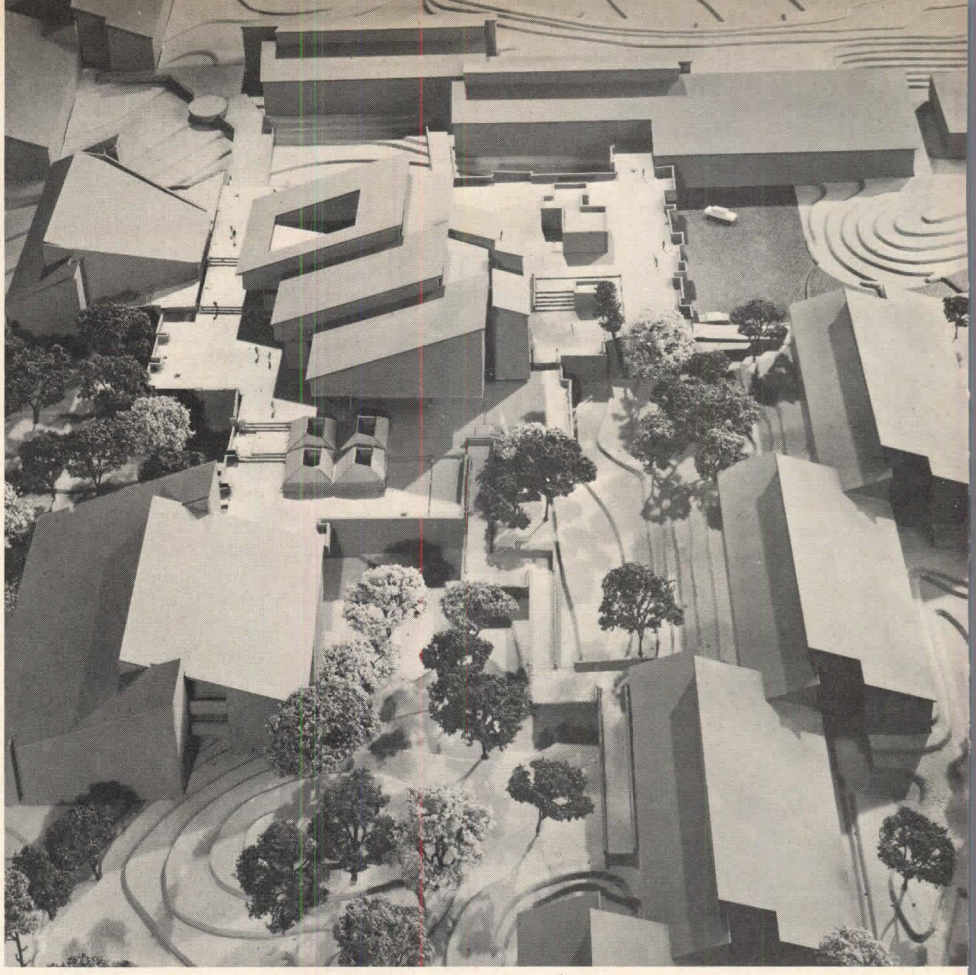


Photo: Hedrick Blessing

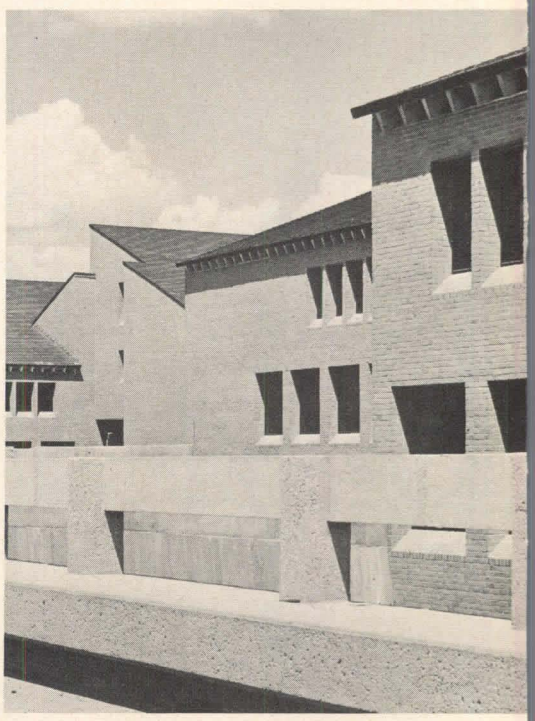


Photo: Orlando Cabanban

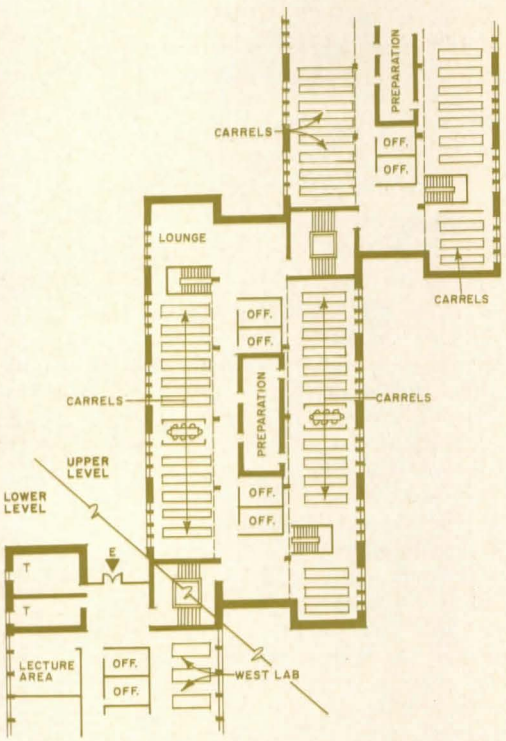
The Orchard Ridge Campus, Oakland Community College, Farmington, Michigan, is a partially completed campus that already houses 2000 students. Typical plan (facing page) shows arrangement of teaching carrels, informal student spaces at the ends, with learning materials at the center and adjacent teacher offices. Architects: The Perkins & Will Partnership.

Under this system, city sites are not removed from the tax rolls by their use for schools. After the facility has paid for the school, it continues to produce tax income for the city. Additional taxes are also produced, since, due to the shortage of sites, many of the buildings would not be built under normal circumstances.

In its over-all effect, the Fund's program has been likened to miniature urban-renewal projects without requiring either Federal or local financing.

Architecture: Educational Hardware

"Architecture is hardware, like closed-circuit TV. It can motivate or hinder the student, but it doesn't have a lot to do with learning." This is the statement of an educator, Dr. John E. Tirrell, President of Oakland (Michigan) Community College, whose educational ideas have been gaining increasing recognition, and who recently commissioned two architecturally impressive campuses.



"Software" is the educational concept, and "hardware" the means of its implementation, says Tirrell. The hardware — mechanical learning devices, environmental equipment and buildings — come later as subordinate objectives to implement the primary objectives of educational philosophies. Tirrell's philosophy sometimes collides with those of the traditional teacher and the traditional classroom. They have probably had as much to do with the increasing integration of the school into community life and the radical change of school planning as those of any other educator in the nation.

Not only are there two new campuses, one partially built and the other in the design stages, specifically designed to carry out Tirrell's philosophy, but his group is rapidly acquiring new spaces for expanding facilities. Tirrell's educational concepts are therefore of importance to the architect as they bear on architectural form, or, as Tirrell would say, "hardware specifications."

"What we do is identify our objectives, and one of those objectives is not to duplicate the past," he notes.

The Hard Decisions Are About Software

"There are many hard decisions to be made about softwear," continues Tirrell. These will determine his hardware specifications.

Part of Tirrell's softwear is the conviction that you can teach anyone anything. "Variance, in time, brings out a variance in learning." His method is to sequence the material and give the learner the time he needs.

Besides employing learning devices that are radical compared to those of the traditional school, he would utilize every scrap of land and every building he could press into service. The vacant land that accumulates as the result of renewal projects lying dormant until the slow machinery of renewal builds upon it would be pressed into service as a learning center. Tirrell would pitch a tent, bring in the school facilities, and educate. "Teach them anywhere and everywhere, and let them go out to the monument (the permanent schoolhouse) and take their quizzes. Take a trailer and park it in the ghetto and from Monday to Friday have a college."

He suggests that the school as it presently exists could be used to manufacture hardware material and ship it to spots of learning. Tirrell points out that this idea is not without precedent. There are students of the Chicago Junior College who completed courses and were awarded degrees without setting foot on the Chicago campus, he delights in telling people; they were inmates of Joliet Prison.

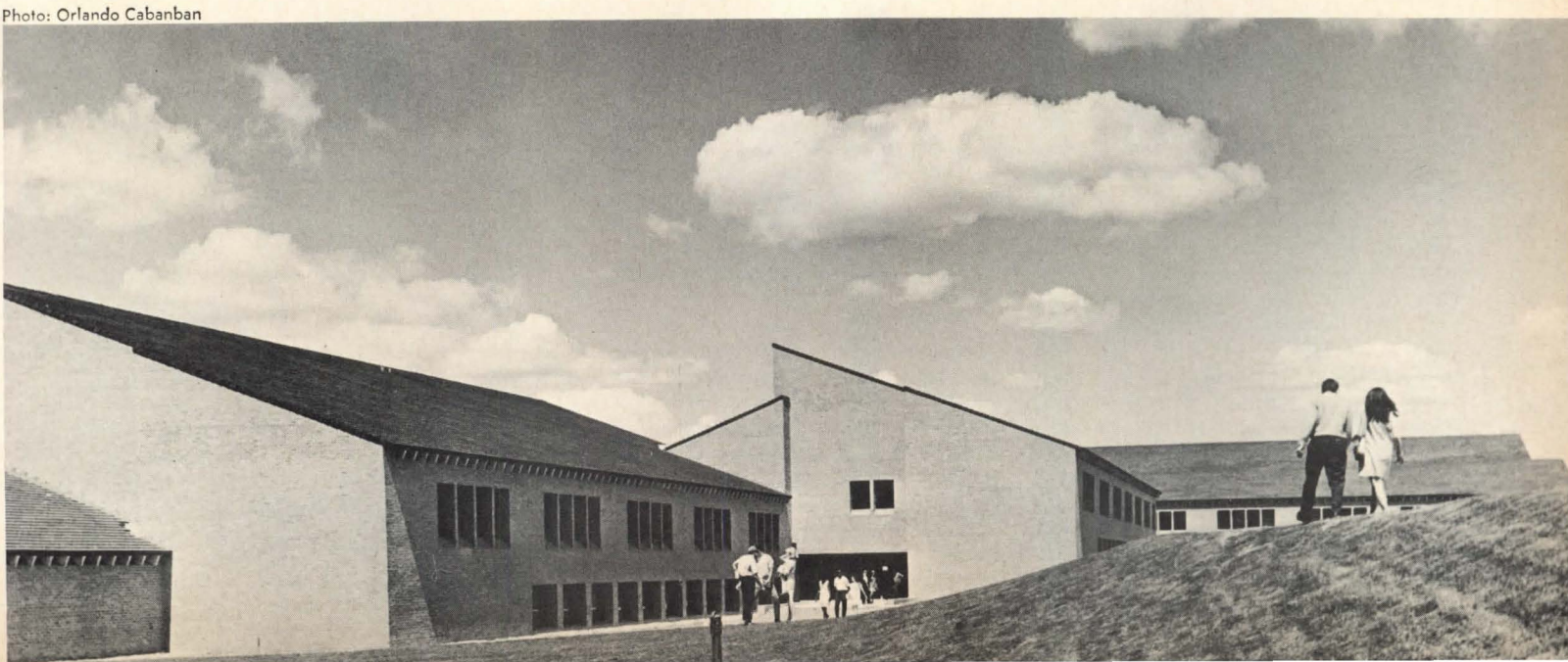
"We are trying to redesign the system to make it easy on the human — the most precious resource we have, both student and teacher." Tirrell remarks with distaste on the tendency of some school administrators to vie with each other pridefully on the percentage of students they failed. "This is not student failure," says Tirrell; "it is educational failure."

"For example," he continues, "why the monkey business of keeping test information from the kid? Why is the effort made to torture the student with uncertainty, instead of finding ways to motivate him?"

The Classroom

"The 50-minute classroom has no relation to human learning." If the problem were given to the Rand Corporation to devise a method in which the fewest number of students would learn the least in the longest period of time, at the expenditure of the maximum amount of human resources, they could not devise a better method than that employed by the individual lecturer addressing a group of seated captive students. "We

Photo: Orlando Cabanban



are attempting to turn the problem around; we are trying to find what we can do to reverse the method," points out Tirrell.

The obvious solution was to get rid of the classroom. In Tirrell's schools, learning areas consist of study carrels combined with informal study (lounge) areas. The student checks out his packet of learning equipment and pursues knowledge at his own pace. He compares notes with other students in the informal study lounges, and, when questions arise, has direct personal access to the instructor. This system is augmented by frequent group discussions and lectures by instructors and invited guests.

The student sets his own pace, and, to a large extent, his own attendance time. All students do not make the transition from servitude to academic freedom easily. As a result, work is evaluated weekly. When a student begins to encounter problems, he is quickly counseled, and, in rare cases, his home is contacted.

A radical departure from usual educational procedures is to give the student a clear understanding of his course objectives, what he is expected to attain, and what he will know after he has completed each particular unit of study.

A very important result of the program, says Mitchell Tendler, Oakland Community College director, is that the "kids are kept fluid. They do not learn by the bell, setting themselves to imbibe knowledge like a Pavolovian dog at the sound of a gong, and turning themselves off when the release bell sounds. The educational system keeps them active at all times. The student sparks the knowledge, and the instructor is right there with the bellows to fan the flame."

What is the consequence of the Oakland Community College philosophy on school design? In terms of the traditional schoolhouse, it might well be catastrophic. However, this does not necessarily mean the end of architectural involvement in educational hardware, as the results of the Rice Design Fete illustrate (pp. 198–213). Tirrell co-authored two of the programs. One resulted in the theoretical design of a monumental educational building, the other in an ingenious architectural plan for the wide dispersal of education. Nonetheless, some architects feel threatened by Tirrell's *ideas*, as *illustrated* by comments after one of his slide lectures in which he carefully detailed his educational philosophy, accompanied by theoretical learning hardware. A well-known architect, who shared the platform with Tirrell, stated, "I am not prepared for this kind of thing. My grandfather was an architect, my father was an architect. I have just seen my entire profession decimated."

Tirrell has *no intention* of decimating the architectural profession. His interest is the hardware that will do the best job, and he promotes architects who will design what he requires. To this end, he has planned a research project with English architect Cedric Price this fall at the Cranbrook Institute of Science to explore the possibilities of Price's "Thinkbelt" concept.

The Oakland Community College idea of the classroom is the classroom where you find it. A grassy lawn that faces a learning trailer, a tent pitched on renewal land, an open space in an architecturally monumental school, a bus, or your own living room. The traditional

classroom is no more pertinent to learning in this concept than the Quincy school is functional in today's city.

Relocatable Facilities

The permanent schoolhouse as cumbersome, unfunctional hardware, is highlighted by the increasing use of relocatable temporary classrooms. These movable temporary structures, originally conceived to meet the needs of overcrowding, brought on by the war "baby boom," are becoming an increasingly common site plunked down in schoolyards and playing fields to augment existing facilities.

These facilities have been damned by architects as ugly, by neighborhoods as eyesores, and by teachers as inadequate, poorly functioning hardware. According to an EFL report, published several years ago, there were at that time at least 36,000 relocatable facilities that housed over 1 million pupils. Some of the structures predated World War I.

Less than 1 per cent of the buildings were architecturally designed. In most instances, they represented cheap, short-term construction, and were not abandoned on schedule, remaining in use for years, eventually proving, because of their high maintenance cost, to be more expensive than permanent structures.

Most temporary structures used in conjunction with the traditional schoolhouse have proven planning failures. However, as hardware for more flexible educational concepts, their very mobility is their virtue, as is illustrated by some of the solutions at the Rice Design Fete, proving that temporary buildings are only bad for permanent educational concepts.

Flexibility

The central factor emerging in school design is flexibility. No longer a limited interior flexibility epitomized in the movable partition, but a total flexibility encompassing the school building and the learning process itself.

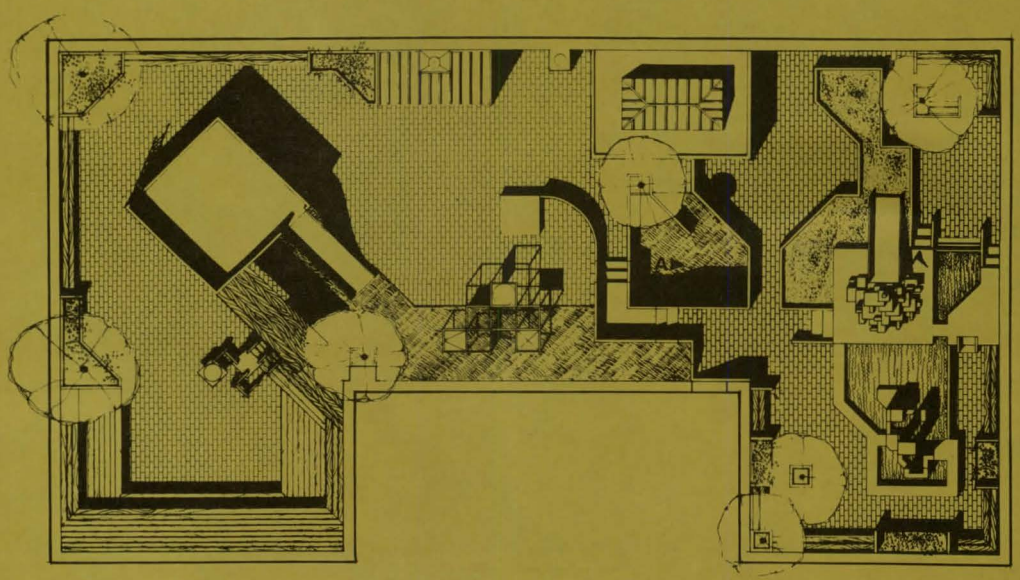
James J. Morisseau, of EFL, points out that the emphasis is no longer on the design of a school, but instead on an educational center. George A. Vikre, architect and school designer, notes that "if the educational vocabulary is impermanent, in a state of flux . . . the architectural satisfaction of it can no longer be a permanent solution to last 50 to 60 years. It may be that the architects must absorb this as a fact, and design easily changed buildings that puts them [the architects] in a clairvoyant position of being required to design knowingly for as yet unknown changes of the future."

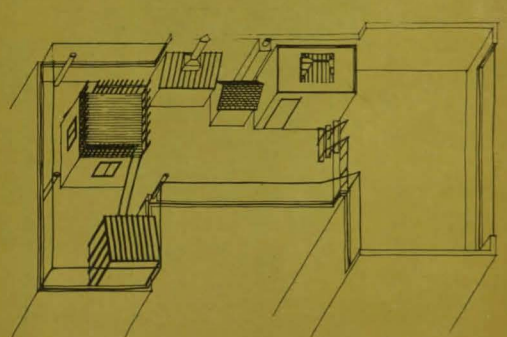
How? The answer seems to be twofold: extreme flexibility (structure, space enclosures, finishes, mechanical and electrical), and restraint in design.

More than ever, a new or renewed restraint in design is mandated that will challenge every usage of material and every design device before it is permitted in the total design, so that the resulting simplified design can more easily meet the needs of change.

Professor Theodore Larsen, director of the University of Michigan SER project (School Environments Research Project, an activity of the Architectural Research Laboratory at the University), suggested that the concept of flexibility required a radical shift in the traditional role of the school architect. "Instead of being a one-shot design performer who disappears as soon as the building contractor turns over the keys to the school's superintendent, the architect now comes in at the very inception of the school curriculum, participates in setting up the original design programs, creates the original school plant, then continues on as a design consultant who points out plant improvements that can and should be made from time to time. . . . if the architect knows

An example of rooftop space reclaimed for urban playground is The Little Red School House, Inc., of Greenwich Village, New York City, which will use its rooftop for four- to six-year olds. The raised north end was designed for pre-kindergarten, with the lower end for older children. Pipe frames and awnings provide shade, with lightweight plywood and glass fiber panels for play structures and enclosures. Artificial turf, sand, and water create a variety of surfaces. The design was presented by the architects as a guideline. Parents will execute murals and play structures. Architects: Hammel, Green & Abrahamson. Project architect: Ronald W. Haase. Designer: Clark Neuringer.





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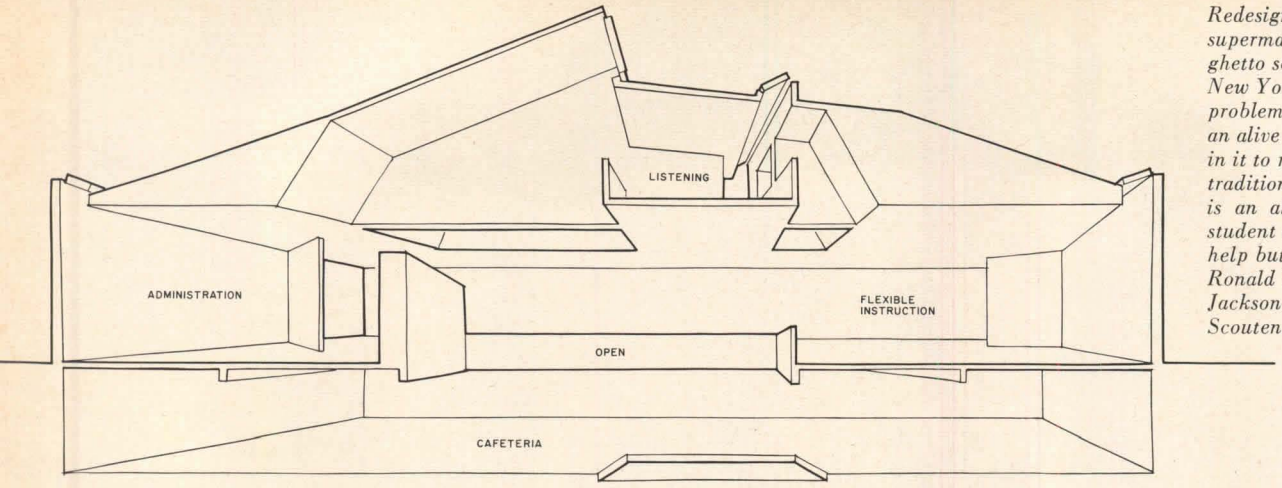
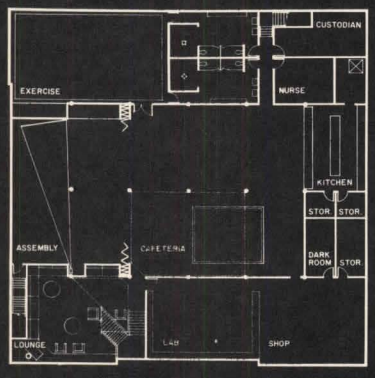


SECTION A·A

Redesign of an abandoned supermarket creates a prototype ghetto school. Commissioned by the New York Urban League for problem students, the school creates an alive environment with little in it to remind the student of the traditional school. The concept is an alive milieu in which both student and teaching staff cannot help but get involved. Architect: Ronald W. Haase. Associate: Barry Jackson. Project designer: Alan Scouten.



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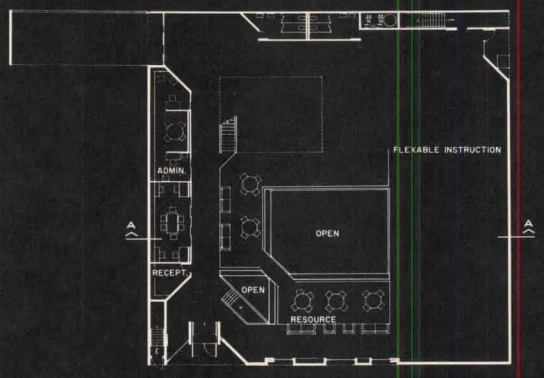

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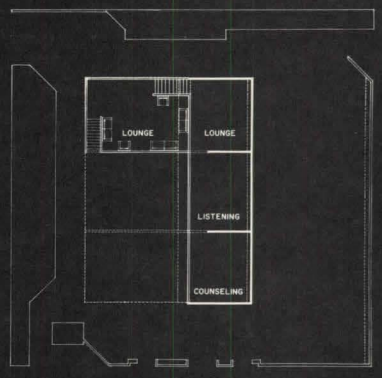

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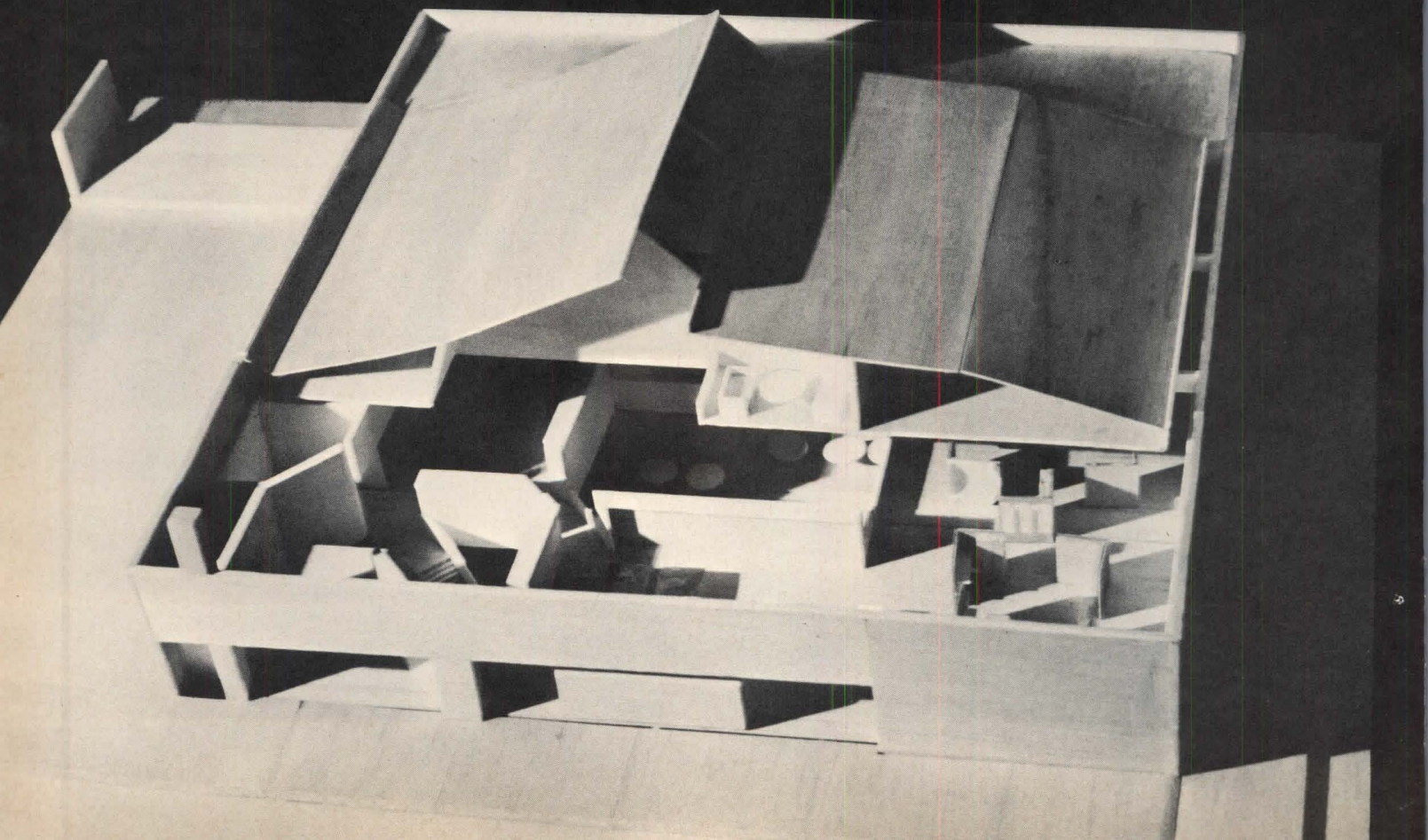


he is going to be responsible for the future changes in the school plant, it is quite likely he will design the original structure to be as flexible and permissive of alteration as possible."

The flexibility that must be designed into schools is often thwarted by old, inadequate facilities. Whether they should be renewed or altered is debatable, according to Laurence Palmer, a Perkins & Will partner. He thinks that someone should call a stop to the process of adding nooks and crannies to old schools. He mentioned one instance: a school built in the last century that has had 10 different additions. Palmer objects to the piecemeal solution that saddles the architect with existing commitments where the architect's only contribution can be to add to and interpret unworkable, obsolete conditions. This process he characterizes as being like placing your left elbow where your backbone should be.

Flexibility in school facilities has extended far beyond the schoolhouse. The use of learning spaces in other buildings has been a working concept for a number of years. The idea of using the ground floors of housing developments for schools was tried and proven successful almost 20 years ago in what is now P.S. 9 in New York City.

The school in a low-rent project, which gives preference to large families, started as a one-room annex to a nearby school. In two years, it expanded until it occupied five classrooms and a lunchroom. In the ensuing period, it further enlarged and was designated a separate school.

Schools in housing projects have a number of obvious advantages. Most of the students do not have to cross dangerous streets to get to school; they can utilize existing playground space when not in use, and may facilitate parent-teacher cooperation.

Among instances of the growing use of other than school buildings for schools is that of the civil rights group mentioned earlier who are converting an abandoned supermarket into a school. Architect Ronald W. Haase, the designer of these facilities, points out that there are a series of such markets, all in depressed areas, that could be redesigned for school use.

Classes have been held in vacant garages, stores, and any space available in slum areas by the various self-help projects. Haase has also designed a small schoolyard park for the top of a tenement building.

An example of facilities where you find them is Cleveland's Supplementary Educational Center located in an old warehouse. It complements and expands existing educational programs of the regular city schools with scarce equipment, specialized commercial and industrial exhibits and machinery, a variety of educational, technical and cultural display, and educators specializing in particular fields.

Flexibility Afforded by Environmental Conditioning

"We are now building very muscular and scientific-looking buildings which appear as if they would perform superlatively indeed; they look as if their design were forged from function, but which in many cases do not really work well at all," said Jonathan King, vice-president of the EFL.

Whether our technology works well or not, it is having a measurable effect on educational facilities.

A major factor in school design that has made possible educational spaces necessary for new educational ideas is the use of mechanical environmental equipment. "A child does not learn any better scratching his heat rash," says Gores. "Kids have had the right not to be cold for a long time. One of the first considerations of the earliest schools was the provision of wood. Kids are now winning the right of not being hot."

Photo: Ronald W. Haase

Teaching is possible in the physically uncomfortable egg crate schools, contends Gores, but the nature of the container influences the form of education. He is fond of saying that "education is a fluid taking its shape from its container."

The ideal container, according to Gores, is about a 4000 sq ft pond upon which the "ducks and ducklings" can float. This "mutable, malleable space," is impossible without air conditioning.

New teaching methods demanded such innovations as core, classrooms, team teaching areas, relocatable classrooms, multipurpose rooms, corridorless schools, windowless classrooms, and other features of today's institutions of learning are made possible with new thermal-control equipment. They would have been unworkable in the old finger school design, a design that was limited by the distance that a breeze could crawl across.

There are other advantages to the air-conditioned school and the new open planning. Air-conditioning engineers claim that, in many instances, it is more economic, due to savings in the cost of structure than the traditional two classrooms divided by a corridor.

Unit conditioning and more advanced and sophisticated environmental conditioning equipment has allowed the building clusters. One department or related departments can be strategically located and equipped with their own heating, ventilating, and cooling equipment.

Improvement in conditioning equipment has brought with it the question of the windowless classroom. Architects were enabled to question the validity of windows that were not needed for a view, particularly in urban settings, or ventilation. Out of the SER studies on the windowless classroom, one positive factor to emerge was that windows themselves had to be reconsidered and redesigned. Environmental conditioning made possible the consideration of more wall area as teaching space and designing the window as a viewing picture surface.

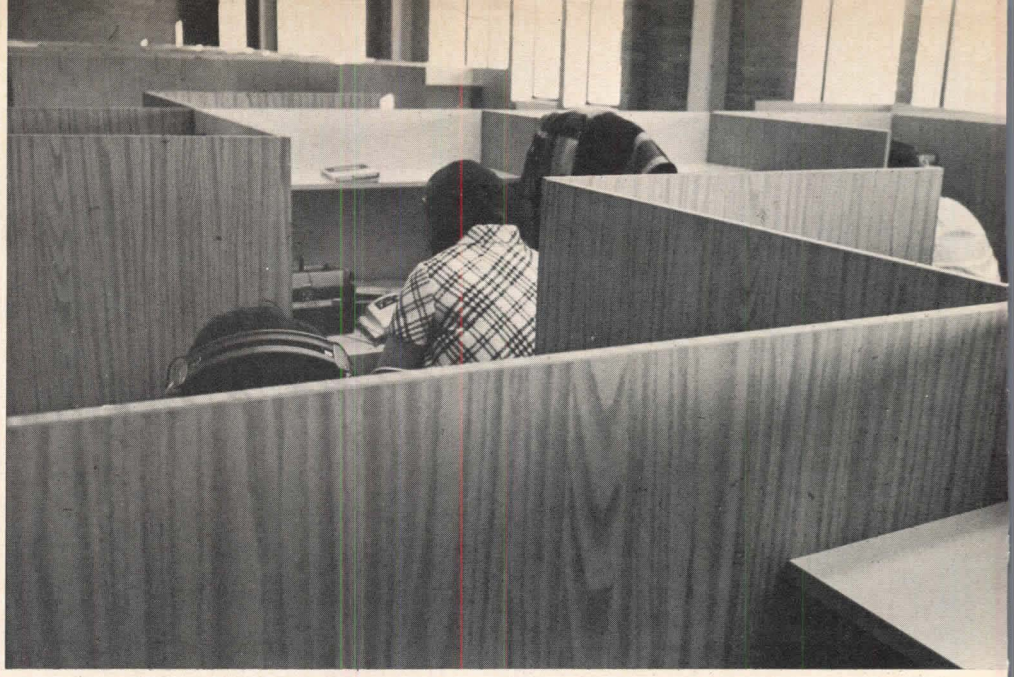
Relocatable schools, mobile classrooms, and expandable schools equipped with self-contained heating and refrigeration units that can be plugged into the parent school make the interior of these flexible facilities habitable.

The development of multizone air handling units, capable of being located on rooftops such as those developed by the SCSD, as well as flexible units used inside buildings to service core rooms, provide alternative design possibilities as well as special design problems.

Air-conditioning technology has supplied an essential ingredient of flexibility. This is an essential for the realization of new teaching techniques demanded by the changing educational philosophies. This is all-important to school design, for, as Morisseau says, "Any building today will be at its half life at the year 2000. Anybody who pretends to know what education is at 2000 has rocks in his head."

The Changing Role of the Architect

The one permanent characteristic of today's educational process that everyone acknowledges is change. "If you announce that secondary education is changing, the usual reaction is: 'To what?' With the assumption that when



Student carrels at Orchard Ridge Campus, Oakland Community College, Farmington, Michigan.

it gets there it will stop changing. Of course, change has now become a simple fact of life. . . . Buildings do not change from this to that. They change and change and change again." Change, although discussed on many levels, is seldom understood, according to Jonathan King of EFL.

The role of the architect in school design, this constantly changing building type, is often controversial. Some say that students learn despite architects, and others that learning is impossible without the environment that only the architect can create. Whatever role the architect might play, there is no doubt that his position in relation to the educational building is unique.

Instead of the traditional "form giver," he is asked to justify his forms and their educational implications. He is becoming a partner with the sociologist, educator, planner, technician, and members of other disciplines. Education may be the fulcrum upon which we are trying to revolutionize the society, but in the process, it is also pressuring the architect out of his traditional role.

The emphasis upon a flexible learning environment is forcing the architect to consider environmental evaluations quite aside from those of the schoolhouse as a *building*. "The architect has at his command all of the known applications of flexibility, and it is pointless to list or discuss them. He will, more than ever, be required to invent new ones," predicts George A. Vikre of the architectural firm of Cataldo & Vikre, Schenectady, N.Y. "Since he [the architect] is not magically all-knowing and all-seeing, he must call for the partnerships of the educators and school administrators to learn what flexibility means to them in their teaching disciplines and spheres of influence. It may be that the architect must design the sidewalks when he learns where the people will walk," Vikre concludes.

To Haase, the role of the architect is to pull out of education the things that have implications for architecture. Haase maintains that the architect has control only of what the architect builds, and that, sometimes, individuals other than the architect have more influence on the learning environment. For example, the business manager, through his purchase of furnishings, controls the working interior of the educational space. In this instance, the industrial designer becomes more important than the architect. Haase observes, "It is the industrial designer who designs the furniture and movable fixtures that make the educational space work."

Rigid but Low Standards

To Gores, standards sometimes have a more compelling, significant influence on education than either the architect or the educator. "Standards build up through

the years," maintains Gores. "They protect the bureaucrat from having to rethink his ideas and come up with programs that will help the student. The bureaucrat hands on these standards to the architect, which takes architecture away from the designer, and leaves him with cosmetology," says Gores. "They prevent the architect from creating an environment. They take away the activity of architectural support, so the only recourse the architect has is to make it pretty."

The Architect

It is obvious that the ambitions of the educators cannot be met without the architect. Builders, engineers, and contractors are not equipped to translate the educators' demands. This is true because educators speak in abstractions; they do not know the form of the building they want until they see it.

The changing function of the educator is prescribed by the new educational philosophy — a philosophy with "emphasis on the individual and the learner as an activist. The teacher must become a moderator, and a stimulator, the true catalyst to the learning situation, rather than the dispenser of facts to passive pupils," points out Vikre. In this context, the building itself must be an active medium in the changing educational demands, among which are programs that are not only trying to solve educational problems, but social ones as well.

This may be a healthy condition for architecture. The dichotomy between school form and school planning reflects the split between architectural thinking and the capabilities of building technology. In only a few instances is building technology meeting the needs of 20th-Century society. It is significant that one of the most important steps taken toward industrial building should be in schools and that it should be actively encouraged by the EFL.

The Lifetime Architect

"Change may mean the involvement of the architect throughout the building's lifetime," comments Theodore Larson. "When education is highly diversified and characterized by rapid change, the schoolhouse is then a facility rather than an end in itself, or a building in itself," he adds. As a result, the "school building should never be considered really finished until it is eventually gotten rid of or wholly obsolete. It must always be in the process of becoming something more desirable, educationally," he concludes.

This concept involves a radical shift in the traditional role of the school architect. Instead of being a "one-shot" design performer who disappears as soon as the building contractor turns over the keys to the school superintendent, the architect now is involved at the very inception of the school curriculum. He participates in setting up the original design programs, creates the original school plant, and then continues as a design consultant who directs plant improvements that can and should adapt the school to changing educational demands, according to Larson. He adds that if the architect is going to be responsible for the future changes in the school plant, it is quite likely he will design the original structure to be as flexible as possible.

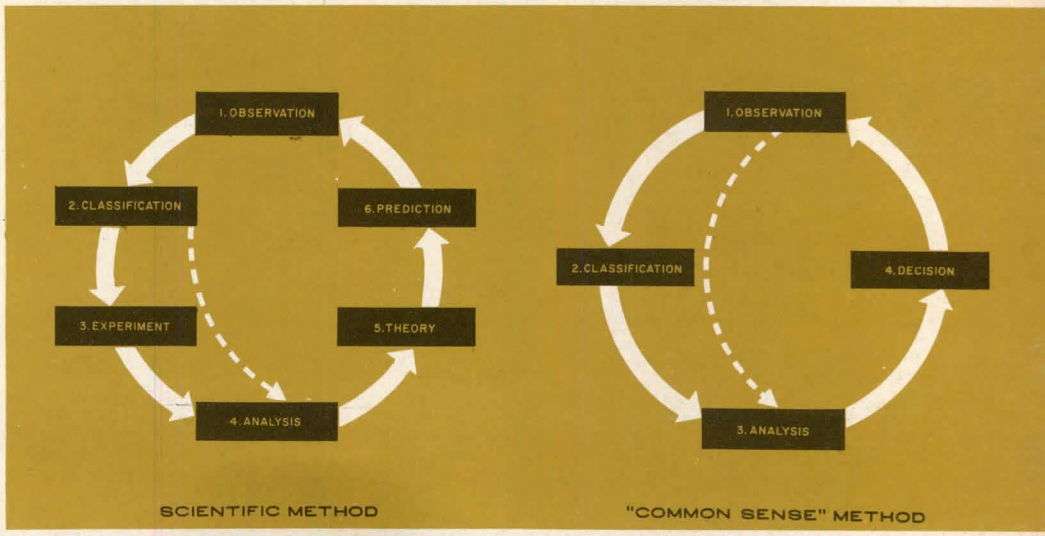
"This concept implies a different approach to design and facility cost," Larson points out. "The cost of the school would be evaluated on the basis of the total school life, with flexibility as a design and cost factor."

The Architect as Form Generator

One of the first modern schools to be worthy of consideration as architecture, The Crow Island School, was designed in 1940 by Saarinen & Swanson and Perkins & Will. The design of the school was the result of months of intensive study on the part of teachers, architects, and administrators. "Larry Perkins sat in the classroom and studied the educational procedures," says Palmer. "Today, the educator in Podunk assumes that the architect knows more and will do the right job. This leaves out the client contribution. The architect should not get too smug. The client has an important contribution to make. The stimulation he can provide cannot be substituted."

"The client gets the kind of building he deserves," he continued, implying the kind of stimulation he gives the architect. "The owner's role should be one of enlightened empathy." But Palmer adds that the architect's responsibility is also to protect the educator from what he does not know. This would seem to imply that the architect may at times bring to the design of a schoolhouse more knowledge of educational philosophies than that of the educator.

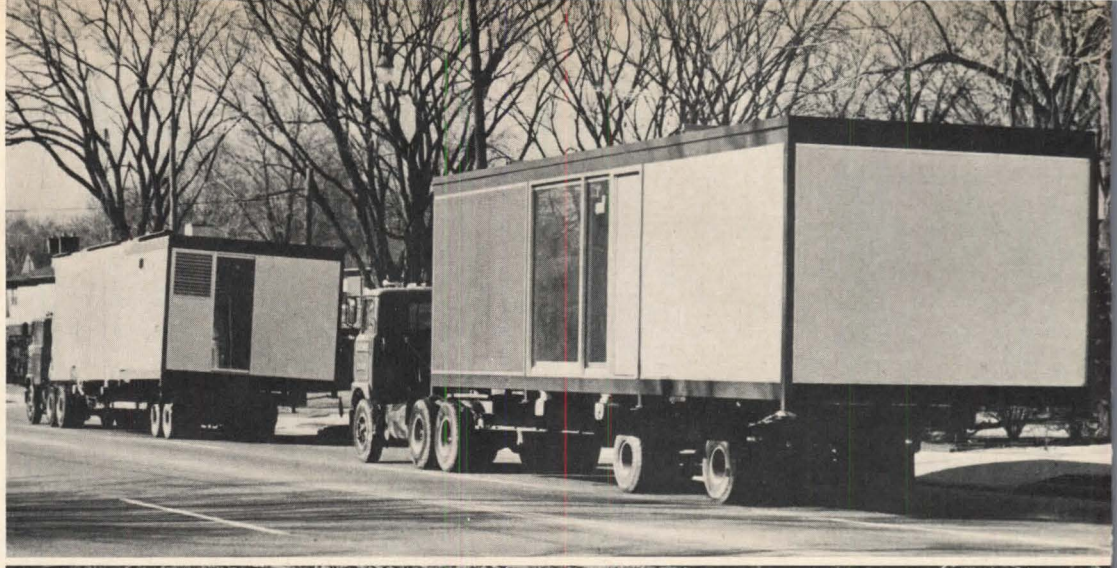
A major problem in school design, as Morisseau sees it, is that the average client does not present the architect with adequate program requirements. Architects who have pressed hard in school planning have consciously taken over the client function, says Morisseau. However, he feels that the client gets the best job when he writes the program himself or hires an educational consultant. Job control is ultimately in the hands of whoever hires the consultants. If the architect hires the consultant, he is quite likely to be the major influence upon the form of the building. The change in architect and educator relationship is that, formerly, the architect with a program based largely on numbers of people came first. The educator then tried to fit his program into the cellular space provided by the architect. "Now the educator has become the inventor of new education terminology," says architect Vikre.

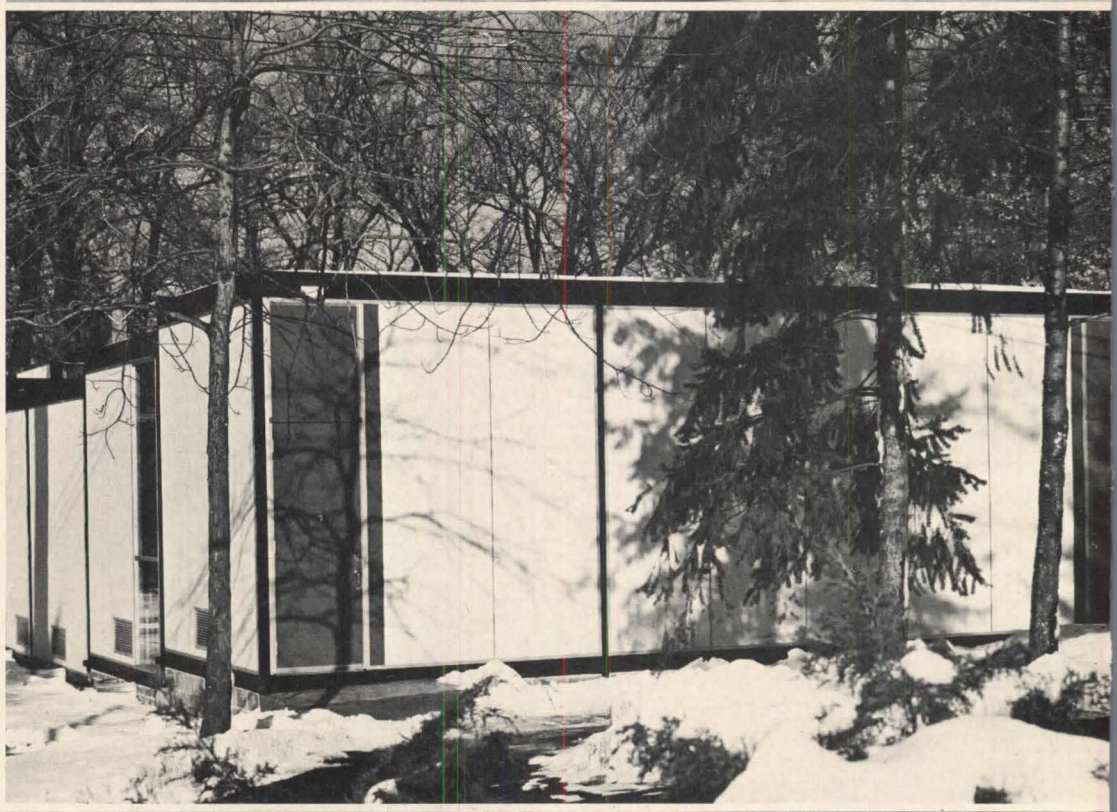


Schematic diagram of stages in reaching a scientific prediction compared with "common sense" decision-making by Lawrence Wheeler.

"The changed function of the educator seems to be prescribed by the new basic educational philosophy. With emphasis on the individual and the learner as activist, the teacher must become a moderator, and a stimulator — the true catalyst to the learning situation, rather than the dispenser of facts to passive pupils," continues Vikre.

Architects are expected to design structures that will facilitate the educational process. He is required to create an environment for learning. Architectural ability to do this is attested to by the wealth and variety of architectural planning of learning spaces even if somewhat detracted from by the incessant "architectural treatment" that insists in finish-





Prebuilt units adapted to school use were constructed in 38 days for the Oakland Community College, Farmington, Michigan. Photos show units in transit, in place, and an interior view. Architects: Ziegelman & Ziegelman.

Photos this page: Daniel Bartush

ing off excellent plans with a plethora of strange roof forms.

Behaviorial Patterns in Learning

Architects have joined forces with behaviorial scientists to seek a scientific basis for the design of the educational environment.

The state of reasearch in relation to the learning environment was stated by the SER. They say that an environmental science already exists in the form of a sizable mass of knowledge dealing with the effects that various environmental factors, such as atmosphere, temperature, light and sound, and social groupings have on human comfort. It is their contention that such information can be used by the architect to predict whether the occupants of the space he designs will be comfortable or not. They ask, however, what effect comfort has on the learning activities of the student. In this respect, they contend that our existing knowledge of environmental relationships is woefully inadequate.

Very little is known of the environment as an integrated totality, because the factors have been studied in isolation and the results measured only in terms of physical tolerance. Knowledge is lacking as to the impact of environment upon the learning process.

Commenting on this fact, Professor Handler of the University of Michigan told the Research Institute in Washington D.C., "It is an astonishing fact that the problem of human requirements has received less attention than other kinds of building research. Sporadic attacks on the problem have been made during the last three decades or so. There has been much talk, a substantial body of folklore has come into existence, and the art of pretentious know-how has flourished. But scientifically grounded knowledge about the effect buildings should have on their inhabitants seems to be minimal. This is indeed curious. After all, buildings are designed for people, and an understanding of what you are designing for should be the first order of business. Yet what should be first is the last problem to which building research has been directed."

Architect Ewing H. Miller recently published the results of the work of his office in conjunction with psychologist Dr. Lawrence Wheeler, which they term merely the first step in understanding student need in relation to specific design problems.

Wheeler explains some of the reasons that behavioral scientists have not generally taken an active interest in architecture, despite the fact that architecture offers such a pervasive set of stimuli for human behavior. "Perhaps," notes Wheeler, "it is because the behavioral sciences are experimental sciences and the expense of solving architectural problems experimentally has been seen as prohibitive; or because buildings are exceedingly complex stimulus sources and the behavioral sciences are just emerging from the struggle to understand the effects of relatively simple stimuli; or because architects and architectural engineers have rarely stated their problems in terms that are meaningful to the behavioral scientist; or, finally, because all new joinings of different professional fields occur only when a need and a challenge become apparent to members of each field — and this is only beginning to be the case."

What can the behavioral scientist do for the architect, asks Wheeler, and answers that the scientist's prediction becomes the basis of the architect's action. The theoretical prediction of the one guides the decision-making of the other.

The behavioral scientist has no magic formula for obtaining better data than anyone else. His only "secret" lies in a rigorous training in the use of systematic, controlled observation, finely tuned to pick up those special aspects of human behavior that give the greatest promise of solving the problems the scientist is interested in — in this instance, the educational environment.

Learning Environment Evolution

"What is there about architecture that is really significant in terms of education?" asks Dr. David S. Abbey. His answer is that the worth of architectural solutions in their relation to the learning process must be contrasted with their educational intent. He also states that there is the possibility that good architecture and education are not related.

In evaluating student reaction to Scarborough University, Abbey found that student reaction ranged somewhere between "apathy and hostility." He contrasted this to the almost universal laudatory recognition that the buildings had received in the architectural press and concluded that "architectural excellence and educational potential may be two completely unrelated dimensions."

Related or not, to design an effective building for learning, the architect must make the distinction between education and instruction, holds Abbey. Instruction involves the simple transmission of information, and education requires the interaction of attitudes and values between teacher and student. The process of both is clearly communication, and the architect is involved in shaping the channel within which this communication takes place. The judgement of the effectiveness of the design will then be evaluated in relation to the effectiveness of the spaces to perform these functions.

The factors that are the most critical to the activities of instruction, says Abbey, "would seem to be those which are treated in every introductory text in learning psychology. These involve obvious factors of sufficient illumination and reduction of glare; comfort in seating without inducing outright sleep; optimum level of distraction from the environment in terms of sound and visual stimuli, and a reasonable comfortable temperature, humidity and air-flow mixture."

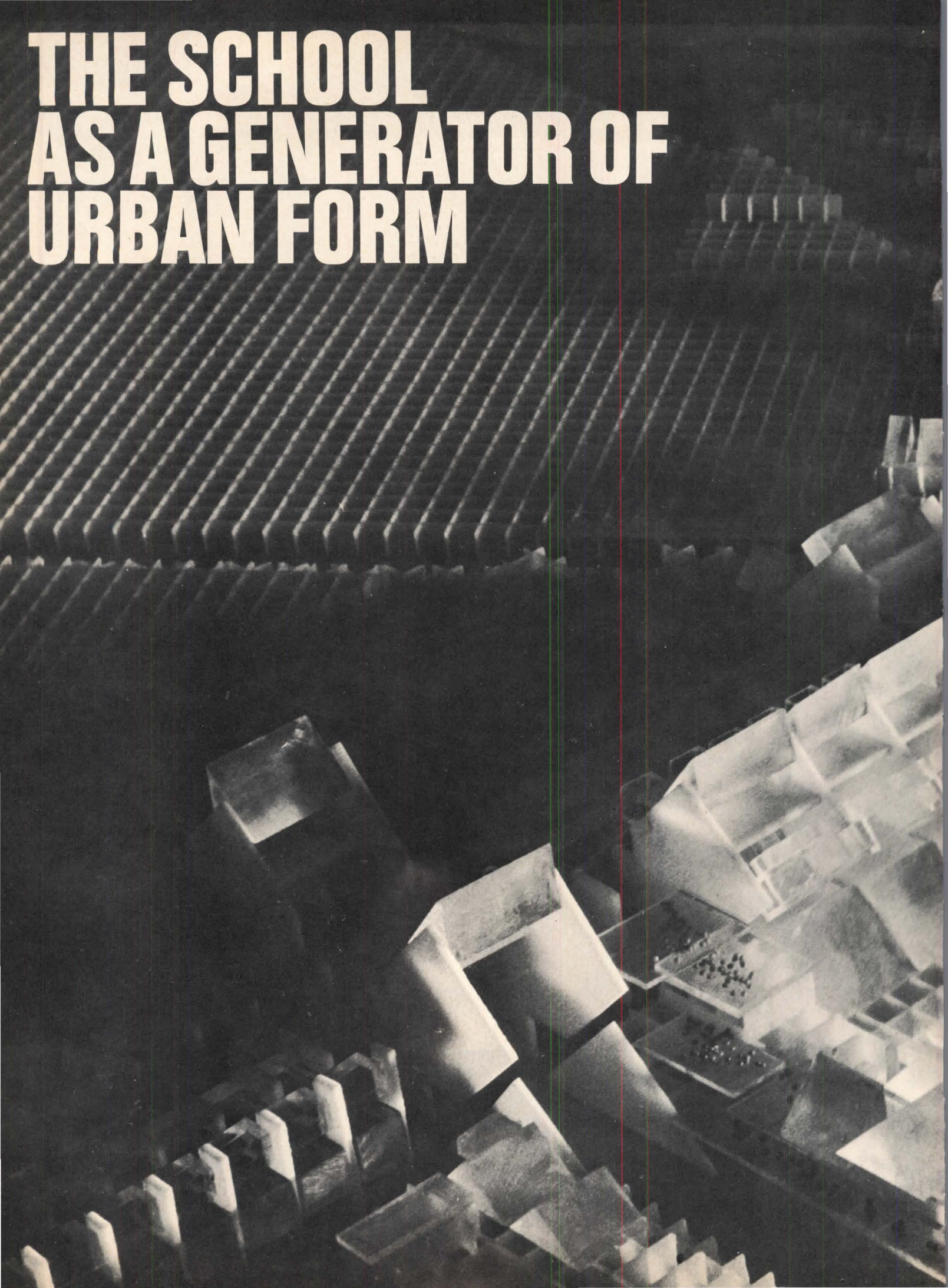
The educational space, on the other hand, should, "provide an environment that says to the student, 'Have fun, explore me; push my walls around if you don't like the way I am; take a section of the floor out if you want to build something big in the basement; change the colored panels around on the walls if you want to redecorate the area; treat me like your own.' " It should be a space that promotes the interaction of students and staff — one that will result in the transmission of values.

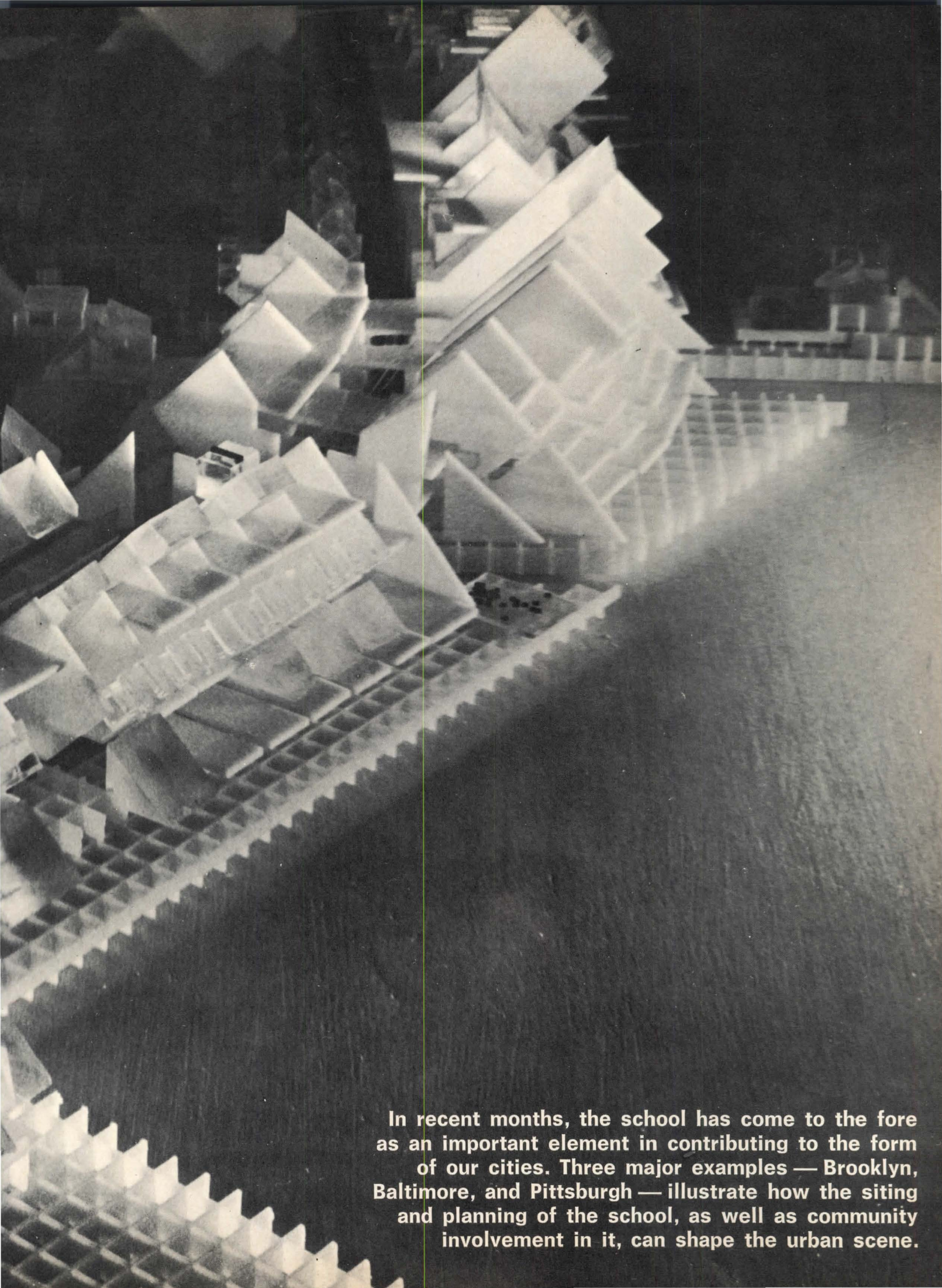
The architect's traditional contribution of aesthetic and artistic contribution to the society must be augmented by the knowledge of the behavioral scientists, maintain a number of architects. "Good buildings can no longer be defined only in terms of good aesthetics, or in terms of the relatively hollow phrase, 'form follows function'; they must be defined not only in terms of aesthetics or structural purism, but in terms of the sociological and psychological environment. Form should respond to human behavioral requirements," says Ewing Miller.

The use of behavioral scientific data in design is comparatively recent, and the behavioral sciences are comparatively new. A number of architects at this time say that their findings are no better than their own intuitive perceptions. In many instances, this may be true. Hundreds of thousands of dollars are being spent to write volumes on the facts of life that a taxi driver could probably tell us for a dollar. Nonetheless, it seems ironic that we have volumes of literature on the learning processes of rats and almost nothing on the learning processes of people. Of course, people may be more complicated, and the intuition of the architect the best instrument for divining their complicated problems at this time.

Architects relying on their intuitive judgments are not quite certain of the pertinence of the behaviorial sciences for design. The scientists, on the other hand, have no doubts about the importance of architecture to their science, as witness Wheeler's statement, "By enclosing or being juxtaposed to living people, a building modifies, enhances, or detracts from various aspects of human behavior." The juxtaposing of people to architecture brings it into the realm of the behavioral scientists, because buildings, in the words of Dr. Wheeler, "exist because they affect people."

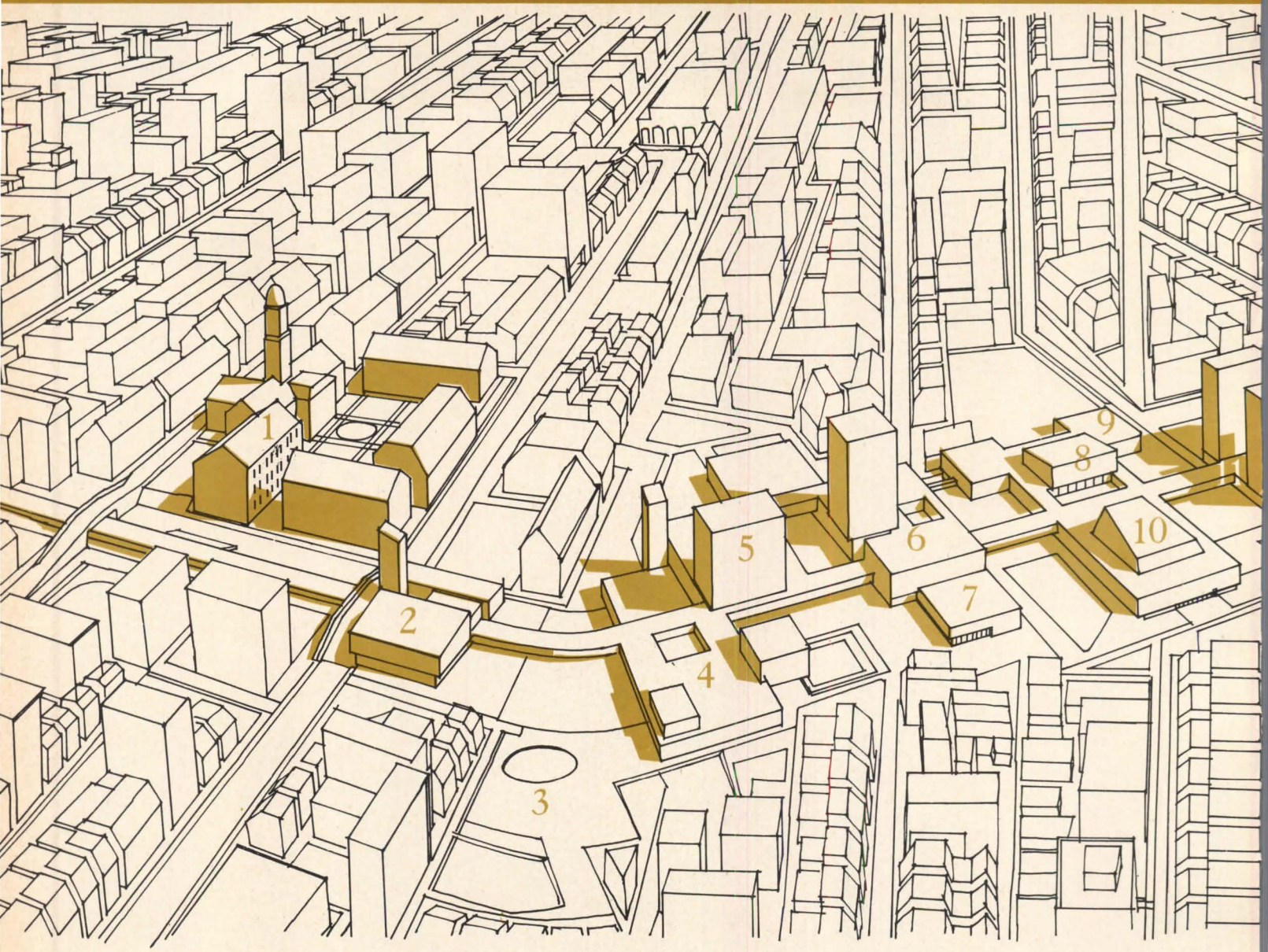
THE SCHOOL AS A GENERATOR OF URBAN FORM





In recent months, the school has come to the fore as an important element in contributing to the form of our cities. Three major examples — Brooklyn, Baltimore, and Pittsburgh — illustrate how the siting and planning of the school, as well as community involvement in it, can shape the urban scene.

Corde proposal includes (1) Brooklyn College; (2) home-school center; (3) recreation green; (4) technical-vocational center; (5) housing; (6) shopping; (7) preschool center; (8) cultural center; (9) preschool center; (10) social science center; (11) fine arts center; (12) shopping; (13) housing; (14) residential school center; (15) housing; (16) physical science center; (17) home-



The school is the basic institution in the community that has to address the slum resident; it cannot be isolated or unanswerable to the community," Bernard Russell, Assistant Director for Program Development and Evaluation of HUD's Model Cities Administration, told P/A. "In our next urban stage, schools have to be involved in urban design. It is very hard to translate the school system into visible form; we can't house kids the same as adults, but still have to build in flexibility so the place can be used 24 hours a day. We can't wall the community off."

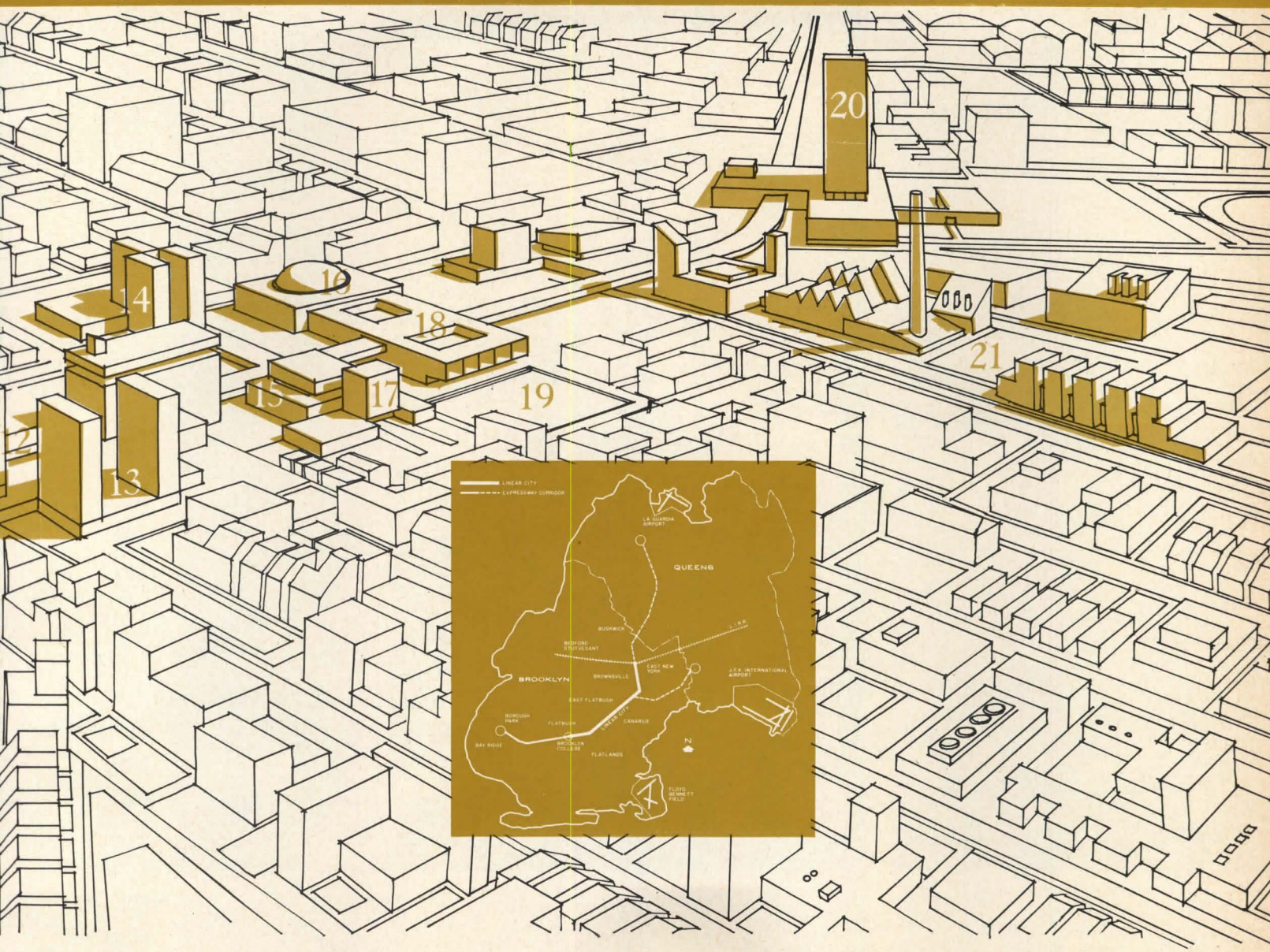
In some urban plans that are now causing comment for their forward-looking concepts, the school has emerged as one of the prime shapers of the future city environment. In Brooklyn, it was the generator of a new plan that will infuse new vitality and advanced planning techniques into the run-down heart of the community. In Baltimore, schools have been proposed as the ideal "connectors" between sections of the city that would otherwise be split by a highway, and, in addition, a school park has been suggested as the ideal symbolic crown atop an historic eminence above the city's Inner Harbor. In Pittsburgh, the city's 22 current high schools are going to be combined into five "Great High Schools" that will, with interconnecting transit and transportation patterns, form the matrix of the city's future development. In many other cities, education parks (pp. 174–187) are either proposed or in the works, projects of such magnitude as to make them, inevitably, the cynosures of their areas.

In a study that HUD made of the applications for Model Cities grants, education was found to be of prime importance. "Sixty-one percent both of cities likely to be funded and those not funded mentioned education in their goal priority sections. Education was the component most often mentioned as the highest priority goal, and the second most frequent component in which at least one innovation was proposed." The areas of interest in the Model Cities proposals were, according to the report: "(1) Efforts to link the school and the community; (2) efforts to link education and employment; and (3) more or less innovative efforts to reallocate resources and revise curricula, structure, and teaching methods to upgrade the quality of education (with particular emphasis on educationally disadvantaged youth)."

It is too much to say that the school has, or will ever, become *the* epitome of the generator of city form, but, as is shown here, there is strong evidence to support the postulation that it has moved out of the exclusive confines of the secondary street and the exclusive planning control of the board of education. The major current reason for this, of course, is that the school is the logical place to bring about the cure of a number of urban ills on several levels: a racial mix can most easily be achieved through the proper planning and placement of large schools; the desparate needs for sociological uplift to minorities and the city poor can be ameliorated in part at least by the facilities of central schools; the knowledge necessary to get out of the ghetto, or change it, is only available there; and the revamped school plan can act as a spur and pattern for needed urban redevelopment.

A closer look at the examples of schools in Brooklyn, Baltimore, and Pittsburgh will provide us with an understanding of just how powerful a force education can be in determining the way the city should be.

school center; (18) community service center; (19) recreation green; (20) new community college; (21) industrial park. Map below shows alignment of proposed expressway atop freight lines and linear city site between Brooklyn College and new commercial center.



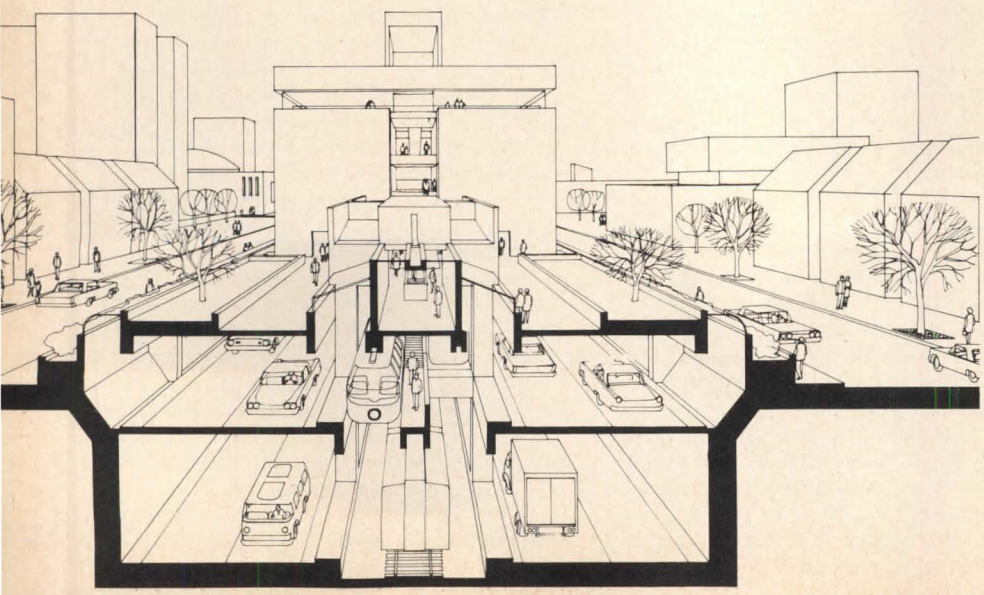
BROOKLYN
SCHOOLS STARTED IT

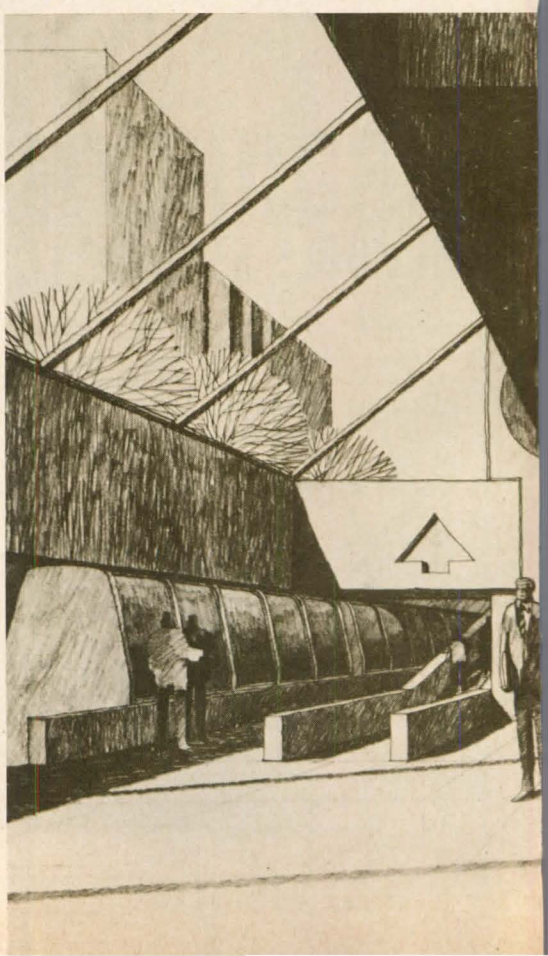
For many years, there existed on official maps of Brooklyn a proposed highway known as the Bushwick alignment with the interstate roads system. It was a baby of Robert Moses, and, like many of his pet highway projects, would have slashed directly across the borough in good old, the-shortest-way-between-two-points-is-a-straight-line, pragmatic engineers' fashion, uprooting and displacing thousands of families on the way. Some link in the interstate chain is needed here, but the Moses plan deservedly languished until powerful State Senator Anthony Travia prevailed on the legislature to delete the Bushwick alignment (which, incidentally, would have displaced *his* home) and study using Long Island Railway freight tracks of the Bay Ridge line. Mayor John Lindsay agreed with the wisdom of using the existing open spaces of the LIRR trackage, and that plan has grown in favor.

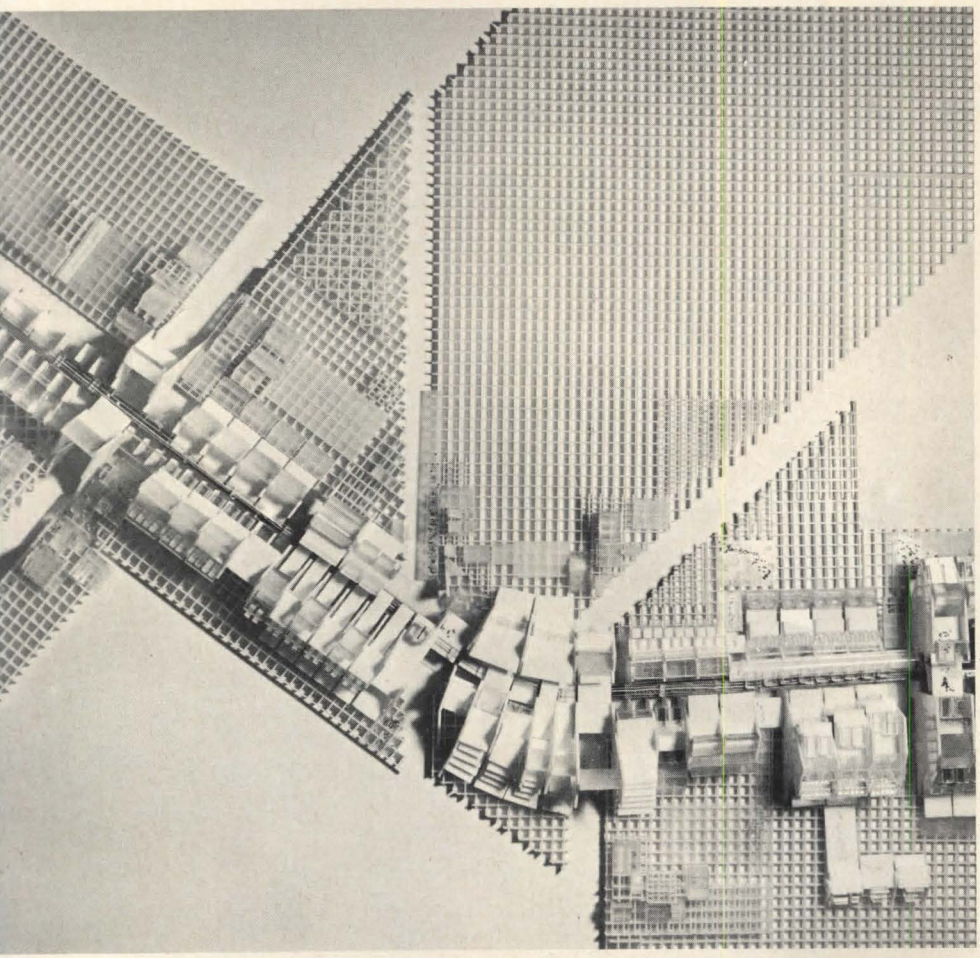
Meantime, residents of Brooklyn were agitating for assurances from the Board of Education that something would be done about the unfortunate state of schools in the areas of East Central Brooklyn. The Board came forth with an announcement for seven schools to be scattered throughout the section. This was denounced on the grounds of de facto segregation (the area is populated largely by minority groups) by the militant Negro leader Reverend Milton Galamaison and parent groups, who proposed instead an education park development in the Flatlands, a largely undeveloped section scheduled for industrial use. The Board of Education answered with a proposal for *two* education parks: one to serve East New York and parts of Queens borough, and one to serve Canarsie, Brownsville, Flatbush-East Flatbush, and Midwood Flatlands. The Board was under injunction by the parents' group not to proceed with its plans, and it rejected the community's proposal on the parents' own basis of continued de facto segregation in the Flatlands site (plus the fact that the city planned an industrial park there). The impasse was broken by asking Dr. Cyril Sargent of the Corde Corporation, an educational consultant organization, and Professor of Education at New York's City College, to examine the problem and report his suggestions.

Sargent, upon studying the community and the proposals, disagreed with both groups, suggesting that a splendid opportunity not only for new schools but also for general community rejuvenation was being missed by not utilizing the air space and related open space of the railroad tracks-future highway that runs diagonally, southwest to northeast, through the area. He suggested a "linear city" plan running 5½ miles from Brooklyn College at the southwest to a new community college at the northeast. This development would include not only schools, but also housing, commercial areas, cultural centers, a community service center, and recreational greens. By traversing several types of subcommunities, the plan would obviate the de facto segregation element in the other plans. To solve the segregation problem, the schools would take students from several neighborhoods, white as well as black, middle as well as lower income. This is intended to create a dynamic situation

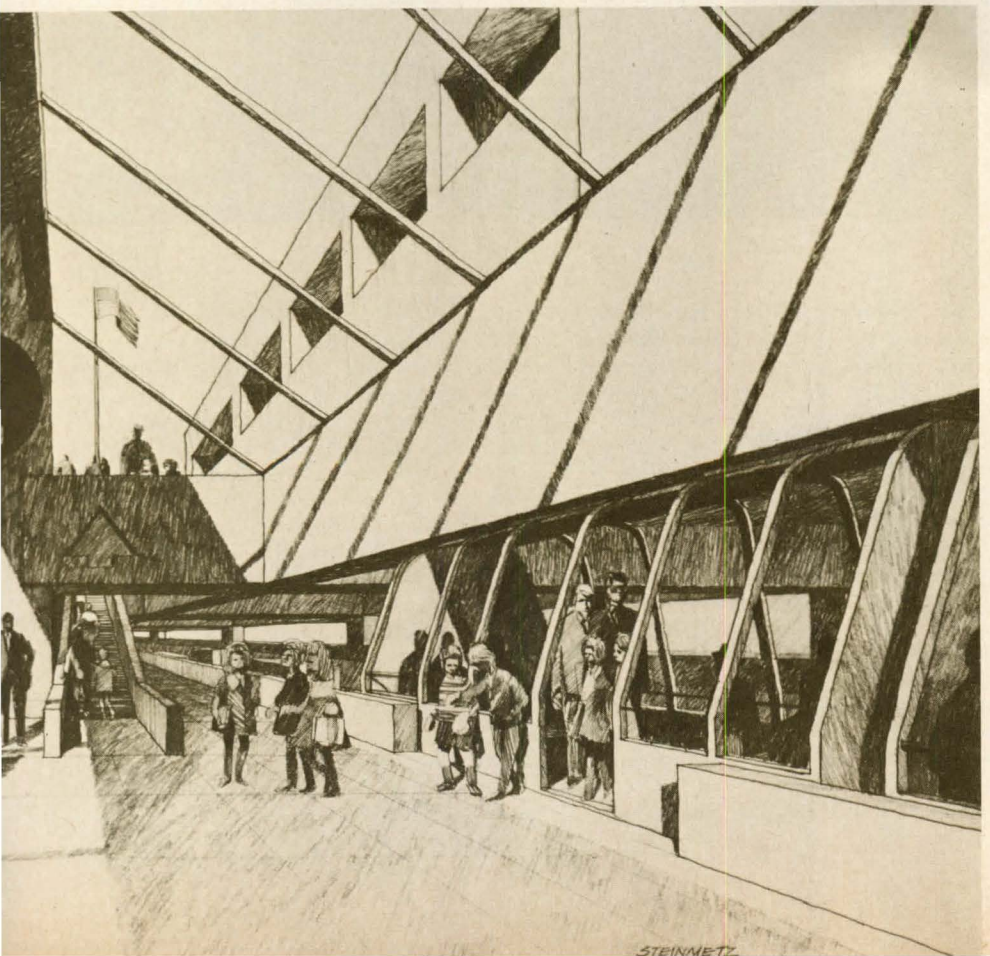
McMillan, Griffis & Mileto model (above, facing page, and pp. 162–163) shows possible configurations of Brooklyn development. Section from Corde Corporation report (below) indicates integration of transportation systems with linear city. Rendering at right shows transit stop.





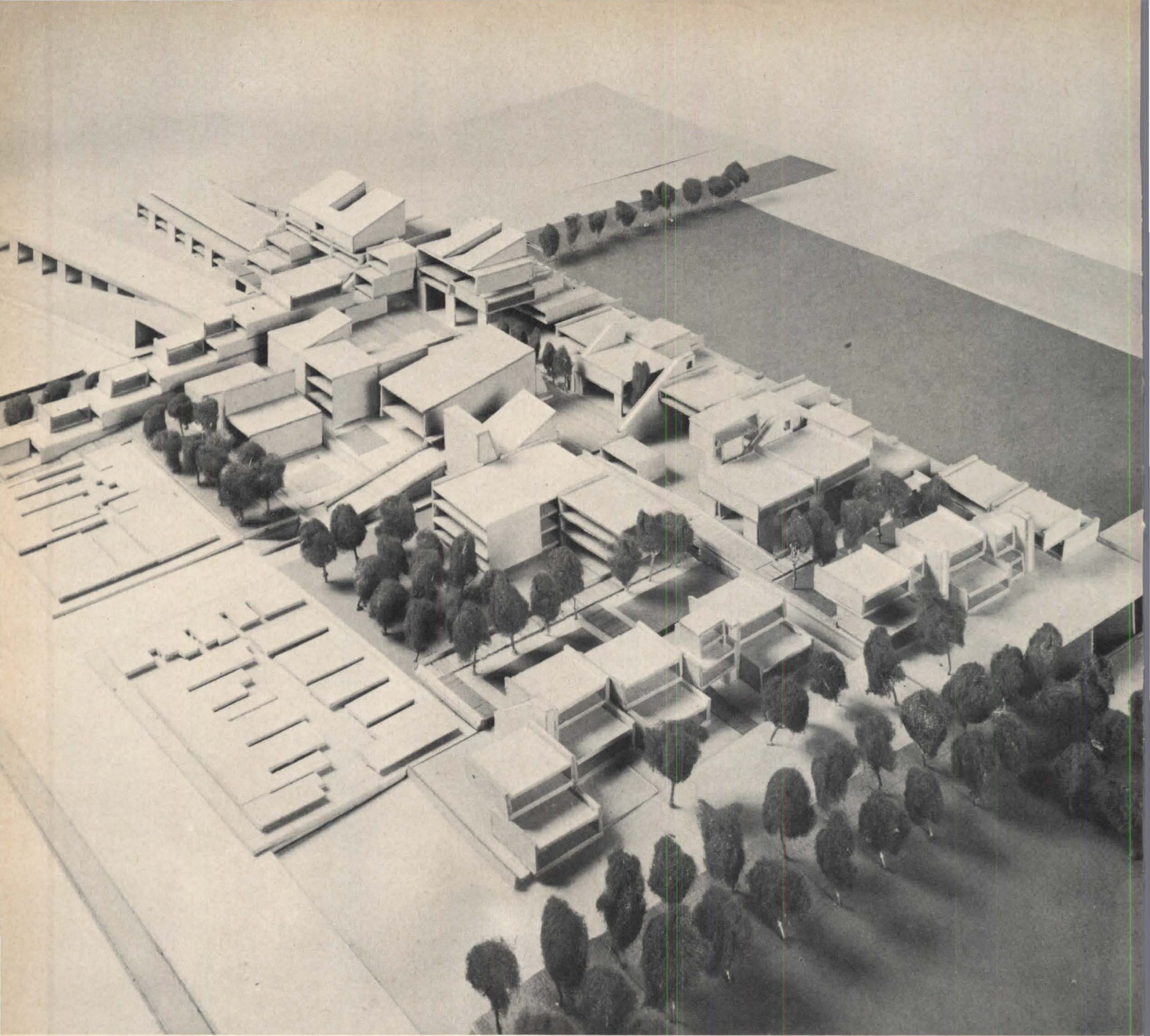


Brooklyn model photos: Ann Douglass



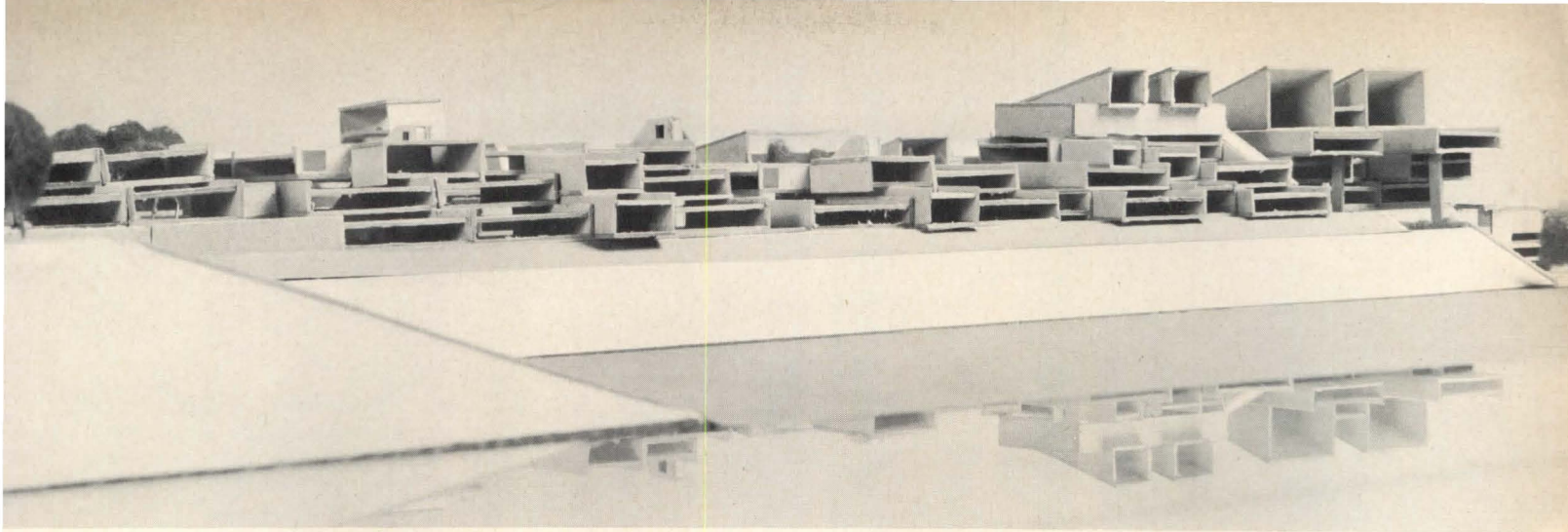
that will arrest sociological and economic decline in the area. This plan found a welcome from Mayor John Lindsay and the City Planning Commission, which asked New York architects McMillan, Griffis & Mileto for conceptual drawings of the "linear city" for study and public announcement. The Baltimore architectural and planning firm of Rogers, Taliaferro, Kostritsky & Lamb next was retained to prepare a *modus operandi* report to get the plan going. This was presented to the city's decision-making team (city planning, schools, traffic, and so on) in October, and accepted. The Rogers firm subsequently was appointed "prime contractor" to the city's client group for the project, to oversee the work of numerous architects, engineers, planners, and consultants from many disciplines (sociology, real estate, landscape architecture, education, transportation, economics, lighting, acoustics, space programming, management systems and operations research, political science and government operations, psychology, physiology, demography, financial-local).

An order has been issued to the Board of Education to create 15 new schools within the framework of the plan, which has since been extended another mile north to terminate in a commercial center being designed by I. M. Pei & Associates for the private-public development of the Bedford-Stuyvesant section backed by Senator Robert F. Kennedy. (Unfortunately, that center is being designed separately from the thoroughly integrated systems approach of Rogers for the larger plan, although Rogers approves of the idea of ending in a commercial center.) The schools are to be completed by 1972, meaning that practically everything else must be done as well, including transportation, transit, and all housing and community facilities that are to be contained in the development. An estimate of $88-million has been made for all design services in all disciplines, employing about 300 people between now and 1975. Urban design gets $10 million of this for itself (compared to $4,800,000 for Baltimore's plan). Currently, the entire project is being programmed, and the organizational system set up (this will include a third group from the community to give the client and planning groups feedback on whether their proposals will have grassroots acceptance). As you read this, an office should be opening in Brooklyn, and an apprenticeship program employing local youth starting, thereby bringing the whole thing back to education.

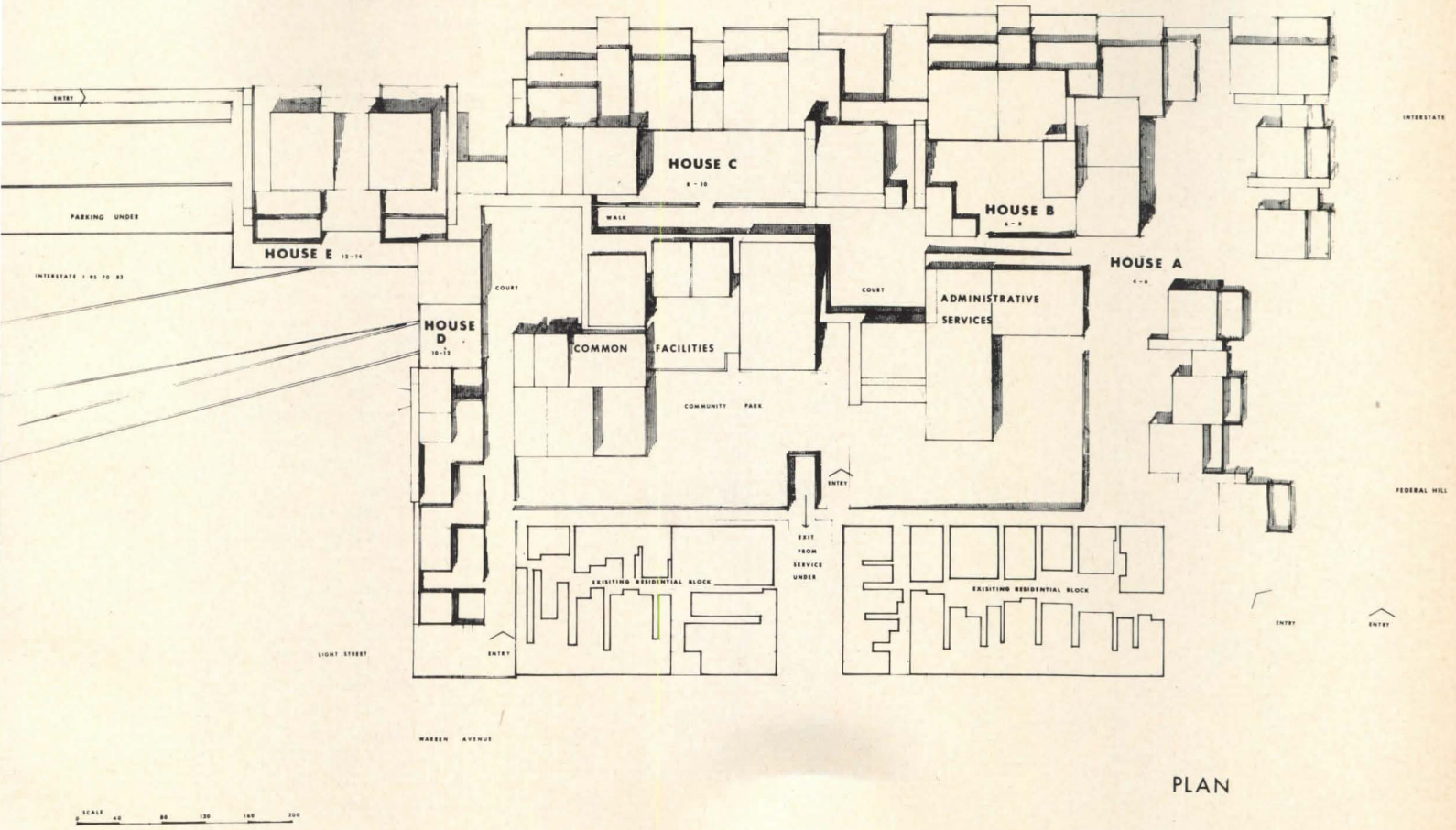


BALTIMORE
CONCRETE PROPOSALS

A brand snatched from the burning might best describe Baltimore's dramatic rescue from urban blight at the hands of the highway engineers, and the turning of these highways into a program that very likely will become a paragon of imaginative use of roads (and road funds) to produce creative urban plans rather than the obverse. Thanks for this new breath of air go to new men in both state and city governments, and to a report by the same Archibald Rogers who is now doing good works in Brooklyn (the Baltimore report got him the Brooklyn job). The report — "Recommended Organization for Design of Urban Freeway System in Baltimore City," prepared in July 1966 for the Advisory Committee for the Interstate of Baltimore City to the State Roads Commission of Maryland — proposed the creation of an *urban design concept team* to perform three major phases of the work on Baltimore's roads system: "development of a planning framework along [the selected highway] corridors as the basis for the design of the Urban Freeway System; schematic design of the freeway system related to the above planning framework; and preliminary design of all elements of the freeway system." To do this work, a team similar to the one subsequently adopted for the Brooklyn plan was proposed. This team would actually design everything related to the highway system in an urban design and planning sense and turn over to the contracting engineers and roads people documents so prepared as to admit little change during construction. The Urban Design Concept Associates proposal was accepted and the prime contract was given to Skidmore, Owings & Merrill (Nathaniel Owings, John Weese, and Norman Klein) to oversee (other UDCA members: J.E. Greiner Co; Parsons, Brinckerhoff, Quade & Douglas; Wilbur Smith & Assocs.). One regret Rogers and Weese have is that they came on the scene too late to structure the client with representatives from all concerned agencies, the way the New York client group is set up. The architects and planners are now deep in the study of the neighborhoods to be affected



Corde Corporation's Inner Harbor school concept.



PLAN

by the highway alignments, and whether all the alignments are valid in all respects. The system will probably be to study from the periphery of the 18.5-mile road system, where problems of dislocation and relocation are less severe, into the more complicated problems of center city. Weese sees the problem as twofold: physical, to preserve, enhance, and restore affected areas; and human, to keep dislocation at a minimum and perform imaginative relocation when necessary, plus designing and planning so that the highway can serve as a spark rather than a blight to the environments and lives of the neighborhoods it passes through.

School proposals that have come out of Baltimore so far would strongly flavor the city's new plans. One is a recommendation by education consultant Cyril Sargent for an education park overlooking the Inner Harbor adjoining Federal Hill, covering the highway network slated for the water's edge there. Another is a system of schools and community buildings to bridge the highway as it passes through Franklin-Mulberry corridor, a minority neighborhood, connecting the bifurcated area and branching out into it to give it even more cohesiveness than before.

Sargent and the Corde Corporation were asked by Baltimore to propose how a pre-K-9 system with a 6000-pupil capacity could best be interwoven with the city-highway plan scheme in the Federal Hill area. The answer was a terraced school park on a platform over the interstate roadworks. To bring the plan down into children-size increments, Sargent proposes five "houses" within the park, organized in the following manner, and featuring non-grading:

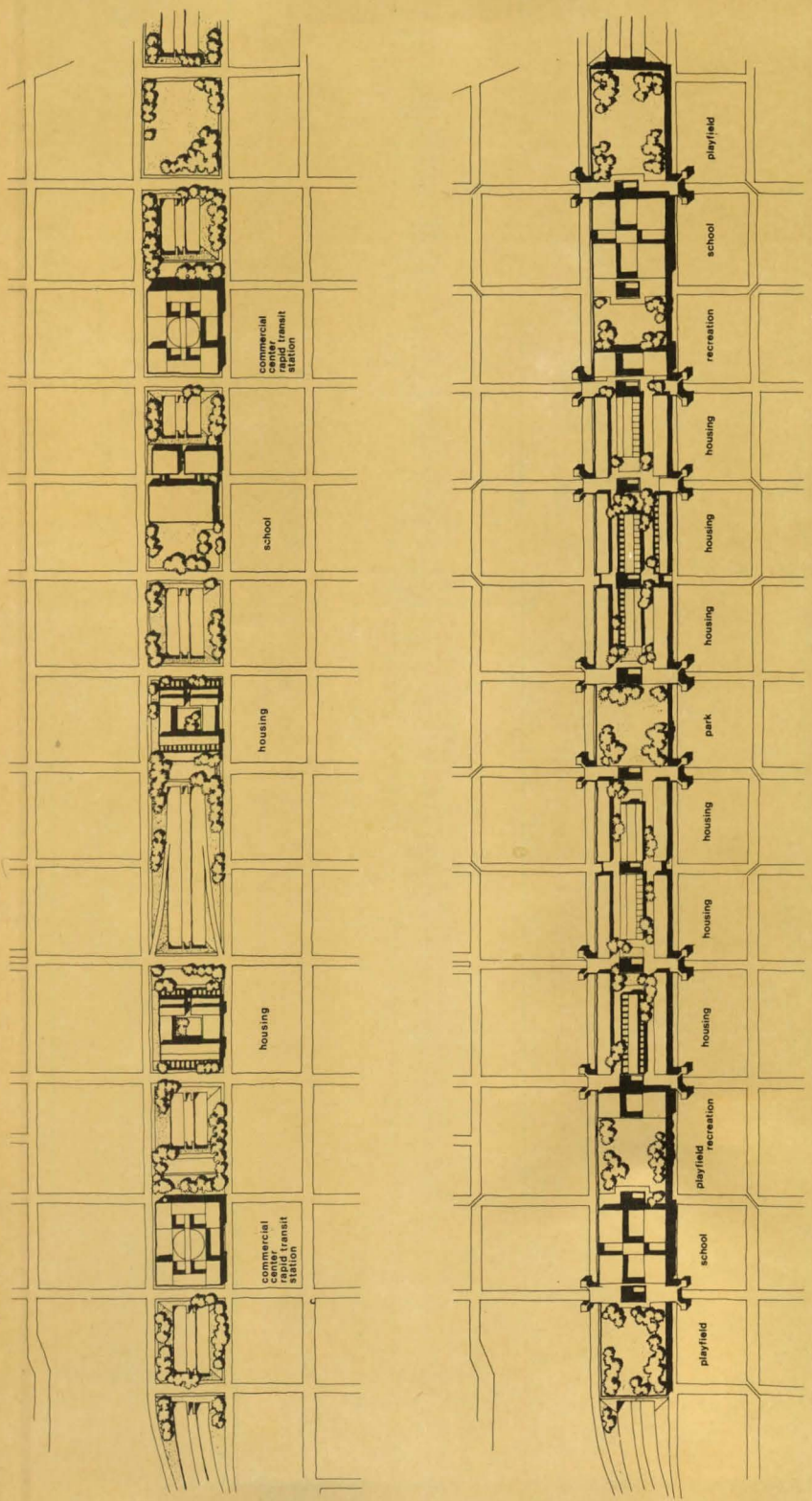
House	Age Level	Enrollment
A	4 5 6	800
B	6 7 8	1300
C	8 9 10	1300
D	10 11 12	1300
E	12 13 14	1300
		6000

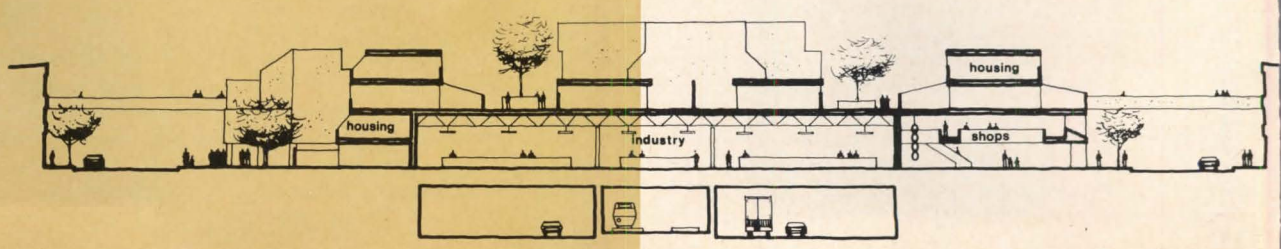
Most authorities agree than an education park for as many as 6000 pupils should have a site of 20–25 acres. Developing such a site in downtown Baltimore would ordinarily be an economic impossibility, even if such space were readily available,

but Sargent estimates that more than 20 acres could be assembled for the school on Federal Hill through the following means: private sources, 1.9 acres; space from the Inner Harbor redevelopment project, 4.0 acres; air rights over the highway system, 5.5 acres; and terraces, decking, play areas and other space created on the structural platform, 10.0 acres.

Needless to say, this school will make a decided impact not only on the SOM-lead plan for the interstate highway system, but also for the neighboring Inner Harbor Project (which was given the go-ahead as a Model Cities proposal in January). The use of part of Federal Hill, one of Baltimore's most cherished historic sites, for a terraced school park rather than a highway ravine makes the site at once eminently useable by students and the community and also introduces it as a visual symbol viewed from the redeveloping central city area across Inner Harbor. Moreover, it will not be an isolated educational complex in its own neighborhood, being intended to contain numerous community facilities such as an 800-seat music center, a 500-seat theater, a 250-seat audio-visual center, generous dining facilities, a library, swimming pool, a community park, and other recreation areas. The preliminary configuration of the site is intended to encourage community as well as student participation. There are entrances into the complex radiating to all sectors of the area except the harbor; the common facilities for the schools (re-useable after hours for adults) are situated at the community park; and there is parking space for 500 cars beneath the interstate road.

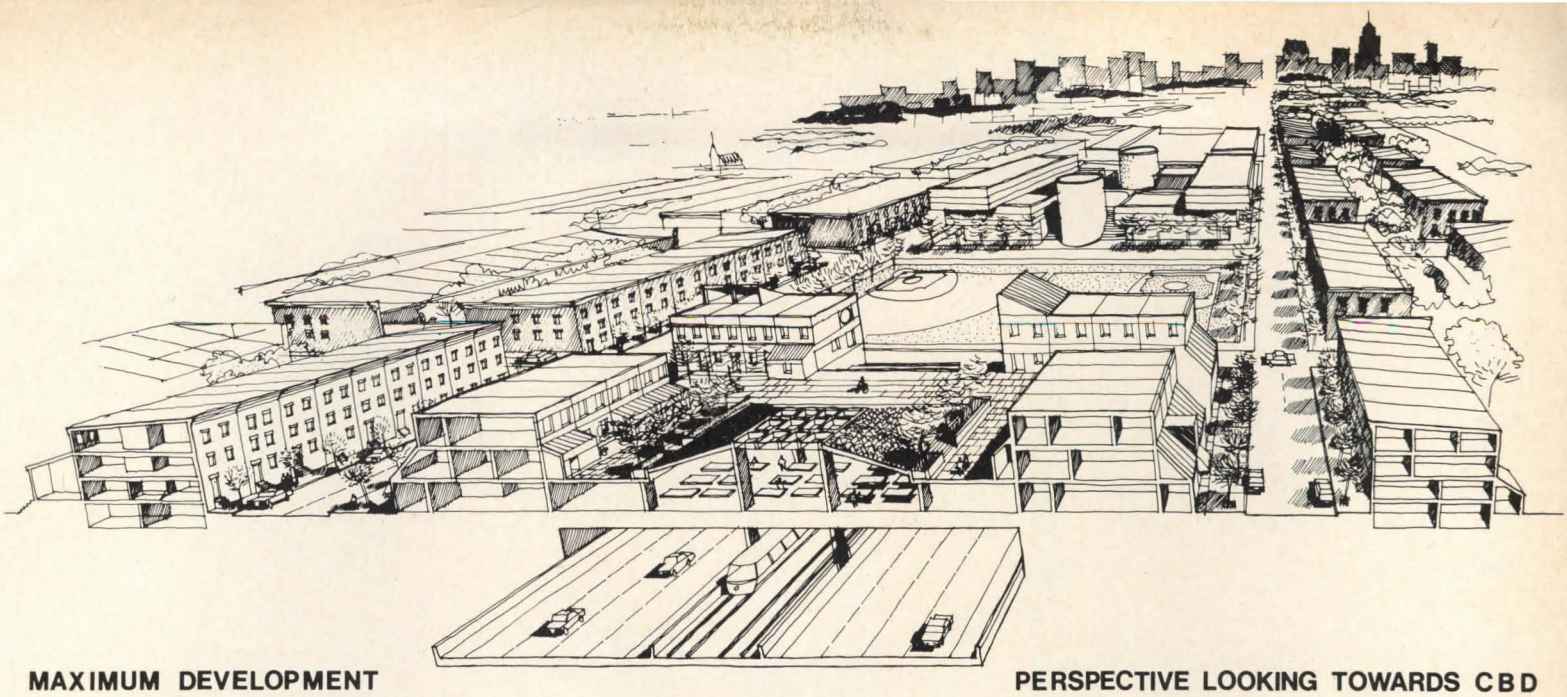
An early estimate of the cost of the project compared with equal facilities in separate schools on a number of sites indicates the sum of $19,380,000 for the Inner Harbor school park as opposed to $18,650,000 for more regulation-type dispersed schools. This estimate is simply for site acquisition, platform and made land, parking, equipment, and construction. It does not include the "intangibles" of extra commumity involvement, the role of the Inner Harbor school as a working symbol of Baltimore's rejuvenation, the fortuitous use of some highway funds for siting and construction, or the various advantages of education park developments over scattered site school buildings (pp. 177–178). Most cities would be willing to put up the extra $730,000 for such added benefits, and it is likely that Baltimore will.





MAXIMUM DEVELOPMENT SECTION 0 10 20 30 FT FRANKLIN MULBERRY

SOM's development studies for Franklin-Mulberry corridor show minimum (left, above) and maximum (right, above, and section, right) use of air rights over expressway Baltimore map (facing page) shows location of Inner Harbor school and Franklin-Mulberry site on city's highway system.



MAXIMUM DEVELOPMENT

PERSPECTIVE LOOKING TOWARDS CBD

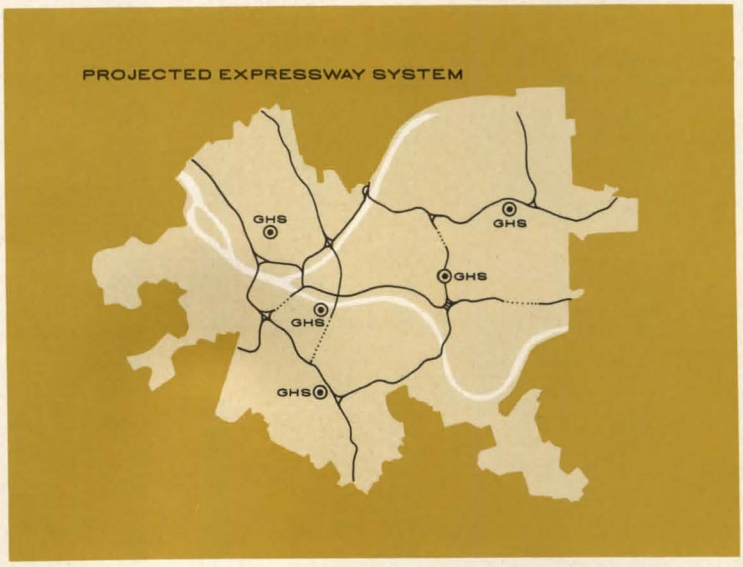
Donald Tompkins of Skidmore, Owings & Merrill's Washington office, in discussing the plans for what is, in effect, the making of linear redevelopments out of the interstate highway corridors in the city, cites conceptual study sketches for the Franklin-Mulberry corridor as examples of what might be done to turn these road alignments into municipal blessings. Franklin-Mulberry is, as noted, generally a "disadvantaged" neighborhood, the kind usually most likely to be split by highway construction. In Baltimore, however, an effort will be made — is in the initial phases of being made by the Urban Design Concept Team — to use the road system in conjunction with other developments to attach rather than divide the community. Judicious relocation occurs first, perhaps some distance from the actual highway line (thereby giving still another area of the city a renewal jolt), and the traffic alignments themselves will be treated as sites for "connective" municipal development. High on the list of uses for this linear development are schools. Two alternate schemes are being studied at present for a 4000-ft-long stretch of highway in the Franklin-Mulberry section (similar plans are being prepared for the Rosemont area just to the west). One proposal is for schools and community facilities bridging the expressway, but punctuated by openings for ventilation and for a relief from tunnelphobia for drivers. The other proposal bridges the entire length of the section, with additional walkways and neighborhood services located thereon. Both proposals locate a school at either end of the linear plan as generators of involvement both in the new services and in the total community. Thus, schools become the operative element in causing an area of Baltimore that could have been completely divided and sent into urban decline by the usual highway blight to become, instead, more of an organized, cohesive community than ever.

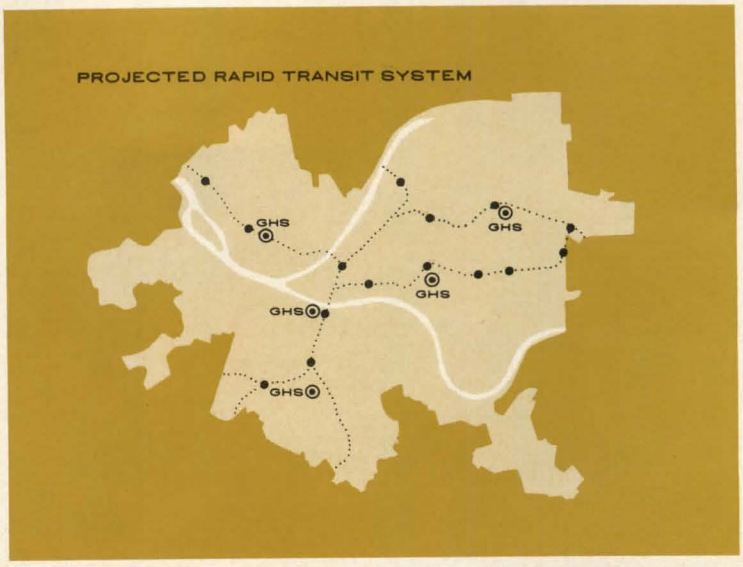
PITTSBURGH
SCHOOLS ARE THE MATRIX

The Pittsburgh school board has not built a new high school in 40 years. This condition, deplorable as it might seem, makes for starting with a clean slate when it comes to planning new facilities, and when Sidney P. Marland, Jr., took over as Superintendent of Schools in 1963, he wasted no time in starting to rectify the situation. Moreover, with the cooperation of the city administration, the Department of City Planning and other city agencies, and the advice of the Harvard Center for Field Studies, the Board of Education contracted with Urban Design Associates of Pittsburgh in 1964 to study the situation and report its recommendations. (UDA is led by architects and planners David Lewis, James N. Porter, and Raymond L. Gindroz; teacher and administrator Bernard Berkin; and Geoffrey Copcutt, architect and planner of Cumbernauld New Town in Scotland.) The result was a proposal for an ambitious series of five "Great High Schools" to replace all 22 existing secondary public schools in the city. Each will include facilities for adult education as well. Each school will be the focus of a radiating school system containing 30–40 preschools, 12–18 elementary schools, and 4–5 middle schools. They will serve as school centers and act as the central core of five sections of the city, each containing 100,000–135,000 people. The Great High Schools will, consequently, not only furnish badly needed new schools, but will also, by their placement and variegation of student body, serve to integrate areas of Pittsburgh that are presently disparate both racially and economically. Superintendent Marland describes the process as "the marriage of physical renewal to human renewal."

According to UDA, its approach was to examine: (1) the way Great High Schools could provide an educational environment for youth; (2) the way each school could relate to its particular community; and (3) the way all five schools would affect the urban structure of Pittsburgh. All concerned city departments and the consultants researched all aspects of the program, from sociological implications to transportation and transit, from curriculum to the city's urban renewal posture. The result was a matrix for future planning that, it can confidently be predicted, is of far greater meaning for future directions in the arts and sciences of architecture and planning than the bunch of newish commercial high-rises down in the Golden Triangle. For here, even more than in Brooklyn or Baltimore, a civic facility that can cause involvement of the entire community — the school — has been used as the generating force for planning development, sociological betterment, economic integration, and to act as cultural, educational, and commercial focus within its own subcommittee. Since the placement of the centers was determined by the connecting highways and future rapid transit lines as well as by the desire for a racial and economic "mix," the result, as UDA sees it, "will be a series of wholly 'new cities within the city,' each designed to embody those social and functional values which we wish to see our cities affirm." Now that three years of initial planning and preliminary study are over, and the Great High School concept has been embraced by Pittsburgh officialdom, site assembly is under way, and actual architecture and planning authority has been put in the charge of Hellmuth, Obata & Kassabaum,

Preliminary site studies for five Great High Schools (left) are broken down into how the schools would be served by Pittsburgh's projected expressway and rapid transit systems (below).





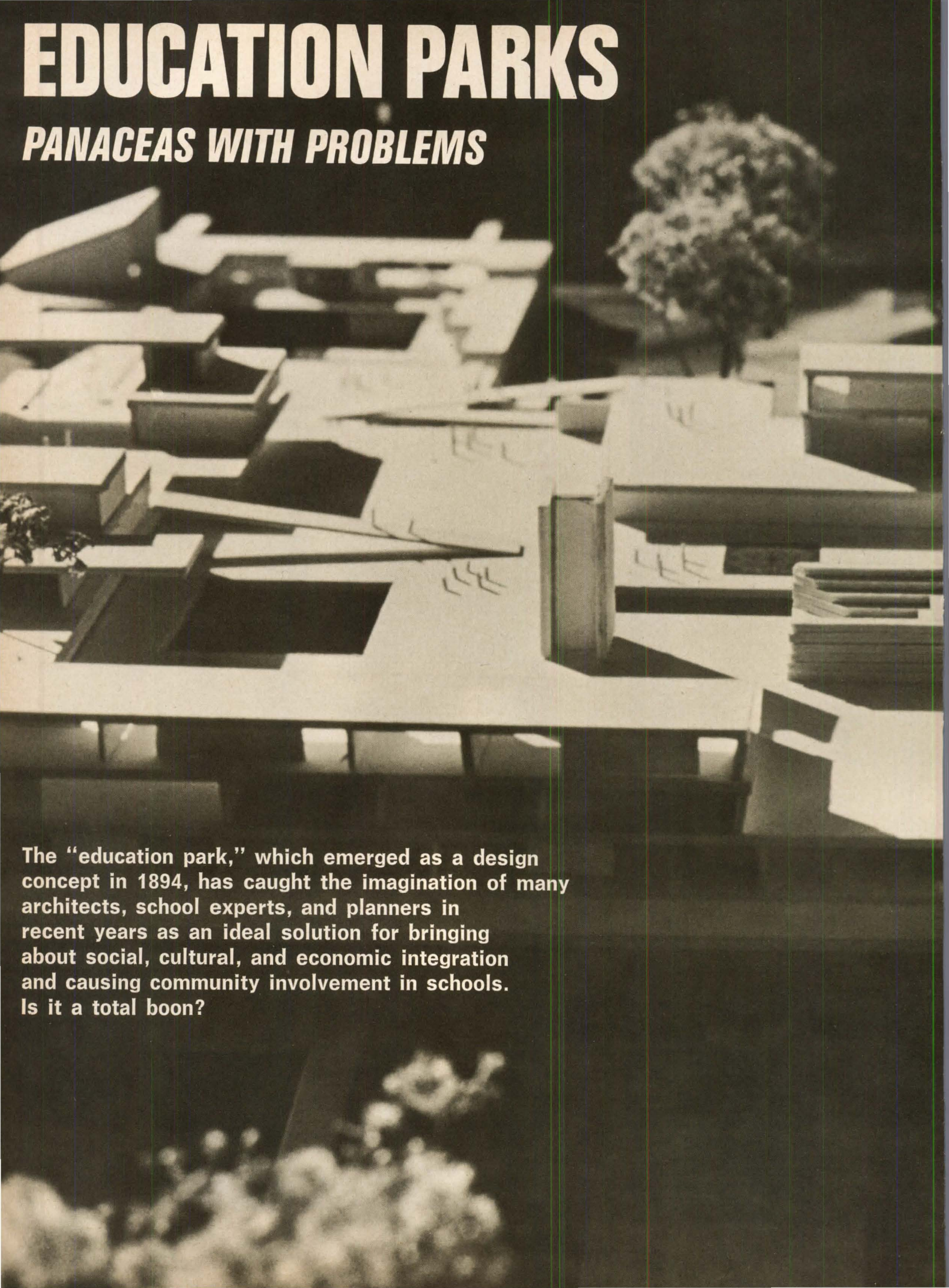
of St. Louis. There may be some site changes and configuration alterations in the plan before it is completed (Marland expects some classes to start in September, 1971), but the over-all concept of the five Great High Schools acting as sub-city-centers connected together and to the main center of Pittsburgh by transit and expressway systems should provide a model of what important roles schools can play in forming our cities.

Gyo Obata says that "The project team, which consists of educators, architects, social scientists, systems analysts, and engineers, takes the assignment and its potential solutions seriously. The team is committed to building a new educational system which can be employed for social needs and which will be the basis of urban reorganization.

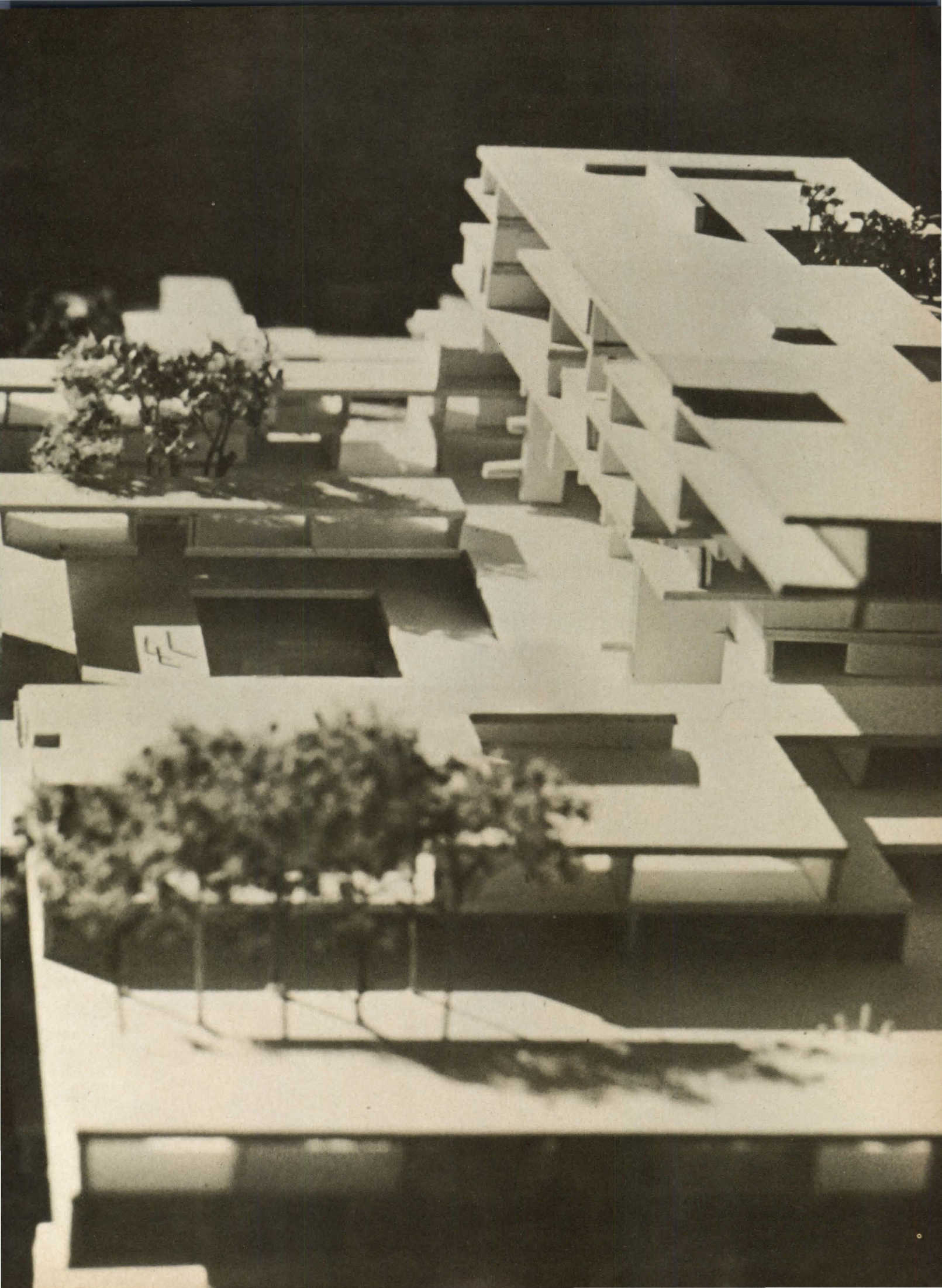
"In doing this work, the project team has crossed traditional professional boundaries. The architect is concerned with social functioning in an educational system; not just with building design. Educators are following their theories into architectural planning. City planners, social scientists, and building engineers are being drawn into the full range of decision making, rather than being left to make plans in a vacuum."

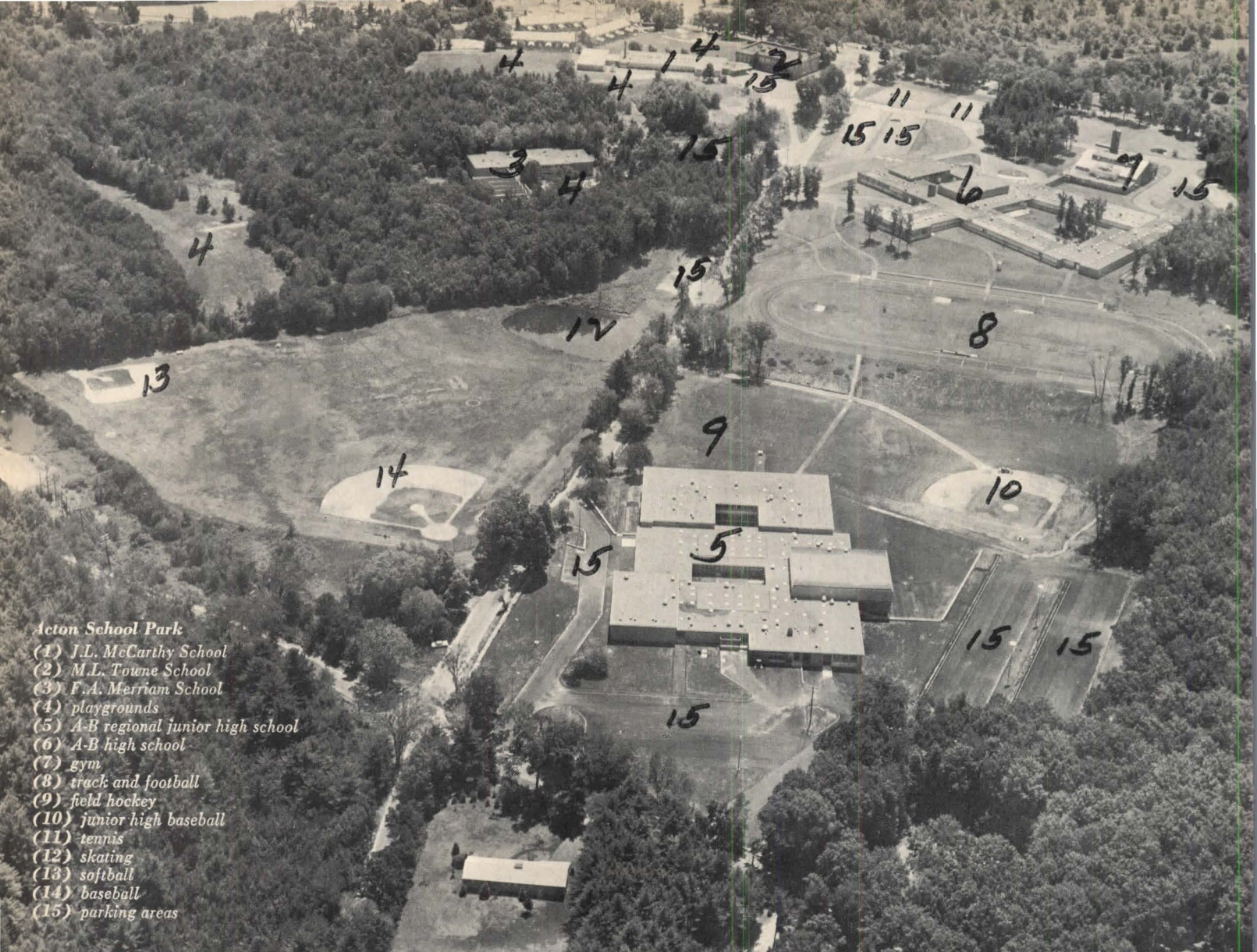
EDUCATION PARKS

PANACEAS WITH PROBLEMS



The "education park," which emerged as a design concept in 1894, has caught the imagination of many architects, school experts, and planners in recent years as an ideal solution for bringing about social, cultural, and economic integration and causing community involvement in schools. Is it a total boon?





Acton School Park

(1) J.L. McCarthy School
(2) M.L. Towne School
(3) F.A. Merriam School
(4) playgrounds
(5) A-B regional junior high school
(6) A-B high school
(7) gym
(8) track and football
(9) field hockey
(10) junior high baseball
(11) tennis
(12) skating
(13) softball
(14) baseball
(15) parking areas

George Washington Carver Junior-Senior High School in New Orleans won P/A's First Design Award for Curtis & Davis in 1957.

"When doing new school parks, you must make new criteria for individual sites and needs in all cases. These will continually be different; parks cannot be done on a prototype basis."

— Dr. Max Wolff,
Senior Research Sociologist,
Center for Urban Education

"The concept of education parks is an appealing one, but how does it hold up under real conditions? We have found that only under real conditions involving specific planning situations can the benefits and limitations of the education park be usefully assessed."

— Dr. Cyril Sargent,
President, The Corde Corporation

One of the main targets of those considering education parks today, particularly in urban areas, is racial and economic integration. That this aim may prove, hopefully, to be a relatively short-term goal does not make it any less important, but it does lead to a consideration of the other roles that education parks might play. Originally, the idea was advanced by Preston Search, Superintendent of Schools for Los Angeles. In a 1901 book, Search wrote of his 1894 proposal for a 200-acre park that would accommodate all of the city's pupils in separate buildings in a parklike setting that would get them away from pollution and urban crowding (*that* was thinking ahead in 1894 Los Angeles!). Facilities would include a zoo, a museum, a ranch, gardens, and playgrounds. The park, Search contended, would be a cultural and meeting center for the whole community as well as a center of education.

Search's proposal was not acted upon, needless to say, although, at this writing, three 13-acre "garden schools" are being proposed for the Hunters Point ghetto area of San Francisco by architect Aaron G. Green and educational consultant Don DeNevi. Both of these concepts are, at any rate, bucolic devices for escaping from urban surroundings, while the education park, as it is generally thought of today, is becoming a very urban creation sired by performance design, behavioral studies, and systems research out of the economic, educational, and social needs of our cities. While some good work is being done in less dense areas — the Anniston project on pp. 182–183, for instance — almost all the significant projects and studies (for there are few parks now completed or under construction) seem to be coming from large cities. Pittsburgh, New York, Baltimore, Chicago, Philadelphia, Toronto, Pontiac, and East Orange (N.J.) are among the urban areas reporting consideration of education parks of one sort or another. This is undoubtedly because both the needs and the problems are most concentrated in center cities. As Cyril Sargent says, the education park "must now be evaluated in an urban context as a means, together with other planning tools, of improving the physical condition and quality of life *in* the city."

What Is an Education Park?

Physically, an education park is a complex of different schools on a common site sharing common facilities such as athletic fields and buildings, library, dining and kitchen areas, auditoriums and halls, art studios, mechanical and electrical services, and the like.

It is obviously a much simpler task to put all these elements together on a huge rural or suburban site than in the city, where real estate is worth its weight in gold bullion. One of the existing education parks, Nova, in Broward County, Fla., was assembled on an abandoned airport in the country. It is not distinguished architecturally or from a planning standpoint. Its main accomplishment is as a visible statement of an educational idea, according to Sargent, and the creation of an educational research center and a mutual TV network that will serve the entire complex, when it is totally finished. The education park of the Acton-Boxborough Regional School District in Acton, Mass., is even less sophisticated, consisting simply of three elementary schools, a regional junior high school, and a regional high school, plus shared sport facilities, on the same site. An earlier complex, the George Washington Carver School Park by Curtis & Davis (proposed by Charles Colbert in 1953), although in New Orleans, is situated in semisuburban Gentilly and thus had no trouble assembling 90 acres. It was, moreover, designed as a school for Negroes in a Negro neighborhood, and remains that, thereby not qualifying for one of today's most important sociological qualifications for the education park.

Therefore, it seems, we have still to see an education park that does all that its advocates claim it will do. We do have studies and reports and plans for several projects that could set education off on a new and interesting course, if implemented, among them Pittsburgh's Great High Schools, Baltimore's Inner Harbor school, the Cross-Brooklyn Expressway proposals, and an education park designed by Berman, Roberts & Scofidio for the forthcoming book, *The Education Park Picture Book*, being produced under the auspices of the Center for Urban Education.

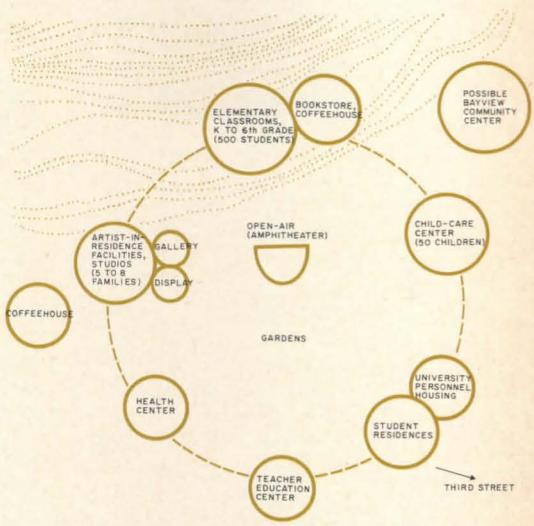
What Are Its Advantages?

A list of advantages and shortcomings of the education park was prepared by Donald J. Leu, Consultant in Educational Planning, Michigan State University and I. Carl Candoli, Consultant in Educational Planning, Ohio State University, for "A Feasibility Study of the Cultural-Educational Park for Chicago" under the College of Education of Michigan State in January, 1968. The items can be paraphrased briefly, and selectively, with additions from other sources.

Integration. It would bring together children of diverse racial, religious, social, and economic backgrounds.

Quality. Concentrated plan would reduce inequities in staff, facilities, and program often found in neighborhood schools.

Commonality. It would encourage more universitality of experience among students, thereby increasing mutual understanding and shared experiences.



SCHEMATIC DIAGRAM OF ELEMENTARY "GARDEN SCHOOL" IN HUNTERS POINT

Student organization. It would make simpler the grouping of students to pursue appropriate goals.

Total environment. It would make possible the creation of a "total educational environment" to seek ideal educational aims.

Specialized factors. Its large size would make possible specialized services and facilities not feasible in smaller units.

Value. It would enable a better controlled "value atmosphere."

Decentralization. Being largely self-contained, it would make administrative decentralization from central Boards of Education workable. Could set up its own plan boards and citizens' groups.

Flexibility. Organization of grades could be extremely flexible, and arrangements of age groups equally so.

Curriculum and assignment. Flexibility and coordination of curriculum would be greater, and pupil assignment to special areas more possible.

Wider horizons. Children would be removed from physical and emotional confines of specific neighborhoods and opened to different attitudes and stimuli.

Specialists. Teachers concentrating in particular disciplines could have more time, and be more available, by remaining in one complex.

Concentration. Richness and variety of knowledge and experience of staffs now at many schools would be brought together. Further, staff members could be

grouped and regrouped for best effect.

Economy. Many services, including food service, mechanical and electrical, and many sorts of technical and electronics devices, would be pooled to serve the entire complex.

Coordinated planning. Scope of the operation would make desirable and necessary cooperation with city planning, transit, parks, cultural, and other city authorities, plus community groups, unions, commercial organizations, and others.

City improvement spark. It could act as the large-scale generator of meaningful city planning, or even become the core around which urban plans are made.

Shared knowledge. Education could become a noncloistered thing, with a dialogue going on between school and community.

Interpenetration. Commercial and community facilities could exist in the school park, making physical and mental confrontation possible. Students could work and learn part-time in nonschool facilities.

Adult involvement. Through continuing education, cultural and recreational facilities, and particularly adult involvement with children's education, the park would work for all ages at all times of the day.

Services. More services will be available to the community as well as the students — for instance, health care and social welfare departments — which otherwise would be fragmented in other sites.

What Are Its Shortcomings?

Dr. Frederick C. McLaughlin, Director of the Public Education Association, takes exception to the idea that education parks are ideal for urban areas. He says, "Land is too hard to get, too expensive; the bigger the park, the more busing and crowded streets and crowded transit facilities. They must be located on transit lines where land is more expensive. I feel they have very limited value in cities. It's different in rural areas or smaller cities." Dr. McLaughlin also feels that one of the advantages school park proponents claim for them would not come about — namely, community involvement. "People would not go so far to it, particularly those who would most need it, the people who would have to take public transport."

Even friends of education parks do not find them universally desirable. Dr. Sargent, in a study Corde did on the possibility of a 20-park system for Philadelphia, advised against it. As for better quality education in parks, Sargent wrote that "it is hard for us to see how a park could provide significantly more educational advantages than already exist within many areas of Philadelphia. In some areas, however, the education park would be very useful." Integration and transportation were incompatible for the Philadelphia proposal: "Whether one uses a neighborhood school or a park to integrate these students, he is faced with large-scale transportation, and the park does not overcome the problem of awkward gerrymandering of attendance areas to achieve racial balance."

And from the Leu-Candoli report on Chicago:

Neighborhood. Parks take schools out of neighborhoods, along with teachers and their direct contact with neighborhood concerns.

Alienation. Fears of alienation of children from their neighborhoods and homes.

Transportation. Increase in problems to children, problems of cost, crowded streets and transit lines.

Accessibility. Loss of accessibility to concerned parents and usual home-school contact.

Bureaucracy. The large-scale organization would run all the usual risks of establishing bureaucratic habits.

Scale. It would create another vast "thing" for people to deal with who already are unnerved by inhuman scale of the city. Internal individuality and change in parks must be paramount.

Costs. The expense would be great. Should always be compared with what could be developed in other ways in each situation.

Obsolescence. Unlike a number of schools built at various times, the education park would move toward obsolescence all at the same rate.

What Is the Verdict?

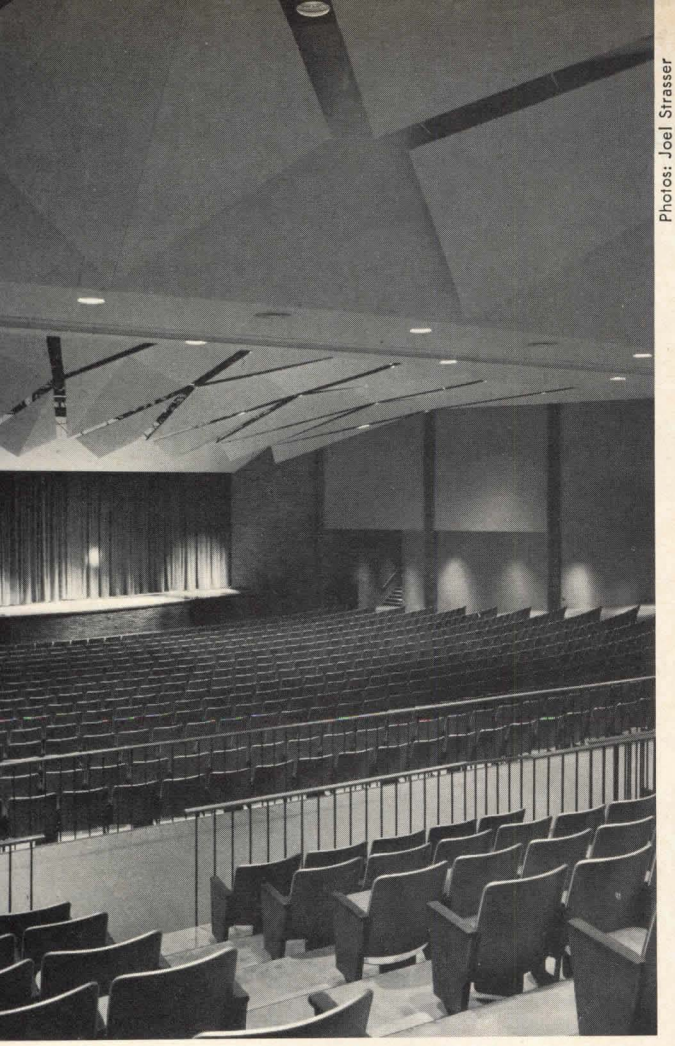
It depends on the situation, as Wolff and Sargent indicated at the beginning of this article. There are cities where transit problems would be so intolerable that education parks would be wasteful and deleterious to children; others where the transportation systems would aid the park concept and even benefit from it (Pittsburgh). There are places — one suspects mainly rural or suburban — where the cost and scale of an educational park would not be compatible with the life of the community. In others, the cost, though high, might be justifiable in terms of the results and benefits derived by students and adults. (And Wolff points out that erection of education parks in cities frees older schools in more prime locations for sale by the city, thereby donating to the municipal kitty.)

For the future, what happens when the black-white, poor-middle income, urban-suburban rift has been healed? Will the enormous education parks be in the right locations? One suspects they will be only if all the other imponderables (transit, appropriateness to area, community involvement, diversity of services) are taken into consideration at inception and only, and more importantly, if the Board of Education works not independently but as a partner with the City Planning Commission, the related municipal authorities, and planners, designers, and consultants from all fields.

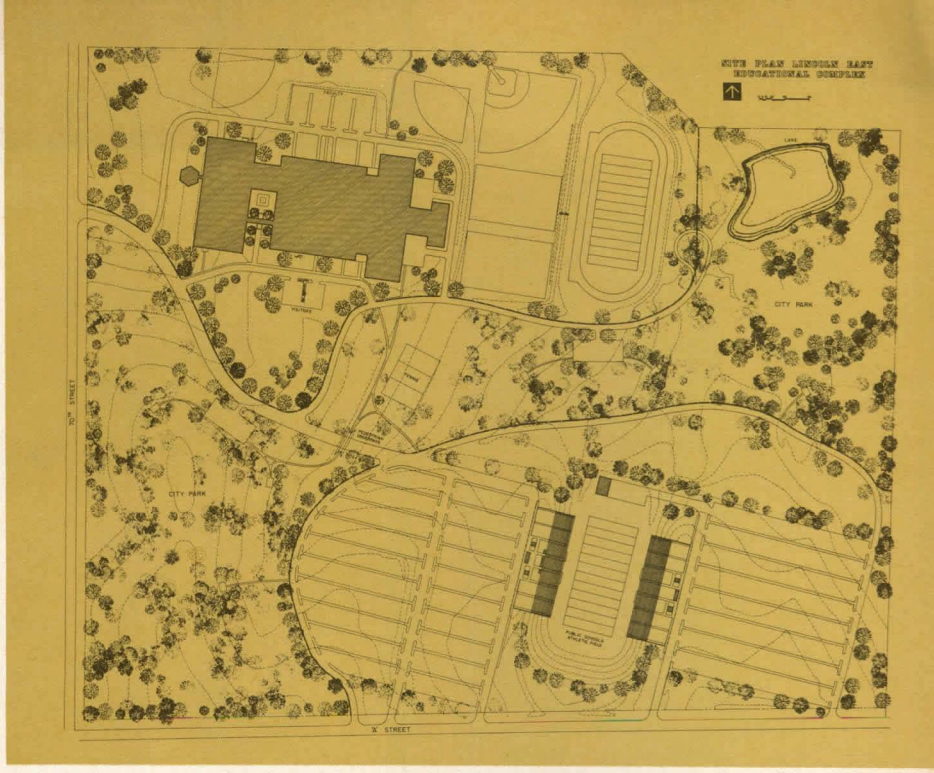
Lincoln East Educational Complex, Lincoln, Neb., by Davis & Wilson, was designed not only as a secondary school expandable to an ultimate student capacity of 2400, but also as an accommodation for the community's adult high school and adult vocational and continuing education programs. The adult center is located next to, but separated from, the high school's administrative offices, and contains eight classrooms and a center for independent study so that a portion of the adult program can be conducted during the day. After 4 P.M., the entire school (41 stations) is used by the adult center until 10 P.M. Last semester, the adult program had 1503 registrants with a median age of 22 years. The program is now being expanded for year-round operation. This "round the clock" and "all year" use required complete interior climate control for the building, as well as 100-ft-candles of artifical illumination, windowless teaching stations, dual storage facilities for all teaching stations, and central headquartering of secondary school teachers, rather than individual classroom assignments. A divisible auditorium accommodates 1200 for school and community purposes. The school is also used by the University of Nebraska's Teachers College as part of its teacher training, all teaching spaces being designed to take four to six teacher-observers.

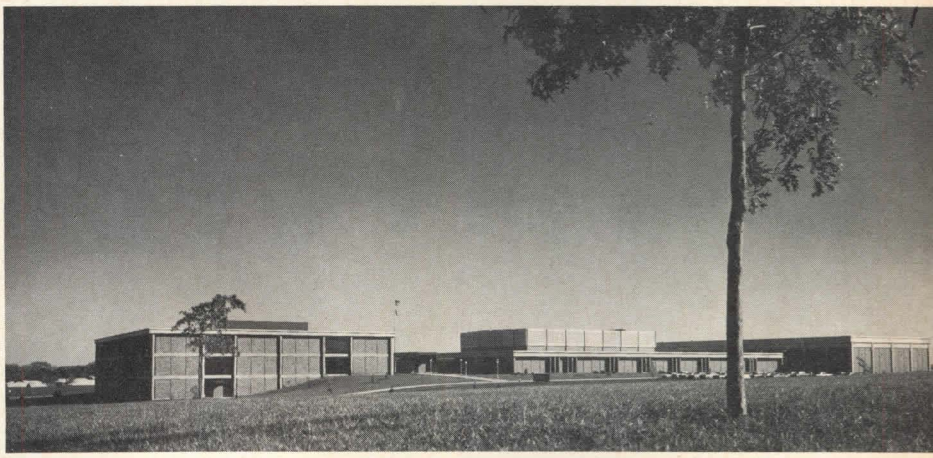
The 160-acre site of Lincoln East contains central athletic fields and a stadium for use by the entire community, as well as a new city park donated by the city. Extensive parking spaces for school staff and attendants and for public events has been provided.

LINCOLN EAST

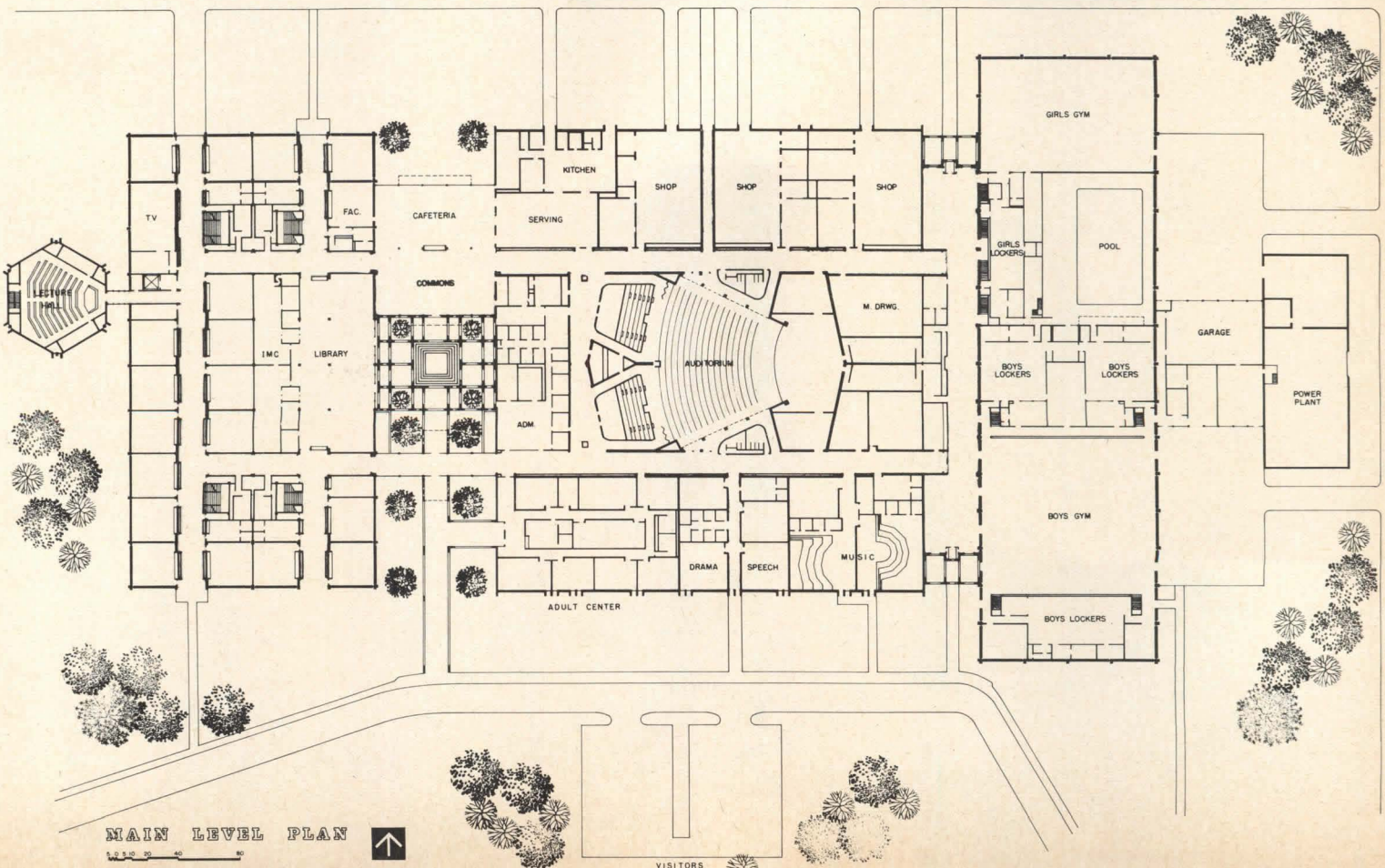


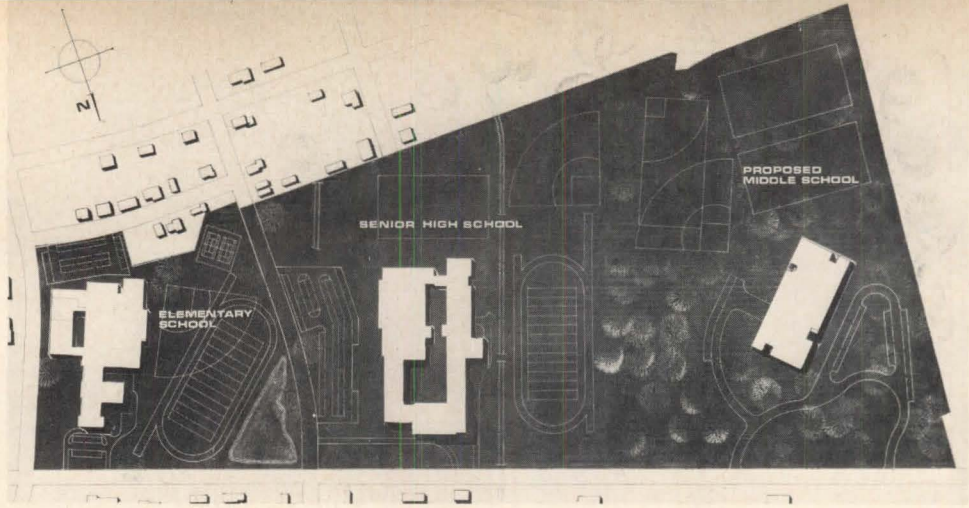
Photos: Joel Strasser





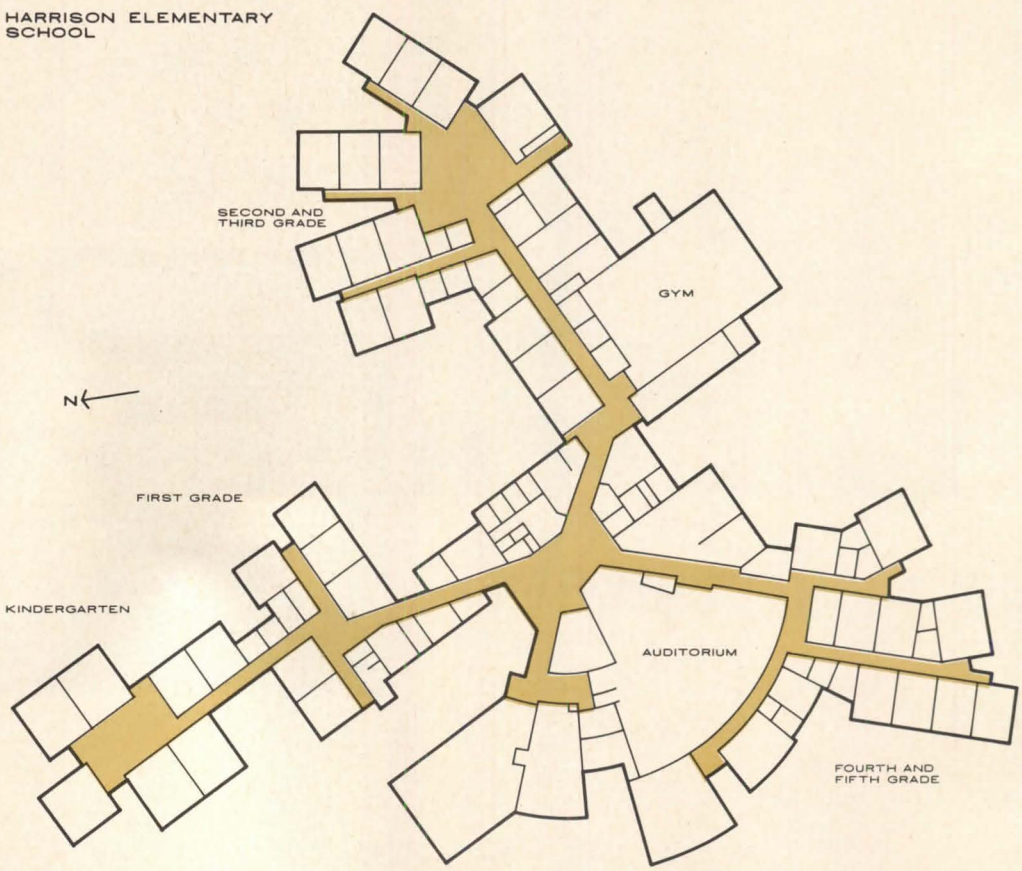
EDUCATIONAL COMPLEX



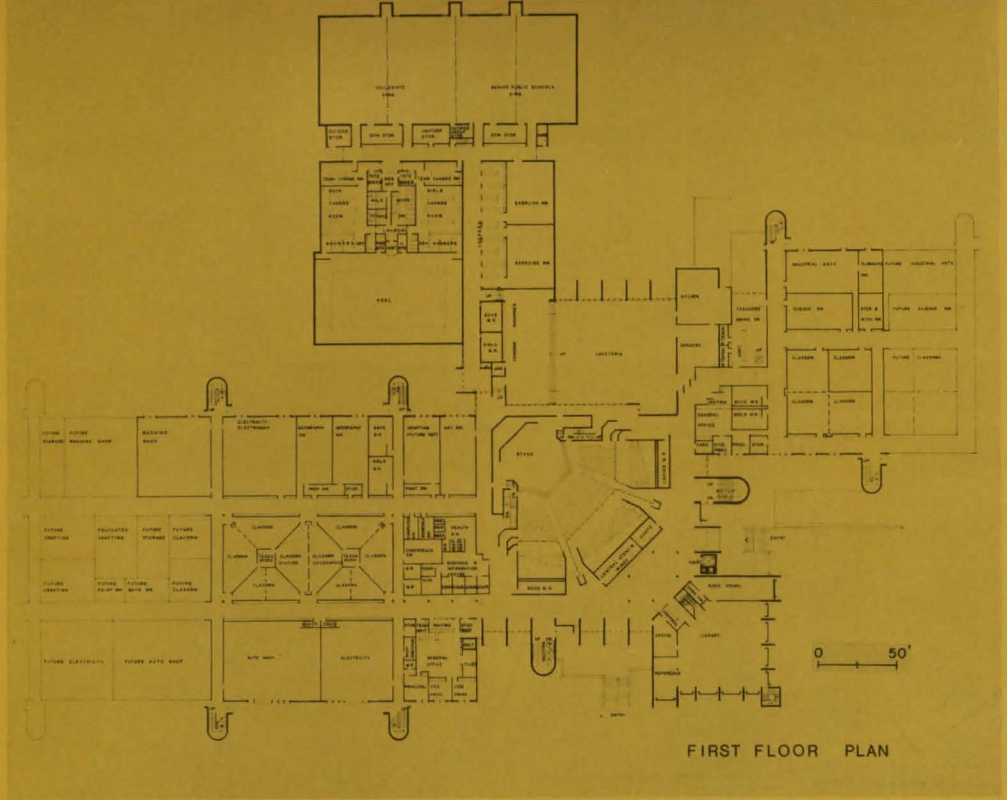


Harrison Educational Park, Harrison, N.Y., by Frederick P. Wiedersum & Associates, would move all the school district's 2450 students onto one 54-acre site in a three-stage program of elementary school (K–4), middle school (5–8), and high school (9–12). Despite the concentration of all school facilities on one site, the greatest distance a student would have to travel to school will be 2.5 miles (transportation to school is provided for children traveling over a mile). Although the generous site and some existing facilities to be enlarged and updated presented no peculiar organizational or planning problems in creating an education park (these, as noted, are most likely to occur in more urban areas), the plan would allow centralized studio facilities for audio-visual education for the entire school, to include, according to School Superintendent Louis M. Klien, "not only live TV programs sent out, but also sound movies broadcast, and the use of taped materials and of computerized instruction."

The park would feature community use of facilities, both for recreation and for adult education. In this manner, there would be a longer "life" for the buildings each day, and greater involvement of the citizenry. Another effect of the park would be to integrate a community that is composed of rather distinct ethnic groups (although the Negro school population is thus far negligible). The three-school system also would make the appropriate assignment and conditioning of peer groups possible, where before younger children had to share facilities with 17- and 18-year-old youngsters. Klien notes that the project would give the opportunity of operating three instead of four schools for the same student body, as well as the obvious benefits coming from shared services and facilities. "The Educational Park will give us a School System tied in with the entire community," he says. The plan is in doubt for passage as this issue goes to press, but the designers are hopeful of eventual resolution.

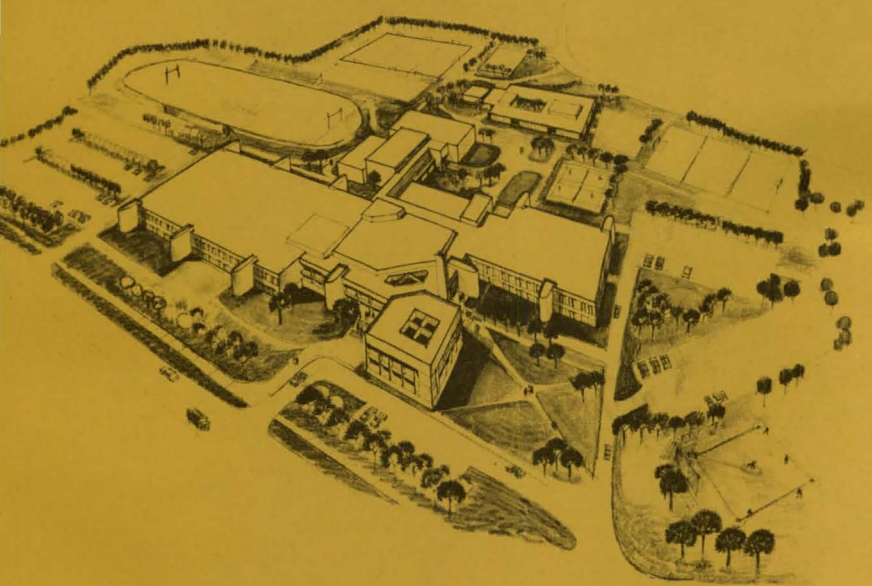


HARRISON EDUCATIONAL PARK

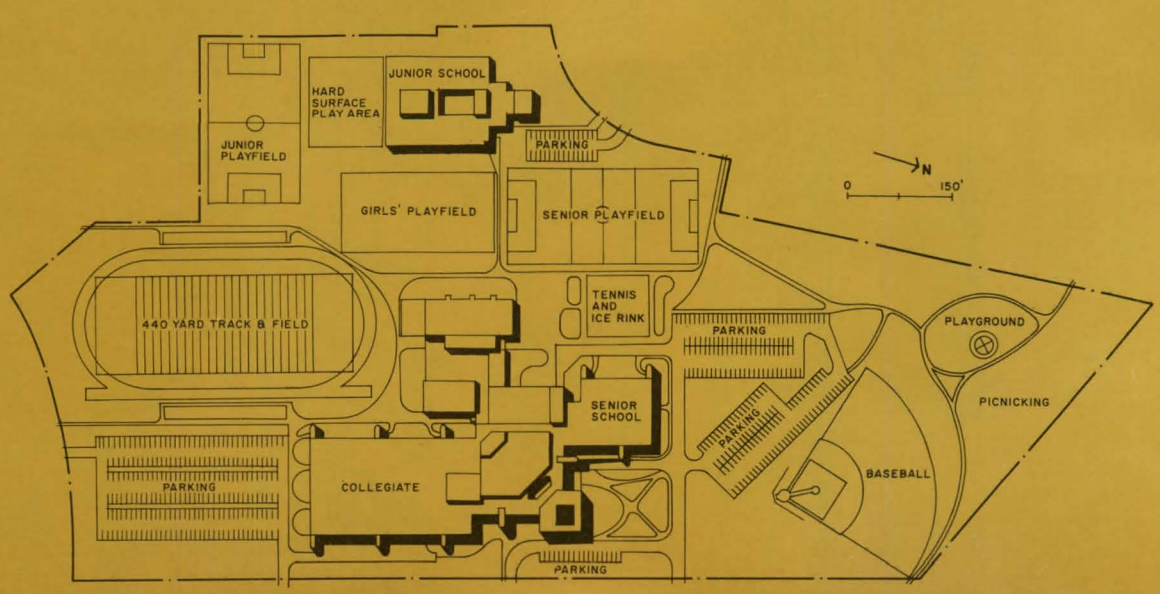


FIRST FLOOR PLAN

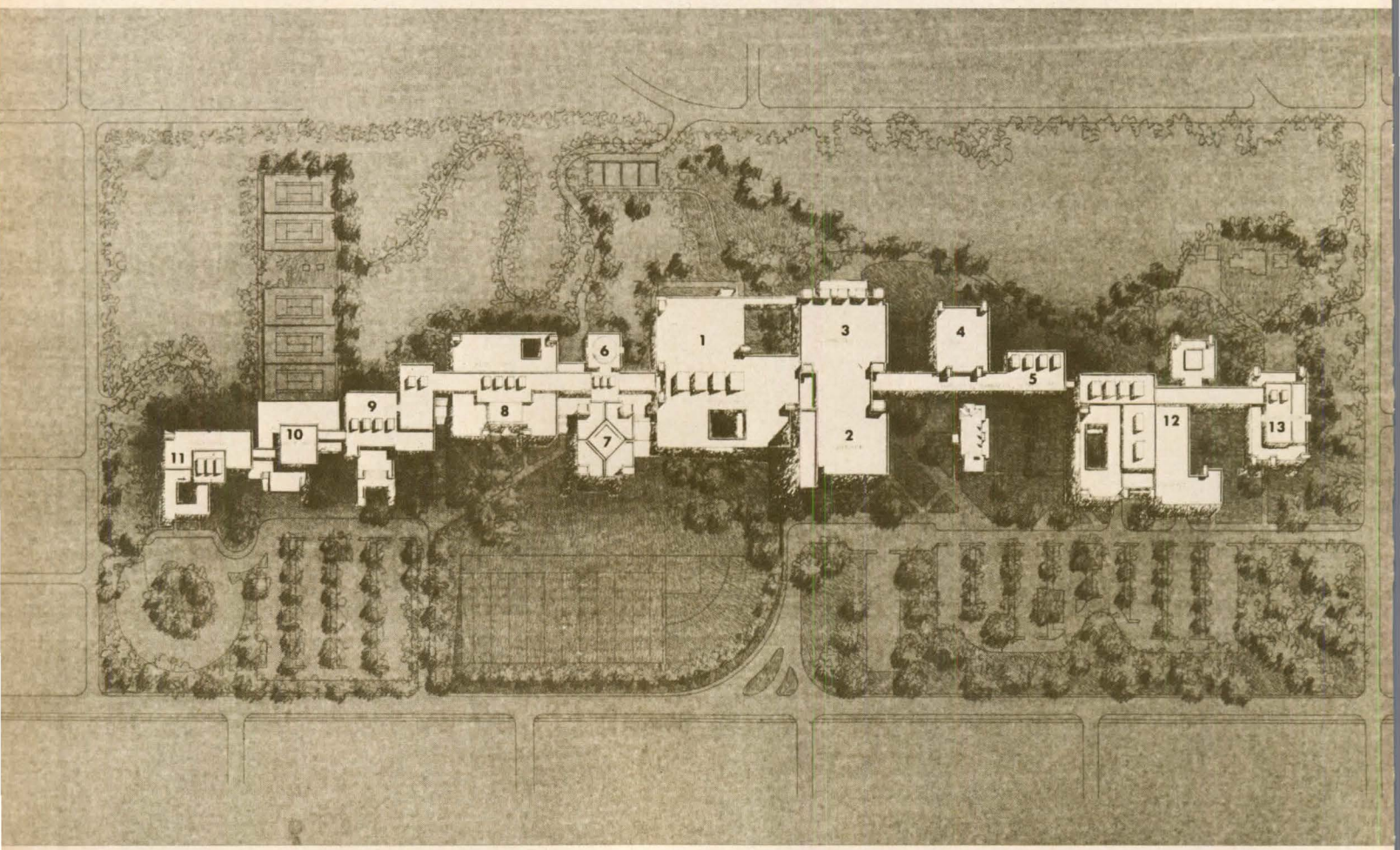
STEPHEN LEACOCK EDUCATIONAL COMPLEX



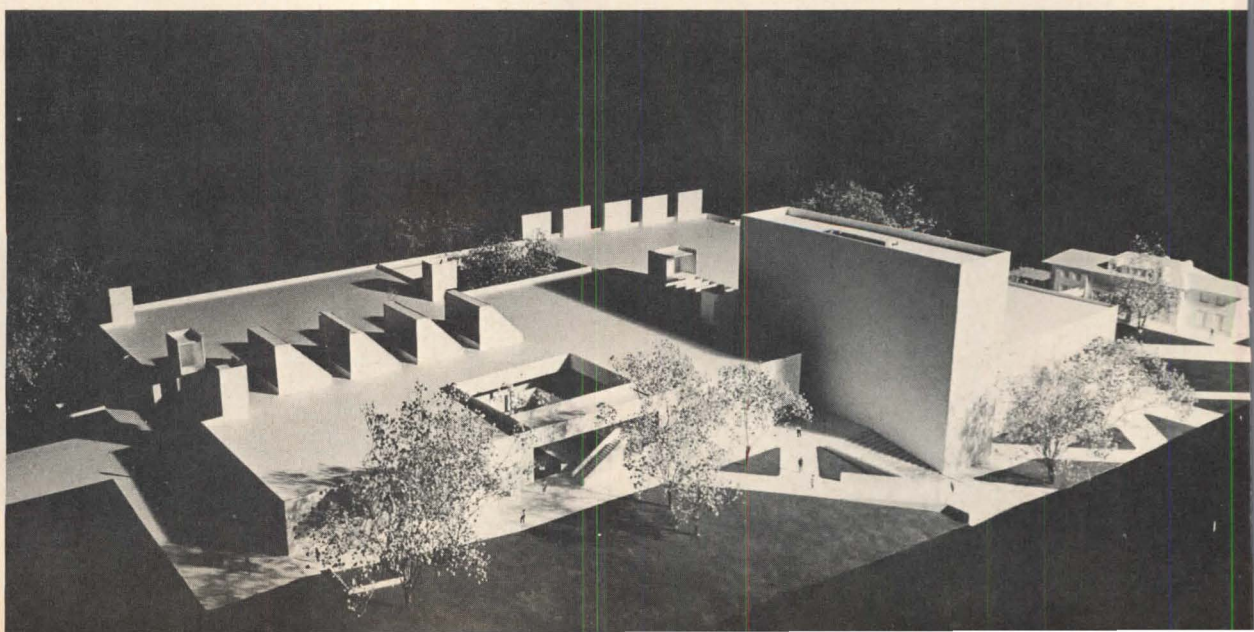
Stephen Leacock Educational Complex, Scarborough, Ontario, Canada, by Abram & Ingleson, will provide facilities for a current 2235 and a projected 3315 students in grades K–13 on a 25-acre campus. The program is divided into three stages: junior school (K–6); senior school (7–8); and secondary school or collegiate institute (9–13). Complex will include: central library and resource center; special science clusters; auditorium-lecture hall; group athletic facilities; classroom for large and small group study; TV production center; shops; cafeteria; common facilities for health, guidance, food services, teachers' spaces, mechanical, electrical, and janitorial services; controlled-climate environment; parking; and playing fields. The senior and collegiate schools will share such common areas as the auditorium-lecture hall; cafeteria; athletic facilities; guidance and health centers; audio-visual and educational TV services; teachers' stations; and common services. The separate junior school will share mechanical, electrical, and service facilities, and outdoor spaces. The typical classroom design will allow for: short- and long-term convertibility into smaller seminar spaces, standard classrooms, and larger group spaces; ever-changing techniques in audio-visual learning and educational TV; teachers' work areas; and an integrated structural, mechanical, and electrical system flexible enough to provide for these changing needs. (The major mechanical plant will be situated at the center of the complex, for easy distribution to the three schools. It will be a heat pump installation.) The auditorium will be designed for flexibility and divisibility, so that it may be used for small, separate classes as well as assemblies and productions open to the community seating up to 1100.

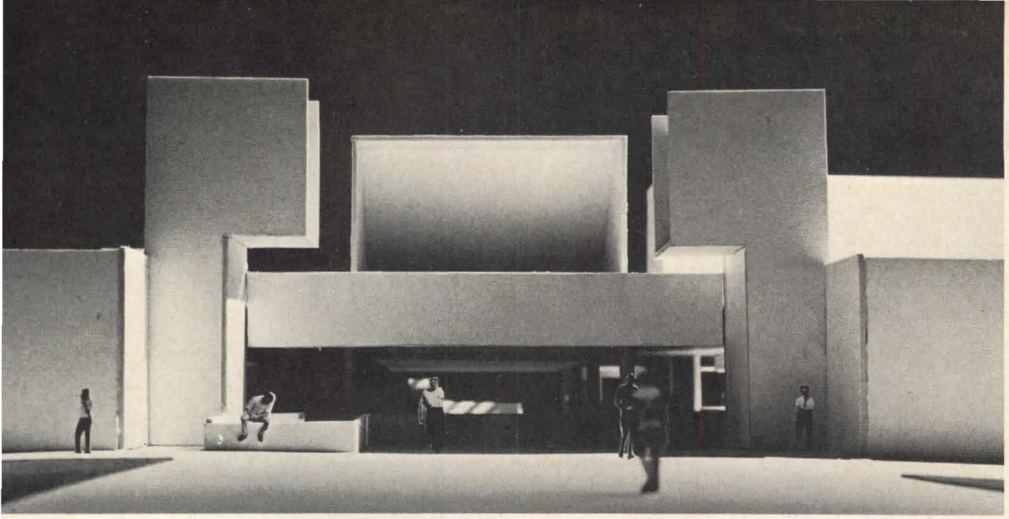


ANNISTON EDUCATIONAL PARK



(1) upper school
(2) auditorium
(3) gymnasium
(4) pool
(5) industrial, commercial, service arts
(6) planetarium
(7) lecture
(8) middle school
(9) lower school
(10) play shed
(11) early school
(12) varsity
(13) system central



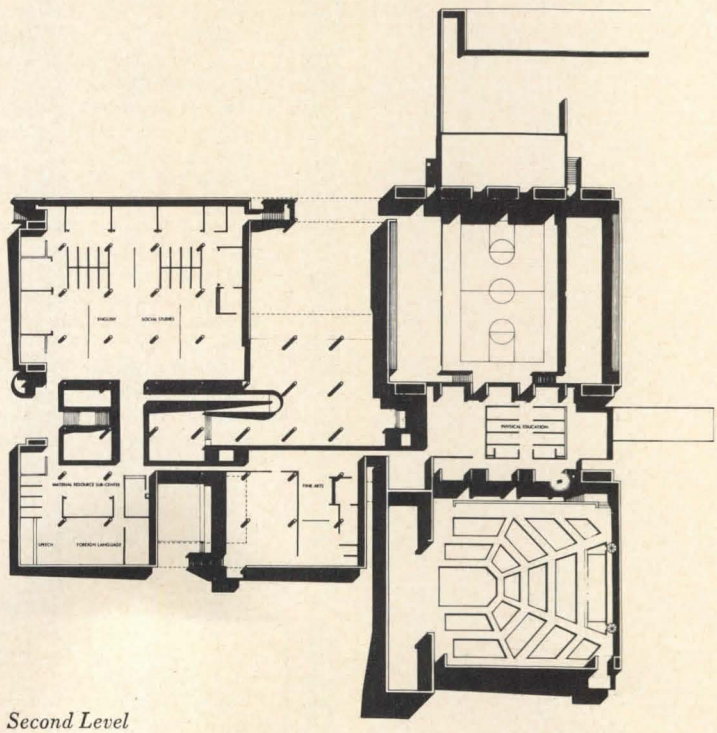


Entrance ramp between gym and auditorium.

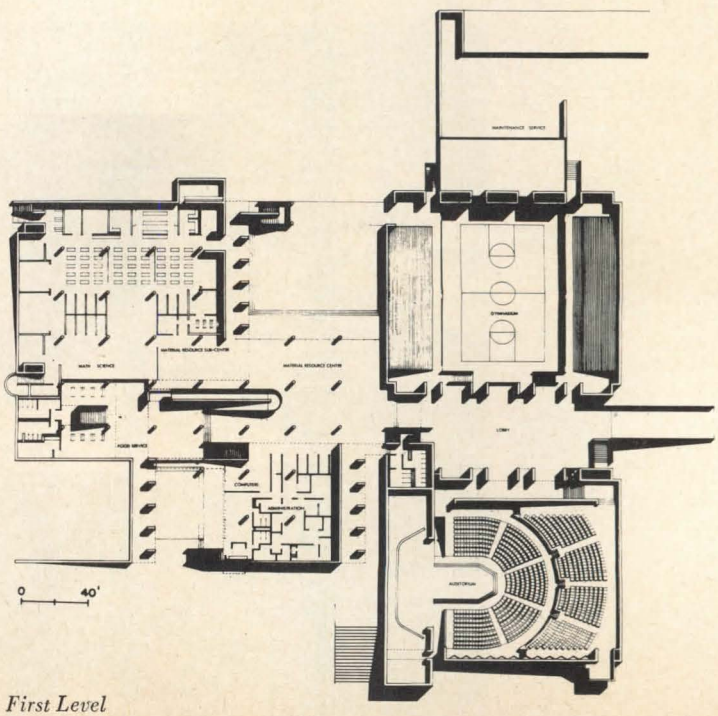
Anniston Educational Park, Anniston, Ala., by Caudill, Rowlett & Scott of Houston with Poole, Pardue, Morrison & Dean of Anniston as associates, will take 4500 students from age three through two years of college along an "academic street" on a 55-acre site presently occupied by several old estates. The linear plan, which will be built in five phases beginning with the upper school, auditorium, and gymnasium, will contain lower school and its play shed; middle school; a planetarium and large lecture structure; upper school auditorium and gymnasium; swimming pool; industrial, commercial, and service arts; "varsity," or two-year college; and "system central," or control center for the entire complex. An old mansion will be retained as a conference and teacher preparation center.

The basic premises underlying the Anniston project are: student involvement in the discovery of knowledge and interrelationship with fellow students and the academic "community." The individual is the keystone of the architectural and educational process, with emphasis on the student's progress at his own rate and within his own interests and capabilities. The "home base" of the student becomes the Materials Resource Center rather than the old classroom. The student can experience cross-currents of interdisciplinary learning but also grow with his peer group (emotional maturity so often occurring at a less rapid rate than intellectual maturity). The number of mutual meeting grounds along the academic street — play shed, planetarium, great lecture hall, auditorium, gymnasium, and so on — makes interaction of age and interest groups a rich "mix." Learning is treated as an ongoing thing; even lunch periods are part of the process, quick-frozen food being dispensed from carts and reconstituted at ovens along the street during the noon hour. The park will function on a year-round basis, each week having five school days of 13 hours a day (permitting evening work by students and adults).

According to the architects, "A street implies people mixing, differing situations, and varied experiences. Why an educational facility and a street? In fact, the facility is the street. The street will eventually be one-half mile in length. Not one long, undifferentiated street, but rather one which as it moves along from early school to two-year college, always presenting a different face; always providing the student with a better understanding of the whole; always creating an enriched environment which affords the individual the greatest opportunity for development. The street is open in plan to best meet the spirit of the educational program." The architects say that Anniston plans to link an eventual six parks within the city and, far in the future, link the city park system with education parks throughout the whole southeast U.S.



Second Level



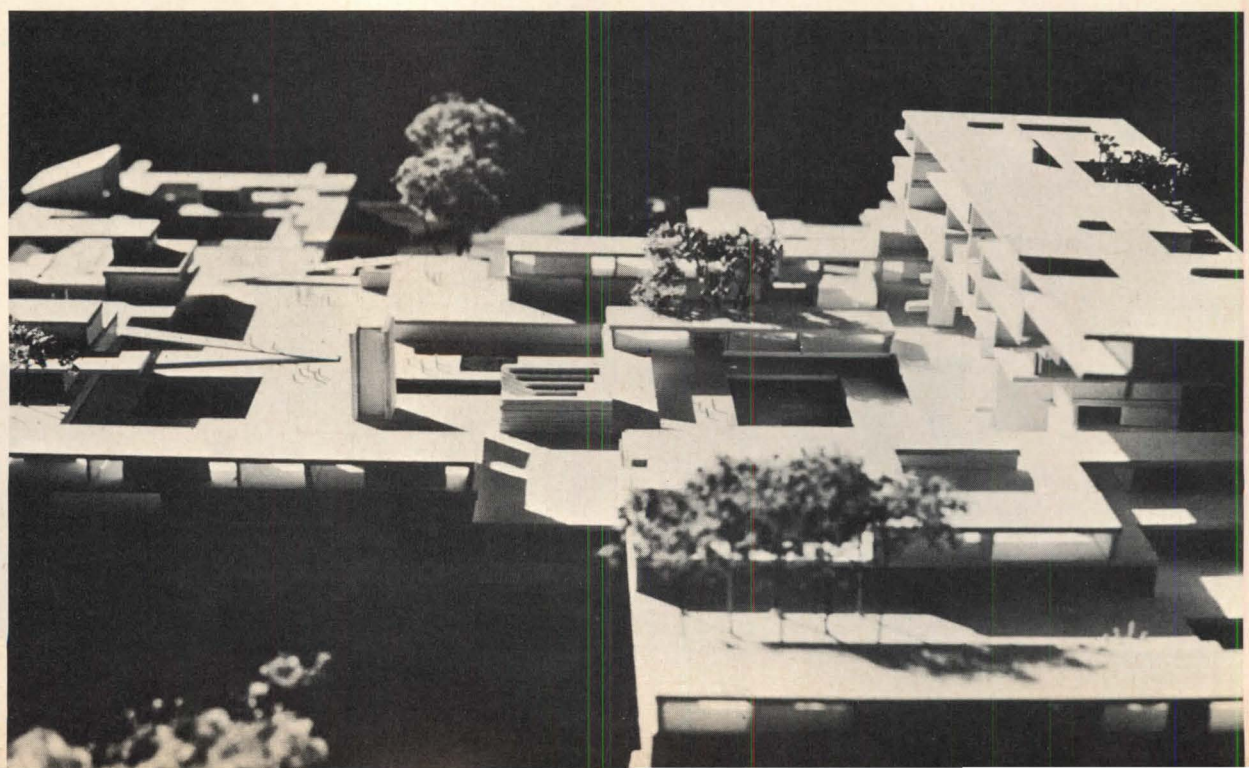
First Level

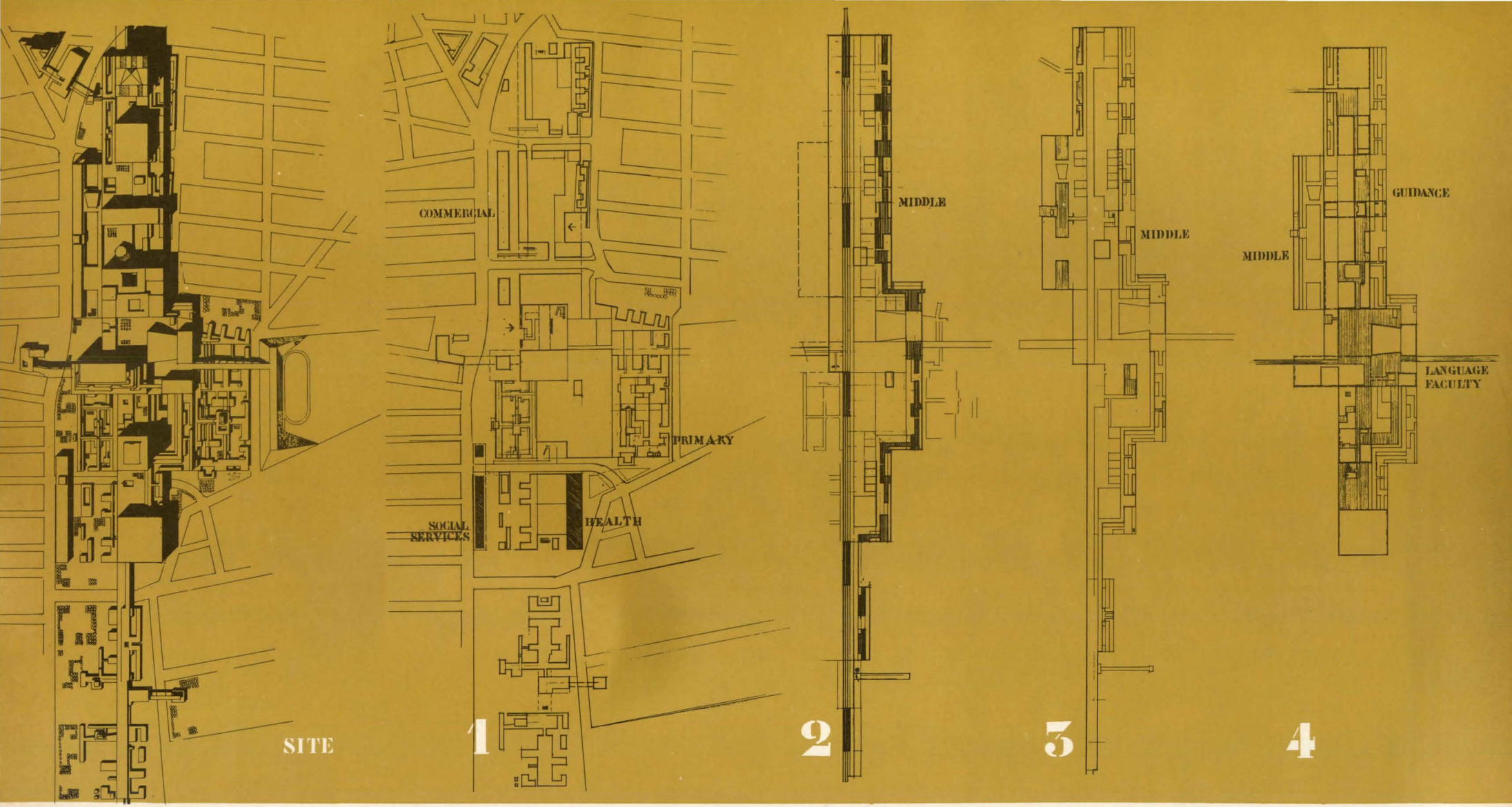
A VISIONARY PARK

For the forthcoming book, The Education Park Picture Book, *The Center for Urban Education assembled an interdisciplinary team to study all aspects of the education park concept. Educators, sociologists, planners, traffic and transportation experts and others all are feeding their expertise into the center for development of an hypothetical education park designed for the book by Berman, Roberts & Scofidio of New York. Hypothetical only in the sense of not actually being commissioned, it should be stated, since the team used for the study in progress a real site with real statistics and real interviews in the field dealing with real conditions.*

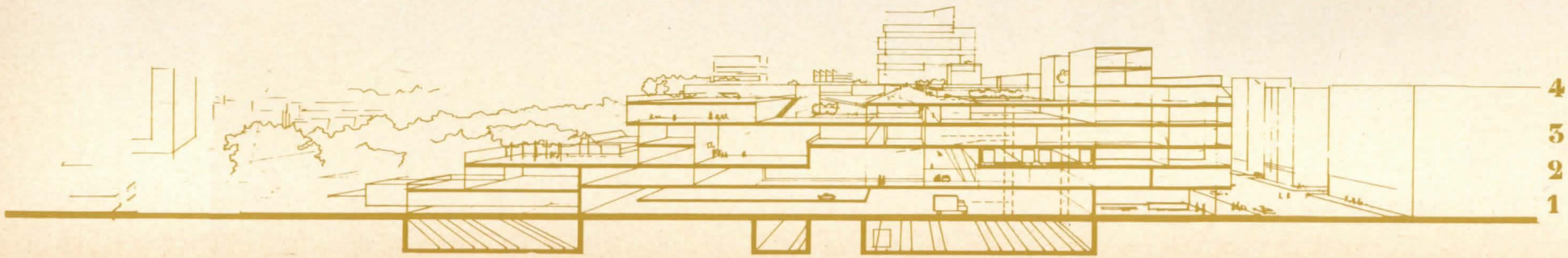
The site is eight miles from the center of a great city, six miles long by two miles wide, bisected by a rail line running its length east-west, with a cutoff in mid-area leading to the south boundary. Population of the study area is approximately 200,000. The railroad divides a plateau of generally good, middle-class white homes to the north from less desirable Negro habitations to the south. Commercial center is near the terminal station of a rapid transit line in the northwest portion serving middle and low incomes; there are also several strip commercial center located throughout the area both north and south of the tracks.

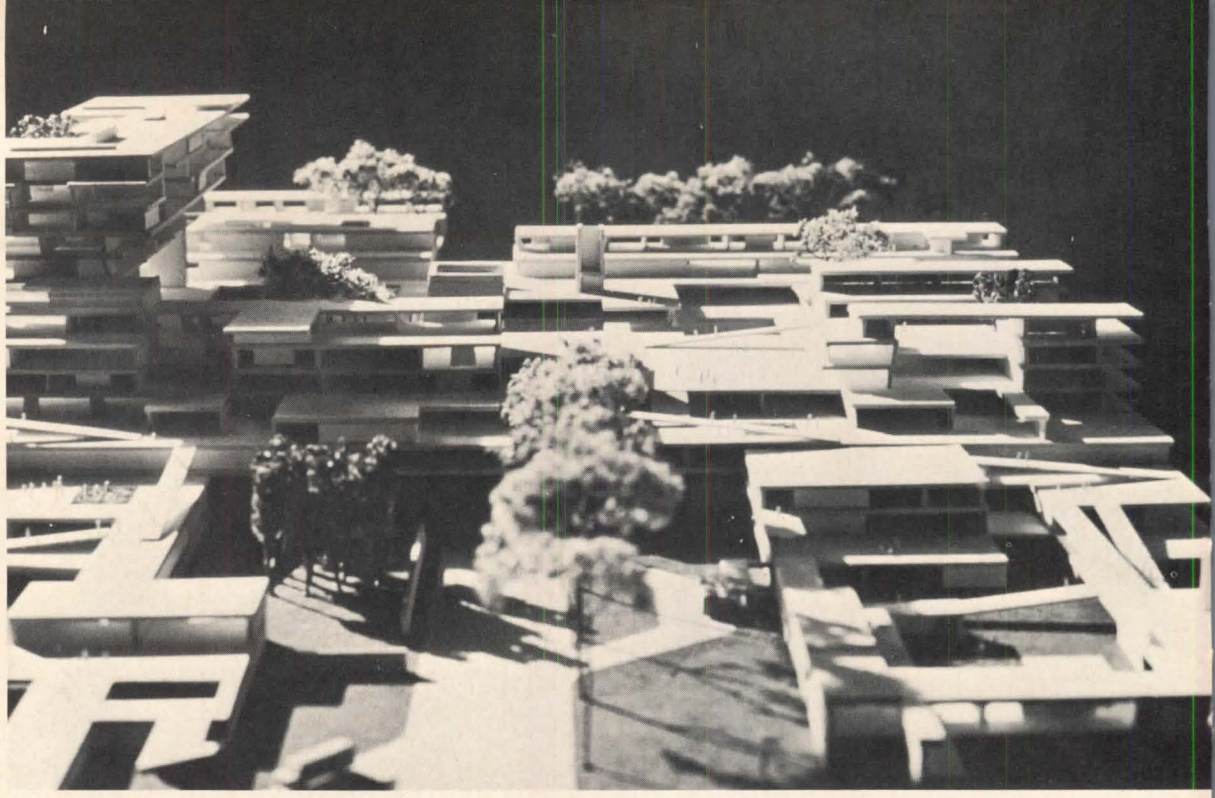
It became obvious that the prime area source for the development of the education park is the air rights over the tracks and the immediately contiguous areas for: (1) economic and land acquisition purposes; (2) greater facility of introducing an adequate transportation system for the park; (3) using the park to become a new civic lodestar, to break the segregating barrier between the north-south, white-black division in the area; and (4) as an ideally central location of sufficient size to involve the park with the community and the community with the park. Site selection being made, the architect proposed that "the three school groups be arranged in such a way that they form an envelope over a core of transportation and resource facilities. The schools would cascade down in terraces, similar to a hillside development." Thus, the primary schools would occur at the bottom of the structure where they would be most convenient to transportation and most secluded from upper school activities. The transitional spaces of the middle schools would be at the intermediate level, probably at the same level as the Education Park Transit system platform. At the top of the complex would be the secondary schools, this being the most public of the areas, with an open street running the length of the complex and including, in addition to learning spaces, cafeterias, snack bars, and lounges, the offices and resource spaces for the various faculties, and a variety of open spaces. Play and open areas would be on all levels, appropriate to the demands of the various schools. The park's student body has been thought of in traditional grades, but this arrangement is quite changeable thanks to continuing examination of educational and social developments in the schools and the community, and to an "open ended" systems approach to the architecture, which emphasizes that a consistent vocabulary of design discipline should prevail, but that the building should really have an "unterminated form" to allow all necessary changes of curriculum and learning approach. The architects see a consistency of planning and design approach as the key to keeping the individuality and involvement of the student within a huge, changing complex. This smaller community feeling would be reinforced by the arrangement of students — particularly in secondary schools — into coun-

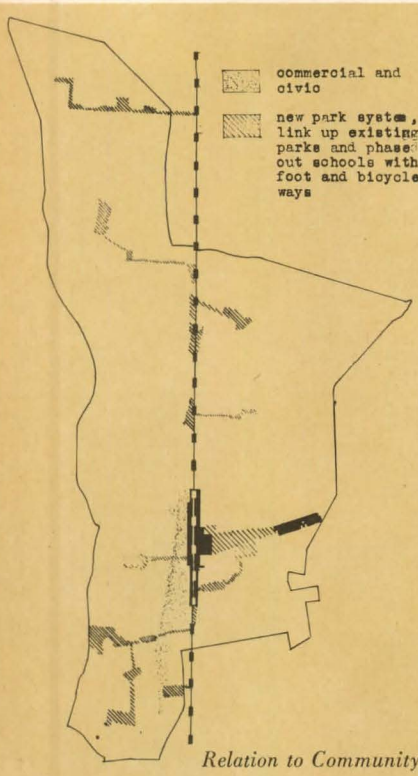




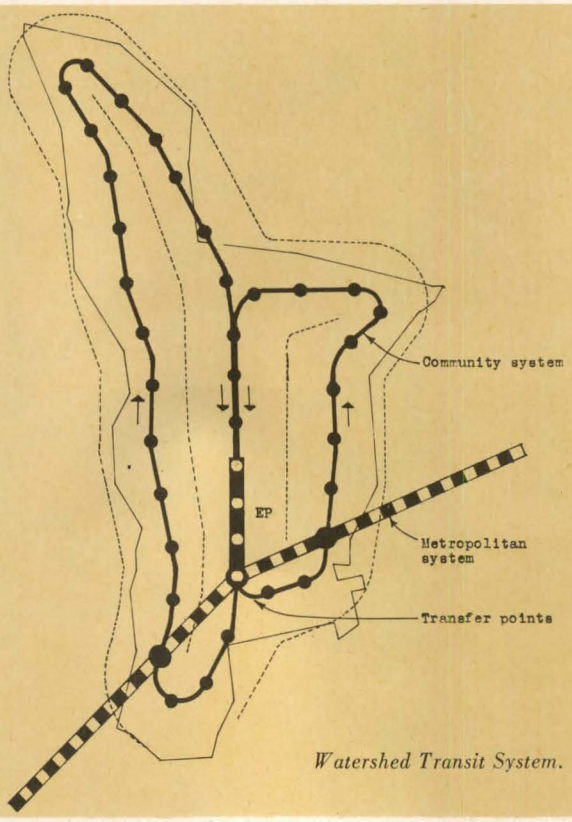
Plans and section indicate park is planned pyramidally, rising from lower school through middle school, culminating in upper schools and resources at top.



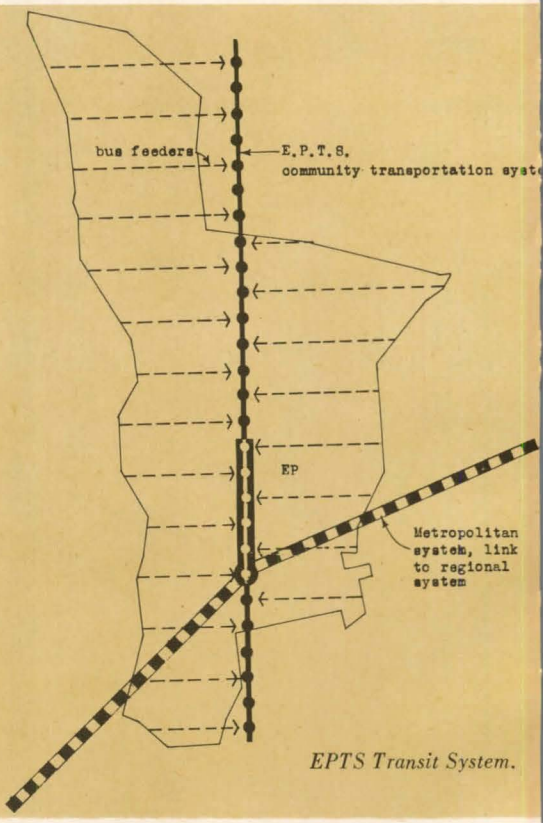




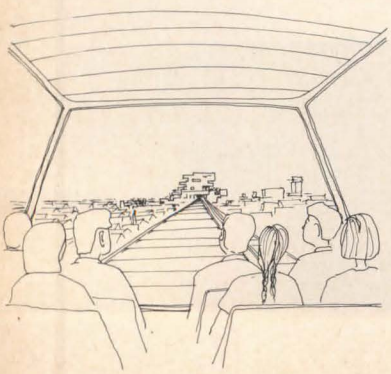
Relation to Community.

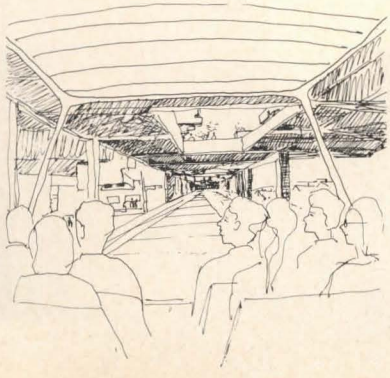


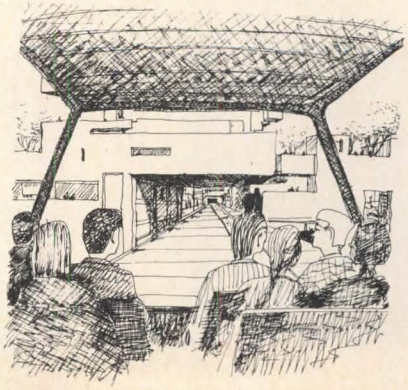
Watershed Transit System.



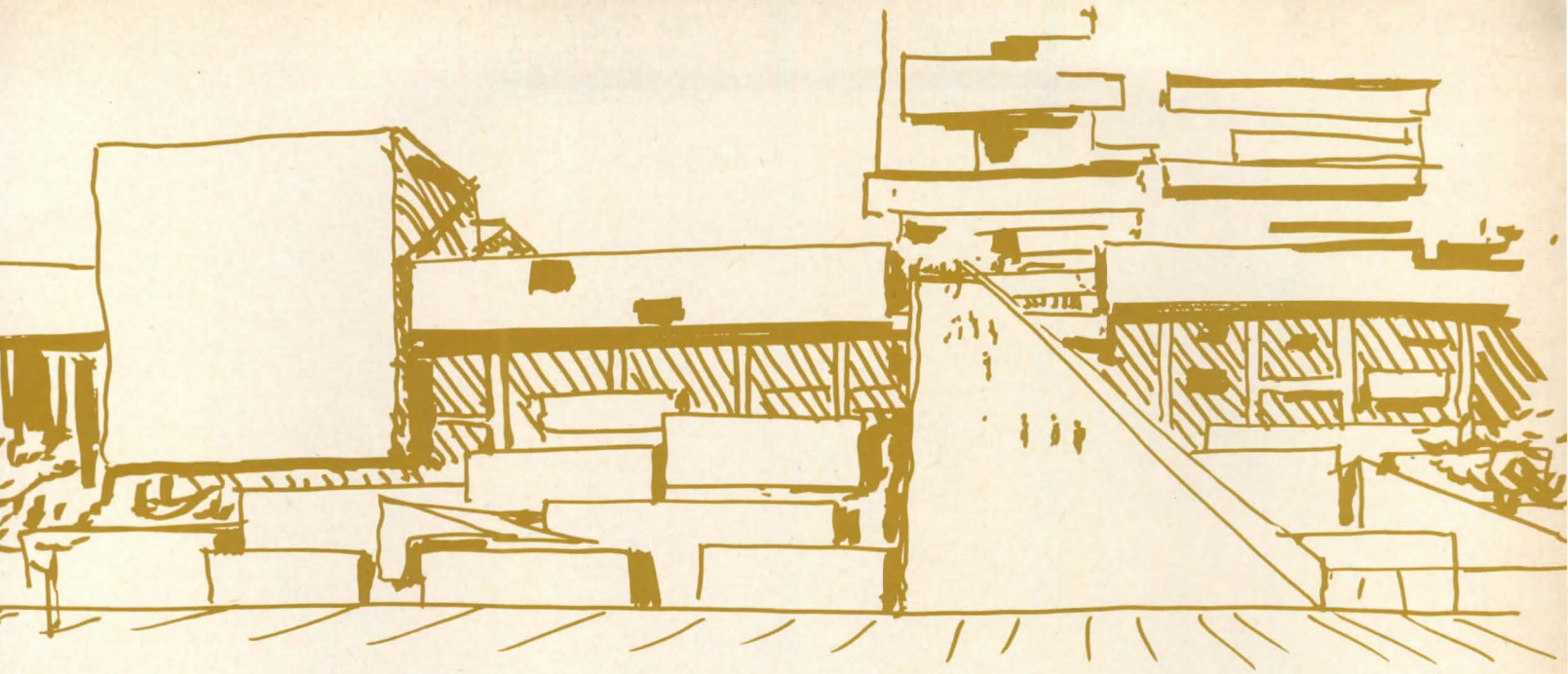
EPTS Transit System.

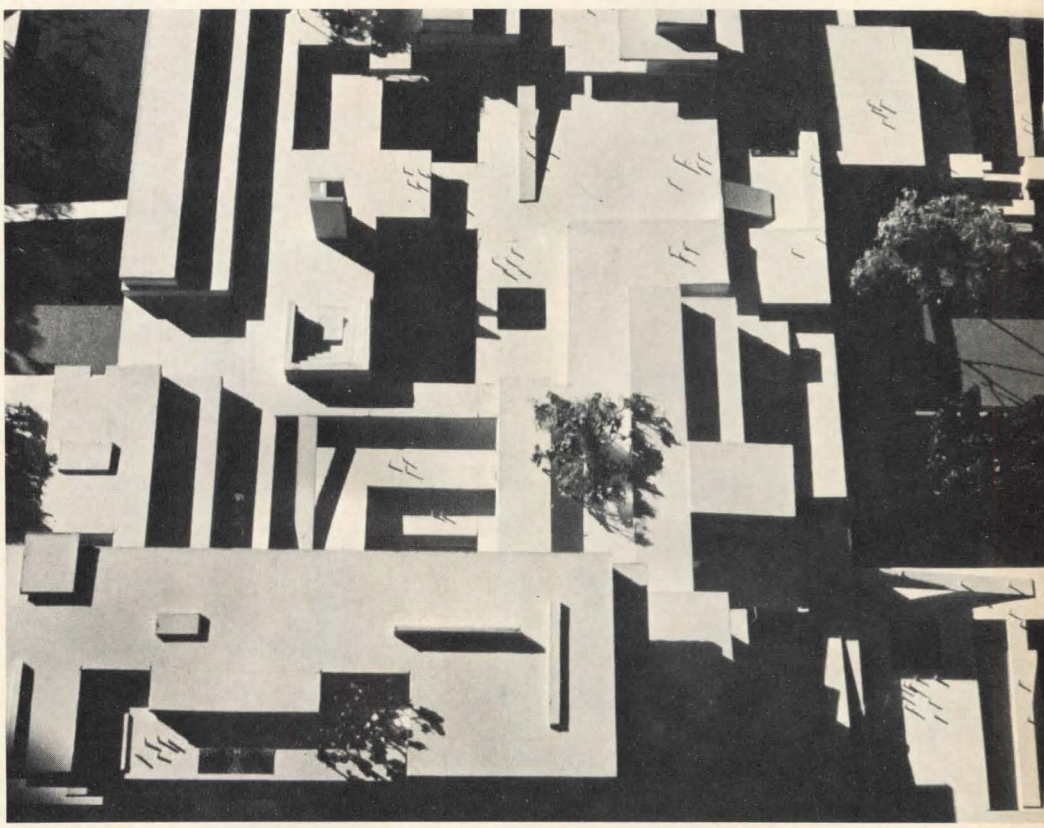






Sequential drawings at left illustrate how students would approach and come right into education park on transit lines.



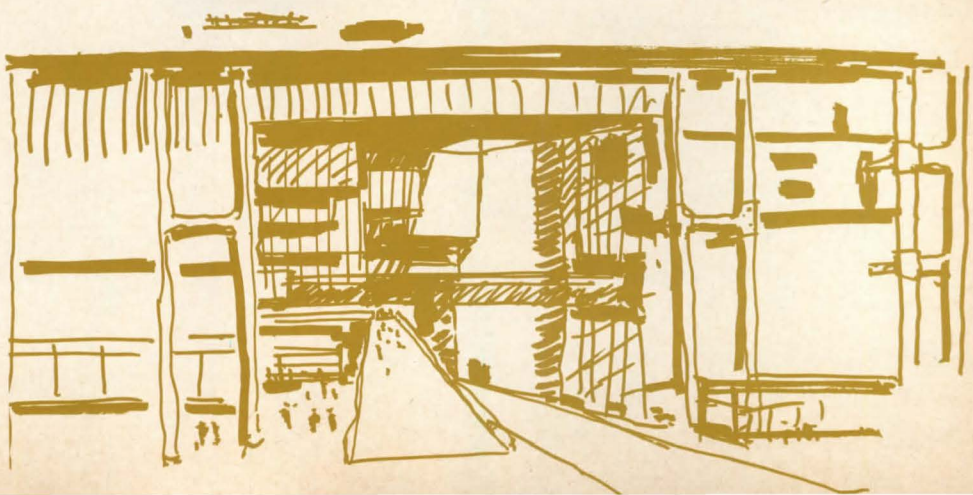


seling groups under a guidance counselor.

Resources, as noted, would be within the complex. The library center, for instance, would penetrate vertically through the park as well as stretching out horizontally to the different schools. Access from the street level would welcome the public.

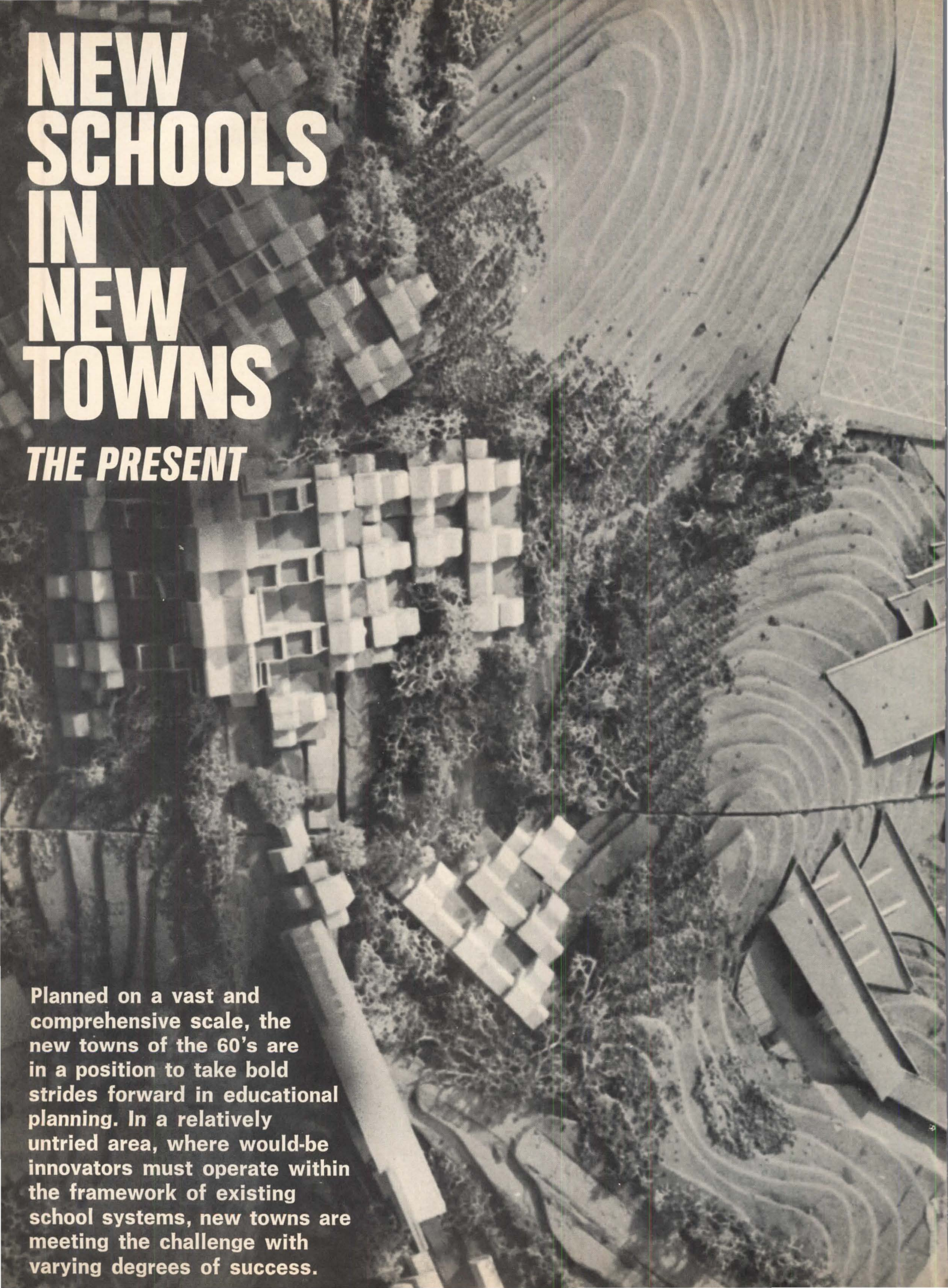
Two transportation methods were considered for the park. One, named "Watershed," was a unidirectional system of trains on rubber tires over streets or sidewalks guided under computer control and with the ability to connect with related systems in other parks. This would require a network 26 miles long, and would put transportation within a quarter mile of every student. It was deemed too expensive, unfortunately, so a system of buses connecting with an in-park Education Park Transit system was adopted. Maximum travel distance would be 5.33 miles; maximum time in transit, 15 minutes (average time, 9.5 minutes). The EPT system would have five stations within the length of the complex, according to transportation consultant Ernst Hacker.

Aside from community use of the park, the planners emphasize the desirability of the park's penetrating the community. One proposal is that certain functions might take place outside in a nearby civic center; the park might become involved in a community museum and art gallery; and that a school farm and zoo be developed as part of a public recreation park on an old former school site. More importantly, as part of middle and secondary learning, students would work part time in community services both in the park and in the city, such as banks, beauty parlors, health centers, printing establishments, and the like. It is estimated that 25 per cent of the student body would be involved in the work situation at a given time.



NEW SCHOOLS IN NEW TOWNS

THE PRESENT



Planned on a vast and comprehensive scale, the new towns of the 60's are in a position to take bold strides forward in educational planning. In a relatively untried area, where would-be innovators must operate within the framework of existing school systems, new towns are meeting the challenge with varying degrees of success.

During the subdivision era after World War II, home building became a big industry feeding on demands created by a virtual five-year moratorium on residential construction and a dozen Depression years. Two generations of underhoused Americans gobbled up its products in a more or less indiscriminate stampede to the suburbs, where cheaper land assured every man of his little plot and cars assured him access to the city center.

As the pell-mell developer boom progressed through the late 40's and 50's (at the average rate of 1,300,000 housing units per year), the faults of surburbia became more and more obvious to both observer and resident, and the volume of criticism grew louder and more urgent.

By the time the affluent 60's rolled around, buyers had become more demanding and harder to satisfy. And the emphasis in their reasons for moving to the "country" had begun to shift. The new commuter was not so much a confirmed suburbanite as an urban escapee. About the same time, there began to emerge a new breed of urban planner with new ideas and new dedication. Into this confluence of planning talent and buyer selectivity stepped a few real estate entrepeneurs, with imagination and social conscience, who began to pick up the threads of community planning that had started with Radburn, N.J., and the greenbelt towns of the 30's — more recently supplemented by postwar planning experiences in the European new towns.

Operating on a large scale made it possible to set aside land for permanent open spaces, parks and sports facilities; industrial reserves, usually for light industry and research, were meant to make new towns more than bedroom communities. And by making use of professional planners who integrated community facilities into the town fabric, the new developer hoped to attract those city dwellers who had no wish to desert the good life, but wanted to enjoy it in a semirural setting.

Although such leaders in the field as James Rouse of Columbia, Md., and Robert Simon, lately of Reston, Va., planned for a mix of housing and incomes, it remains to be seen whether this will even*tually* work out. Although the Federal Government has lent its support to the concept of orderly growth in expanding metropolitan areas, the bulk of its financial aid to the country's physical environment has gone to central cities. However, HUD's recent funding of the development of a low-cost housing scheme for Reston is a step toward realizing the goal of balanced housing in new towns. It offers the possibility of relocating some of the urban poor who have been trapped in the ghetto or displaced by urban renewal.

(As P/A goes to press, President Johnson is introducing legislation that would offer the most significant aid to date. It calls for Federally guaranteed bonds or debentures that would eliminate the risk to new town investors. But opposition is expected, particularly from big city mayors.)

At present, new towns, like the suburbs, remain middle-income oriented, and these are the people who might be expected to demand the best possible education for their children. Decaying facilities, overcrowding and all the other familiar problems facing the cities' school systems have, according to most authorities, been instrumental in driving the middle class out of the cities.

It would seem, then, that the time is ripe, and opportunities for educational innovation offered by the virgin lands and master plans of new towns are just about perfect — opportunities to correct all the ills of haphazard growth, to incorporate flexibility for the future, to site schools imaginatively adjacent to parks and/or commercial complexes, and to experiment with new ways of educating our children in an effort to improve on what many educators consider outmoded and inadequate systems.

It was this promise of a *tabula rasa* that brought together a group of educators and architects under an Educational Facilities Laboratories' grant at Rice Institute last year. If new things were to come out of new towns, some brainstorming and leadership was called for from all professions closely involved in their realization. Results of the two-week session (programs were a year in preparation) present some bold new ideas and form a compendium of the most advanced thinking in the field (see pp. 198–213).

Problems of Reality

Since there is initially little or no population in new towns, traditional citizens' machinery outside the new town limits is comparatively uninvolved. The developer and planner are free to confer with local school authorities, usually the county or a state school district, under whose jurisdiction the schools will remain. This is, of course, not only an opportunity but a gratuitous responsibility for corporations whose main object is, after all, to make money. It requires great quantities of patience, time, and special consultants. But there are obvious rewards. The progressive developer considers it to be part of the planning process, and there is little doubt that a genuine concern for the public interest can be coupled with an equally genuine enlightened self-interest.

Many obstacles face the would-be innovator in new towns. Sited close to areas of rapid growth, one of two types of difficulty usually has to be faced. Reston, for example, is located in a county where recent increases in school-child population has reached 6,000 to 10,000 per year — primarily outside Reston. The county is hard pressed simply to get roofs over students.

On the other hand, many new towns are located in semirural areas that have not yet been suburbanized, but lie in the path of probable growth. Here, local school boards sometimes tend to be overwhelmed by the inrush of new ideas and the practical problems of changing in a few years from semirural to semiurban districts.

Some of the most discouraging setbacks can come from the separate authorities (and so-called separate interests) of such departments as parks and recreation, libraries, and schools. Sometimes reinforced by limiting legislation, this departmentalization has made it impossible, in some cases, to integrate such facilities as community playing fields and public libraries into the school complex.

Money is, of course, always a problem and, aside from normal school requirements, the staffing and maintenance of after-school-hours programs for both adults and children have sometimes suffered because of inadequate funding.

Although the new towns of the 60's are still too new to analyze voting behavior and attitudes toward contributing monies to the public coffers, it is discouraging to note that their close cousins, the established suburbs, have been reluctant to vote the tax dollar for maintaining adequate schools, at least in the New York City area. And suburban schools have begun to show the symptoms of neglect and overcrowding so common in the city.

In those cases where innovation has been introduced into the educational system of new towns, it has usually been a joint venture between developer and school board — with the initial step often being taken by the real estate entrepreneur and his master planners or advisory staff. Such men as Rouse, Simon, and Patrick Cusick, Jr. (of Litchfield Park, Ariz.) have hired educational consultants and become personally involved in initiating dialogues with local school authorities. They have brought school boards together with interested bodies such as the Ford Foundation-financed Educational Facilities Laboratories (EFL), which

Photo: Joseph W. Molitor

STAFFORD HARBOR, Va.
Paul Rudolph's first-stage plan for the proposed new town of Stafford Harbor near Washington, D.C., separates schools from the town center and makes them the focal points of valleys, surrounded by cluster housing on the ridges. An interesting school form has evolved out of Rudolph's decision to accentuate the natural hill-and-hollow terrain. Housing is built up from the high ground, and schools are dug into the hills at the head of ravines. Roof terraces of schools are formed by stepping down the slope and will be used as outdoor teaching spaces. Playfields, arcing down the valley from elementary to high school in successive terraces, include tennis courts, baseball diamonds, and a football gridiron; the high school structure circles a swimming pool. This school-sports complex can provide a point of social interaction for the entire community.

has been the benefactor of a number of school boards planning facilities in new towns. The progress of these efforts has depended largely on the receptiveness and energies of local school authorities.

Of Schools and Plans

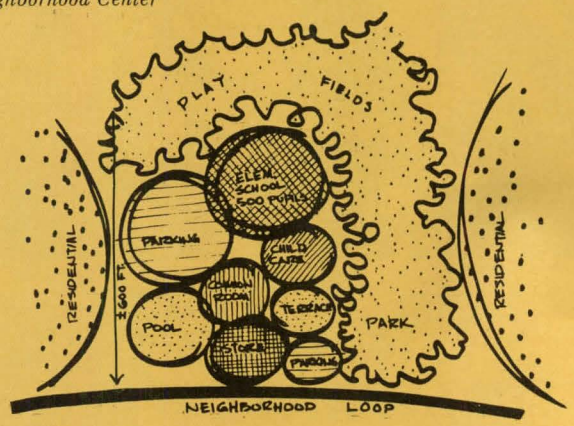
In providing a community large enough to be interesting and small enough for the individual citizen to comprehend and participate in, the smallest unit is usually a pedestrian-oriented neighborhood of about 5,000 to 10,000 people. They are grouped and clustered in a variety of ways, depending on housing density, terrain, and so on, into villages, and the villages into the town.

The value of flexibility, in regard to both schools and other components in the plan, is recognized by most far-sighted professionals: "The traditional approach of making a plan and then effectuating 'the plan' is archaic," commented Morton Hoppenfeld, Columbia's Director of Planning and Design, in a recent *AIP Journal* article. The art and science of building new towns is so new that it waits on the feedback from actual experience.

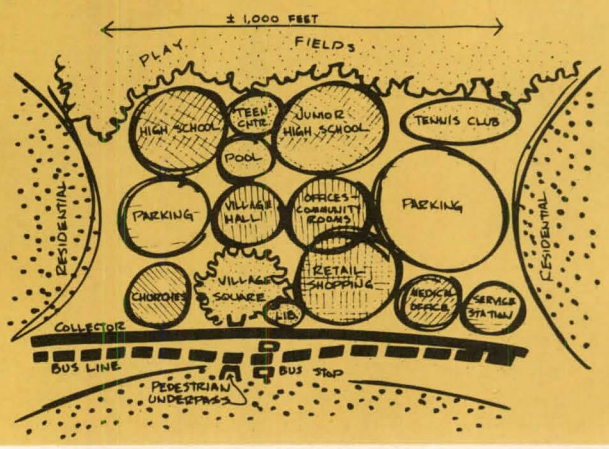
It is too early to judge the success, or lack of it, in educational planning for the pioneering new towns of the past five or six years — perhaps too soon to predict whether new towns as they are planned and financed today will survive at all. But the school/community relationship can provide a laboratory for study. Of the more than 200 land developments in the country that call themselves planned communities, there are a limited number that might qualify as new towns or satellite cities. Out of these, a few of the more ambitious examples might serve as case studies.

COLUMBIA, Md.
Site plan of Columbia's first neighborhood center shows relationship of elementary school to commercial-community-play facilities (above). Floor plan of first elementary school will accommodate the flexible team approach to teaching (top, facing page). Rendering is view of community complex (facing page) designed by Van Fossen Schwab. Construction is underway on both school and neighborhood facilities.

Neighborhood Center



Village Center

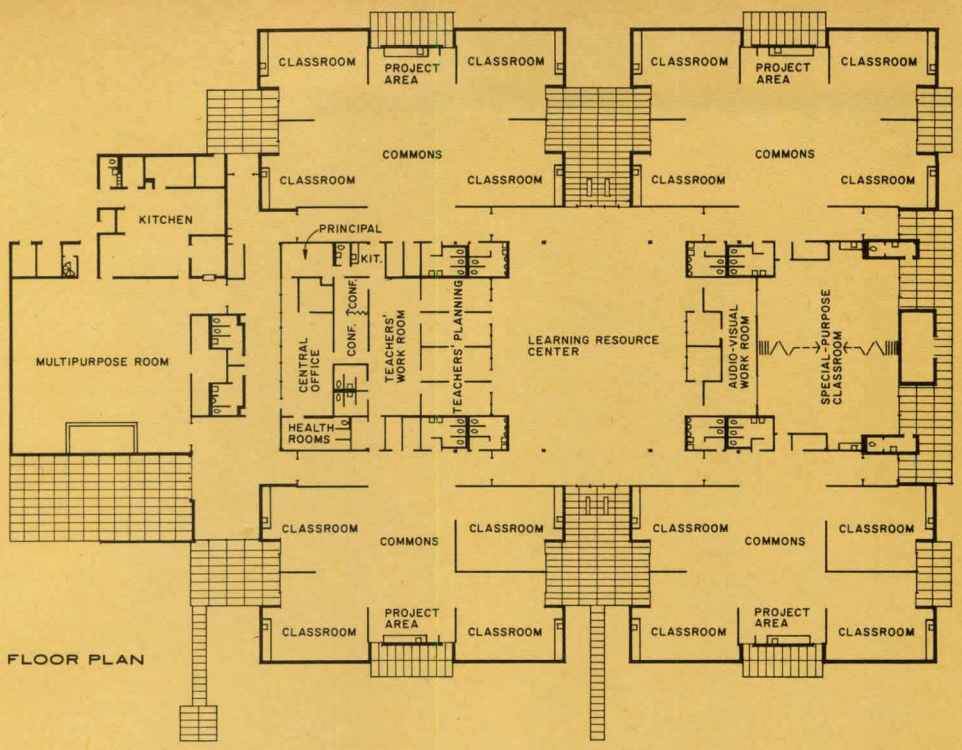


COLUMBIA, MD. The team of consultants who formed Columbia's planning concepts have established this new town as an exemplar of thoroughness in its social analysis. The 13-member interdisciplinary group, including representatives from the fields of sociology, education, recreation, economics, and transportation, pooled their ideas in an effort to provide optimum living conditions for the satellite city whose minimum population is expected to be approximately 100,000.

The place of schools that evolved out of the study group's discussions was stated by Hoppenfeld, a professional planner, as basic and central to the community structure. "Acknowledging learning as a basic foundation for a human community, and, therefore, the maximum access to and use of school plants as a prime objective, we chose (with county school board agreement) to adopt a system of relatively small schools within walking distance to surrounding residential communities."

In neighborhoods with a population of about 5,000, elementary schools are integrated into a small commercial and recreational complex. At the village level (serving from 10,000 to 15,000), a high school and intermediate school are combined with larger and more sophisticated community facilities. And in the town center, plans call for a college campus, offices, shopping and medical facilities, hotel and other urban amenities.

Construction has begun on the first K-5 (kindergarten through fifth grade) school, designed by McLeod, Ferrara & Ensign, under an EFL grant. The school is essentially one large open space interspersed with clusters of offices and classrooms that can be closed off. It revolves around a learning resources center bounded by four "instructional clusters" or large dividable teaching spaces. Planning has taken into consideration possible



community uses of the school, but it remains student-oriented.

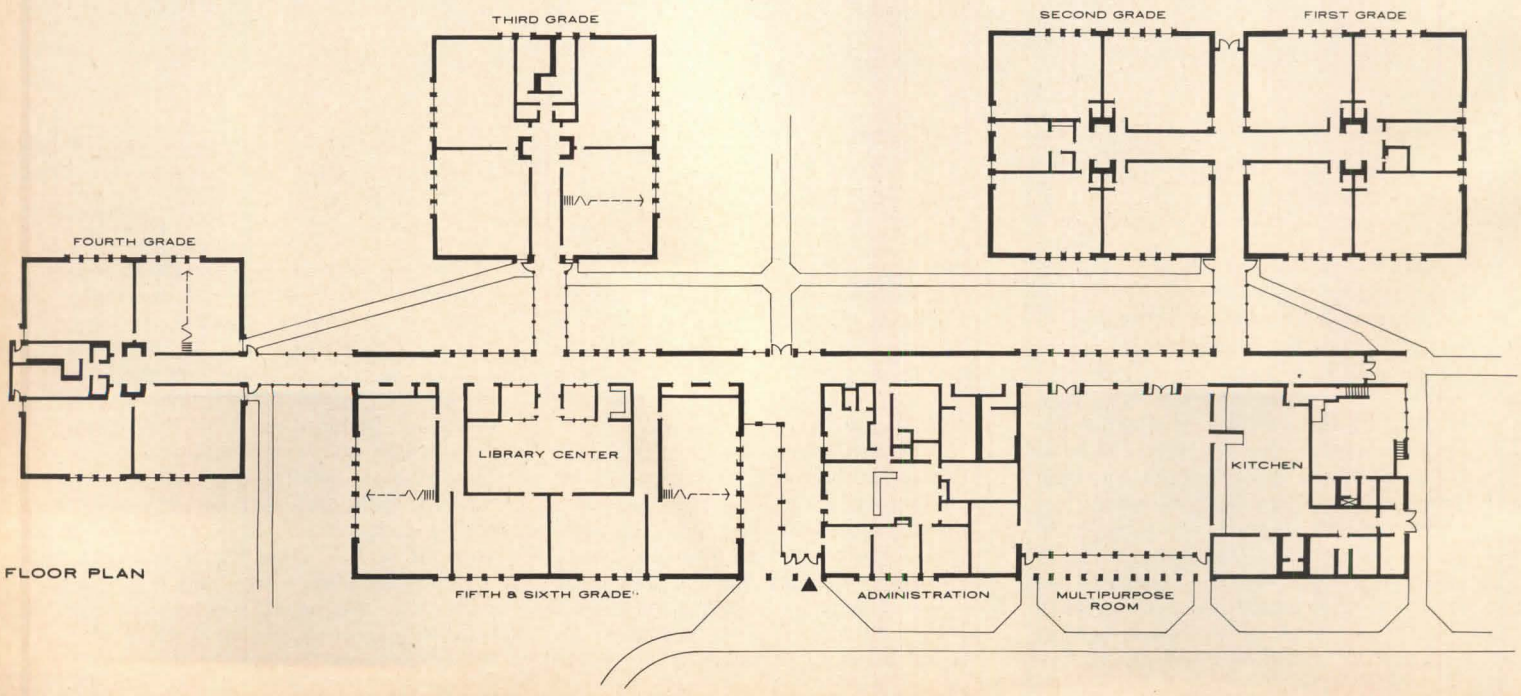
Changes in curriculum, planning of physical plants and administrative organization — in fact, a total re-evaluation of educational philosophy — has been sparked by the advent of Columbia. Innovations include flexible grading in what is essentially a 5-3-4 breakdown (elementary-intermediate-high school years), a kindergarten program, and team teaching, which offers the opportunity for a combination of group and individual instruction. Two model schools, for both the elementary and intermediate grades, will be built in the county — one in Columbia and one outside its boundaries — in an effort to raise educational standards throughout the entire county. Teachers and superintendents are being hired in advance of completion so that they can work out details of the new curriculum before the opening day of school.

These changes are a radical departure for the Howard County school system, a semi-rural district, which has been "working overtime" to change its ideas of what education is all about, according to architect William Ensign. The county's openness to new ideas is commended by Hoppenfeld, who says, "We poked our way in because we had a different way of relating schools to the system. But then the county got their own consultants, put committees together, and are very much on top of it."

Work on the complementary facilities in the first neighborhood center is well underway. Included are a pre-school day-care center and a community building containing a small store, coffee shop, meeting room and dressing area for a nearby swimming pool. The two buildings are to be joined by a plaza and bordered by playgrounds and a wooded park area. An adjacent "tot lot" will provide play space for mothers of children from two to five years of age.

RESTON, Va.

Reston's first elementary school is equipped with closed-circuit TV and audio-visual aids. Its cottage plan is easily expandable (below). School site (above) was left in natural wooded state, except for parking and softball diamond. Parking is shared with nearby church. Other recreation areas (shaded) are integrated into adjacent housing clusters.



RESTON, VA. Perhaps the first new town of the 60's worthy of the name, Reston's strong point has been superior architectural design. In contrast to Columbia, it has been oriented toward the urbane adult. Although this does not diminish the concern for good education — quite the opposite, in fact — it does affect the siting of schools and their relative importance as possible community centers.

"The location of the schools reflects the basic philosophy underlying Reston planning — that Reston would not be child-oriented, but would be designed for people of all ages . . . [schools] are not in the village centers, where it is felt that the emphasis should be, to a certain extent, adult," said Carol Lubin, Reston's educational consultant.

Schools are planned in conjunction with open spaces and parks, or adjacent to golf courses or swimming pools and other sports facilities. The basic village unit of 10,000 will have two elementary schools, which is consistent with county estimates of school needs. The projected population of 75,000 will have 16 elementary schools, grades 1–6; three intermediate schools, grades 7 and 8; and three high schools — a majority of the sites donated by Reston Va., Inc.

Schools are to be within walking distance (less than a mile) of all pupils, and the walkway system is tied into both the school system and village centers.

Well on its way to becoming a prototype for the county, Reston's first elementary school, designed by Caudill, Rowlett & Scott (also under a grant from EFL) opened its doors on January 1967. Original conferences set up by Carol Lubin between EFL representatives, chairman of the county school board, and the superintendent of schools, brought up the possibility of movable schools. This idea was later dropped (when the general character of Reston became clear) in favor of schools that could be "time-phased and enlarged" as the population grew. Caudill, Rowlett & Scott were charged with producing a design that would meet this requirement and also with investigating the possibilities of making the school available for community activities.

The resulting design is a "cottage" style complex where semi-independent units house the various grades in four-room clusters. Cottages are connected by enclosed walkways and corridors. The arrangement allows for future expansion with a minimum disturbance to the functioning school. A number of separate entrances are for the convenience of students approaching from different directions and to make the outdoors accessible for instruction. A number of civic groups use the school for meetings, and a supervised recreation program has been set up by the county recreation department for children after school and during the summer.

A nursery-kindergarten, organized and administered by Reston's nonprofit foundation for handling community programs, is operating at capacity, but, by recent act of the Virginia State Legislature, kindergartens will soon be incorporated into the public school system. It is expected that the nursery school will then be devoted to the younger children.

There is continuing agitation for higher education at Reston, and a 55-acre site has been tentatively set aside near the town center for this purpose. Other plans include a two-year community college, and a "super graduate school" to serve the proliferating "think industry" in and around Washington, D.C.

An interesting grass-roots development is the Montessori school formed by a citizens' group in cooperation with families in a neighboring community. The school opened in 1966 and is based on the methods of the well-known Italian teacher who has met with such startling success in teaching pre-school children.

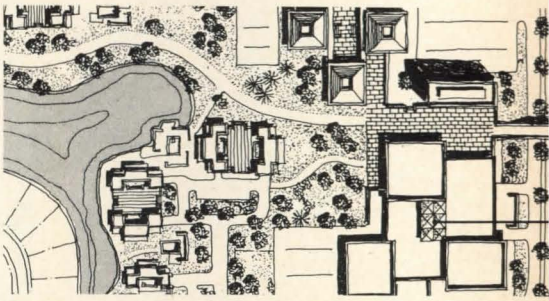
This kind of spontaneous community involvement is not surprising among Reston residents. But it might also be expected to play a role in the growth of education in any planned community, once people begin to take root.

What effect Reston's recent change in management might have on schools or on Whittlesey & Conklin's master plan is uncertain, but the new corporation, Gulf Reston, Inc., professes a particular concern for education.

LITCHFIELD PARK, ARIZ. Situated just west of Phoenix, one of the fastest growing cities in the country, Litchfield Park, is being developed by a subsidiary of Goodyear Tire and Rubber Company for a planned population of 75,000 to 100,000. The master plan, by Victor Gruen Associates, calls for central grouping of schools, which are a "major determinant of community subdivisions," says Edgardo Contini of Gruen's office.

Each village cluster of four neighborhoods (7500–10,000 total population) will be served by an educational-commercial park. Two villages are combined into what is called a "community" with a population of 15,000–20,000; focal points are a high school and shopping center tied together by a large common plaza. The town core forms a central spine for communities and is to provide a wide range of private and public facilities. It will probably include a satellite college campus of Arizona State University on a 525-acre site donated by Goodyear.

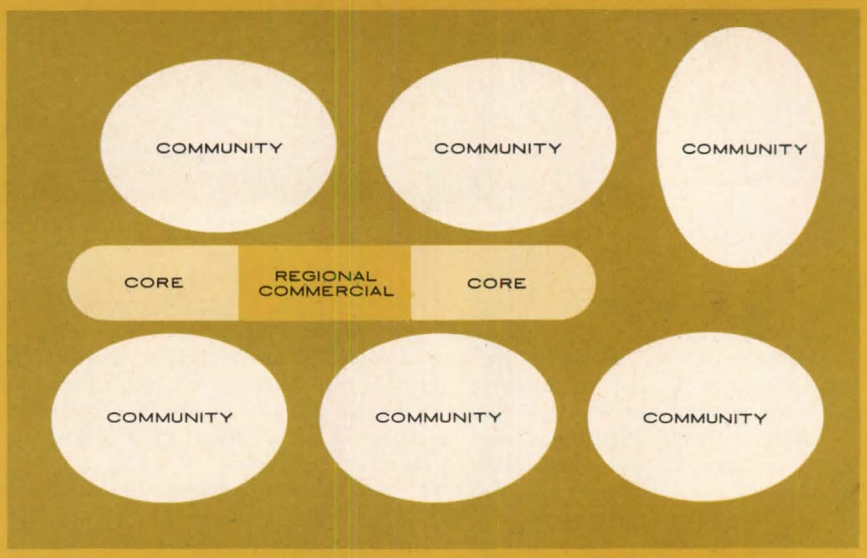
Patrick Cusick, vice-president of Litchfield Park and a professional planner, is an avid proponent of the advantages of education for both personal, civic, and business reasons: "The area that can provide the best education will grow fastest." Cusick generated enough enthusiasm among school superintendents and school boards of three affected districts to get $5000 from each school board for a



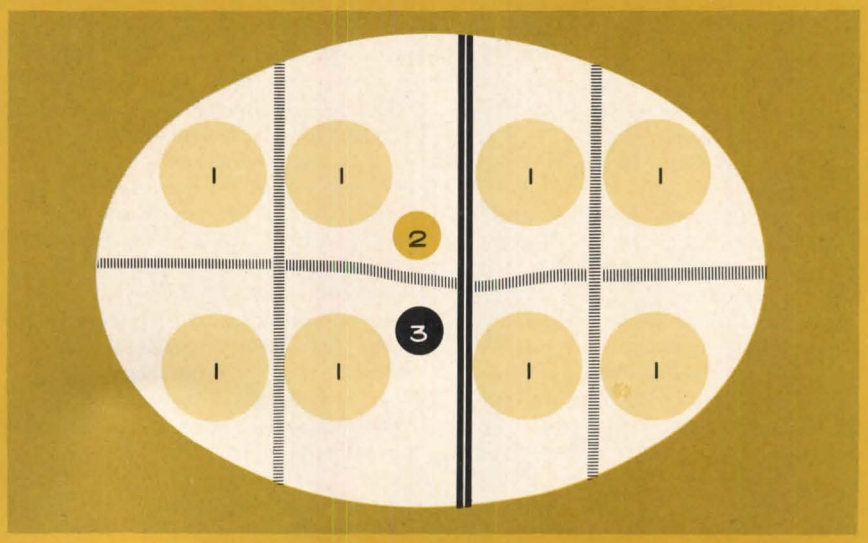
study of facilities and programs. Goodyear matched the $15,000, and Arizona State's Bureau of Educational Research and Services was commissioned to do the study. Other monies contributed toward the study have come from EFL and the National Institute of Mental Health.

Recommendations call for a flexible breakdown of grades: village educational facilities will include one unit for children from 4–7, two units for children from 8–10, and one unit for those from 11–13, which will take pupils through the conventional eighth grade. Teaching units would share an instructional resources and materials center, cafeteria, auditorium, and administrative offices. Although physical planning is not yet complete, the program seems to indicate a solution similar to Reston's cottage plan complex.

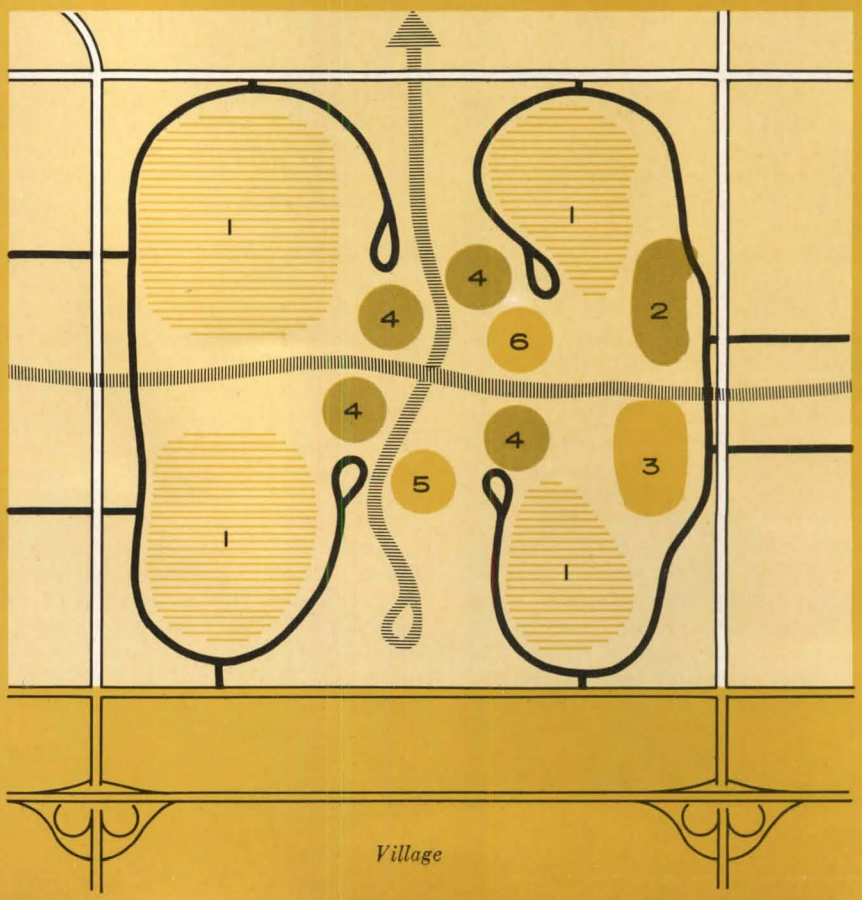
In addition to provisions for adult education, the study recommends setting up the system in a way that will involve parents as closely as possible with the education of their children — by bringing them into classes for talks on subjects related to their field of work, for instance. This suggestion, in combination with the siting of schools in centers for combined adult-child use, seems to be in line with one of the stronger educational and social planning trends. In what might be dubbed the anti-ghettoization movement, sociologists and planners are fighting segregation on all fronts — age, race, income, profession — and it seems entirely possible that if adult and child activities are boldly integrated,



Town



Community



Village

LITCHFIELD PARK, Ariz.

Schematic diagrams show how schools are integrated with other components into the active centers of the town, community, and village.

Town: *Composed of six communities, it will probably include a satellite campus of the Arizona State University in the core strip.*

Community: *Two villages, of four neighborhoods each* ***(1)****, revolve around a high school* ***(2)*** *and commercial complex* ***(3)*** *tied together by a common plaza and served by an arterial roadway and footpaths.*

Village: *Four neighborhoods* ***(1)*** *center around an elementary-intermediate school cluster* ***(4)****, recreation area* ***(6)****, and commercial facilities* ***(5)****, and share a high school-commercial site* ***(2, 3)*** *with the adjacent village.*

it might help to close the notorious generation gap.

When queried on prospects for community acceptance of departures from the conventional school system, Dr. Merwin Deever, director of the ASU study, was optimistic. Aside from the spirit of cooperation among school authorities involved in Litchfield Park, he commented, many communities around the country are ahead of school boards in their willingness to accept new directions in education.

IRVINE, CALIF. About one-third of the 93,000-acre Irvine Ranch has been master planned by William L. Pereira & Associates for a satellite city of 200,000 between San Diego and Los Angeles. Thirty public elementary schools will be supplemented by two existing schools, and planners are counting on four private elementary schools. There will be five high schools, including one existing and one parochial. High schools will take advantage of centralized facilities by serving student bodies of 2000 and up.

Detailed planning (including computer models in five-year increments through 1990) is being done in-house by the Irvine staff, but Pereira's land-use patterns are generally being followed. Irvine's size and the mix of different concepts proposed in the plan make it an interesting candidate for observation. In one area, schools are strung out along a park belt, interspersed with churches, neighborhood clubs, libraries, and small commercial developments. There are a few school clusters, and a number of single neighborhood schools planned in various combinations with community facilities, small commercial centers, libraries, clubs or health centers. They are usually sited at the edge of compact housing clusters, and are bordered by low-density housing, parks, small open spaces, or golf courses.

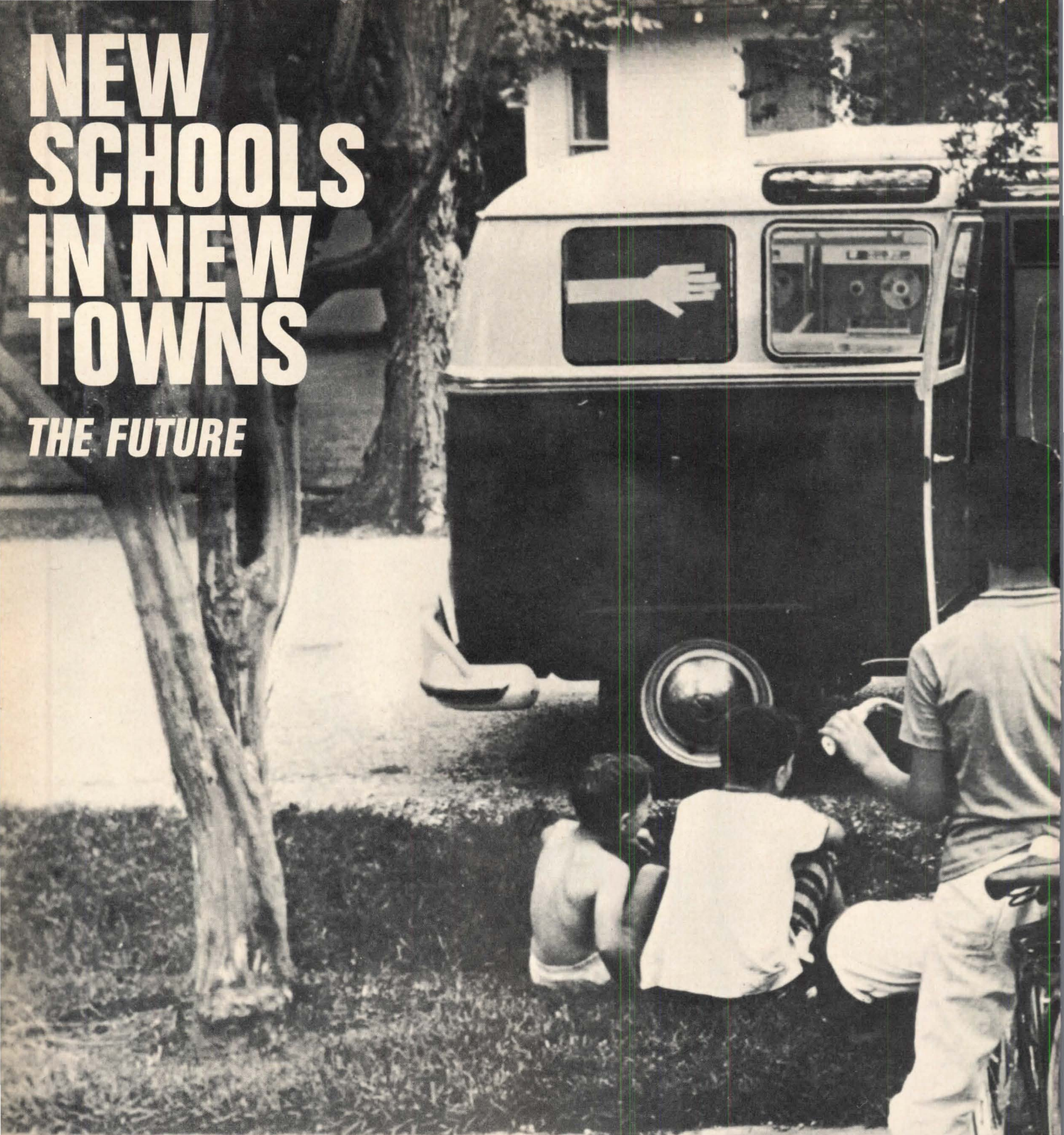
Although a town center is planned, the present hub is a recently completed branch of the University of California. In contrast to the other new towns discussed, the UC campus is clearly separated from the town center.

For town planners, the siting of schools has offered the most clear-cut opportunity for influencing school/community relationships. And the enthusiasm generated around new towns has been responsible for advancing administrative organization and curricula beyond established policies. However, many architects, educators, and planners are dissatisfied with the present rate of progress and look forward to a much more adventurous future.

IRVINE, Calif.
Portion of Irvine's master plan shows mix of concepts for schools (solid color): the individual school, the park cluster (lower left corner), and the park strip (tinted) forming a horseshoe around the spoked University of California campus (left center). All are combined with various community-commercial facilities. Arrows indicate golf courses; "T.S." at left center is site for technical school.

NEW SCHOOLS IN NEW TOWNS

THE FUTURE



Results of a charette at Rice University, headed by leading architects and addressed to the problems of education in the new town, were amazingly pertinent in projecting future patterns of school design and educational direction.

The hypothetical new towns designed during the Fourth Rice Design Fete conducted by the School of Architecture at the Rice University, Houston, Texas, are important because they *were designed* by some of the nation's leading architects to specified educational programs written by some of the nation's outstanding educators and consultants. The educational "software" in the programs (the educational concept) inspired new concepts of educational "hardware" (the means of its implementation) by making the entire town an educational vehicle. A major point that all the solutions had in common was that none of the "hardware" was operational without the use of educational technological devices.

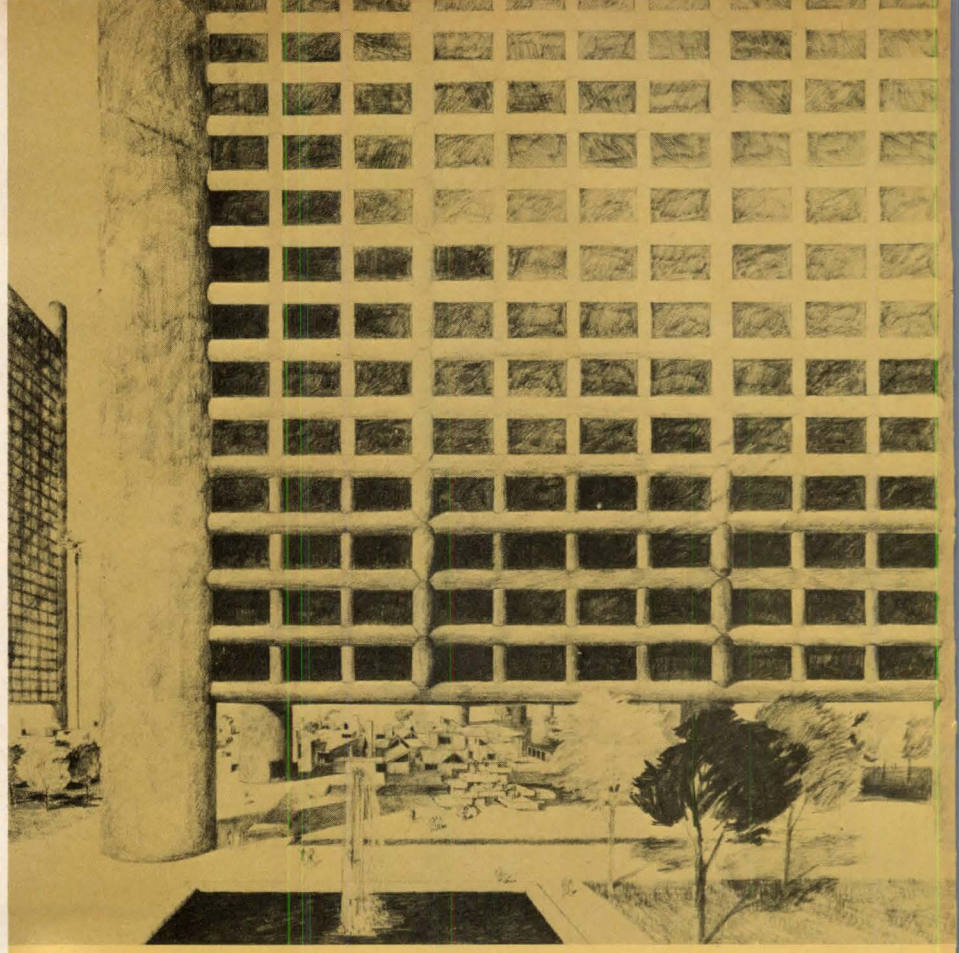
The Fete participants, in comparing the traditional single-teacher, individual-classroom-oriented school with today's environment, found the two hopelessly mismatched. The educators and the designers questioned every facet of today's educational "software," such as rigid grade divisions, the practice of restricting formal education to set years of the learner's lifetime, and the arbitrary assigning of hours of the day, days of the week, and weeks of the year, to the educational process.

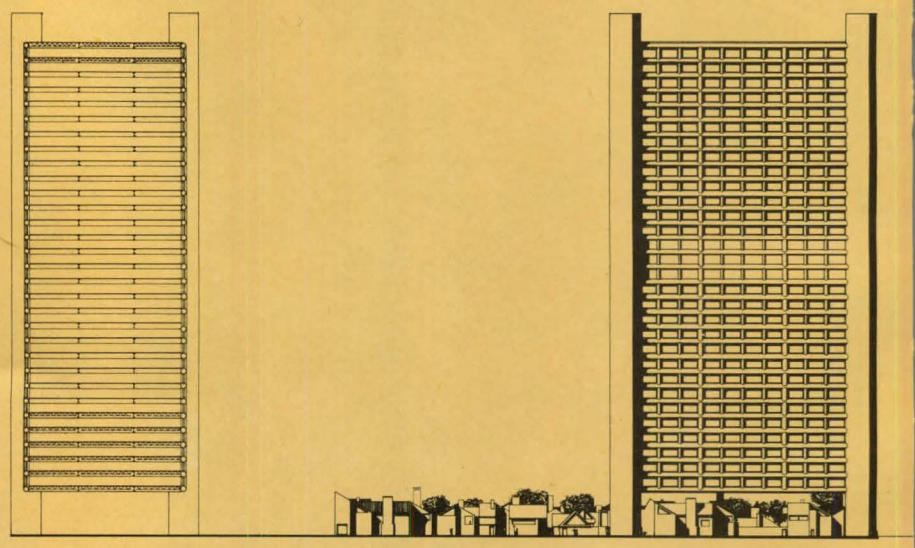
New towns were chosen by the Fete because they offered an opportunity to consider solutions in terms of total planning on a realistic basis. New towns are being built, planned and unplanned, in many areas of the nation. It is estimated that six million Americans will move into new towns during the next 20 years.

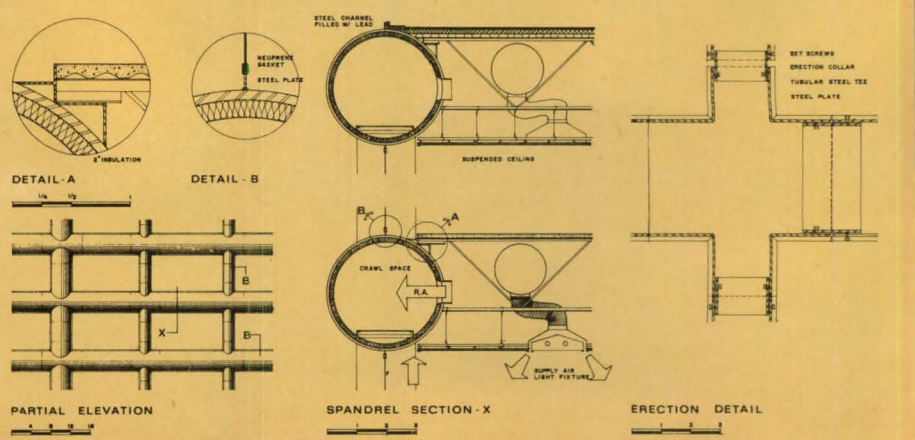
Designs ranged from an imposing megastructure combining electronic learning and transportation, to Pop education projects where educational facilities were informal and as accessible as "beaneries." Two of the teams extracted from their programs those elements that would permit architectural solutions. Three accepted the promise of sprawl and confusion, segregation, and urban discord and worked with these existing conditions. The sixth team gave a slide show.

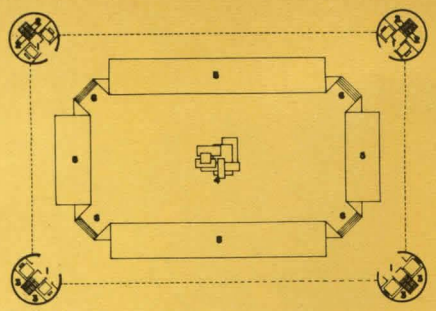
Those that accepted the environment "as is," conceded that the new town was *an extension* of the old, and as liable to the same illnesses that have created today's urban crisis. They employed present-day technology, and turned the idiosyncrasies of our environment to educational advantage. In so doing, they evolved solutions that could be put immediately into operation.

Following is a brief synopsis of sites, programs, and design solutions evolved at Rice.









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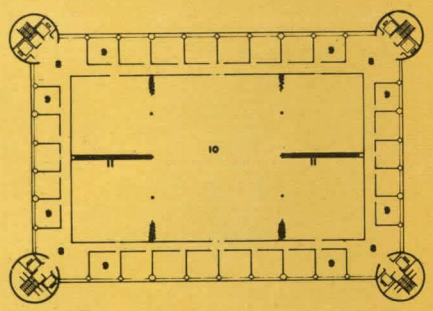
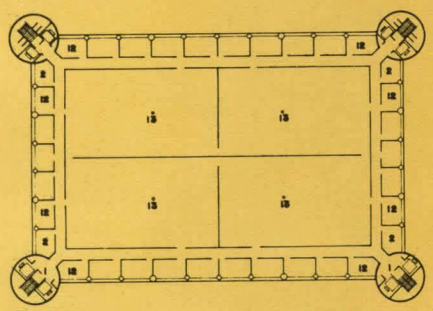
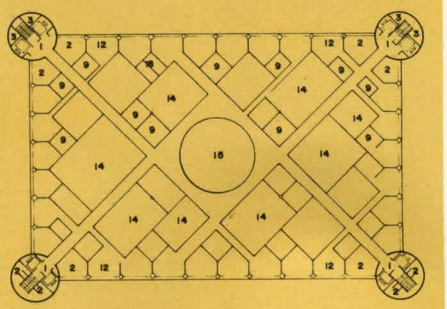


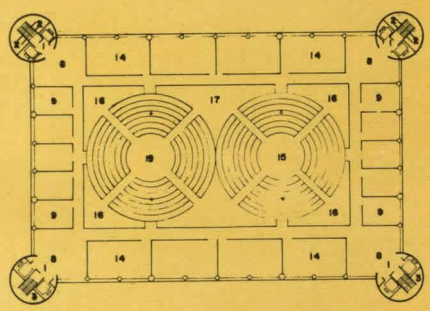
LECTURE



SHOPS

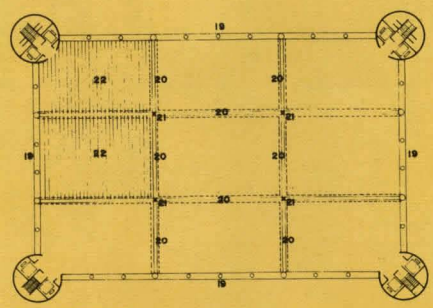


MELD

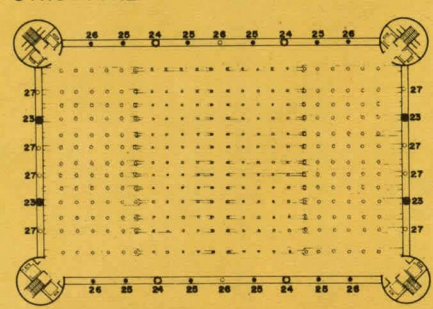


CARRELS

1. ELEVATOR
2. TOILETS
3. LECTRICAL DISTRIBUTION
4. CARREL SCULPTURE
5. LAWN
6. STONE STAIR
7. SUNKEN COURT
8. LOUNGE
9. SEMINAR ROOM
10. LECTURE HALL
11. SLIDING DOOR
12. OFFICE
13. SHOP
14. CLASSROOM
15. CARREL THEATRE
16 STORAGE
17. CARREL PREP.
18. AUDIO VISUAL STG.
19. EXTERIOR PIPE TRUSS
20. CROSS TRUSS - 13-15 FL.
21. COL./ TENSION ROD
22. STEEL JOISTS
23. A/C SUPPLY RISER
24. A/C OTHER FLOOR
25. RETURN AIR
26. PLUMBING RISER
27. ELECTRICAL RISER
28. DISTRIBUTION DUCT



STRUCTURE



MECHANICAL

Educational towers, constructed of steel pipe to utilize the production facilities of the new steel mill, would house school facilities and corporate offices. The towers would be surrounded by single-family lots.

Towers' school facilities would be available 24 hrs a day, serving students at high-school level and above, including adult education. They would form the coordinating, programming, and administrative nuclei for the educational activities of all age groups.

Rendering and elevations made by the Colbert group (facing page) show a typical tower surrounded by residential housing. Details (facing page, bottom) suggest ways of integrating mechanical and structural systems. Plans (this page) show the proposed school facilities; the floors above these would house corporate offices.

EDUCATION IN STEEL

A new town developed by a major steel company in relation to a new steel mill about 30 miles east of Houston. An initially dependent town that will eventually develop into a self-contained satellite of Houston. The projected population is 150,000. The town will accommodate a high percentage of blue collar workers in a low-density residential water-oriented community.

Following is a synopsis of the program submitted by Dr. Albert Canfield and Dr. John E. Tirrell:

(1) If education is to prepare people for happy, productive lives, gainful employment, and to participate in civic and community activities, then it must provide contacts and experience that will optimize the achievement of these goals.

(2) The traditional practice of using educational facilities for the entire educational job must yield to spreading education among the community, so that it becomes an integral part of community living and the personal growth of the citizen.

(3) Modern technology permits instantaneous interchange and transfer of information. Education as a social process must use technology in all its forms and potentials.

(4) The educational evolution of programming instructional material makes possible improvement in the utilization of self-instructional devices. The utilization of programming principles, small learning steps with frequent success and avoidance of failure with repeated review, allows the extension of education into the home, factory, and office.

(5) Education to be planned in all its forms, programming instruction for use by learners in a wide variety of environments, frequent opportunities for learners to assist in the learning process of others, emphasis upon education as a continuing element in life, and a maximum utilization of all community facilities.

(6) Utilization of home study through portable packages, specialized facilities for occupationally related training in major business institutions and service agencies and the use of older groups to assist in the training of the younger.

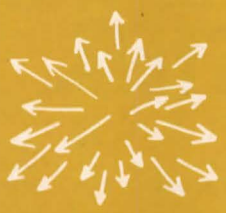
(7) Because of the relatively low group interdependency in the work environment, and the size and magnitude of the plant operation, feelings of personal meaning-

NOW

PROPOSED

THE CITY

The center of Colbert's town is shared by the "anachronism" — the single-family dwelling — and the steel towers. The town is designed to be active at all hours. The automobile is accommodated below grade and the pedestrian above grade, with linking vertical connections. The town is designed to create centripetal, inward forces, in lieu of the centrifugal, outward forces as in the case of Los Angeles and Houston.



THE NEIGHBORHOOD

PLAZA PLAN

lessness are apt to develop, particularly in the nonmanagerial and nonprofessional groups. This need, which is not met in the work environment, should be considered in the recreational and cultural activity of the town and should relate directly to the over-all educational activity.

(8) No differentiation of library, art museum, parks, recreation and the educational activity of the community.

(9) Concern for production, inventories, and general stature of the economy will be the primary producers of anxiety because of the general background of the citizens. It is anticipated that the upward thrust of most of the citizenry will be toward professional, rather than managerial occupations.

(10) College training will be pushed by parents. Educations will be viewed as something valuable in and of itself.

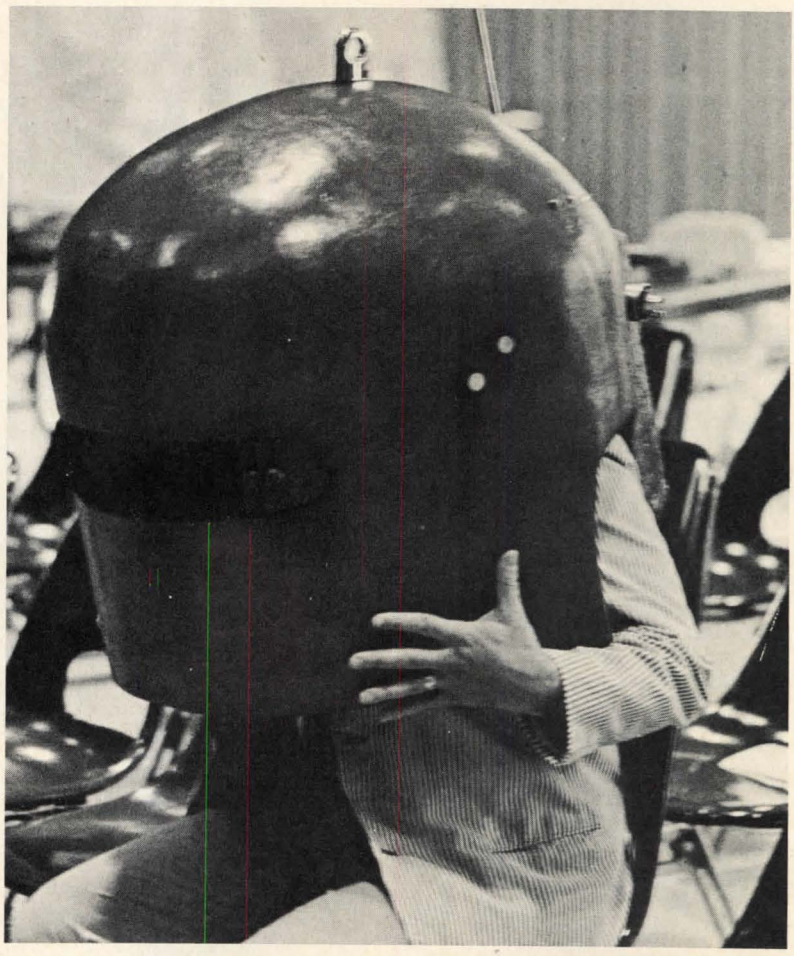
(11) A great portion of the educational process can be accomplished through home consoles, and through self-study utilizing carefully and professionally developed sequences of lesson material.

Design Solution: Piped Education and the Head Carrel

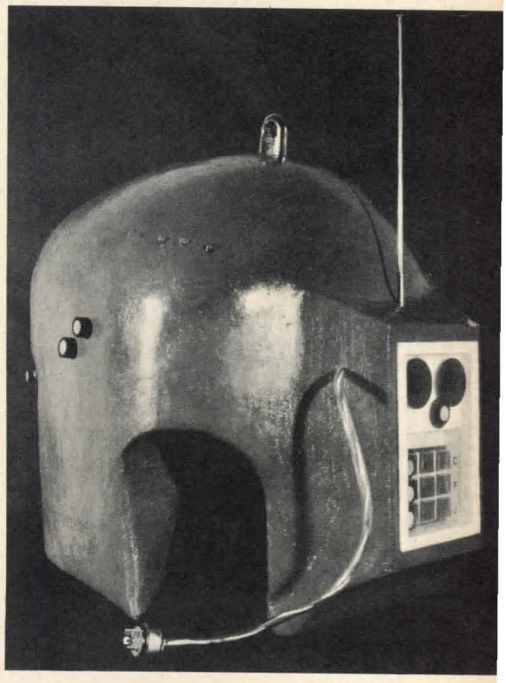
The largest single monument, and the smallest self-contained educational mechanical device were designed by the group of students headed by New Orleans architect Charles Colbert.

This new town design sought to solve educational problems by organization of the community. Beginning school grades are left dispersed, with education centralized at the high school level and above. The solution is not the reorganization of the educational system through new devices, but the solidification of the community around education by drawing the town from its periphery and pinning it in the center with combined corporate-education towers.

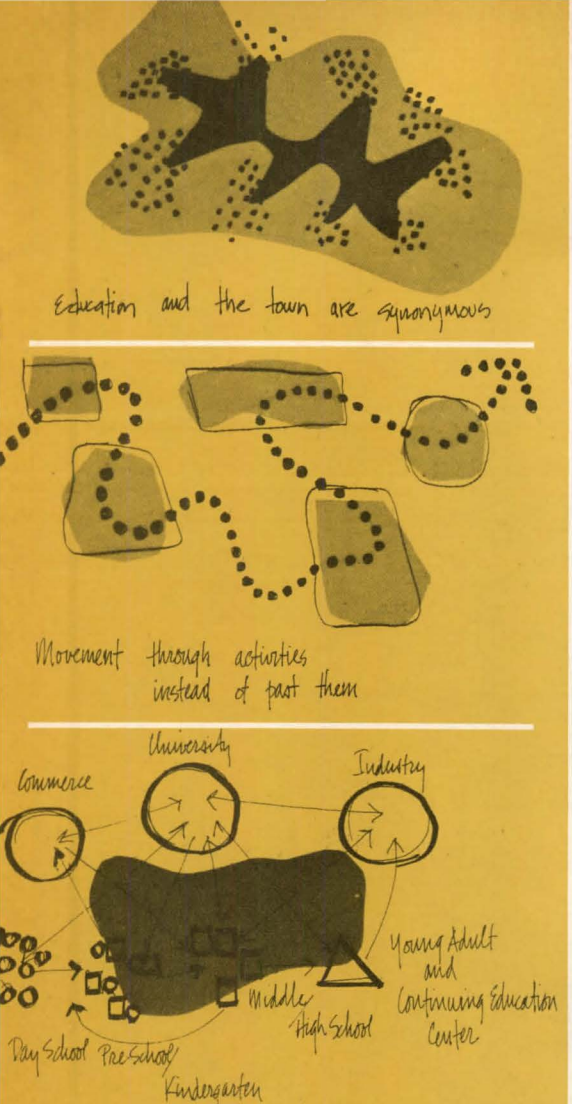
Colbert's group conceived education combined with big business. Although it might constitute an education to learn about big business, this does not seem to have been the prime objective of the Tirrill and Canfield program. The educators specifically stated that learners would, because of the nature of the steel industry, be oriented away from it toward professional rather than managerial occupations. Therefore, the close relationship between corporate offices and school seems less desirable than it was considered in this design solution. The Colbert group's new town design is as much corporate as educational hardware.

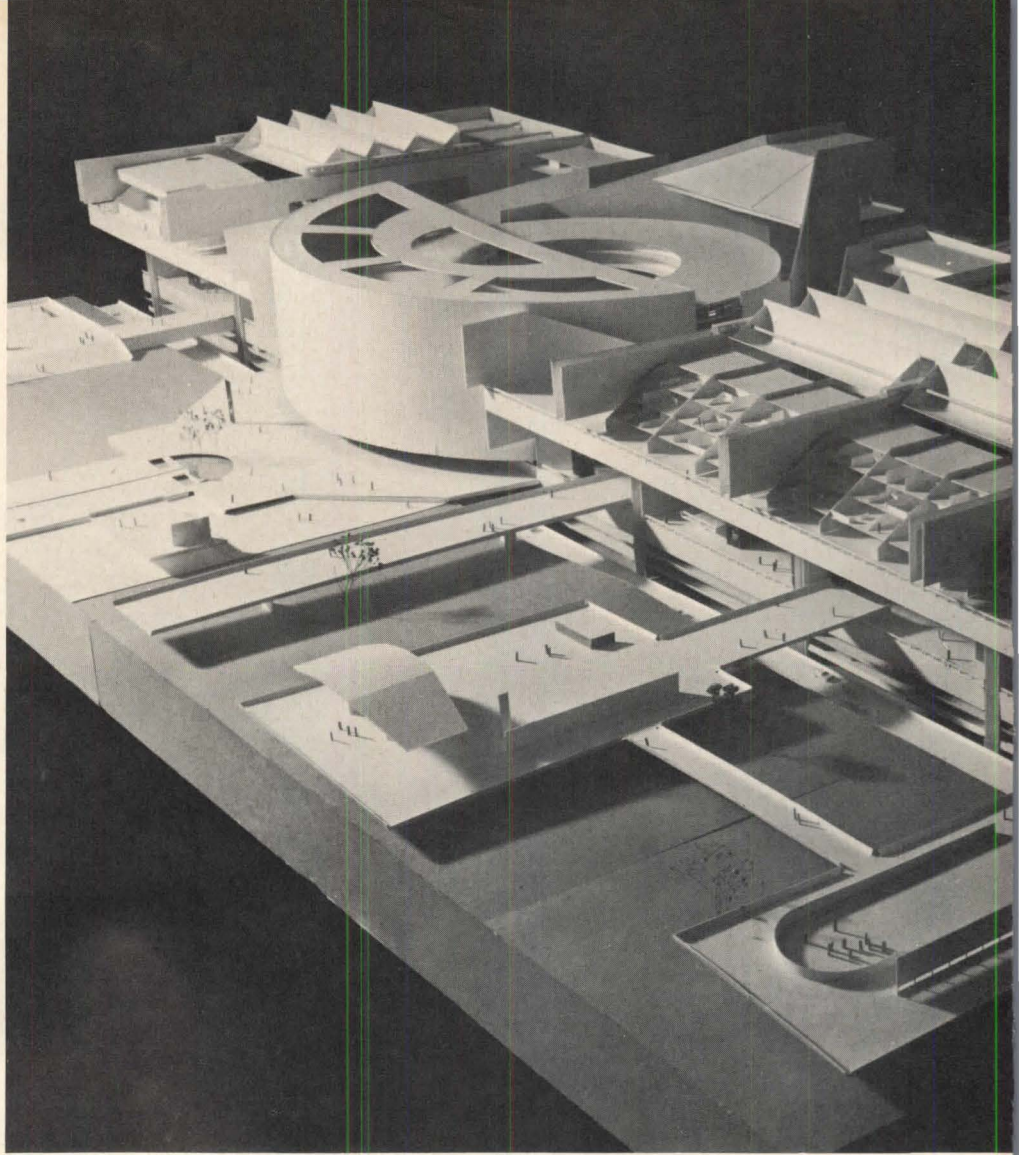


Photos: Courtesy, Rice University



The shoulder carrel would not weigh more than 20 lbs, and would have its own power source. It incorporates instructional media of all kinds: TV, tapes, recordings, computer connection, two-way radio, telephone, slide projector and screen. The carrel also provides environmental control such as cooling, heating, ventilation, and lights. As the architect notes in somewhat of an understatement, it provides "the ultimate in eyeball-to-eyeball teaching." Colbert also suggests that the carrel might eventually be replaced by cerebral electrodes installed by a physician at birth, which, one presumes, would make dropping out of school a real headache.



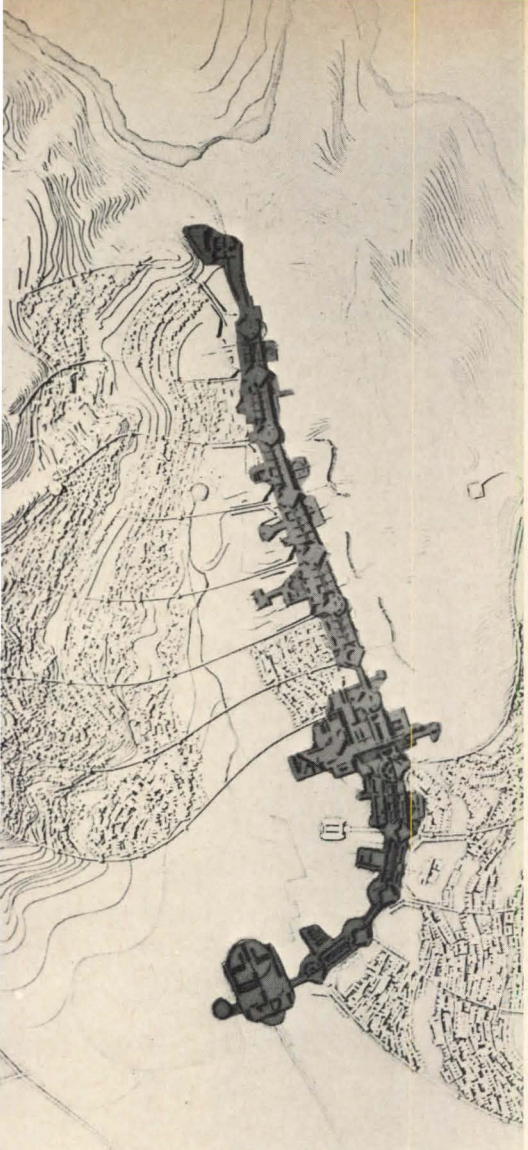


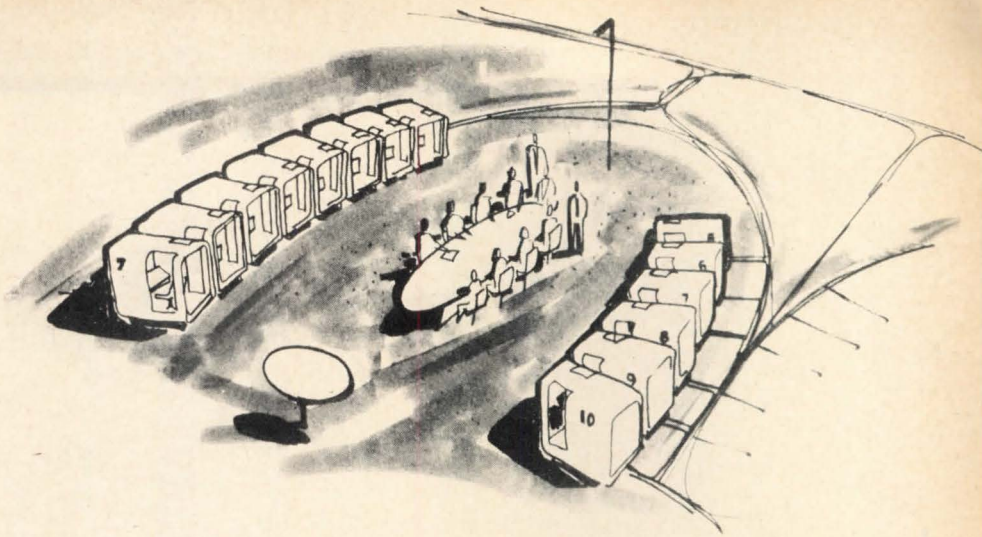
Kennon's educational plan is one of movement linking "town and gown," as shown in these schematic sketches. The spine of the plan is the Educational Concourse, which has the bustle and vitality of a surburban shopping mall. Commercial and community facilities would be distributed along its length, creating a grand mix of facilities. The town's residents would encounter these educational options on foot or travel to them in their carrel cars.

UNIVERSITY

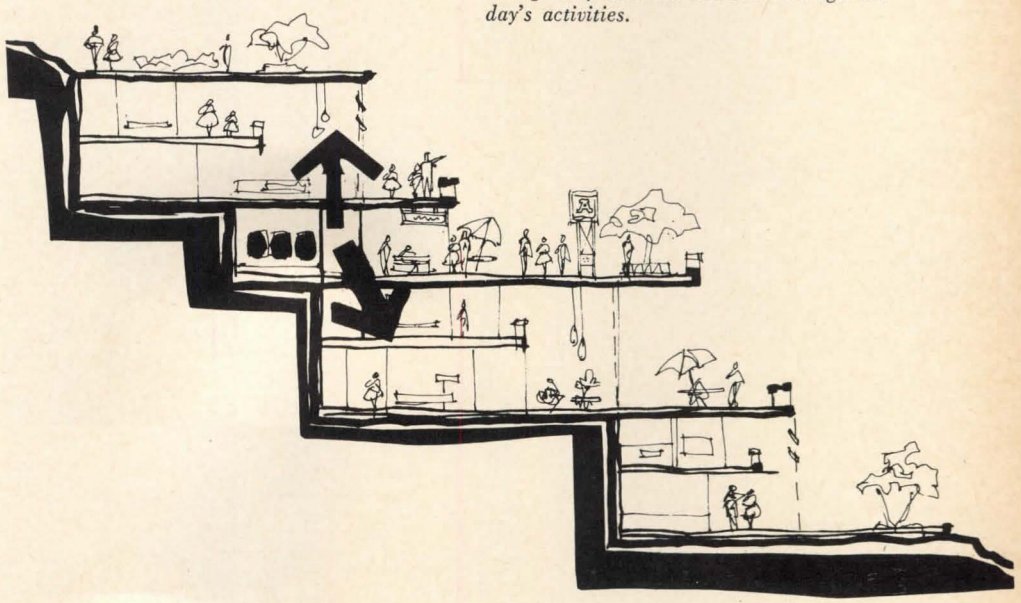
A new town, theoretically proposed as a permanently dependent satellite 30 miles east of Los Angeles, would have a population of 75,000. The new state university is to be located adjacent to the town, which is of a low-density, residential character. The automobile would be restricted to the residential areas, with local transit to community facilities accomplished by using a bicycle or walking.

New community colleges and state universities are being constructed with commerce, industry, and housing developing haphazardly in their wake. In this program, supplied by Dorothy M. Knoell, Programmer for the State University of New York, the university is the generator of community services. The business of the town is education, and the traditional separation of "town and gown" is broken down by the university assuming direction and leadership of the new town. The en-





Computerized carrel car operates on electric track. It is an adjunct study cell, versatile enough to follow the resident through his day's activities.



SIRED TOWN

tire town hinges on its educational hardware.

In the Knoell program, industry and commercial zoning together account for only 9 per cent of the total acreage of the new town, with 16 per cent utilized for public right-of-way. The topography of the area tends to dictate the land use. Good housing for the non-student university population is a first priority, followed by public educational facilities, supporting services, shopping, and other facilities. The university could build and operate its own supporting facilities for the staff if the community fails to provide them.

Design Solution: Optional Education

The group, headed by Houston architect Paul Kennon, designed a megastructure in which the integration of community and educational facilities is an integral part of the structure. The new town is a grand mix of society, industry, commerce, and education.

This interaction is achieved by placing all facilities in a central "Educational Concourse," similar in structure to a suburban shopping mall. The concourse is no more than three minutes "Computerized Carrel Car" trip from the most distant dwelling in the new town. During the trip, the commuter may further his education in the carrel. Arriving at the mall level, the resident is tempted by a candy store arrangement of facilities juxtaposed among community facilities.

Kennon notes that transportation is the key to any city, and proposes five types: a carrel car, which is a local transit from each home to the educational concourse; mini-busses, which serve the village units and move people through the educational concourse; automobiles parked beneath the concourse; and railroad transit entering at the automobile level.

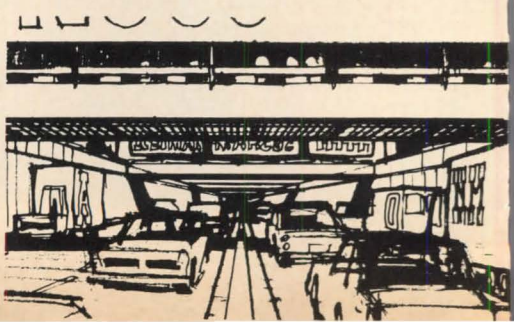
The carrel car is in reality a flexible space that can be attached to homes as study rooms, serve as a mobile study, docked at the school or drawn up in a protective semicircle like covered wagons to ward off the arrows of ignorance. The carrel car is nothing more than a super live-in attaché case, almost a permanent appendage of the learner.

As Colbert found it necessary to extend the learner's capabilities with a learning helmet for the single building, Kennon found it necessary to provide a separate room for his megastructure. Both men have concluded that the human body needs extensions or attachments to cope with their new towns as educational hardware. The most significant contribution of the Kennon group was to disperse education throughout their structure where it can become either a momentary or a full-time activity. To this end, they concentrated on placing educational options in the path of all the new town's citizens to be either sought out or stumbled over. The Kennon plan is a smooth-functioning, effortlessly operating piece of educational hardware.

TOWN PLAN

SCALE

Communication is encouraged through sequences of images that are not architectural. The inevitable commercial signs and billboards are anticipated. The idea of mixed media is appropriate for the high speeds along the strip developments. The architecture of the new town defines very little; hence the use of signs.



POP EDUCATION

A new town halfway between Washington, D.C., and Baltimore that is part of the East Coast megalopolis. It is initially dependent but eventually self-contained with a population of 150,000. It is to be privately developed with diverse employment characteristics utilizing the computer.

The educational philosophy and specifications as outlined by Carol Lubin of Simon Enterprises and Ronald W. Haase, Architect and Educational Consultant of New York, calls for a library-centered educational system that will provide for every age and economic level and the varied artistic, cultural, and technical requirements of the total population. Although the town is self-contained, its education system must take into consideration both the facilities and the requirements of the two major cities by which it is bracketed. They will affect its growth rate and the ultimate way of life of its occupants.

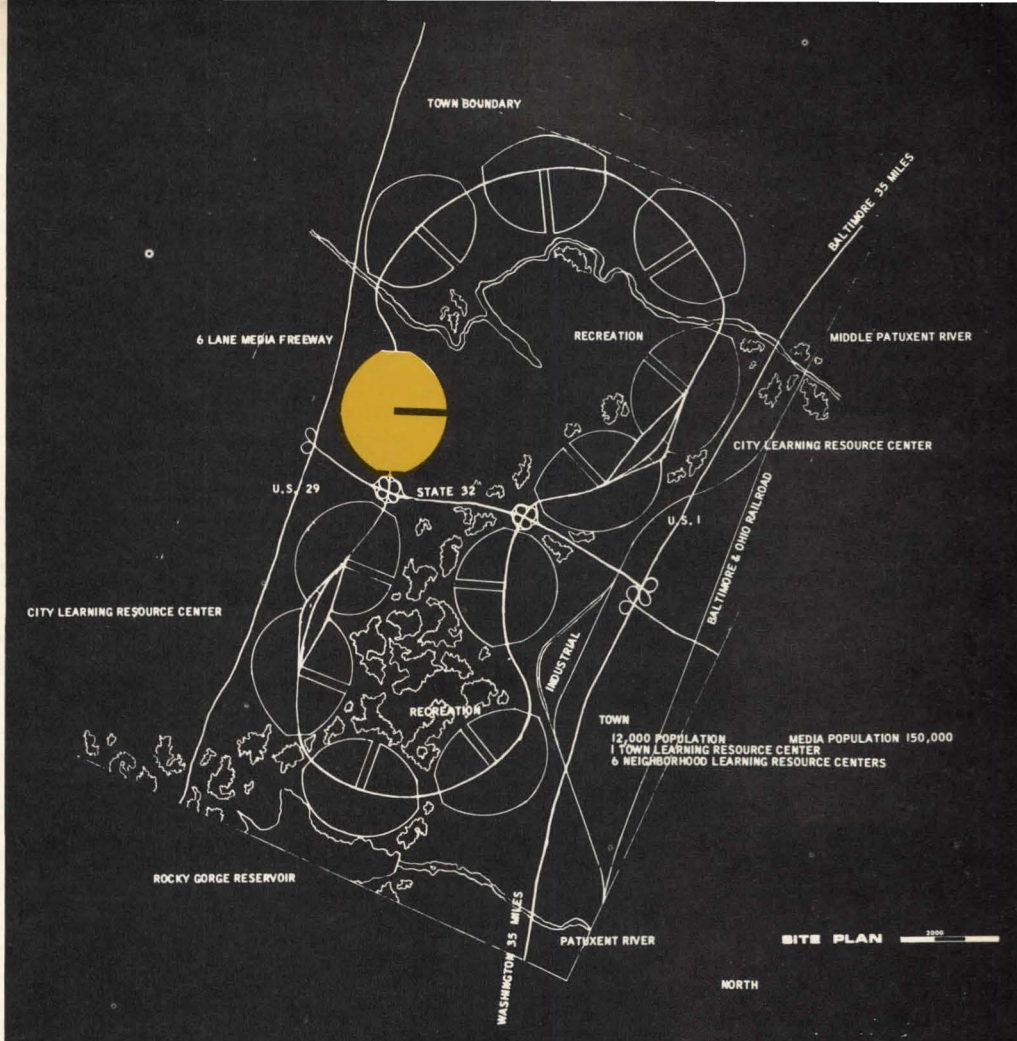
Facilities proposed by Lubin and Haase for the new town are as follows. Each neighborhood of 500 families should have a Learning Resource Center with facilities geared to the needs of the small children in the neighborhood. They would also provide training in early childhood education and programs of special concern to young mothers or retired persons seeking opportunities for study on a part-time basis near their homes.

The Neighborhood Learning Resources Center would be accessible 24 hours a day.

The center facilities could be enlarged by the use of both mobile visiting units and closed-circuit television. Special plug-in areas for bookmobiles, artmobiles, scientific exhibitions, and healthmobiles to visit and service the neighborhood would be provided.

Central service stations would be located in each block or cluster of 40 or more homes where television and teaching connections and other teaching facilities can be used at any hour.

The Town Learning Resources Center is

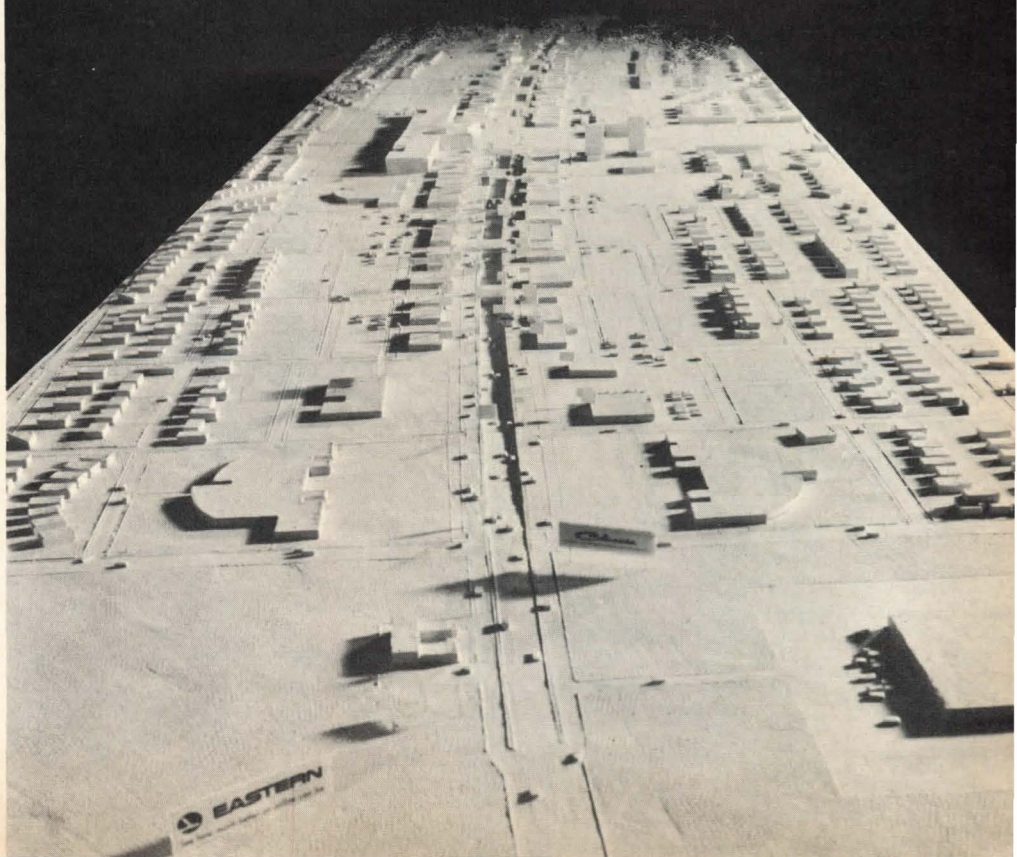


The communication educational strip is the generator of the city.

Residential grids are residual. The penetrations of the strip within the grids and the elongations of its borders increase exposure between public and private areas.

Only the generating roads and some of the school's Learning Resource Centers are originally designed and "tasteful." The adapting elements, private and public, are anonymously designed and within the realm of the developer. The generating structures of the town are communal and cooperative. The anonymous structures are individual and competitive.

The open-end strip allows phased growth. The character of the strip changes between its edges and along its length. The main street, near the center of town, is accessible from pedestrian walks. Toward the edges of town, the strip becomes totally vehicular.



located and designed for initial use by as few as 250 families, but adaptable to meet the expanded educational needs of a town of 3000 families encompassing all age groups.

Senior Learning Resources Centers provide the equivalent of high-school education.

The City Learning Center includes major buildings that serve as visual symbols and focal points of intellectual, artistic, and scientific activities and provide the resources for higher education and larger scale community activities.

It is equipped to provide educational programs at the college, university, and postgraduate levels.

Branch facilities are also included in the industrial areas, with special rooms designed for industrial experimentation and with areas for educational recreational use by persons working in industries. This includes teaching machines and television and reading rooms.

The educational development of the new town is planned to be carried out in stages as the city grows.

Design Solution: Education as a Commercial Strip

Philadelphia architect Robert Venturi and his group put educational facilities in strip developments and interwove them with commercial and movement systems. The communication educational strip is the generator of Venturi's new town. It is do-it-yourself educational hardware. Educational facilities are the pins and pivots that make it move. They are temporary hardware that can be unfastened and relocated to keep the community swinging.

The Venturi solution is anti-Reston. In Venturi's words, it provides "an exciting, not too safe walk to school." It is a kind of Walt Whitman, "Song of Myself," where the learner speeds by the blinking tubes and imbibes the classics.

Education is placed along the way of the learner, but unlike Kennon, Venturi did not construct monumental educational hardware; he chose familiar, well-trodden paths. Venturi makes education easy for the greatest nation of consumers in the world. Education is another consumer product placed to sell.

1

Chart at right shows Price's "Kit of Parts." Photos illustrate some possible applications of these tools: ***(1)*** *Wrecked automobile suspended below an elevated expressway is a grim reminder of the value of safe driving.* ***(2)*** *Modified highway signs become traffic monitoring stations and information screens.* ***(3)*** *Industry explains what it is doing.* ***(4)*** *A portable projection screen allows educational films to be shown.* ***(5)*** *Backs of bus seats create learning carrels.*

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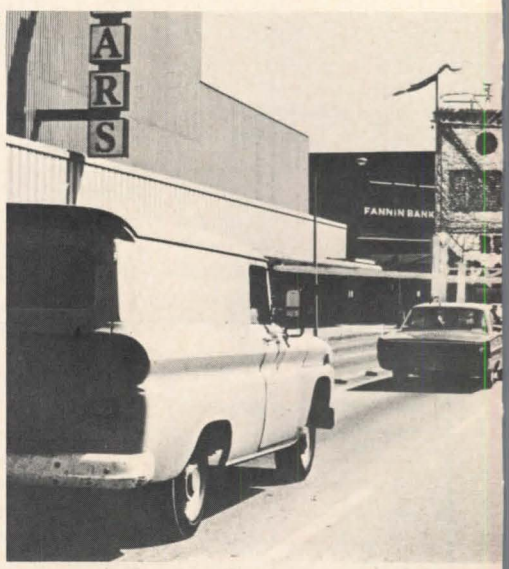

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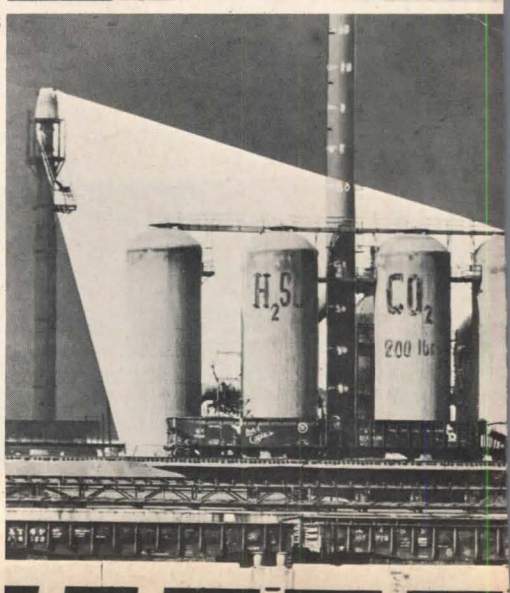

TOTAL LEARNING ENVIRONMENT WITH A KIT OF PARTS

A new town developed with Federal funds in conjunction with Federal Atomic Research Facilities. It is a satellite city 30 miles southwest of Chicago, located on a major radial freeway with a highly educated population of 220,000. The population is predominantly professional, semiprofessional, and skilled. It is a residential district of medium density.

The educational plan proposed by Canfield and Tirrell is technologically oriented with centers around educational nodes. It is planned to serve a relatively limited population growth in relatively independent settings. Nodes are for learners to check out, study, and proceed from unit to unit of study as they progress from course to course based upon their individual ability. Teachers serve as producers of materials to meet individual learner needs.

Home-study units, which, coupled with telephone or television tutoring, provide the foundations upon which expanded uses of technology can be based.

The anticipated residential development of this new town includes 14 neighborhood units, each of which is about 1 square mile in area. The educational mode in each unit serves the immediate residential area and is within virtual walking distance of all residents and citizens of the area.

Design Solution: Sprawling Education

The team, headed by Cedric Price, English architect, concentrated on designing a "kit of educational parts," assuming that someone else would structure the town and build the buildings. They concentrated on a first set of tools together with a development plan sufficiently indeterminate to encourage varied and possible diverse development nodes. The prime objective was to suggest methods whereby artifactual conditions would be designed to encourage and increase exploitation of education by the new town's occupants through a range of choice. The objective is the acceleration of decentralization and fragmentation.

Education conceived as a service during

	RADIO & T.V. TRANSMISSION EQUIPMENT		GROUP SHELTER (PORTABLE ENCLOSURE)
	RADIO - RECEIVER		PORTABLE CANOPY
	RECEIVER-MONITOR SCREEN (MICRO-WAVE)		BLEACHER SEATING
	TELEPHONE - HEADSET		PORTABLE VIEWING SCREEN
	PORTABLE POWER PLANT		ADJUSTABLE DECKING
	PORTABLE SOUND EQUIPMENT		STORAGE FACILITIES
	SLIDE &/or FILM PROJECTION EQUIP.		LIFE CELLS (MOVEABLE)
	PORTABLE LIGHTING EQUIPMENT		INDOOR DISPLAY UNITS
	B.A.S. PORTABLE CLINIC		FOOD PREPARATION FACILITIES (MOBILE)
	ELECTRONIC DISPLAY PANELS		WIND SCREEN (PORTABLE & ADJUSTABLE)
	ELECTROMAGNITIZED MIST SCREEN		LIGHT REFLECTORS (PORT. & ADJUST.)
	COMPUTER INSTALLATION (T.B.)		SOUND DIFFUSER (PORT. & ADJUST.)
	CONFERENCE (SUPER-TABLE)		EXERCISE BOXES
	SCHEMATIC LOCATER (ORIENTATION PANEL)		INFANT BOUNDARIES (PORTABLE)
	COMMERCIAL PURCHASE CONSOLE		O.A.S. BUGGY (MOBILE)
	ENVIRONMENTAL CONTROL UNITS		SANITARY FACILITIES
	T.V. & RADIO RECEIVER (NETWORK)		REST AREA - LOUNGE
	TAPE RECORDER & PLAYER		COMMERCIAL PRODUCT DISPLAY
	REMOTE ACTIVATION CONTROL UNIT		EDUCATIONAL MAT'LS. (PERSONAL EQUIP.)
	PORTABLE CALCULATOR		PRIVACY CONTROL EQUIPMENT
	CABLE PATH (ELECTRONICS)		

4

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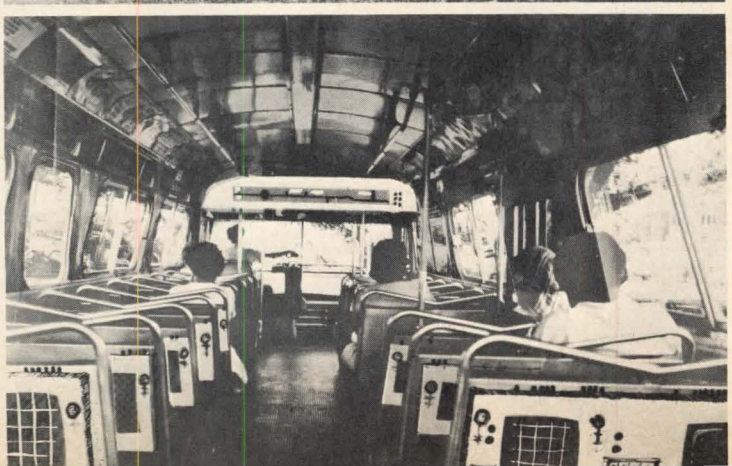
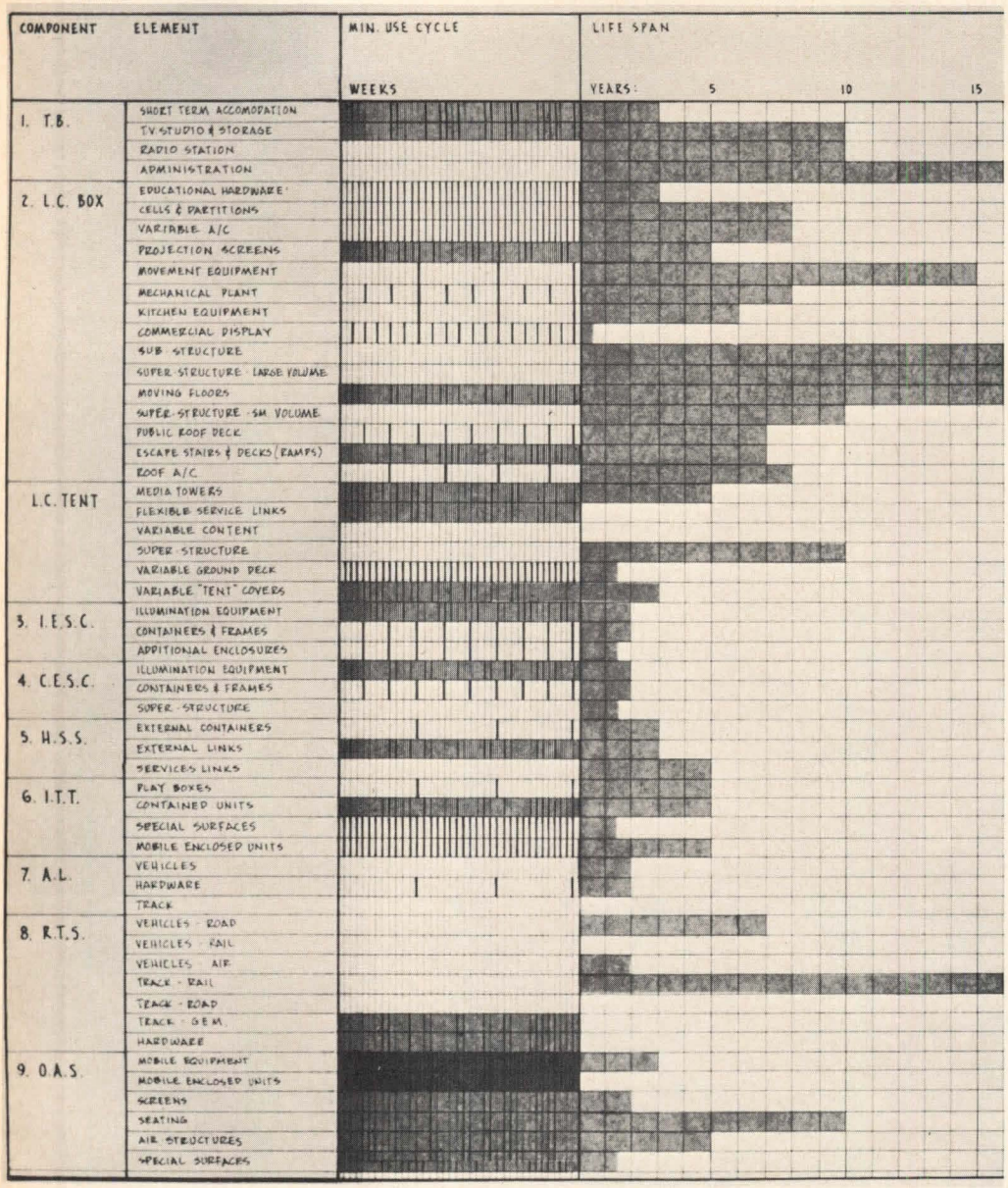


STATEMENT BY PRICE

"The concept of a finite town totally conceived at a single moment in time is considered both intellectually derelict and socially irresponsible. . . . The built environment is likely to become an increasingly restrictive and abrasive content of total life if continuing attention is paid by administrators and their consultants (architects, planners, and romantic social scientists) to its assumed permanence rather than to its shortening socially relevant life. . . . The provision of educational facilities, in physical terms, should not be tailored to any particular requirements made by any particular authority. Rather, such provision should enable a range of educational patterning to evolve which is wider than previously possible. In architectural and planning terms, this requires an avoidance of the providing of a single comprehensive physical dispenser unit.

"No single set of buildings or mechanical facilities will suffice to the year 1980 much less the year 2020. Therefore, the primary object ceases to suggest whereby town planning and individual architectural conditions can be designed so as to encourage an increasing expulsion by society of the range of choices available at any one time. So freeing the path, we will let society play with what they have got."



Educational Parts: Their Use Cycles and Life Span

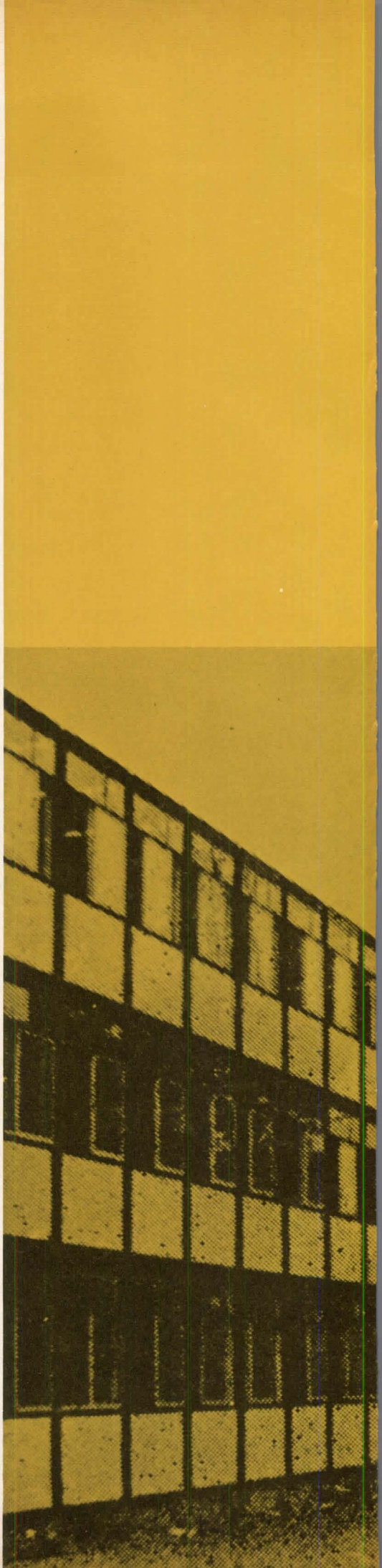
T.B.: *Town Brain*
L.C.: *Life Conditioner*
I.E.S.C.: *Equipment required additional to E.A.V.E.T. (Electronic Audio Visual Equipment and Techniques)*
C.E.S.C.: *Commercial/Educational Show Case*
H.S.S.: *Home Study Station*
I.T.T.: *Infant Teach Toy*
A.L.: *Auto Link*
R.T.S.: *Rapid Transit Servicing*
O.A.S.: *Open Air Servicing*

the total lifespan demands that it constitute a total service industry. Price's educational facilities would approach in expertise the simpler and more anonymous artifacts of the society.

The linking facility of these diverse elements is the town brain (the town's master communications center). It feeds information to the automobile and to rapid transportation, and also services the home and the educational nodes.

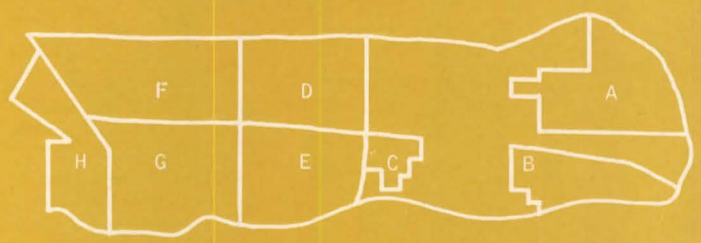
The scheme locates housing away from the major inter-city links. The key elements of the town planning is a communication network, which is essential to the first stage to establish the primary bridge. The final stage of the new town is not a completed network, but the start of a properly fed and balanced sprawl.

Price's educational hardware is conceived in terms of time and growth. It is an extremely flexible hardware with a built-in obsolescence, a self-destruct mechanism to be triggered by changes in educational philosophies.



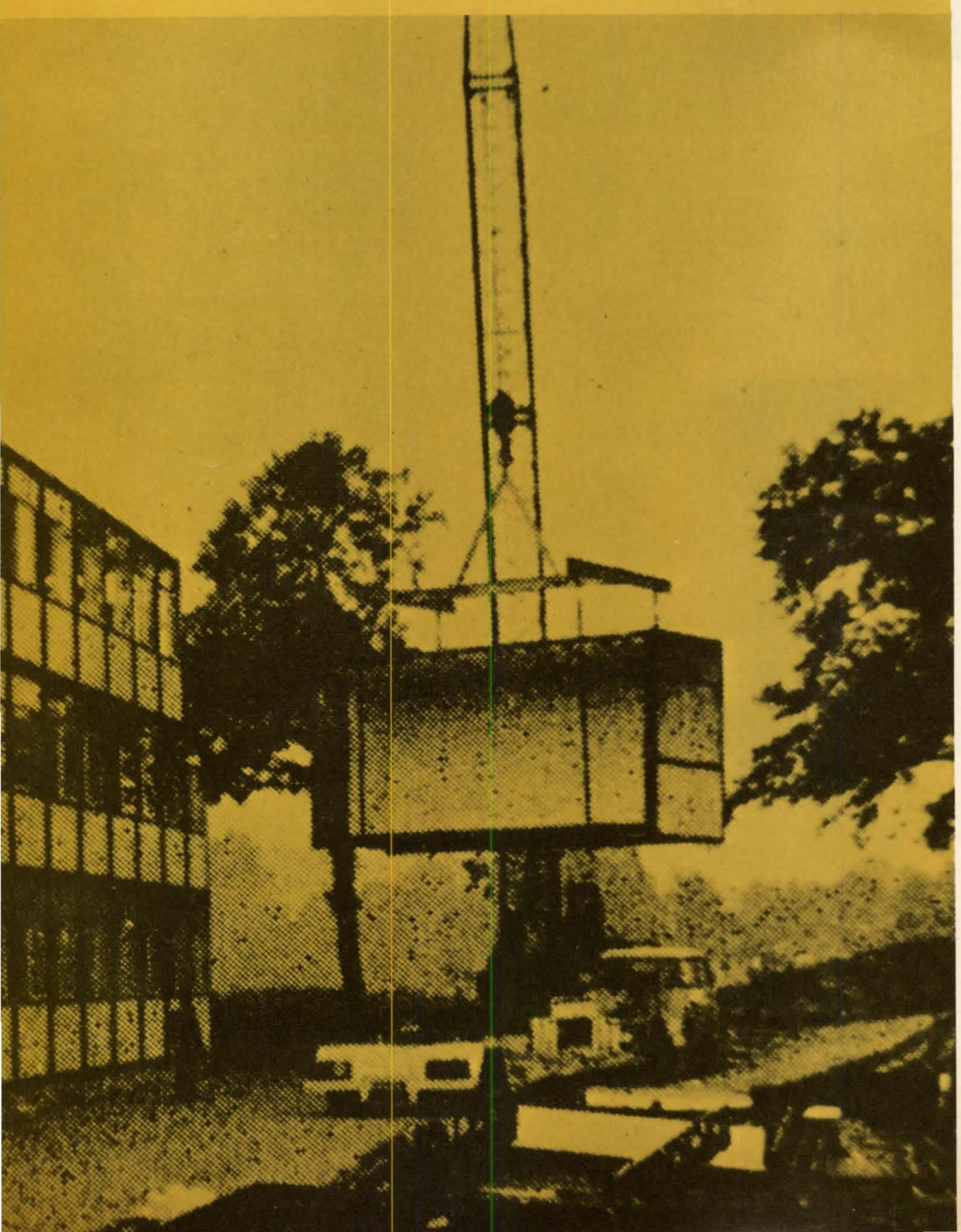
LOGISTICAL DISTRIBUTION

5-10 mph	LOOP STREETS	lead into
10-20 mph	COLLECTOR STREETS	lead into
30-40 mph	ARTERIALS	lead into
60-70 mph	EXPRESSWAYS	



		population	individual study units	child care centers	home centers
neighborhood	A	6396	125	42	3
	B	2217	43	15	1
	C	1282	26	9	1
	D	2203	43	15	1
	E	2181	43	15	1
	F	2793	55	19	2
	G	3635	71	24	2
	H	2181	44	15	1
Washington Street		2500	300	--	--
Total		25388	750	154	12

Community diagram showing logistical distribution of mobile education units.



NEW TOWN IN AN OLD TOWN SITE

A new town within an old town. An existing deteriorated community to be restructured. The area of the new town is adjacent to downtown Houston, with a mixed population of 50,000, consisting of Mexican, white, and Negro citizens. It is bounded on two sides by major movement systems with an adjacent city park.

The program was proposed by Dr. Cyril G. Sargent and Judith P. Ruchkin of City College, the City University of New York, and calls for an experimental approach. All participants are learners, with no age barriers. A long-term student advisor contact, geared to varying individual learner capabilities, is to be established.

To rehabilitate the existing deteriorating community, Sargent and Ruchkin propose that the uncaptive or free learner approach be employed in a linear community. The approach has two facets: First, it must combine a large group of individual and isolated educational and community reforms already in existence, and, secondly, it must contribute new themes of its own.

Following are some of the new themes to be introduced:

(1) Experimental approach.
(2) All participants to be learners.
(3) No age barriers.
(4) Transitional emphasis in preparation for successful learning.
(5) Learning by teams or individuals.
(6) Restructuring of learners' time.
(7) Long-term tutor adviser contact.

(8) Varied learning rythms.
(9) Leisure condoned.
(10) Dispersed learners.

In elaboration of their program, Sargent and Ruchkin specified that home centers in the community school play specific roles that support individual learning needs, provide guidance with the aid of electronic data retrieval and feedback, and encourage social development and train tutor advisers.

The purpose of the linear community school is to foster development of personal qualities of independence, creativity, imagination as well as sympathy, reliability, and responsibility. In the community school, the learner is finally freed from daily and externally imposed and predetermined requirements for assignments, book reports, languages, and the like. He becomes free to search, to investigate whatever interests him, and to seek aid when and where he needs it.

Design Solution: The Social Experiment

Architect Thomas Vreeland and his group designed their project as a social experiment city. The community at large serves as the setting for a controlled experiment by a group of educators and social scientists.

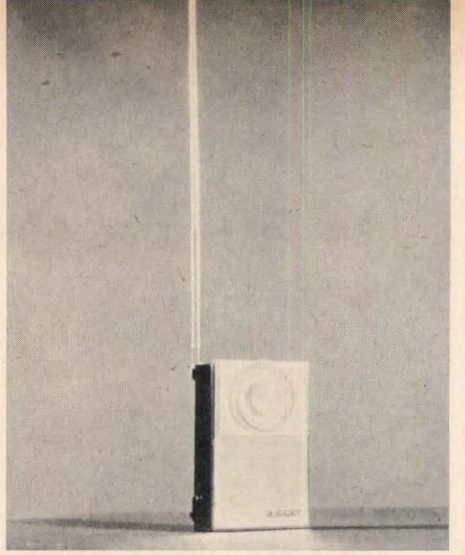
The system designed is all-pervasive, to touch the community unobtrusively at as many points as possible. It works by feeding information into the community as a primary function and receiving back information about the community for scientific analysis. It forms a sensitive communications network.

The network, contrary to conventional educational systems, is noncompulsory in order to make the responses to it as natural as possible. It is capable of functioning as a major regenerative force in the life of the community, a force capable of effectuating gradual social, economic, and cultural changes.

The system is fluid, easily adapted to changes in the environment and social structure. Designed to reach everywhere into the community, it is readily available and easy to use. Teachers released from teaching chores at the community level are free to counsel and advise more effectively at the central institutional unit.

The educational process is broken down into several categories and presentations, films and tapes at one level, which are dispensed at the control center, and individual groups, teachers, and students at another level with individual study. It forms an invisible part of a larger communication network through the new town.

1



Vreeland's chart (facing page) lists a complete range of educational hardware from the central monitoring and programming broadcasting facility to the individual hand-held, transistorized radio receiver. Photos (below) show some typical hardware: ***(1)*** *Individual hand-carried unit.* ***(2)*** *Central control.* ***(3)*** *Child care center.* ***(4)*** *Individual study unit.* ***(5)*** *Drive-in study unit.*

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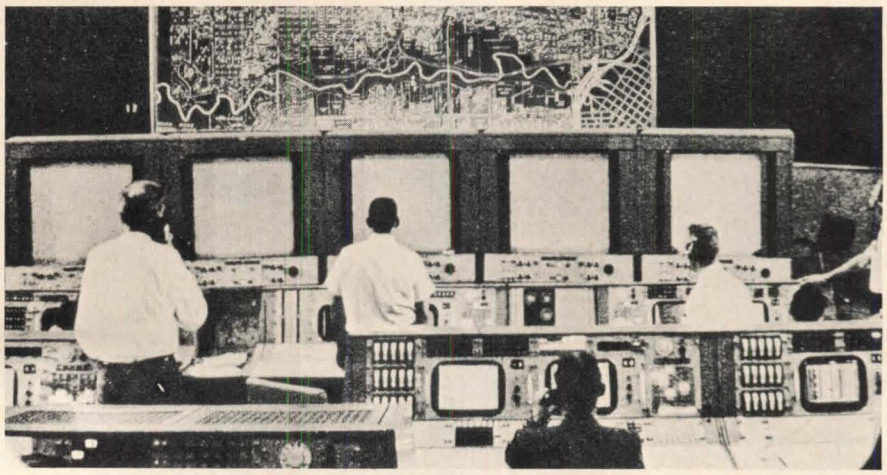

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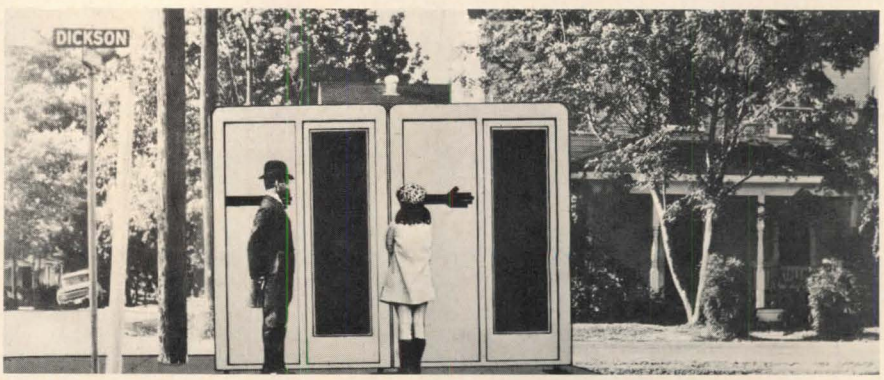

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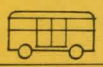
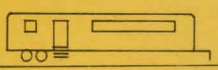
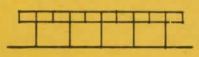
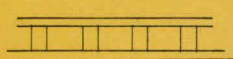
CODE	COMPONENT	NOMENCLATURE	DESCRIPTION	QUANTITY
		individual hand-carried unit	battery-powered, transistorized radio receiver only	7500
		individual study unit, mark 1	cable-connected to central computer bank remote-control console, video screen, card and tape reader soundproof, lightweight, transportable enclosure	300
▪		individual study unit, mark 2	identical to mark 1 except for weatherproof enclosure	450
		portable conference unit	aluminum weatherproof construction 16' diameter, lightweight cylinder, transportable fixed center-pedestal table, 15 seats, blackboard	300
		mobile teaching unit	motorized truck equipped to project pre-recorded video-tape programs driver operated	100
▬		child care center	12'x60' mobile home body tandem-coupled side by side, forms 24'x60' instructional space can also be used singly	154
■		prefabricated home center	SCSD school construction system, fully demountable integrated lighting, ceiling, thermal control and partition systems complete with fixed equipment	300,000 s.f.
■		prefabricated adult learning center	Roux-Dorlut incremental, multi-story building system walls, floor and ceiling factory assembled into transportable cell 1,200,000 s.f. constructed space: 960,000 s.f. residential; 140,000 s.f. commercial; 100,000 s.f. educational	100,000 s.f.
▮▮▮▮		drive-in study unit	cable connected to central computer bank adjustable remote control console, video screen treadle operated	50
		voc-tec shop	Mes-Tex pre-engineered building system steel rigid frame, galvanized steel ribbed roof and wall panels shed only (shop equipment supplied by sponsoring industry)	125,000 s.f.
✱		control	central computer bank monitoring and programming center	1

Summing Up

At the conclusion of the Fete, its director, architect and professor William Tillman Cannady, told P/A, in summing up his impressions of the 12 days of intensive research by the 6 architectural teams, "The challenge to educators, architects, and planners is to inject new life into facilities for living and learning, to re-create a mix of ingredients which places options for a truly vital education within the reach of all students, 3 to 83."

For Cannady, the most exciting developments of the Fete were to be found in the work of architects Price and Vreeland, whose proposals demonstrated the potentials inherent in advanced electronic technology. He characterized their comprehensive employment of equipment as "an assemblage of advanced tools for education." "They foresee that, because of electronic technology, education may become a public utility, piped into every shelter," stated Cannady. He predicts a far-reaching effect on home design as a side result.

Cannady says that transportation will play an ever-increasing role in the education of the future. Thomas Vreeland's scheme of bringing schools to the student, thus establishing a beachhead for betterment of deteriorating communities, has great potential for education in all towns. The concept of turning commuting time into learning time will also be a factor, as Paul Kennon suggested in his "Carrel Car" plan and Cedric Price proposed in his Auto Links and Rapid Transit servicing schemes.

The Rice Design Fete studies will shortly be presented in book form edited by Professor Cannady and financed by the EFL, which also financed the Fete.

Technology and the New Town

The Rice Fete represents more than the comprehensive programs of the consultants, a year in preparation, and more than the intensive charette of 6 architects and 30 students, the equivalent of 5 years' work for one architect. In each program and in each solution, the marriage of technology and education were assumed without question. In each instance, technology for education had an influence on the forms the architects chose for their new towns, ranging from the radical personal-learning "Head Carrel" in an architectural educational monument to the dispersal of education throughout the town by technological means. Perhaps the most significant point was that there seemed almost an inverse ratio of "architecture" to educational technology. That is, where major emphasis was placed upon the learner's access to learning devices at every level from the town brain to the walkie-talkie, architecture, as exemplified by the "monument to the book," decreased in importance. On the other hand, with the major emphasis upon the "architectural environment," the technological devices decreased in importance. This, of course, does not imply that either is mutually exclusive, but it does point out that the architects did not rely upon buildings as necessarily the only educational "hardware."

THE SCHOOL SCENE: *CHANGE AND MORE CHANGE*

It can be seen from the examples in this issue that we are at a jumping-off point in the design and planning of schools. The tools at our command represent the greatest breakthrough in learning aids since Gutenberg. The potentials for schools to act as catalysts for the cure of social ills and the rejuvenation of center cities are at the highest point ever. "Public schools," Gyo Obata writes, "reach an enormous portion of a city's population either directly (the children) or indirectly (the student's family). Yet, the school systems of the nation's cities have been too little used as social tools in fighting the full range of urban problems." This pattern is changing. Obata notes that the multi-disciplinary team he heads for the Great High Schools Program "is aimed at uplifting and remaking the quality of urban life in Pittsburgh by working through its educational system." This connection of the schools with the nature and fabric of the community is as yet less evident in new towns, but the interest of imaginative developers such as Rouse and Simon in providing facilities for superior education will probably broaden to encompass more progressive educational developments in these places. Possibilities for the future are abundant, as shown by the results of the Rice studies.

The future role of the architect in the development of new places for learning will not be that of the designer making separate buildings in isolation from everything but the school board and its program. From now on, he will have to be deeply involved in every area that makes a school and that makes a school a major part of community life. Whether he acts as coordinator of a wide-ranging "team" of experts from many fields as Obata is in Pittsburgh, Rogers in Brooklyn, and SOM in Baltimore, or whether he takes on the continuing responsibility of designing and redesigning the school for its whole "life," as Larson and others have suggested, he will no longer be the design and planning man who comes in, bestows a school monument on the student body, and walks away with his fee. The operative word for the new architect of new schools is involvement. If that is lacking, a pretty building might be built, but it will be a lifeless and useless one.

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SPECIFICATIONS CLINIC

SURFACE MODIFICATION OF GLASS

BY HAROLD J. ROSEN

Discussion of a new process in glass technology that should lead to economies in the manufacture of heat-absorbing and tinted glass. Rosen is Chief Specifications Writer for Skidmore, Owings & Merrill, New York City.

A major breakthrough in glass technology occurred recently with the announcement by an English manufacturer, Pilkington Brothers Ltd., of a process called "surface modification." This process permits the manufacture of special glass, such as heat-absorbing or tinted glass, without interrupting the mass-production capabilities of modern glass-making facilities.

In 1959, Pilkington revolutionized glass-making technology with the introduction of "float" glass. To understand these developments and the effects on the economics of flat glass production, it might be well to review modern glass-making techniques.

Flat glass is a term used to include sheet glass, plate glass, float glass, and rolled glass. The first stage in the production of flat glass is the melting together of sand and other raw materials in a large tank lined with refractory materials that can hold as much as 1000 tons of molten glass. The process, once started, runs continuously, 24 hrs a day for about 3 to 5 years, or until such time as the tank lining needs to be repaired.

The major ingredients are silica sand, soda ash (sodium carbonate), salt cake (sodium sulfate), limestone, and cullet. Cullet is broken glass obtained from previous melts or the breakage that occurs in glass-making operations. The ingredients are fed into one end of a tank and heated to 3000 F. The molten mass is carefully refined as it moves slowly to the weir end of the tank. At this point, the molten glass may be made into sheet, plate, or float glass.

Sheet glass is formed by lowering a steel bar called a bait into the molten glass and drawing it up vertically through a series of asbestos-covered rollers. The drawing machine also works as a lehr, gradually annealing the glass. This drawing process gives sheet glass its characteristic waviness, although present-day quality control has reduced distortion considerably.

Plate glass is produced by rolling instead of drawing. The molten glass emerges from the end of the tank in a horizontal ribbon and is rough-formed between water-cooled steel rollers. The rollers control the thickness, and the ribbon of glass, hundreds of feet long, is conveyed through a lehr or annealing oven to relieve strains and stresses as it is cooled.

To obtain polished plate glass, the ribbon of glass is then ground simultaneously on both faces. This is accomplished by using iron discs, approximately 10 ft in diameter, and grinding with an abrasive slurry consisting of silica sand and water. This product is known as twin ground plate glass. Before the polishing operation starts, the glass is cut into predetermined lengths. These sheets of glass then proceed along a felt-lined bed and are rubbed and polished on one surface by felt-padded discs with fine rouge and water. The glass is then turned over so that the opposite face may be subjected to the same rubbing and polishing operation.

With the advent of the "float" process, the grinding and polishing operation, which is necessary to give plate glass its perfectly parallel surfaces, is eliminated. The capital investment in grinding and polishing equipment may represent 30 to 40 per cent of the total cost of a plate glass making facility. In time, when the grinding and polishing plants are phased out, the price of float glass will probably be reduced.

In the float process, the molten glass emerges from the tank in a horizontal ribbon and literally floats over a bath of molten tin while it slowly solidifies. This process produces an optically perfect glass of controlled thickness, thereby eliminating the grinding and polishing operations.

Until Pilkington's development of the "surface modification" process, the production of special glass such as heat-absorbing or tinted meant a shut-down of the tank and the continuous mass production of glass. This was required in order to add certain ingredients to the melt to obtain the characteristics desired.

With the "surface modification" process, Pilkington has developed a method of producing heat-absorbing glass or tinted glass without interrupting the manufacture of glass. During the period in which the glass is passing over the molten tin bath in the float process, metallic particles are carried into the glass to controlled levels and densities by an electrochemical process. Various combinations of metal particles such as lead and copper are deposited beneath the glass surface, and these contribute to the heat-absorbing and light-reflecting characteristics, while at the same time providing varying tints from gray to copper bronze.

Obviously, such a process would indicate that heat-absorbing glass produced by surface modification could reduce the cost of these special glasses, since it eliminates the cost of plant shut-down and changing of raw ingredients. In the future, more architects will be able to include the use of heat-absorbing glass in their designs because of this reduced cost.

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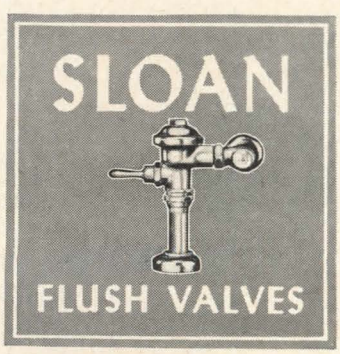

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MECHANICAL ENGINEERING CRITIQUE

HARVARD CENTRALIZES CONTROLS

BY WM. J. McGUINNESS

Electronic consoles control the indoor climate of 170 campus buildings. McGuinness is a practicing engineer in New York City.

Six years ago, this column reported on Harvard's first steps toward electronically controlling its subterranean steam-distribution system that served nearly 200 buildings (AUGUST 1962 P/A). The first stage controlled the North Yard, an area containing about one-third of the campus buildings. Now the other two-thirds are equipped for automatic monitoring.

Control centers in three locations — Langden Hall, Weld Hall and Holyoke Center — serve the major campus areas. Operators at these centers can start and stop fans, check and adjust space temperatures, monitor humidity readings in critical areas, and draw immediate attention to mechanical failures.

Tunnels that connect almost all the buildings used to be important for maintenance men to reach the innumerable valves throughout the heating system. However, the tunnels are now used only when the staff makes a routine maintenance check or occasional emergency repairs to equipment. Even these trips are influenced by the new control system, for the men are directed to points of trouble by shortwave radio signals from the control center.

On weekdays, each center acts independently, but at night and on weekends, control of all three yards is switched over to Weld Hall, from which point one man can operate the entire campus. The operator can dial any of a multitude of visual schematic diagrams on either of two small TV-type screens. As images of the circuits and equipment appear, pushbuttons are automatically coordinated with the corresponding diagram, permitting monitoring and manipulation of equipment at remote locations.

Development

In 1960, the North Yard was equipped for central regulation from Langden Hall. This proved to be such a significant advance in efficiency and savings that the South Yard was similarly converted in 1963.

It is perhaps natural that the central area, the original yard, was the last sector to give in to modernity. Its buildings, some of them over 200 years old, had already been updated with modern equipment, including, in many instances, provisions for cooling. It only remained to tie these facilities to a control center by an electronic network. These changes have now all been accomplished with no visible alteration or blemish to the appearance of such buildings as Massachusetts Hall, which was already 50 years old when General George Washington requisitioned it to house his troops.

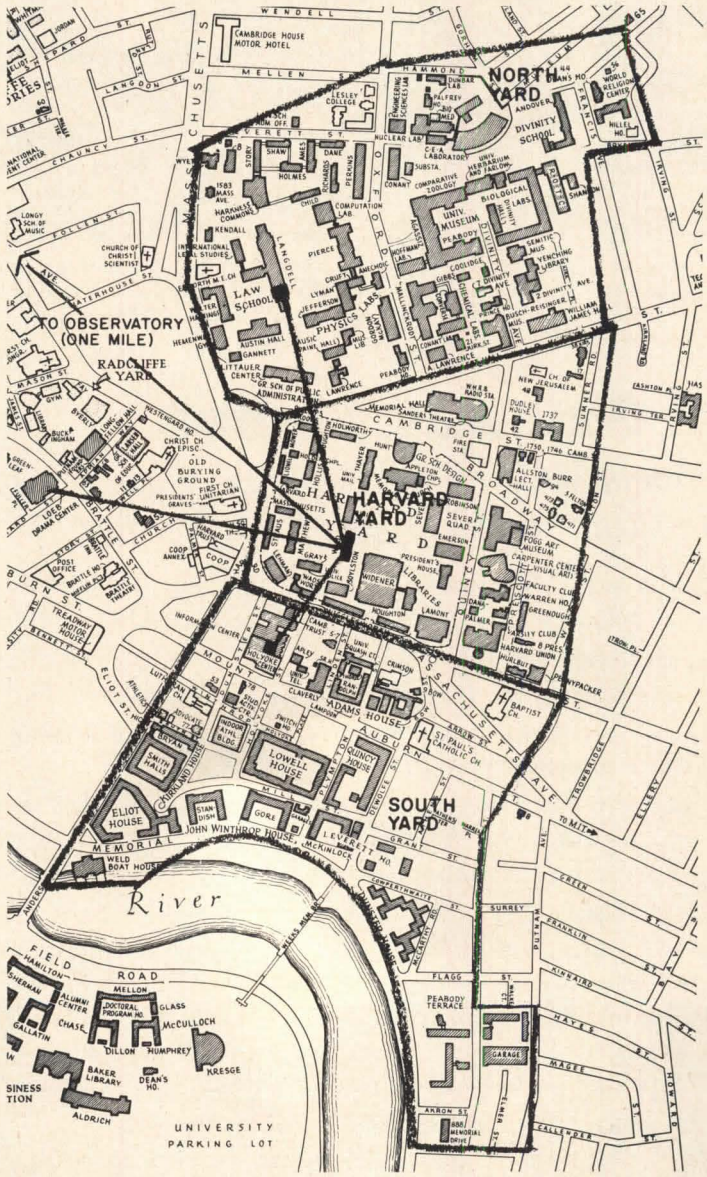
The rapidity of the expansion of comfort facilities can be judged by one statistic: The cooling load on the campus has increased from 200 tons in 1960 to 14,000 tons in 1968.

Savings and Future Expansion

Estimates indicate that 40 men and $400,000 per year will be saved by centralization, enough to pay for the system in 14 months.

Although this is already the largest system of its type in the world, plans for future additions include an increase to 250 buildings tied to one master console. Provisions for this have already been made at the Weld Hall center. It can then control virtually the entire main campus in Cambridge plus Harvard's Athletic Department and Graduate School of Business across the Charles River, The Harvard Medical-Dental School 5 miles away, and the Radcliffe College Complex.

Data centers and electronic controls at Harvard are by Honeywell, Inc.



	FIRST CONTROLLED	NUMBER OF BUILDINGS 1968	CONTROL CENTER LOCATION
NORTH YARD	1960	90	LANGDELL HALL
SOUTH YARD	1963	45	HOLYOKE CENTER
CENTRAL YARD	1967	30	WELD HALL

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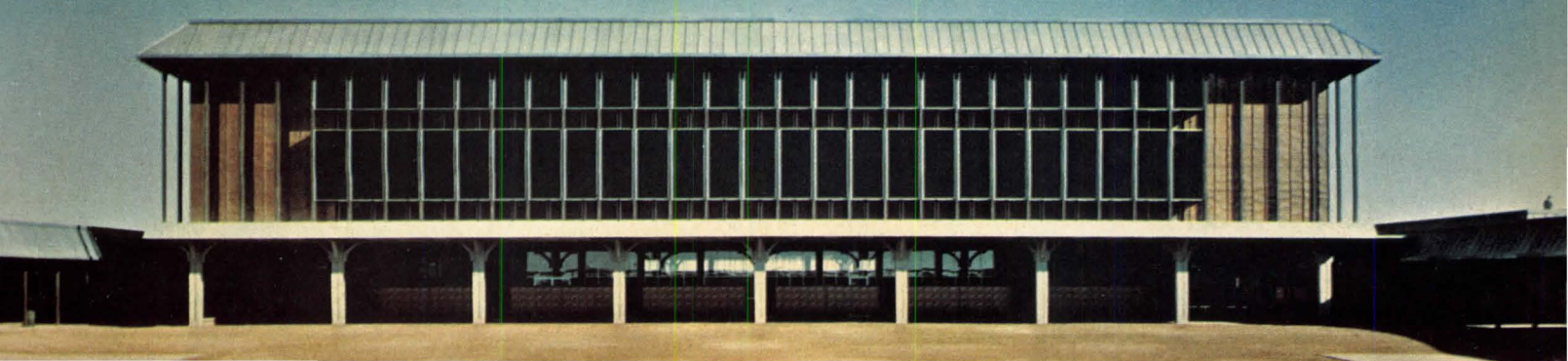

IT'S THE LAW

WORK EXECUTION DISPUTES

BY BERNARD TOMSON AND NORMAN COPLAN

P/A's legal team analyzes court decisions in cases involving disputes over the execution of work and performance.

It is becoming a more common practice to provide, in building contracts, that the decision of the architect or engineer will be conclusive on all questions or disputes concerning the execution of the work and its satisfactory performance. In most jurisdictions, such a provision will be upheld if it is applicable to determinations by the architect or engineer on questions of fact. If the determination of the architect or engineer involves a question of law, however, the courts will question the validity of the provision authorizing such determination. The traditional rule is stated in the Kentucky case of *Kyburg v. State*, 108 N.W. 2d 645, to the effect that "power to construe the contract itself and to determine what is within and what without such contract . . . is an independent question, and belongs primarily to the courts."

Because plans and specifications are deemed part of the contract documents in the normal construction contract, and their interpretation by an architect or engineer may involve both questions of fact and of law, the courts, on occasion, find difficulty in applying the general rules referred to above when an architect's or engineer's decision is based upon such interpretation. The foregoing is illustrated by the case of *Davis v. Merritt-Chapman & Scott Corp.*, 276 N.Y.S. 2d 479. In this case, a construction company had entered into a contract with the Power Authority of the State of New York for the erection of a power plant. The construction company subcontracted the piping system mechanical work. The subcontractor instituted suit against the general contractor to recover payment for the installation of approximately 400,000 lbs of pipe supports, and to recover payment for the reasonable value of services performed and materials furnished for the fabrication of such pipe supports. The principal issue involved the question of whether the client, the Power Authority of the State of New York, was required to supply the supporting materials for the embedded pipe work and whether the subcontractor was to be paid for the installation of supports under the unit price schedule for hangers and supports. The specifications of the prime contract, defining the scope of the work, provided that:

"The work covered by this portion of the specifications includes the installation of all piping materials including pipe, valves, fittings, flexible metallic hoses . . . pipe hangers, and supports . . . which are required to provide complete piping systems. . . . The Authority will furnish all materials except welding rod and cinch anchors for wall brackets which shall be furnished by the Contractor."

The specifications further stated:

"The Contractor shall install the piping systems in the power plant in a thorough and workmanlike manner in accordance with the drawings and bills of material to be furnished him and as directed by the Engineer."

The subcontractor had claimed the sum of approximately $365,000 for the installation of pipe supports for embedded pipe, and $125,000 for material and fabrication of the supports, and the general contractor had presented these claims to the consulting engineers representing the Power Authority. The Authority, through its engineers, rejected the claims, asserting that it was only required to furnish material when piping was permanently mounted on hangers and supports, but that, where piping was to be embedded in concrete, all operations were to be performed by the contractor at the cost included in the bid price.

The general contractor, in defense of the action instituted against it by the subcontractor, contended that the decision of the Power Authority, by its engineers, was binding upon the subcontractor in respect to its claim under the subcontract. The prime contract between the general contractor and the client provided:

"In case of any ambiguity in the plans, specifications or maps, or between any of them, the matter shall be immediately submitted to the Authority, which shall adjust the same, and its decision in relation thereto will be final and conclusive upon the parties."

The subcontract held:

"Any findings, agreement, determination or decision which may be made as between Contractor and the Owner shall be binding upon the parties hereto, and in any dispute or question arising between the parties hereto, shall be determinative of the same insofar as and to the extent that said finding, agreement, determination or decision concerns the same matter or matters in dispute or in question between the parties hereto."

Based upon the foregoing provisions, the lower court found that the subcontractor was bound by the Authority's determination. On appeal, however, the Appellate Court reversed this decision, ruling that there was no ambiguity in the specifications and that the engineers, therefore, had infringed upon the jurisdiction of the court, stating:

"If a contract provides that the decision or determination of an engineer shall be final and binding, such finality attaches, in the absence of fraud, bad faith or palpable mistake equivalent to bad faith, only to those determinations involving quantity or quality of material, classification or amount of work performed, or a calculation as to a final estimate; where the expertise of the engineer is important and essential. . . . In short, the resolution of factual disputes is the prerogative of the engineers. [In the absence of] any question of construction of the contract, the engineers' determination could not be challenged. They do not, however, have the power to construe the contract. . . . The cases cited above are distinguishable from those situations where the meaning of the terms is to be construed and where the court's responsibility for construction cannot be assumed by the engineers so as to oust the court of jurisdiction. . . . The legal meaning of the contract is always the responsibility of the court and not of the engineers."

The court appears to make a distinction between the right of an architect to interpret an ambiguous specification and his right to determine whether, in fact, the specification is ambiguous. This distinction is not clear and the decision in this case may raise more questions than it answers.

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EDWARD DURELL STONE? WHO EVER HEARD OF A BOOK CALLED EDWARD DURELL STONE?

BY JAMES T. BURNS

EDWARD DURELL STONE. *No author given. Introduction by Edward Durell Stone. Horizon Press, 156 Fifth Ave., New York, N.Y., 10010, 1968. 136 pp., illus., $25. The reviewer is Senior Editor of P/A.*

See, see the great big pretty new cocktail table book.

Look, look at the gorgeous illustrations.

Read, read the elementary captions telling how the building you are looking at is not the same as the one you saw on the preceding page.

Lay, lay a memorial nosegay at the base of this expensive puff-book; it may represent the last nail in the coffin of the old-time, unconnected architect.

Listen, listen to Edward Durell Stone declaim: "The biographies of most architects show that they are not entrusted with very large projects involving enormous expenditures until they are at least in their fifties; their period of productivity is therefore extremely limited. Architecture is an old man's profession."

Consider *that* Kallmann & McKinnell, Conklin & Rossant, The Cambridge Seven, Frank Schlesinger, Okamoto & Liskamm, Davis & Brody, and many others who are not yet graybeards in Sulka ties. What are you young whippersnappers doing, being responsible for the Boston Civic Center, Reston, The Lower Manhattan Plan, the Boston rapid transit system, the exhibition of the United States pavilion at Expo 67, the Rochester riverfront redevelopment, the Seattle rapid transit system, the Regional Plan Association's new Manhattan plan, and the American Pavilion in Osaka for Expo 70? Worse still, what do you mean expanding the interests and vistas of architecture beyond the realm of the hand-wrought single building — the exquisite embassy, the sumptuous skyscraper, the crystalline cultural center, the uniform university, the marmoreal museum? You get into engineering, sociology, performance design, behavioral science, transportation and transit, regional planning, and all those other things. You reject architecture as "frozen music" and say it can take many guises, many contrasts, many ambiguities. How are you ever going to put out a beautiful catalog like *Edward Durell Stone?* Maybe you and the rest of the with-it group of architects (including some recruits from the "older" ranks like Archibald Rogers, Nathaniel Owings, etc.) will not have the inclination; you'll be too involved in the continual process of creating communities together with other disciplines and with the people who live in those cities. What a loss for engravers and printers. What a gain for vital new places to live.

BY ALAN H. LAPIDUS

The reviewer is an associate in his father's firm of Morris Lapidus Associates in New York City.

In his latest homage to himself, Stone leads off with the ringing sentence, "This is at last the age of the architect." The ensuing prose makes certain that the reader realizes just who *The Architect* is.

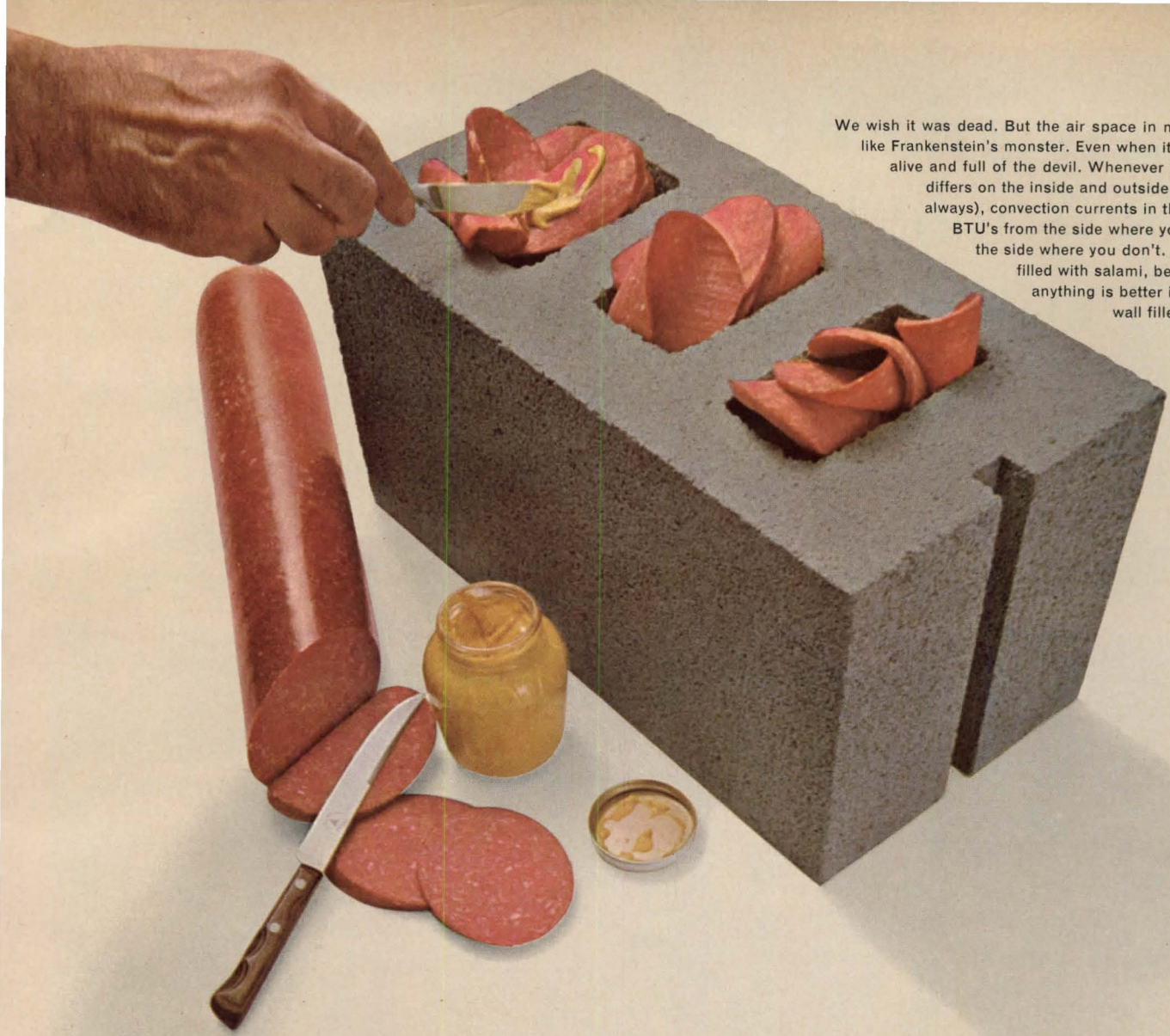
His text ranges over a wide variety of topics, including a solid insight into political realities that suggests the similar goals of LBJ, Louis XIV, Louis XV, Napoleon, and Peter the Great. But it is when his thoughts turn to architecture, as we know it, that he really warms to his subject.

Stone states in his introduction: "It has been said that every great movement or renaissance in the arts has had its inception by way of the intellectual and the artist." Now how is *that* for a basic truth? "Architecture is a grimly serious business," he continues, and the suitable materials for this are "stone, bricks, and concrete." Glass and aluminum are denigrated and dismissed, presumably because they might introduce a note of hilarity. Concrete, it is pointed out, is now ". . . capable of great refinement. It is this refinement that I seek." Stone then goes on to deplore the "current fad" of expressing concrete as a crude material and the "picturesque silhouette and the broken up costly periphery." Indulging in such frippery "results in increased costs, a rejection of the potentialities of the materials employed and a denial of the nature of our age." After thus relegating Kahn, Corbu, Tange and Rudolph to some purgatory for spendthrifts and shortsighted unnaturals, Stone patiently explains how he is the soul of frugality. It all has to do with abolishing the curtain wall and covering half the building with marble. I am not quite clear on this, but we are assured that the new General Motors building in New York City costs one-quarter to one-third less than "other buildings of prestige built in New York in recent years."

A large part of the text is devoted to giving a goodly drubbing to the corridor. The corridor is a nasty evil thing and Stone is quick to point out that "no ancient architecture employed the corridor." What about the Palace of Minos and the Roman Coliseum? In the course of his onslaught, the author points out that the corridor is a pretty dull means of getting from one place to another and that he much prefers to channel people through a series of open courtyards and covered atria. One gets more spatial kicks that way, Stone maintains, and indeed who can argue? He then goes on to state that his covered atria and open courtyards are just as economical as corridors. It is at this juncture that one begins to wonder just what kind of corridors Stone may have had prior experience with. This poor mouthing is a totally new and unexpectedly economical approach to the architecture of Edward Durell Stone: New York City Housing Authority please take note.

At one point, Stone invokes the words of Sullivan: "It is my belief that it is of the very essence of every problem that it contains and suggests its own solution." It is this great credo, so reverently set

Continued on page 226



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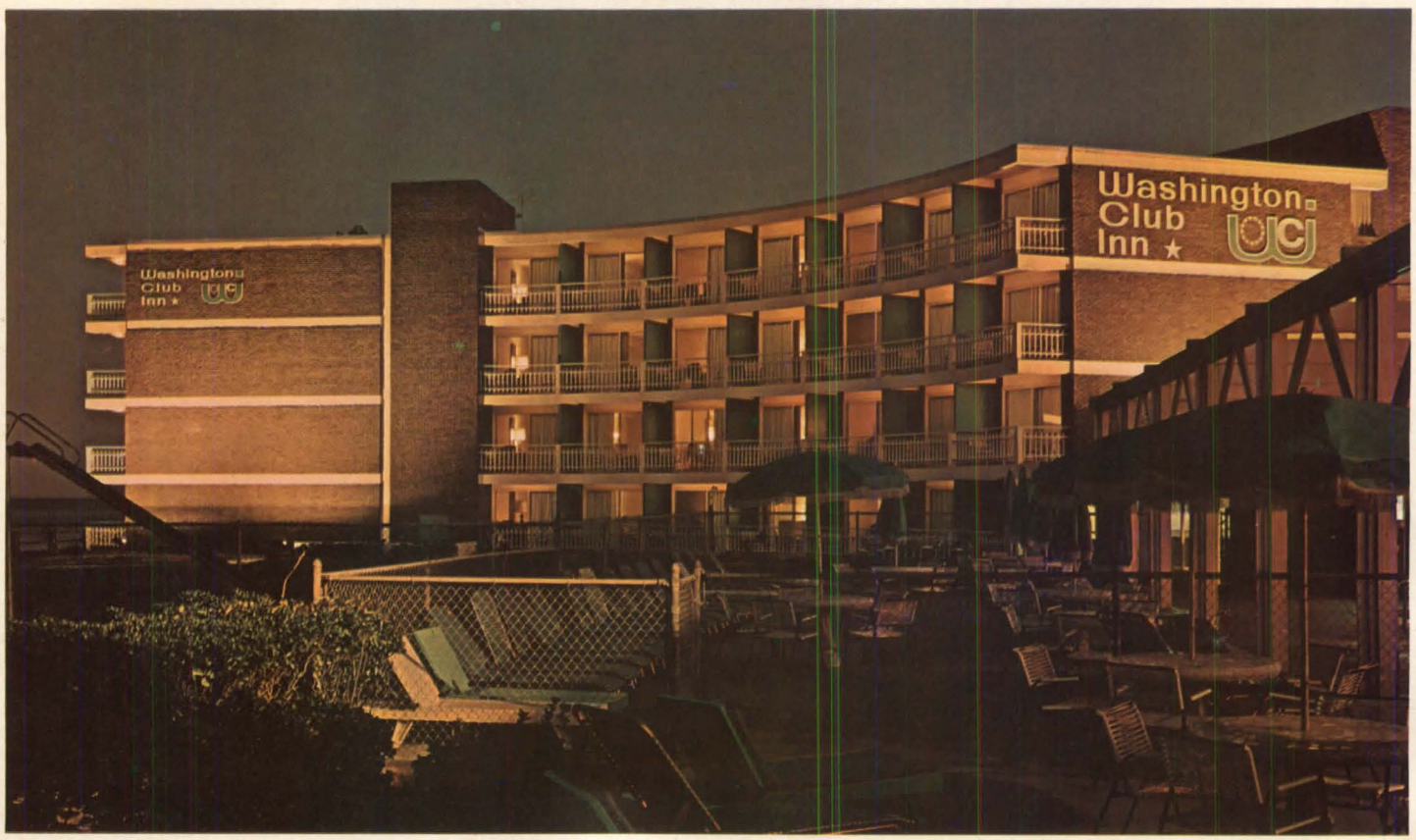

Washington Club Inn, Virginia Beach, Virginia, features 40 8-foot Andersen Perma-Shield Gliding Doors that give each guest a sweeping ocean view. Architect: Evan J. McCorkle, Virginia Beach.

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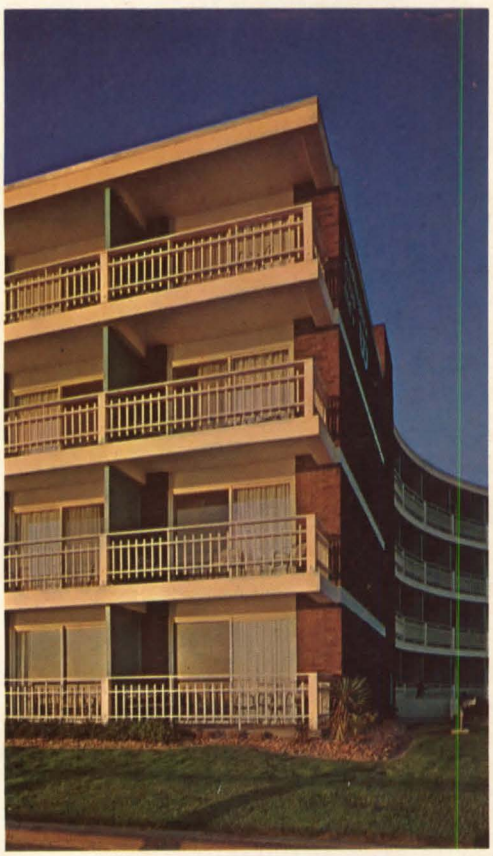

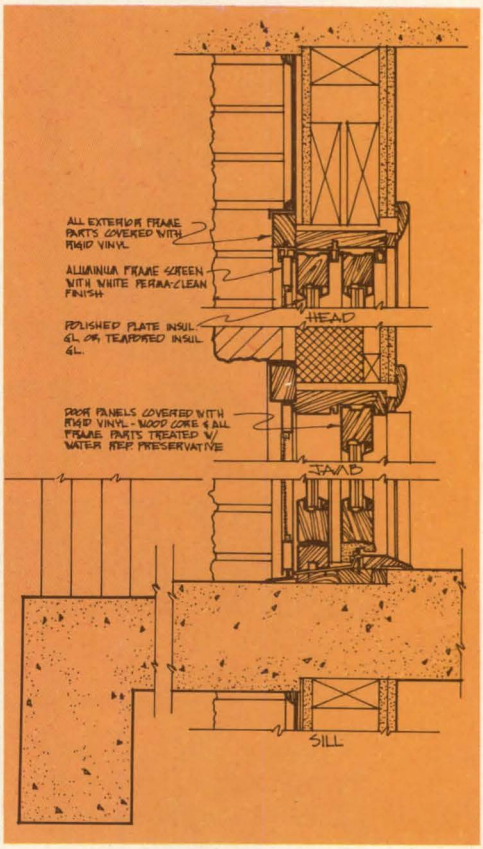

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Continued from page 222

down by the author, that the ensuing examples of his work so often belie. The Prince George Center in Hyattsville, Maryland, the State University at Albany, New York, and the NASA research center in Cambridge, Massachusetts, must have posed similar problems, because the solutions are remarkably similar. Also inherent in a vast majority of his design problems is something whose solution calls for a pierced overhanging cornice, which seems to be the latest cliché that has supplanted his universal grille problem-solution of a bygone day.

The format of the book is large and the quality of the reproductions is excellent. The artistry of Ezra Stoller and Louis Checkman, among others, is given handsome presentation. There are even occasions where the talent of the architect rises above the talent of the photographer. Stone's Church of the First Unitarian Society of Schenectady, New York, is a handsome building and a lovely space, completely in scale with its function. The Community Hospital of the Monterey Peninsula in Carmel, California, is as gentle an imposition on this lovely area as could be hoped for. It is Stone at his least self-conscious and at his best. The other end of the scale is represented by The Perpetual Savings and Loan Association Office Building and Bank in Beverly Hills, California, which is the perfect location for this building. The architectural nuisance committed by Stone for Huntington Hartford on Columbus Circle in New York City is also recorded herein.

It is an uncommon thing for an architect to put out a book devoted solely to the presentation of his own work. Such an act presupposes that there awaits a public thirsting for a concentrated presentation of the works of the master. Judging from the impressive list of commissioned projects and prestigious clients, there is obviously a demand for the talents of the author. It cannot be denied that Edward Durell Stone has carved a place for himself on the contemporary scene. It would seem that he is to architecture what *The Reader's Digest* is to literature and what Norman Rockwell is to painting.

Concise, Comparative Corbu

BY PAUL H. MITARACHI

LE CORBUSIER, 1910–1965. *By W. Boesiger and H. Girsberger. Frederick A. Praeger, 111 Fourth Ave., New York, N.Y., 1967. 351 pp., illus., $25. The reviewer is an architect practicing in New Haven, Conn.*

In a short review addressed to architects of this generation, one need not discuss Le Corbusier's importance or his influence. Just the same, the publication of this new volume of the work of the Master must be brought to the attention of all, whether they have or have not, over the years, collected the seven volumes of the *Oeuvre Complète.*

Le Corbusier died in 1965, in the bright sunlight of the south of France. Thanks to Willy Boesiger, the Swiss architect-publisher of the *Oeuvre,* we will be kept busy unraveling the "patient search," which he records, starting with the work of 1910. Architectural historians will no doubt start their excavations into the archives of the rue de Sèvres studio and while we may gain new insights into the Master, there will be few revelations.

The new volume will not and is not intended to replace the seven previously published ones. They have been published as the work progressed, following the chronological order in which the projects, regardless of type, had been designed or built. In this new volume, the material is reorganized under the following headings: Private Houses; Large

Continued on page 232

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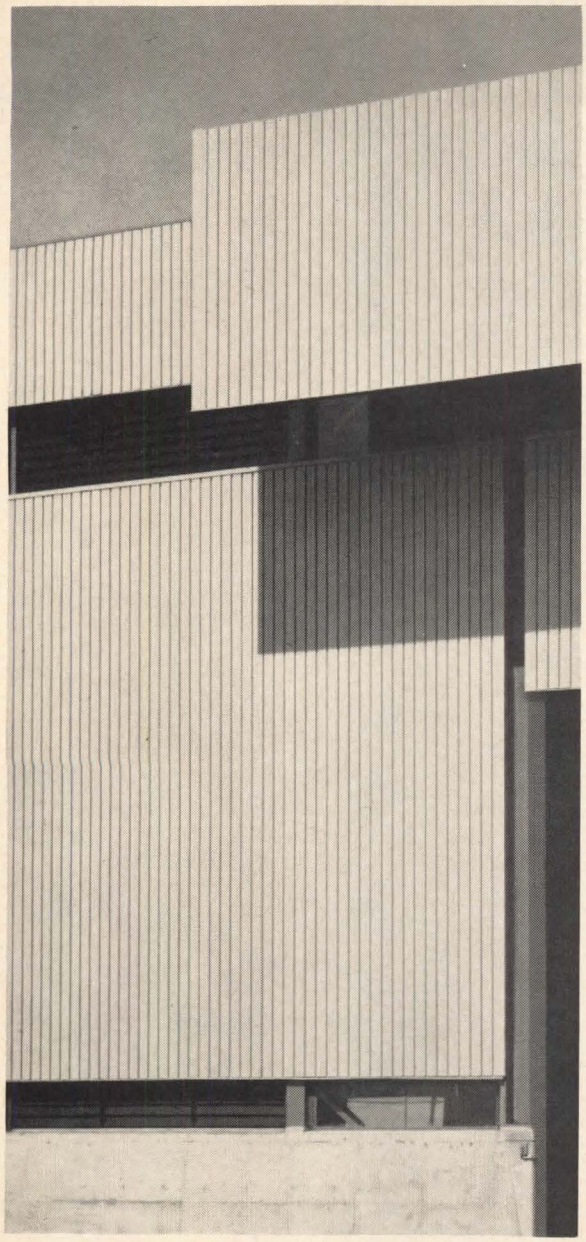

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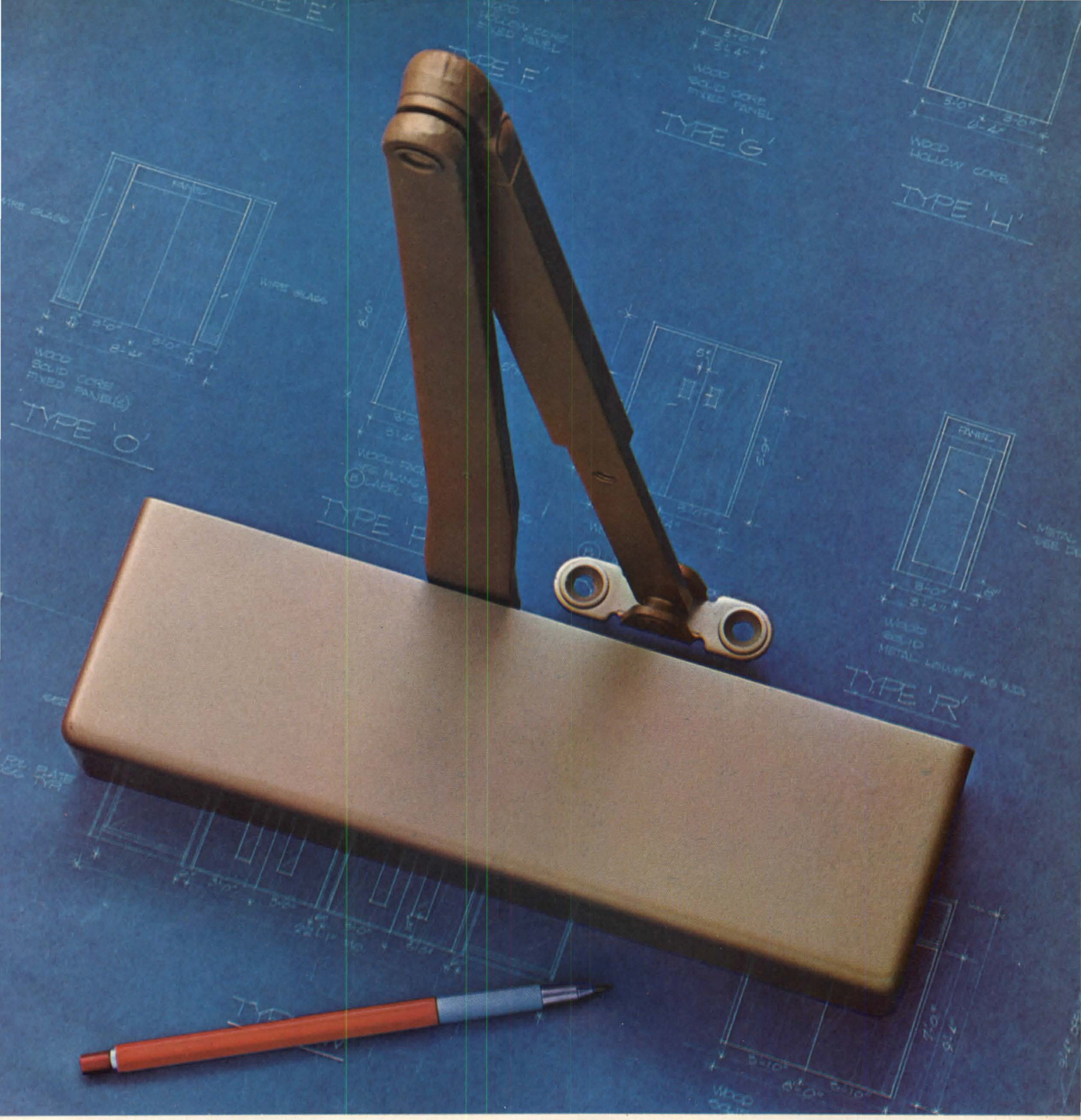

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Continued from page 226

Buildings; Chandigarh; Museums and Religious Buildings; Modulor, Painting, Sculpture and Tapestries; Town Planning. Under each heading the work is again chronologically arranged with almost no change in the text or the graphic material.

One can follow an idea from its inception on through the years. Architects are still refining Corbu's 1914 Maison Domino system. Was it in 1925 that his Five Points of New Architecture were enunciated? We can check his own performance based on these criteria: 1926: Maison Cook; 1927: Garche; 1929–31: Villa Savoie. House after house, to the Jahoul houses in 1954–56 and Shodon in 1956. And so to large buildings starting with the League of Nations competition scandal of 1927 to the Congress Hall in Strasbourg in 1965.

In one volume, one can ascend the ramps of the Villa Savoie, near Paris, that of Carpenter Center in Cambridge, and many other ramps in between. This indeed is concise (351 pages), comparative Corbu. The selection of material is good, the photographs and drawing clear and factual, and, this time, even the translation into English is readable. One always wishes for more drawings and detailed legends; eventually, it is possible that detailed case histories of the major projects will be made. Architecture cannot be experienced in photographs, and even less in text. If we must depend on text and photographs, either to replace an experience we cannot have, or because we have come to an age where books last longer than buildings, the *Oeuvre Complète* and this postscript are as good as we can hope for. The book is such that one is constantly reminded that before the finished building there were drawings, and before the drawings there were confrontations with the site and the program. One is aware of the work in progress, not just the "thing" done, delivered to the client and carefully censored by the photographer and the art editor.

An Old Song

BY EDWARD K. CARPENTER

THE URGENT FUTURE. *By Albert Mayer. McGraw-Hill Book Company, 330 W. 42nd Street, New York, N.Y., 1967. 184 pp., $16.50. The reviewer is an Associate Editor of P/A.*

This is an odd book: odd because it tries without succeeding to be both a picture book and a book with a strong textual message — a *Das Kapital*, as it were, with illustrations. It is odd because it purports to be both a triumphant message for pro-

Continued on page 237

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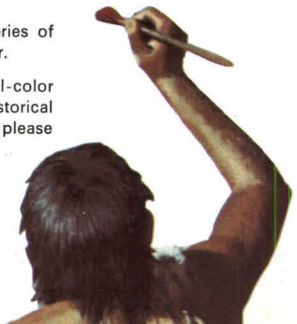

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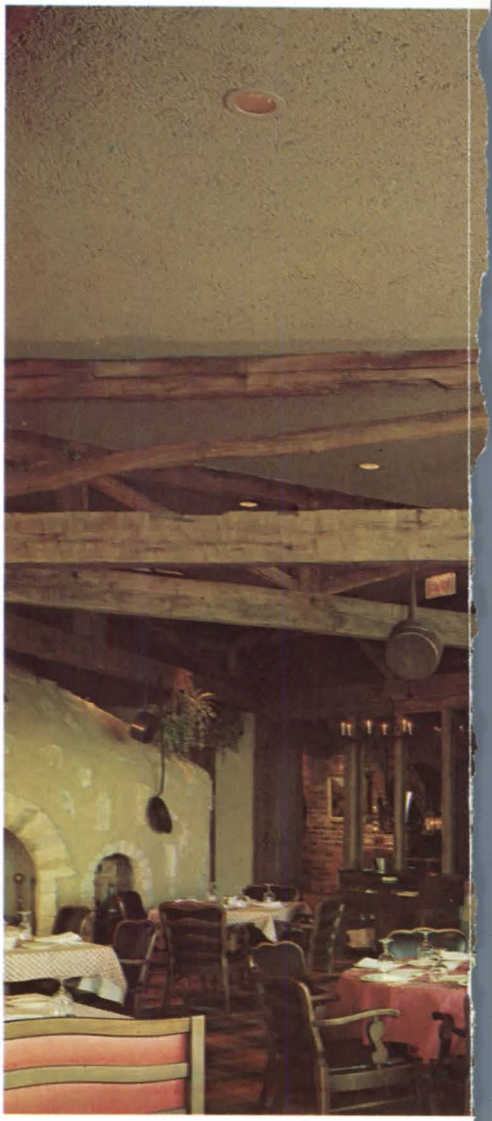

TURKEY — Circa 6200 B.C. The earliest known Mediterranean civilization—nearly 6000 years before the golden age of "ancient" Greece—demonstrates that even neolithic (later Old World Stone Age) man was capable of sophisticated urban architecture.

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(The painting: A neolithic shrine unearthed in Catal Huyuk on the Anatolean Plateau of Turkey. Vulture-costumed priestesses celebrate a funerary ritual. In the background, an artisan paints an accurate diagram of the city and a representation of the eruption of the volcano Hasan Dag.)

Special full-color reproductions of this painting are available. For ordering instructions, please see next page.

Original painting commissioned by
The Celotex Corporation

Continued from page 232

fessional architects and planners and an education for the layman. As a triumphant message, it is somewhat like telling an Olympic sprinter that he must run very fast if he is going to win the race, and as an education for the layman it is something akin to putting an illustrated book on the chemistry of heredity, another of the most pressing matters of our time, on the popular book shelf, charging $16.50 for it, and then standing aside to avoid the rush.

Albert Mayer, who says it is middle-class to want high-tension towers removed from the landscape, has written a summation of his lifetime study of metropolitan planning. Active with Clarence Stein, Lewis Mumford, and others in the American new town movement of the 20's, Mayer is still playing the same tune. Like any good tune, it has weathered the years well. If anything, it has more significance today than it had 40 years ago, and bringing to it, as he does, the accumulated knowledge of a long lifetime, Mayer is justified in replaying it. Unfortunately, Mayer plays it just slightly out of key.

What he wants to do is homogenize the world. Every street would have persons of all colors and faiths, every neighborhood an opera house; every middle-sized town museums and art galleries and Albanian restaurants until Des Moines would be no different from Zürich, and until Elm Street in River Falls would be some sort of cultural mush made up by stirring one part Park Avenue with one part New York Lower East Side with one part Zuni Indian Reservation. Mayer's world would be, in a word, dull.

Still, his examples of how urban problems have been solved or avoided are eclectic and appealing. He urges us to think of how large the population will be in 30 years and to plan new towns in which this population can live. He urges us to think how many automobiles will be on our highways in 30 years and to plan places for them to park.

But any good planning should be flexible. To berate the planners of Sacramento's government center for including only 11,400 parking spaces is like taking a squirrel to task for laying in only 600 beechnuts for the winter. What if it is a warm winter and he needs only 400? What if a new family moves in down the road and leaves cashews for him? He has a nest cluttered with beechnuts, that's what. What if we are not using automobiles by the year 2000? Mayer does not consider alternatives. He has forgotten that on page 11 he called trend statistics "the opiate of the planner and the people." Perhaps he has proven his own point.

Continued on page 248

Nature-tones

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Architect: *George C. Higgins, A.I.A., Sacramento, California.*
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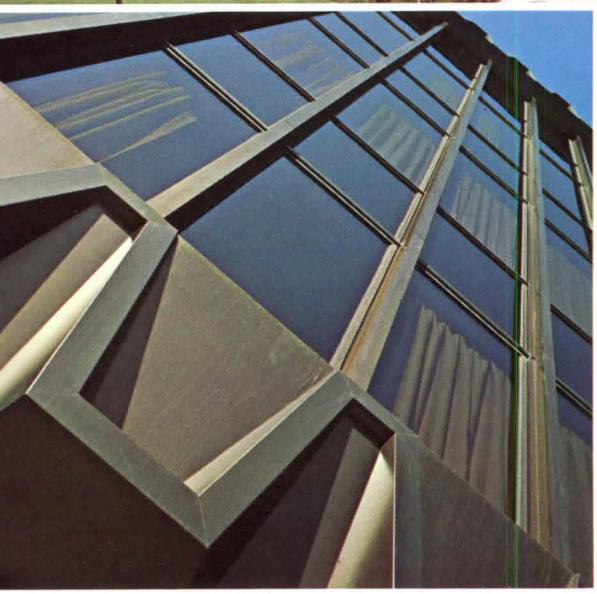

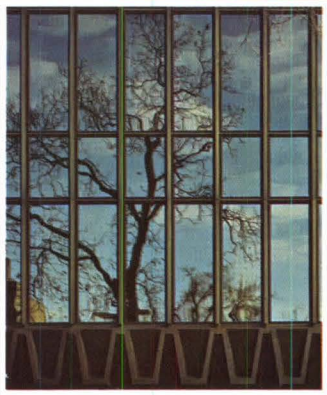

Somerset Maugham said it this way, "And instead of just looking at houses and trees I learned to look at houses and trees against the sky."

Architects John J. Flad & Associates expressed it in The National Guardian Life Insurance Building. The medium: LHR® SOLARBRONZE®, a special environmental glass by PPG INDUSTRIES. Design consistency was achieved by using a special TWINDOW unit of Sable SPANDRELITE® and LHR SOLARBRONZE between vision areas.

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National Guardian Life Insurance Building, Madison, Wisconsin
Architect: John J. Flad & Associates

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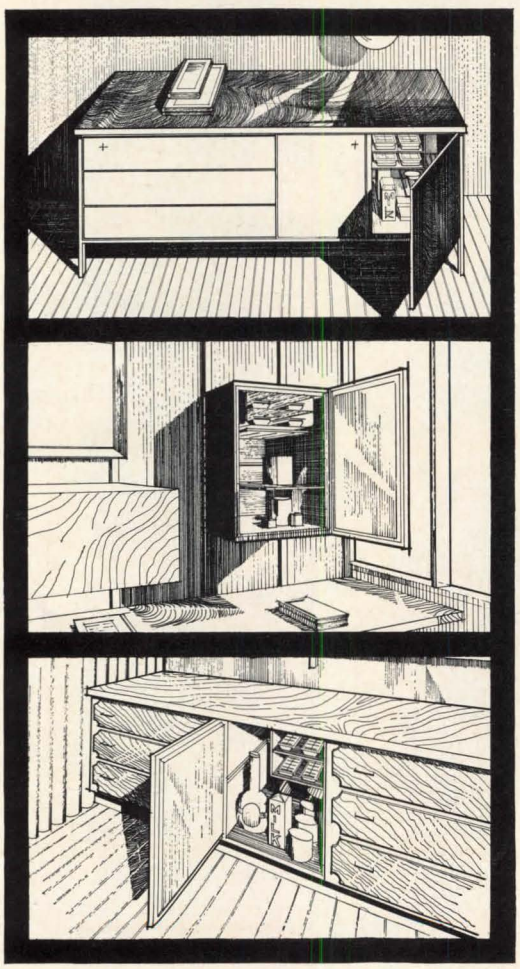

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Architect: Andonian and Ruzsa
Builder: Skyline Builders

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Continued from page 237

Part of the reason Mayer's version does not hold up so well is the orchestration. It is rambling, disjointed, contradictory, and often incomprehensible. He writes: "[This book's] mission is to present urgently the holistic view of urban living, and to show that true urban architecture and ambient urban beauty will not just be created in the White House conferences on ugliness seminars, but will emerge as a crystallizing final expression of our own and our cities' inner growth into revitalized conceptions of function, of circular validity. And we will not achieve a diffusion of either alert participation or of beauty while all our attention is sucked up to the center, all authority and decision and major disposable wealth devoted to central aggrandizement, while the local scene is simply a gelatinous mass and we are inarticulate within it."

Inarticulateness, like charity, begins at home. Perhaps, given a chance, articulateness could go further toward solving some urban problems than Mayer's scheme of taking diamonds and yachts from the rich. That is not really Mayer's idea, although he pretends it is; Robespierre and Robin Hood had the same notion years ago. Mayer apparently never stopped to think that if he reduces the upper classes to middle class status he may have to live in a world without high-tension towers.

NOTICES

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WILLIAM R. JENKINS, Architect and Planner, 2737 Buffalo Speedway 212, Houston, Tex. 77006. M. HAMILTON FREDERICK has joined the firm as associate.

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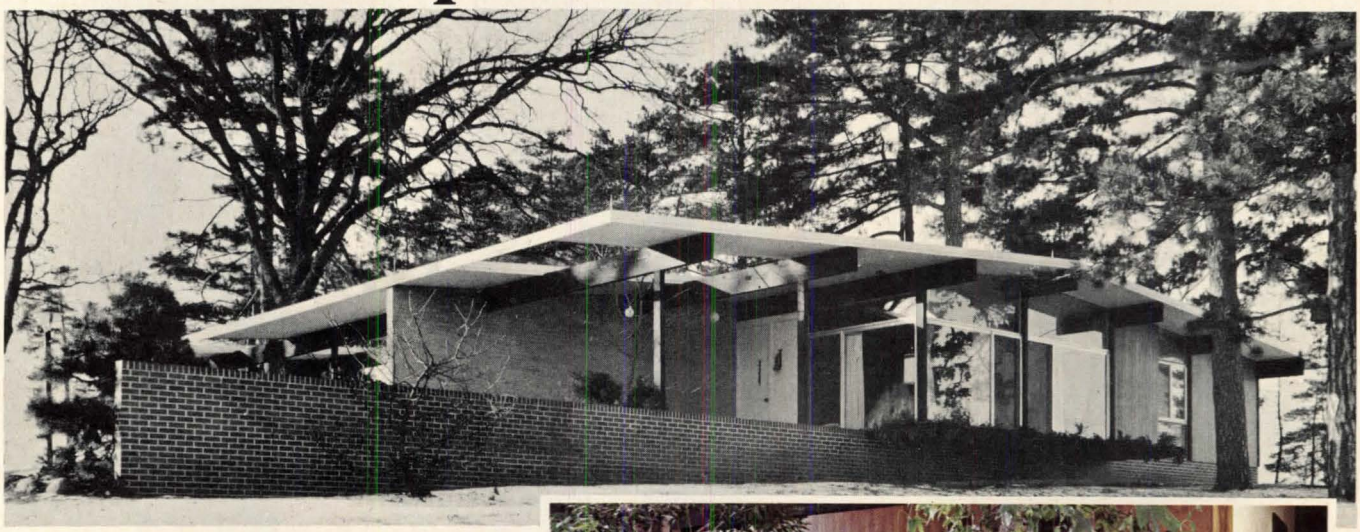
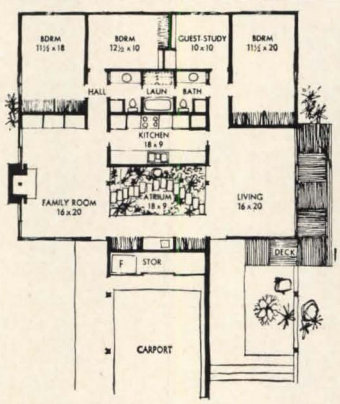
Continued on page 264

Moving nature indoors is easy... with trees, plants and ceramic tile.





The pleasures of an indoor garden are obvious. But, an atrium is often gained at the expense of convenience, or given a self-defeating "fish bowl" treatment.

Architect Ray Heuholt, A.I.A., solved this dilemma by combining living things and a natural material — ceramic tile — in this Des Moines, Iowa home. A ceramic mosaic floor surrounds the atrium and covers the family room, entranceway, kitchen, bath and halls. The atrium can be maintained simply, without worrying about water, soil, spilled gravel or falling leaves.

Ceramic wall tile and decorator tile are also used in the house for which Des Moines Marble & Mantle Co. served as tile contractor.

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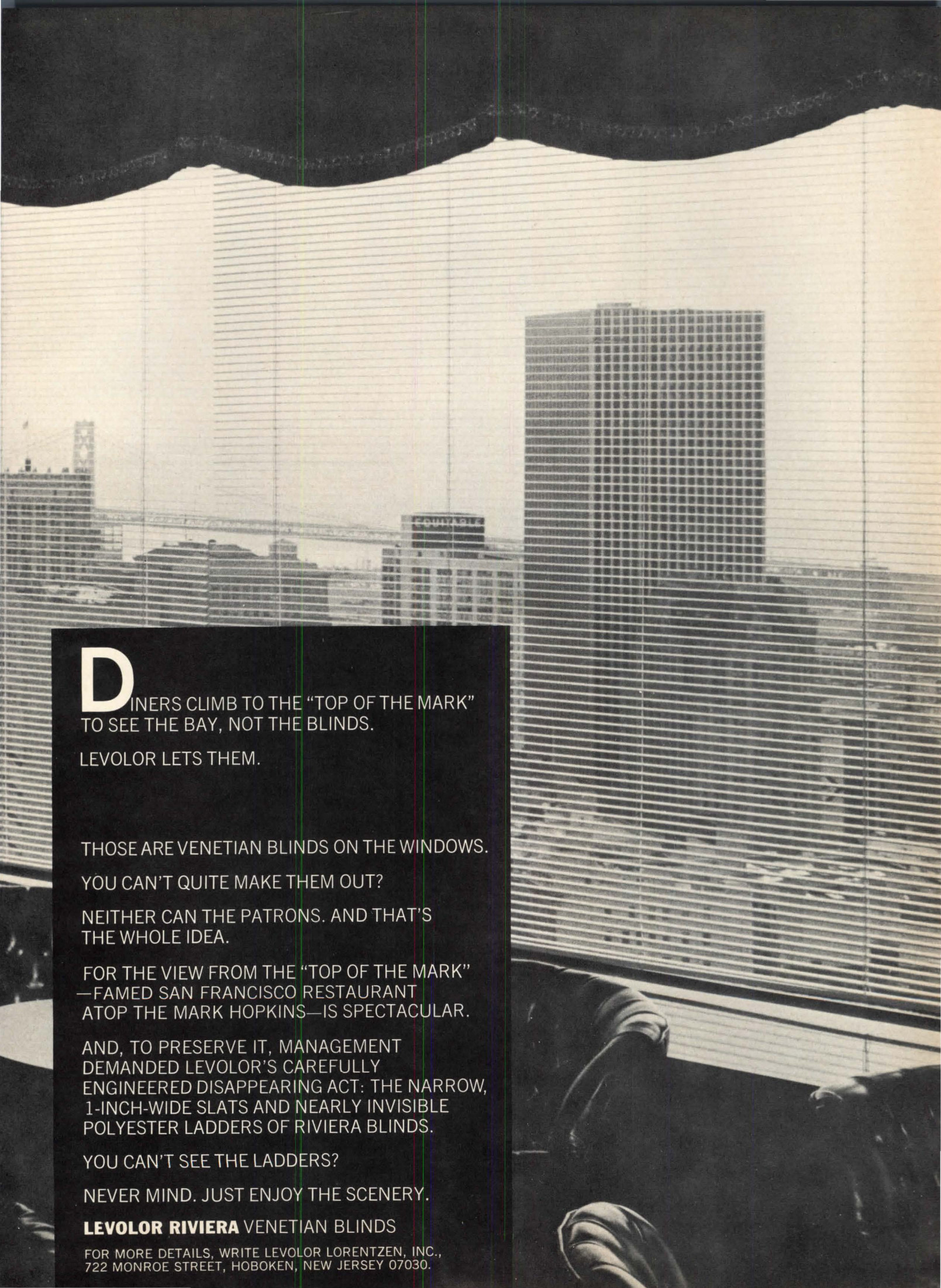

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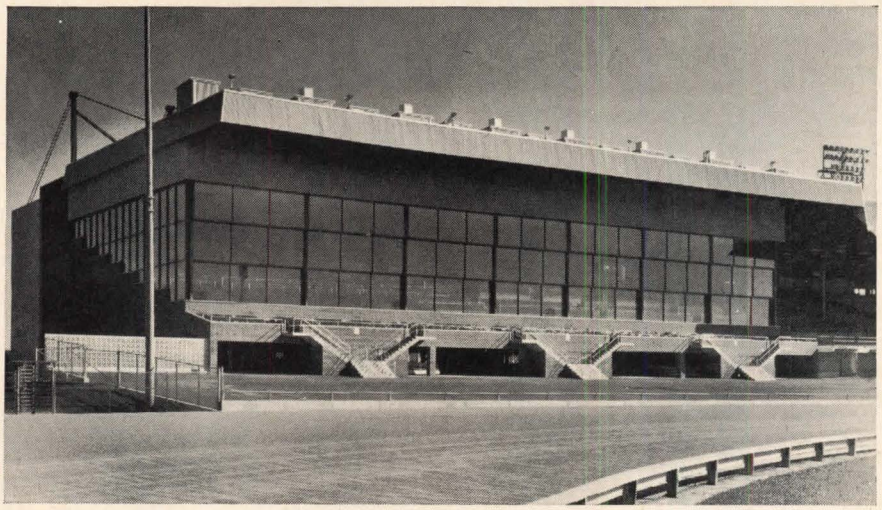
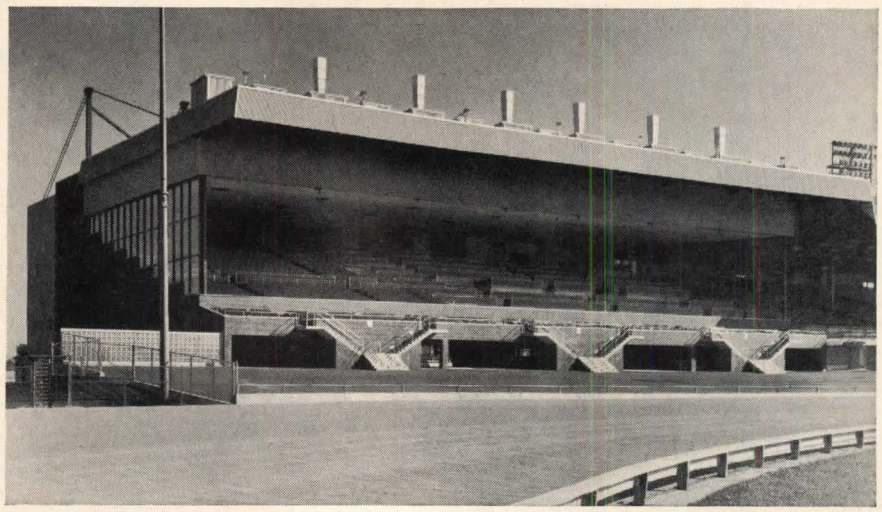


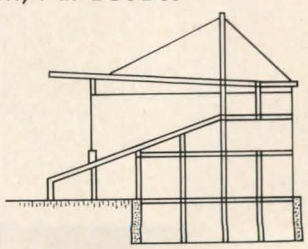
Cable roof permits load-free power window system for Brandywine clubhouse



This new, $4-million clubhouse at Brandywine Raceway, near Wilmington, Delaware, posed an unusual problem. The owners wanted to heat and air-condition the enclosure to accommodate some 2,500 spectators. However, they also wanted to move the windows out of the way so that spectators could have a completely unobstructed view of the track whenever weather conditions were suitable.

Architect Lionel Levy devised an ingenious moveable window system which can be raised entirely out of view by telescoping it into housings above the roof. Engineer Robert Rosenwasser chose a cable-supported roof scheme as the most feasible and economical way to do the job. It permits what normally would have been roof-supporting front columns to serve as mullions and tracks for the window area measuring 196 ft long and 28 ft high.

Bethlehem supplied more than 2,600 ft of cable (with end fittings) and 804 tons of structural steel. We also furnished the engineer with cable and connector data, a service we have provided for many of the nation's cable-roof structures. *Bethlehem Steel Corporation, Bethlehem, Pa. 18016.*



A classic cantilever, the cable system takes over the load-bearing job from the window supports, while providing column-free viewing within the large overhang area required. Eight wide-flange girders were spaced at 28 ft intervals. Each is braced by a pair of 145-ft-long, 2⅜-in.-diam steel cables which pass over a 24-ft-high steel mast. Tied down with fixed bearing sockets on the track side, cables are anchored to a back row of columns by adjustable connectors.

Architect: Lionel K. Levy • *Structural engineer:* Robert Rosenwasser • *General contractor:* Ernest Di Sabatino & Sons • *Steel fabrication:* The Belmont Iron Works • *Steel erector:* McCormick Construction Co., Inc.

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by Yusaku Kamekura, Preface by Paul Rand

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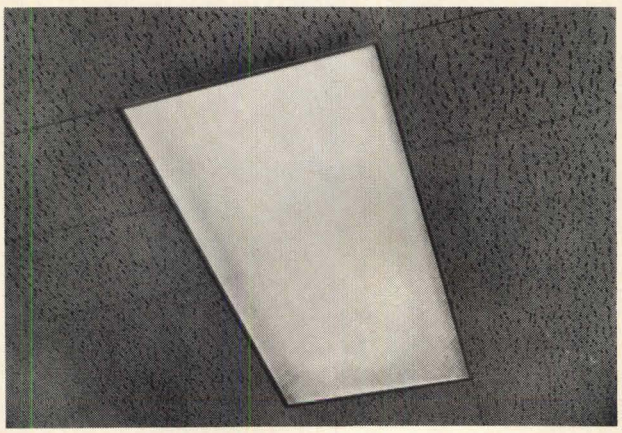

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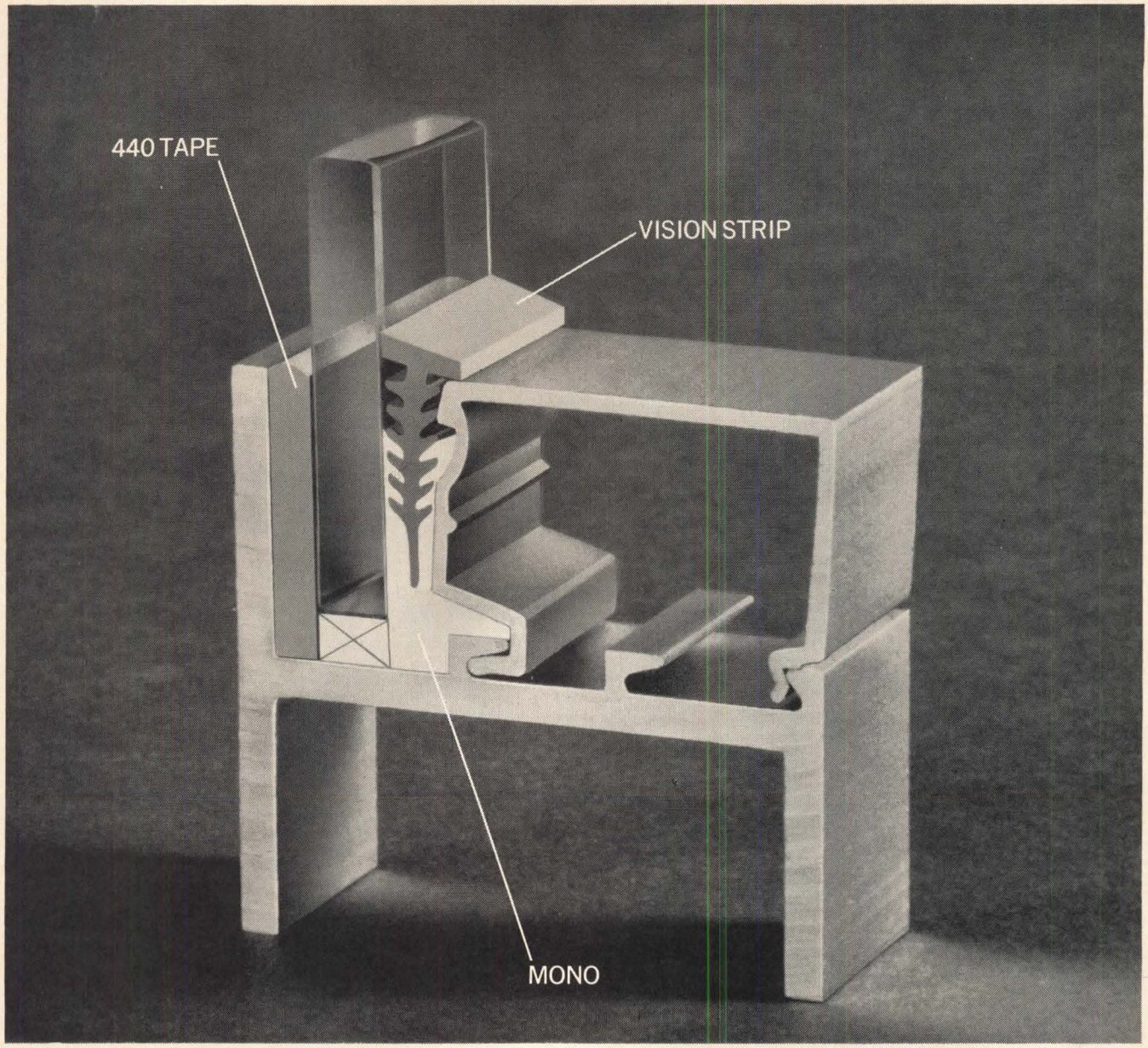

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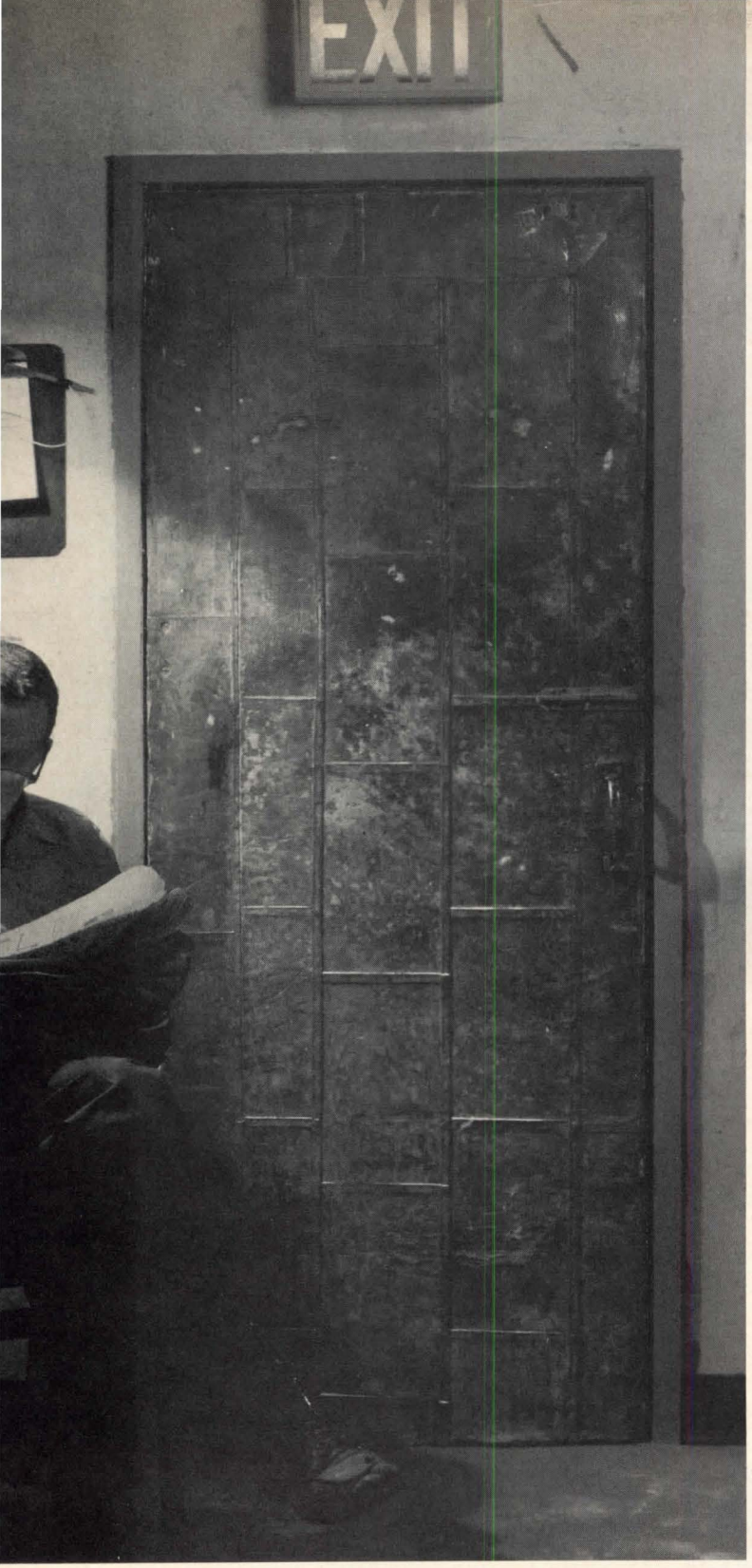

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Cable-roof suspended inside blimp hangar permits conversion to cabinet factory.

There was one overriding requirement when a World War II dirigible hangar, near Elizabeth City, N. C., was bought by Westinghouse Electric Corp. for its I-XL Furniture Co. And that was control of weather inside the 300,000-sq-ft, 190-ft-high structure . . . necessary because regulation of temperature and humidity is critical in any furniture plant.

The problem was solved with a plan devised by architect-engineer, Wiley & Wilson. They suggested the *interior* cable-suspended roof which now "hovers" 24 ft above the floor of the entire hangar. The roof actually hangs from the arched roof of the main structure on 214 Bethlehem cable assemblies, which vary in length to match the curves of the arches.

"Building a real roof, instead of simply an inner ceiling," the architect-engineer explained, "was less expensive than trying to maintain . . . completely weatherproof conditions . . . in the entire hangar."

The cable assemblies required 25,000 ft of ⅝-in. extra-high-strength, galvanized strand with swaged clevis terminals on each end. And the actual roof is a grid of 14-in. steel beams and joists covered with steel roof deck, rigid insulation, and two plies of felt and asphalt. Bethlehem supplied all 251 tons of structural steel beams.

Another immediate need was speed, for the quicker the roof was up, the earlier the plant could be in production. This design, as installed by the general contractor, Basic Construction Co., fulfilled that need.

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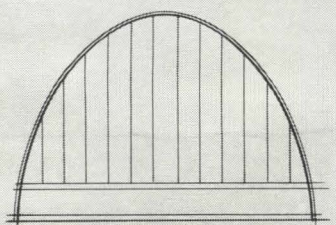

Cross-sectional view of hangar

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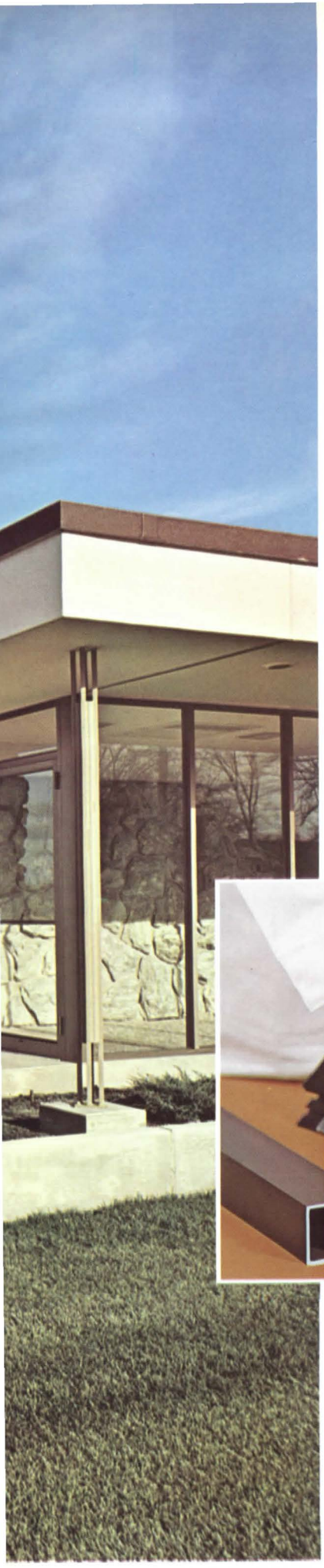

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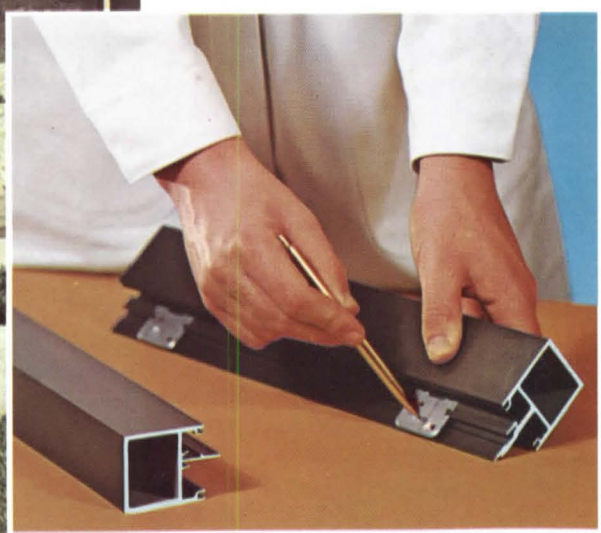

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Continued from page 248

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LE FORT-STRITE ASSOCIATES, INC., Space Planners and Interior Design Consultants, 1733 Chestnut St., Philadelphia, Pa. 19103.

ROBERT A. LITTLE & ASSOCIATES, Architects and Urban Designers, 12025 Shaker Blvd., Cleveland, Ohio 44120.

LYMAN, BALDWIN & CASTLE, Architects, 505 Delaware Ave., Buffalo, N.Y. 14202.

MACRIS & SIMKO, Consulting Engineers, Globe Bldg., 817 Silver Spring Ave., Silver Spring, Md. 20910.

UNTHANK, SEDER, POTICHA, Architects, 756 W. Park St., Eugene, Ore. 97401.

Elections, Appointments

HERMAN BLUM CONSULTING ENGINEERS, Dallas, Tex., announce the appointment of PAT PADDOCK as business manager of the firm.

COMMONWEALTH ASSOCIATES, INC., Architects and Engineers, Jackson, Mich., have promoted STEWART C. BARNETT, JR., to the position of manager of the civil works section of the architecture and General Engineering Division.

ENGINEERS, INC., Consulting Engineers, Newark, N.J., announce that ROBERT B. CALLAN has been named vice-president and director of architecture for the firm.

IMERO FIORENTINO ASSOCIATES, INC., Lighting Consultants, New York, N.Y., announce that RICHARD D. THOMPSON has joined the staff as director of theater and TV studio facilities planning.

VICTOR GRUEN ASSOCIATES, Architects, Engineers, Planners, New York, N.Y., have named ABBOTT HARLE a vice-president.

FRANK L. HOPE & ASSOCIATES, Architects and Engineers, San Diego, Calif., announce that ROBERT E. MELVIN has become head of the architectural division of the Manila office, the Philippines.

ISD INCORPORATED, Interior Designers and Space Planners, New York, N.Y., have added PATRICK REARDON and GERARD D. VAN VUGT, JR., to their staff as project managers.

LOCKWOOD GREENE ENGINEERS, INC., New York, N.Y., have appointed W. BENNETT SHARP, JR., to the position of project manager in the Advance Planning Department.

CHARLES LUCKMAN ASSOCIATES, Architects, Planners, New York, N.Y., announce the promotion of CLIFFORD WALCUTT to chief specifications writer.

REYNOLDS, SMITH & HILLS, Architects and Engineers, Jacksonville, Fla., announce the establishment of a new Division of Planning and the appointment of DONALD M. CHEEK as the division's chief.

The School Scene: Acknowledgements

Progressive Architecture gratefully acknowledges the persons, organizations, and sources listed alphabetically below (by organization) for aid in researching and presenting this special study:

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AMERICAN AIR FILTER COMPANY, Louisville, Ky.

J. Revis Holl, Superintendent, ANNISTON PUBLIC SCHOOLS, Anniston, Ala.

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Dr. R. Merwin Deever, Director, Bureau of Education Research and Services, ARIZONA STATE UNIVERSITY, Tempe, Arizona

Evan Herbert, THE AUERBACH CORP., writing in *International Science and Technology*

Eileen S. Rygh, Educational Park Study, BERKELEY UNIFIED SCHOOL DISTRICT, Berkeley, Calif.

BERMAN, ROBERTS & SCOFIDIO, Architects and Planners, New York, N.Y.

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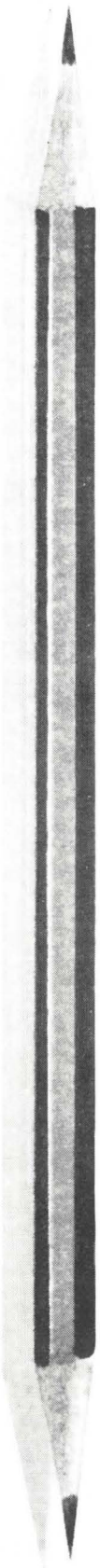

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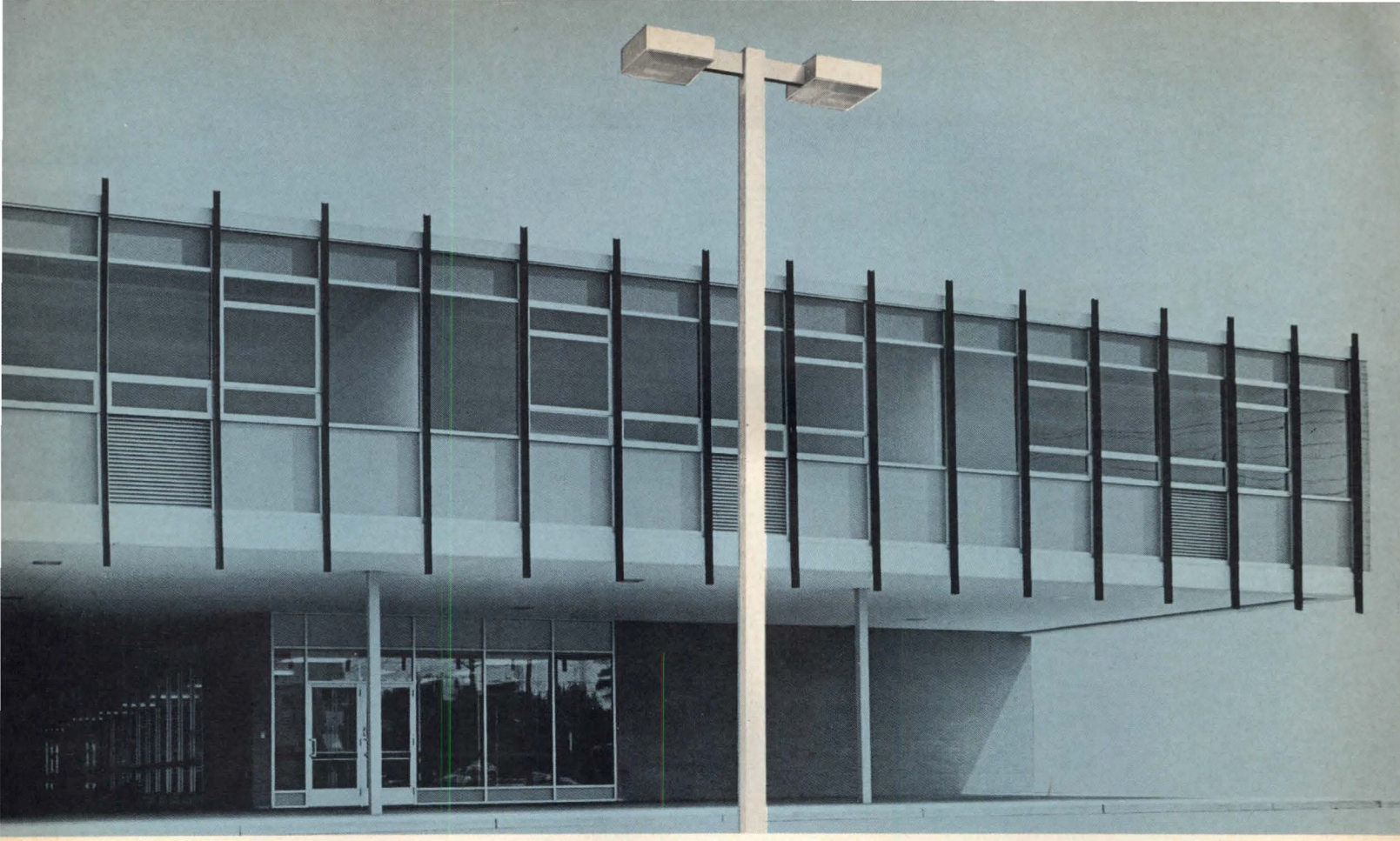

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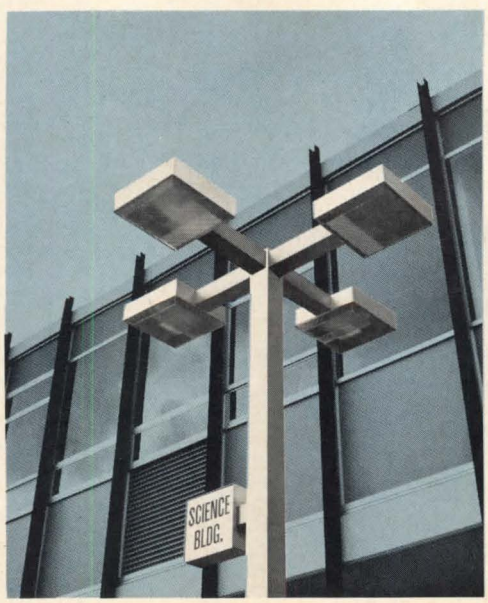

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CAUDILL, ROWLETT & SCOTT, Architects, Houston, Tex.

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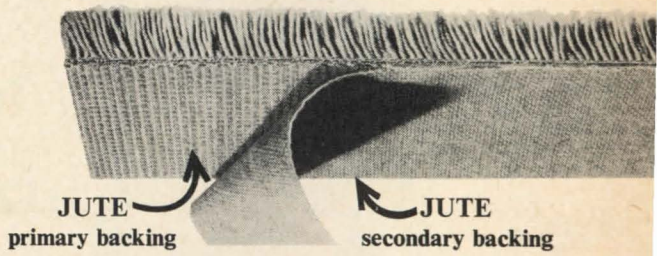

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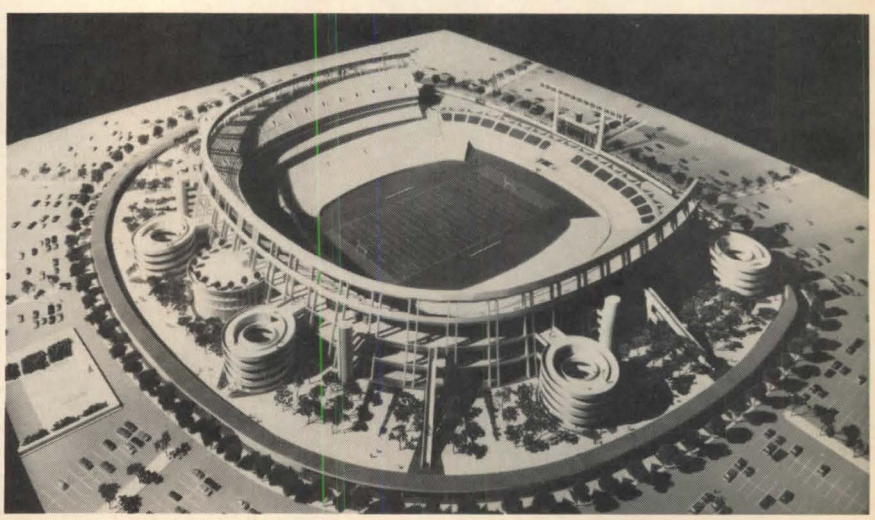
Grand stands created with Pozzolith concrete

(Upper left and below) Resembling a squared-off semicircle, San Diego Stadium is shaped to provide the greatest possible number of prime seating areas for both baseball and football. Six spiral ramps, eight reversible, high-speed escalators and a quartet of elevators — all located outside the main structure — permit easy entry and exit.

(Right) Up to 50,000 spectators can be accommodated by the five-tiered structure. Some 5,000 field-level seats can be rearranged in less than a day to meet increased attendance requirements.

(Lower left) Suspended seating areas are cantilevered from the stadium's rigid-frame structural elements, thereby eliminating all interior columns.



San Diego Stadium, Mission Valley, San Diego, California. Architect-Engineer: Frank L. Hope & Associates. General Contractor: Robertson-Larsen-Donovan. POZZOLITH Precast Concrete: K & N Structural Concrete Co. POZZOLITH Ready-Mixed Concrete: Pre-Mixed Concrete, Inc.

"Functional but festive" is the perfect description of San Diego's new 50,000-seat stadium.

Functional because its "supercircle" shape—a cross between a circle and a square—makes every seat in the house a good one for any event. And spiral ramps, escalators and elevators are on the outside to allow more elbowroom inside.

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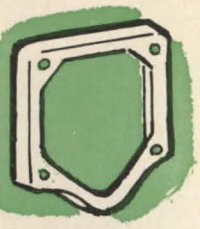

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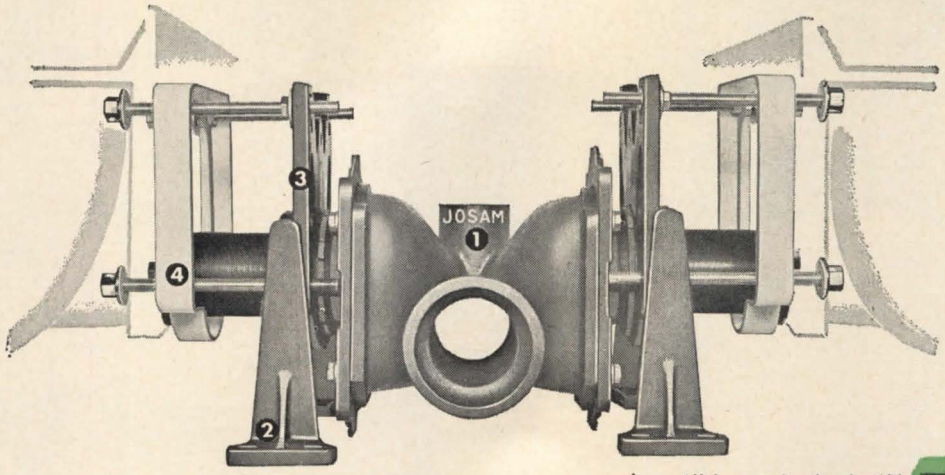
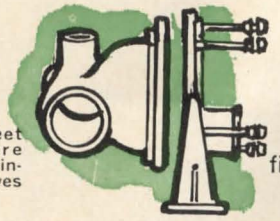
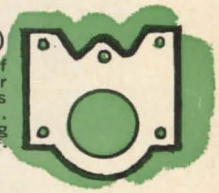
Simplifies alignment . . . Saves one or more hours of labor per bowl* . . . saves fixture breakage . . . saves call-backs . . . acts as template for wall finish, saving tile-setting time.



buttress foot (2)
Short Bulldog feet do not interfere with any type of finished floor . . . saves installation time



fitting and carrier are separate
provide more adaptability to meet changing conditions of installation . . . save revision time and labor



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Fits all types of toilets, blow-out or syphon jet . . . saves handling time . . . eliminates stocking and ordering of different carriers.

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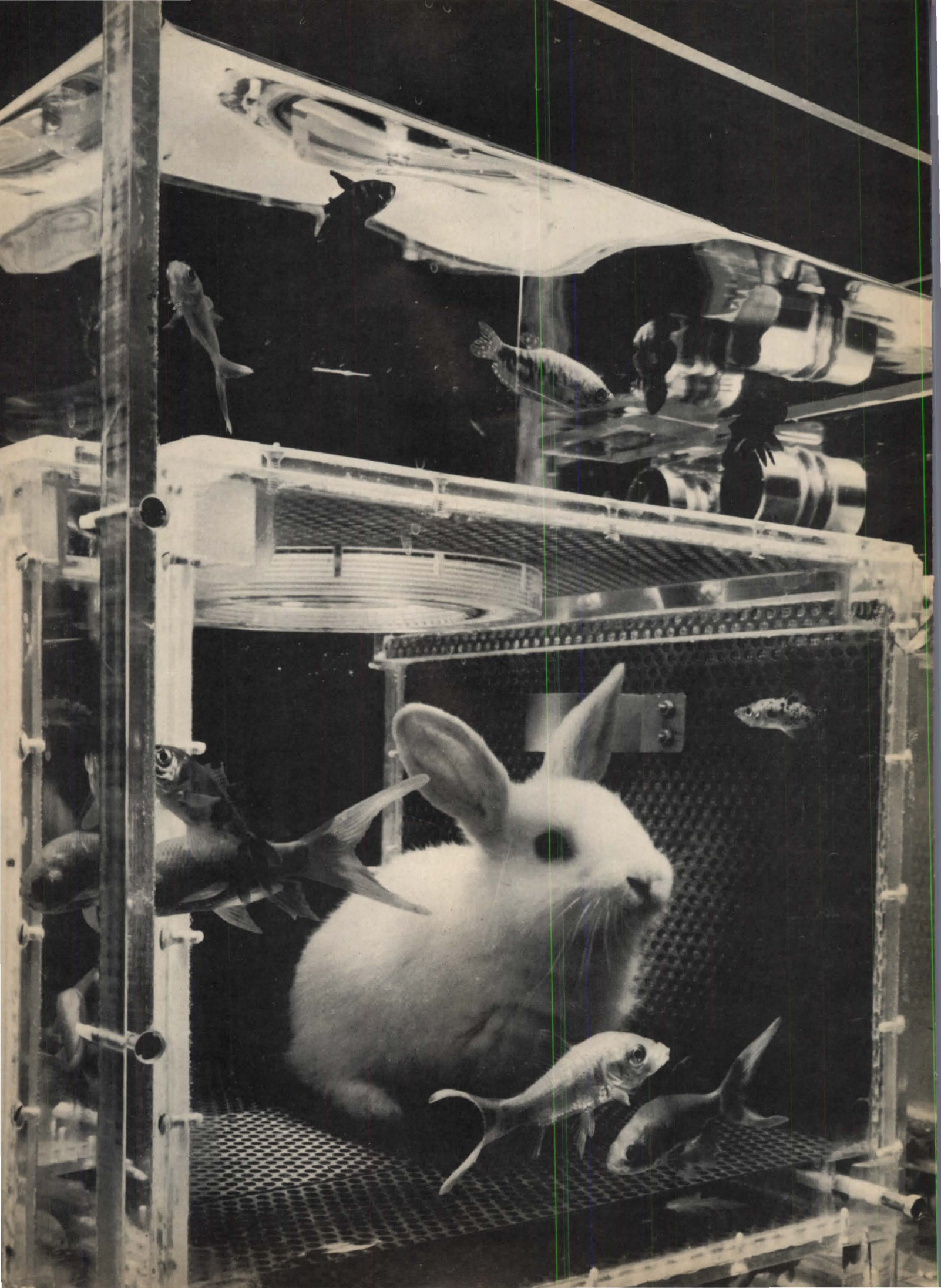


A special message to readers of Progressive Architecture

The underwater rabbit... and how it helped us win the most coveted editorial award in business publishing

The rabbit in this remarkable photo is actually "breathing" like a fish.

Its oxygen is being drawn directly from the water through a gill-like membrane that may someday enable men to live underwater.

A step toward underwater cities?

And underwater architecture?

These were some of the intriguing possibilities considered in the December 1966 issue of *Progressive Architecture*. In a 43,000-word essay titled "Toward the Third Millennium," our editors took a long, searching look at developments that are shaping the future of architecture.

Recently, P.A. Editor Jan Rowan accepted the Jesse H. Neal Editorial Achievement Award—the "Pulitzer Prize" of business publishing—for "Toward the Third Millennium." In competition with more than 560 other publications, it has been judged the best single issue of a business magazine of more than 50,000 circulation published from December 1966 to November 1967.

Though the story of the underwater rabbit was only a small part of the prize-winning issue, it symbolizes the editorial viewpoint that made "Toward the Third Millennium" outstanding ... that makes *every* issue of P.A. outstanding.

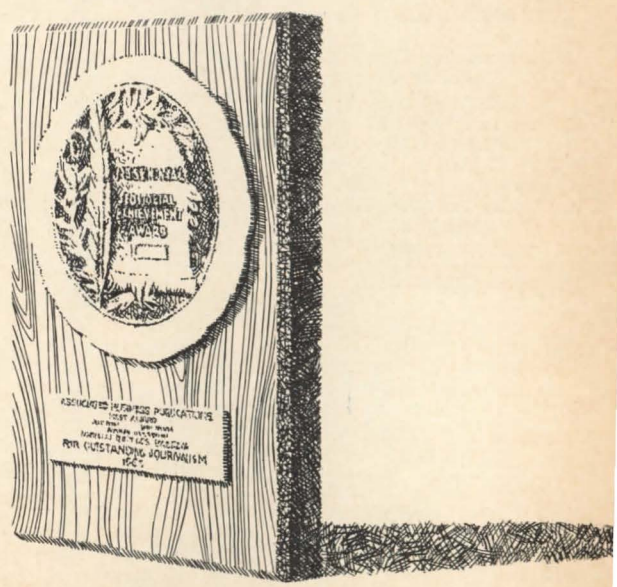
It's a viewpoint that sees architecture in its social and historical context ... that probes behind the forces and events that shape the architect's role.

A viewpoint that is deeply concerned with the future of architecture and that views the architect as the creative force in its evolution.

A viewpoint that is, in a word, progressive.

As the nation's largest architectural magazine, could we have any other viewpoint?

Photo courtesy General Electric Research and Development Center.



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ARCHITECT—Well-established rapidly growing firm in upstate New York seeks young graduate of about three years experience with some background in specification writing. We offer project variety, fine working atmosphere and opportunity for individual growth. Practice includes design of educational, institutional and religious buildings. Please submit resume. Box #571, PROGRESSIVE ARCHITECTURE.

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ARCHITECTS—Virginia Beach, Virginia architectural firm with varied practice has openings for architects and architectural draftsmen with at least three years experience since college. Please send resume and salary requirements to Waller & Sadler, Architects, 1768 Laskin Road, Virginia Beach, Virginia 23451.

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ARCHITECTURAL ACOUSTICS—Opportunities for young architects interested in careers in the growing and challenging field of architectural acoustics; positions available in Los Angeles, Chicago, New York and Cambridge. Please send resume to Robert B. Newman, BOLT BERANEK AND NEWMAN, INC., 50 Moulton Street, Cambridge, Massachusetts 02138. An equal opportunity employer.

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Continued from page 276

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ARCHITECT—A.I.A.; Bach. Arch. Columbia University; N.Y. registration; 13 years diversified experience (U.S.A., Europe and Islands) architectural, structural and interiors; numerous awards; bi-lingual; married and 34. I am looking for an office to which I can contribute in design, organization and produce happier clients. Box #580, PROGRESSIVE ARCHITECTURE.

ARCHITECT—A.I.A., NCARB, degree. Over 20 years all around diversified experience in design, building inspection and production drawings, including 10 years in partnership. Particularly interested in production phase on larger projects. Desire responsible and permanent location requiring such experience and ability. Box #581, PROGRESSIVE ARCHITECTURE.

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ARCHITECT—N.C.A.R.B., 16 years all around experience in design, planning, coordination and production of construction documents, including operation of own office. Looking for permanent and responsible position, in Massachusetts, requiring such experience and with an opportunity for partnership. Box #586, PROGRESSIVE ARCHITECTURE.

ARCHITECT—Registered, NCARB, 32, married, ten years comprehensive experience. Presently project architect, chief designer, 15 man office, total responsibility large multi-use urban developments. Seeking similar position with young Washington, D.C. area firm with variety of interesting work. Resume and samples of work on request. Box #595, PROGRESSIVE ARCHITECTURE.

ARCHITECT—Single, 39, registered New York, 5 states, NCARB. Experience: 9 years international progressive firms. 10 years own practice. Creative designer. Capable administrator. Experienced all phases of practice. Seeking to associate or to assist as consultant. Full or part time. Eastern seaboard only. Free to travel. Box #587, PROGRESSIVE ARCHITECTURE.

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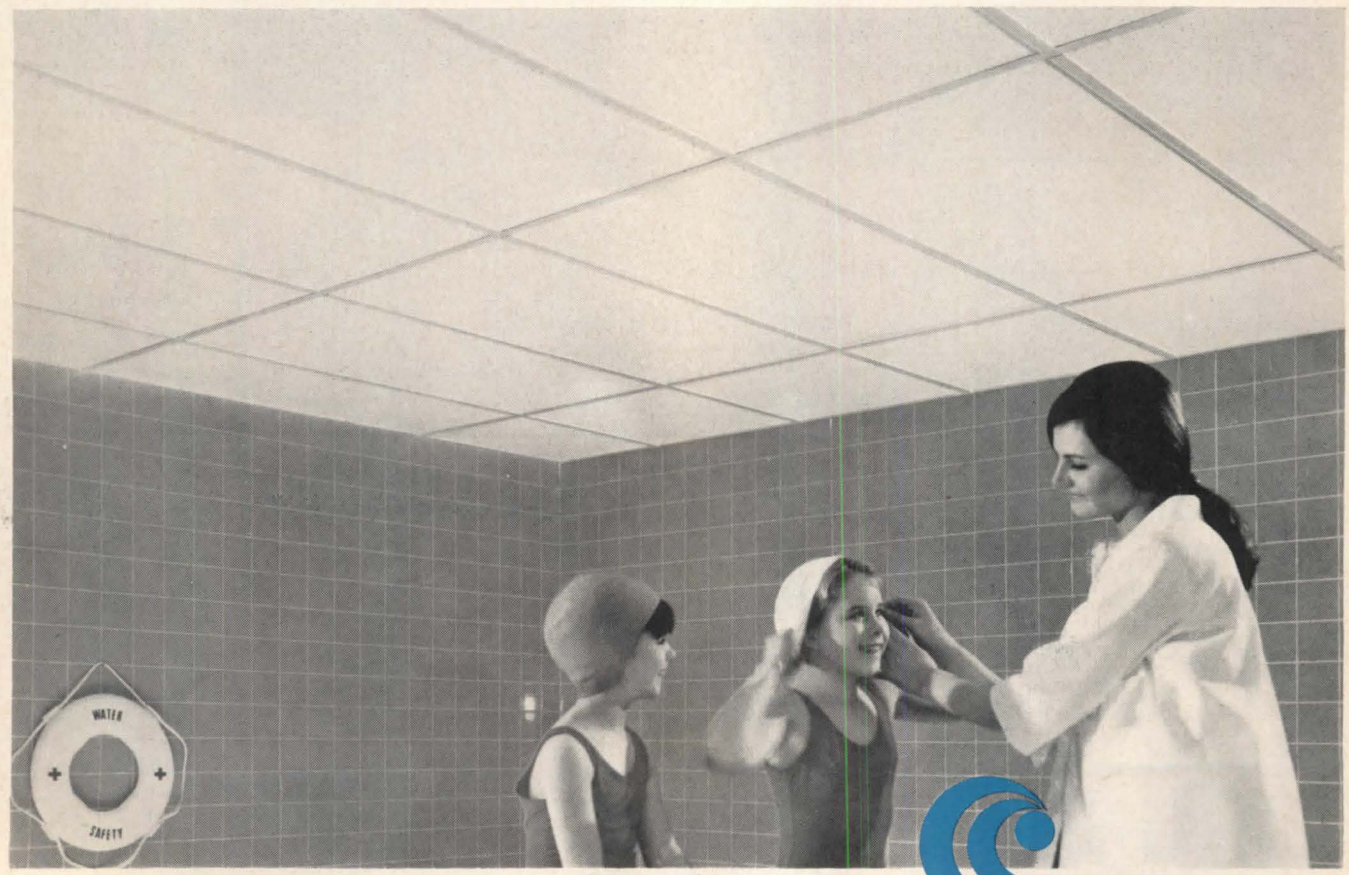

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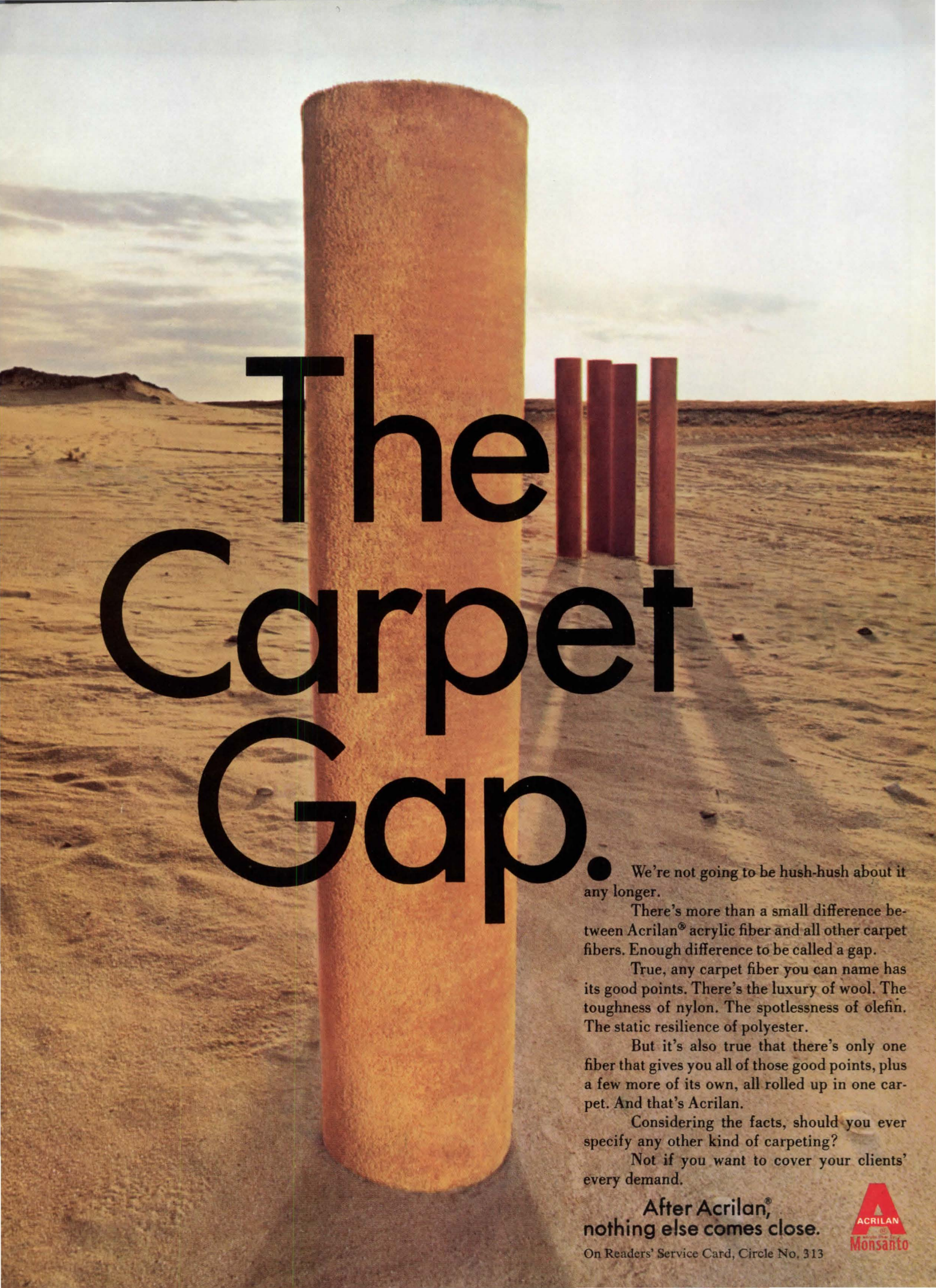

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