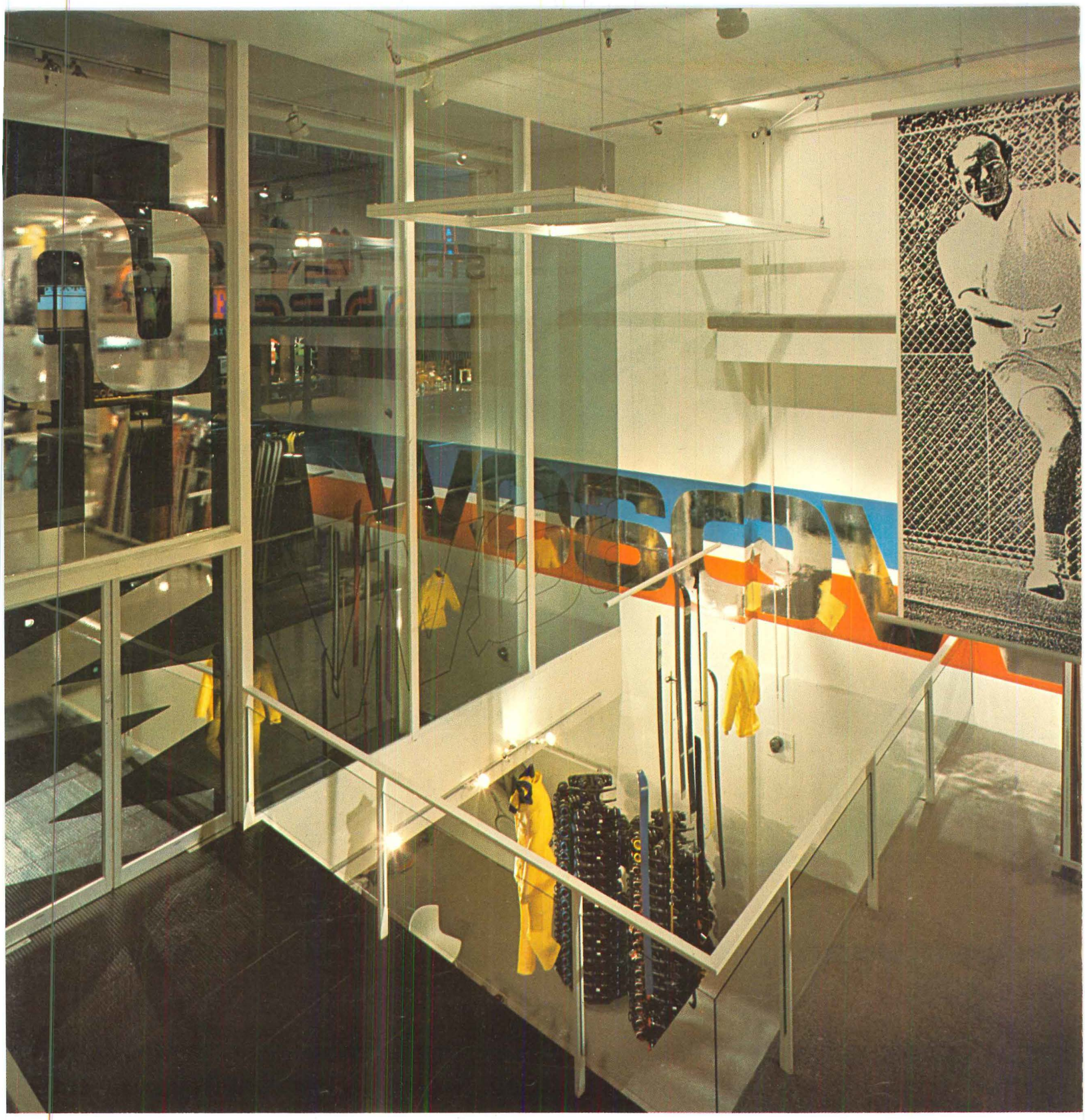


STREETER AND QUARLES WEST, SAN FRANCISCO

BUILDING TYPES STUDY: STORES & SHOPS—DESIGN FOR MERCHANDISING

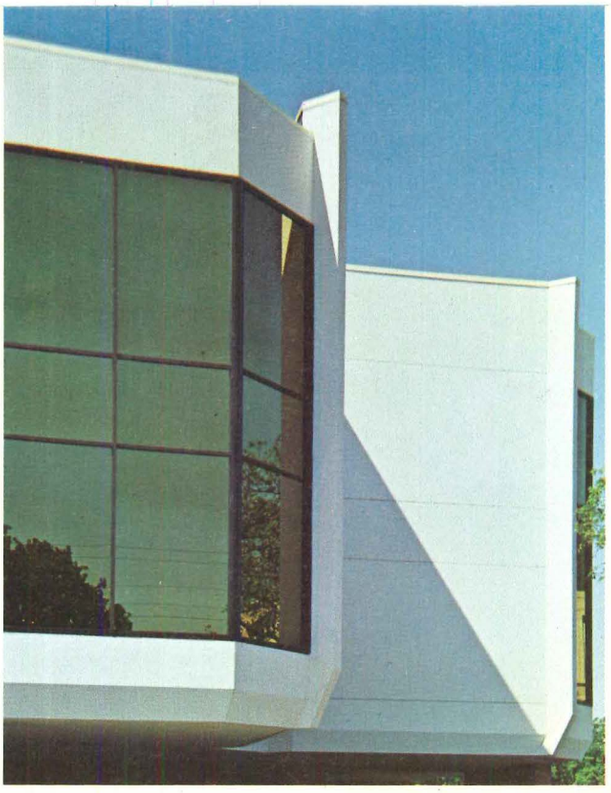
NEW APPROACHES TO HOSPITAL PLANNING

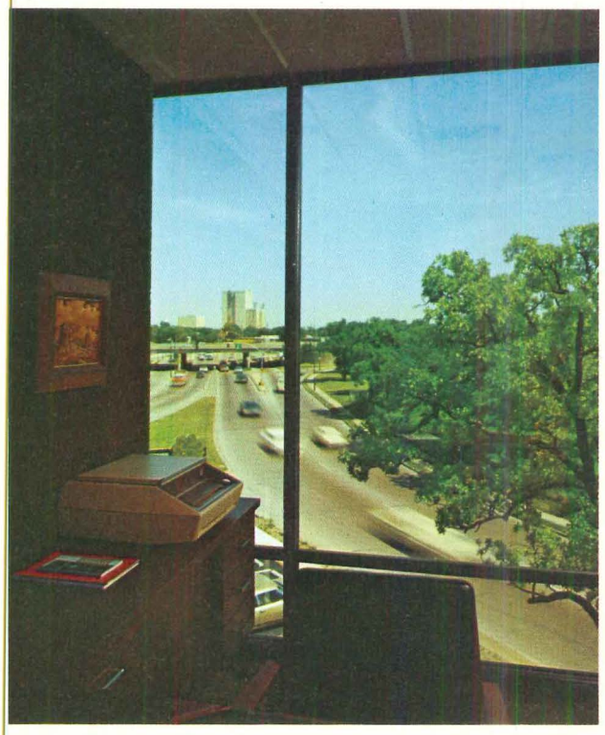
IBM'S NEW COMPLEX IN BOCA RATON, FLORIDA

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

FEBRUARY 1971 **2** A McGRAW-HILL PUBLICATION THREE DOLLARS PER COPY





Golden Vari-Tran® reflective glass makes its debut in Dallas.

This is Lemmon Park Central, the office building designed by Dallas Architects Woodward, Cape & Partners, Inc. Vari-Tran/Golden gave them a beautiful new way to achieve aesthetic effects, while effectively controlling solar radiation and significantly reducing cost of cooling equipment and annual operating expense for owners Southwestern Dynamics, Inc.

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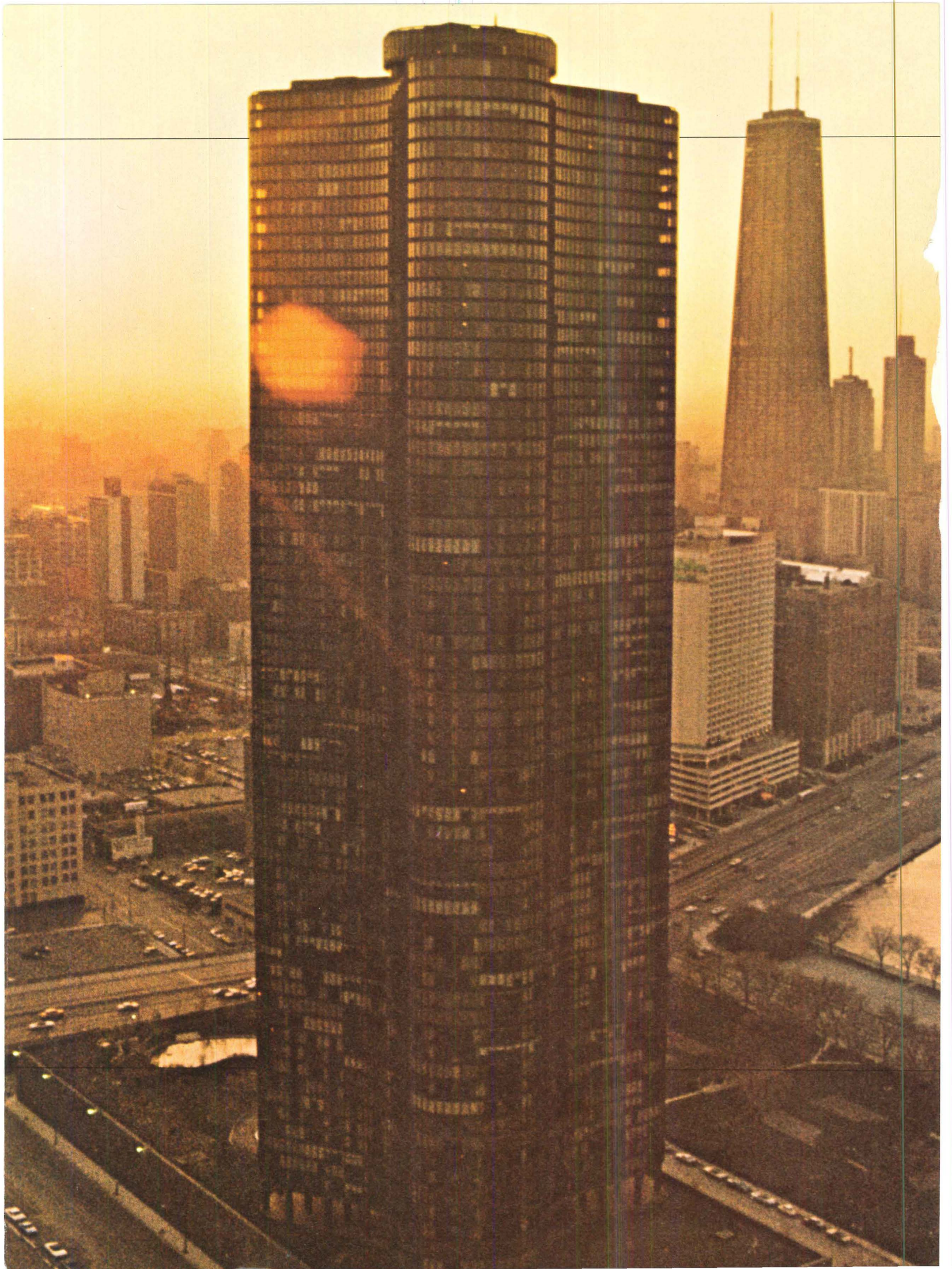

Lake Point Tower conquers the Windy City's weather– with an assist from Butyl sealants.

Will history repeat itself at "Big John"?

In Chicago, so the saying goes, if you don't like the weather, just stick around for a few minutes... it's bound to change.

Trouble is, the change is usually for the worse. If ever there was an acid test for sealants, the Windy City is it.

That's why we're especially proud of the way tapes made with Enjay Butyl rubber have held up in the famous Lake Point Tower. For three blustery winters and rain-swept summers, they've kept the wet in its place... outside.

With a track record like Lake Point Tower behind them, it's not surprising that tapes of Enjay Butyl rubber were selected for Chicago's newest skyline-buster, the John Hancock Building.

"Big John," as it's affectionately called, has enough windows to make it a glazer's nightmare. But since Butyl rubber tapes were used, we're betting it won't be anything of the sort.

Big John's sealants of Enjay Butyl rubber have a lot going for them. Ozone resistance, for one thing. Durability, for another. Plus all the accumulated experience we've amassed with Butyl rubber since we introduced it 30 years ago.

Ask your glazing contractor about it. Especially when you're involved with a building that has to stay dry — inside — for years to come.

Just say Big John sent you.

Enjay Chemical Company, Synthetic Rubber Division, 60 West 49th Street, New York, N.Y. 10020.

Lake Point Tower • Developers: Hartnett-Shaw & Assoc. Inc., Chicago and Fluor Properties Inc., Los Angeles • Architect: Schipporeit-Heinrich, Chicago • Glazing Contractor: National-Hamilton-Division of Bienenfeld Glass Corporation, Chicago • Sealant Manufacturer: Protective Treatments, Inc., Chicago • Windows are Butyl sealed Polarpane insulated glass. Polarpane is a Division of Combustion Engineers, Inc.

John Hancock Center • Owner/Developer: John Hancock Mutual Life Insurance Co. • Architect: Skidmore, Owings and Merrill • Glazing Contractor: National-Hamilton-Division of Bienenfeld Glass Corporation, Chicago • Sealant Manufacturer: Protective Treatments, Inc., Dayton, Ohio •

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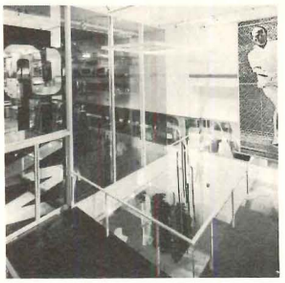

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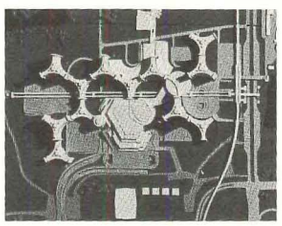
THE RECORD REPORTS



ARCHITECTURAL BUSINESS

ARCHITECTURAL RECORD (combined with AMERICAN ARCHITECT, ARCHITECTURE and WESTERN ARCHITECT AND ENGINEER, February 1971, Vol. 149, No. 2. Title ® reg. in U.S. Patent Office

Indexed in Reader's Guide to Periodical Literature, Art Index, Applied Science & Technology Index, Engineering Index, and The Architectural Index. Published monthly, except May when semi-monthly, by McGraw-Hill, Inc.
Quotations on reprints of articles available. Every effort will be made to return material submitted for possible publication, but editors and corporation will not be responsible for loss or damage.
EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: 330 West 42nd Street, New York, N.Y. 10036. Other Editorial Offices: 425 Battery Street, San Francisco, Cal. 94111; 1249 National Press Building, Washington, D.C. 20004. PUBLICATION OFFICE: 1500 Eckington Place, N.E., Washington, D.C. 20002; second-class postage paid at Washington, D.C.
OFFICERS OF McGRAW-HILL PUBLICATIONS COMPANY: John R. Emery, president; J. Elton Tuohig, senior vice-president—services; George H. Reppert, group vice president; vice presidents: Ralph Blackburn, circulation; John

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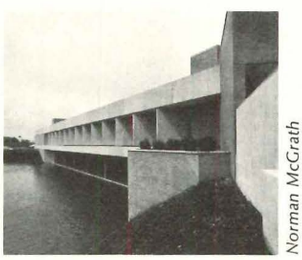
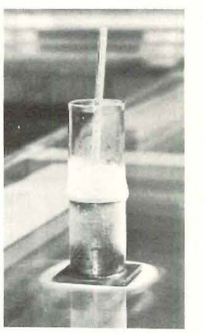


Norman McGrath

BUILDING TYPES STUDY 418

Robert Riggs

ARCHITECTURAL ENGINEERING



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UNCONDITIONAL GUARANTEE: Publisher agrees to refund that part of subscription price applying to unfilled part of subscription if service is unsatisfactory.
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THIS ISSUE is published in national and separate editions. Additional pages of separate edition numbered or allowed for as follows: Western Section 32-1 through 32-6.

POSTMASTER: Please send form 3579 to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520.

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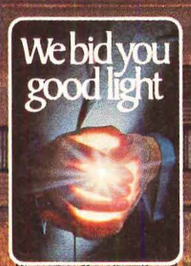

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Architects and social responsibility: good beginning, and a big boost

At the Chicago convention in 1969, with the passage of the "$15 million resolution" to "alleviate urban problems", the A.I.A. as an organization and as a group of individuals took on a major commitment.

In large part through the efforts of the A.I.A.'s Task Force on Professional Responsibility to Society and related A.I.A. staff people and chapter members, the results over the last year and a half have been impressive—perhaps not all that many might have hoped for, but certainly more than many might have expected:

The Community Design/Development Centers, which had a small beginning six years ago, have developed (in over 50 areas) into strong comprehensive planning mechanisms for community self-development. In the last year, with active national A.I.A. support, progress was made in gaining financial support from foundations, OEO, and HUD. And through a seminar held at the Octagon, key Federal agency representatives were exposed to the CDC concept and agreed to work more closely with CDC people in such areas as urban renewal and Model Cities. The U.S. Conference of Mayors has agreed to a presentation by the CDCs at their convention; and a number of legislators have begun actively supporting the concept.

Further, in the last year, the A.I.A./Ford Foundation scholarship program got off to a good start; and its success has resulted in more matching fund money being made available by several universities for the training of disadvantaged. Three more of the seven predominantly black schools of architecture—Hampton, Southern, and Tuskegee—were accredited. Other pre-college educational and remedial programs are effectively underway. So, a strong beginning.

And next year, some stronger follow-through. Much stronger. The reason:

In September, the A.I.A. board established the Human Resources Council, to "implement the programs of the Task Force on Professional Responsibility to Society." The HRC is an action arm. It is chaired jointly by two men who will not mind being called activists—Nathaniel Owings and Robert Nash, the first black architect to be elected a national vice-president of A.I.A. And it is out to enlist the active participation of "an activist corps" of architects from every single one of A.I.A.'s 175 chapters.

Its role is to raise funds from all possible sources, and inspire volunteer effort at the local A.I.A. chapter level, for the support of the Task Force programs named above, plus some new ones—a study of constraints to building and creative economics, the implementation of BEEP—Black Executive Exchange Program, and others. HRC, which will be financially self-supporting, has an executive committee of 12—appointed by the president of A.I.A. from HRC members—which will receive and evaluate proposals for dispensing the funds raised.

HRC hopes to raise funds from more architectural firms (10 have already pledged $100,000), from sympathetic corporations and foundations, and from government programs. And it hopes to use its funds as seed money. For example, says Robert Nash, "We intend to get a few CDC housing projects—projects that are now designed and have enthusiastic local approval—going. Then we can show local bankers and Federal officials how effective the CDC approach can be. "This is where," says Nash, "HUD could really plug in to get housing built."

I find I cannot resist saying that this would be a real Breakthrough—real housing built by the real construction industry on tough urban sites for the people who need it most and designed by architects who, from the beginning, have worked directly and effectively with the community for which the housing is being built.

How soon? Nash says he'll make a report at the Detroit convention in June "on which projects are underway." And he sounds confident when he talks about this and all the other HRC action.

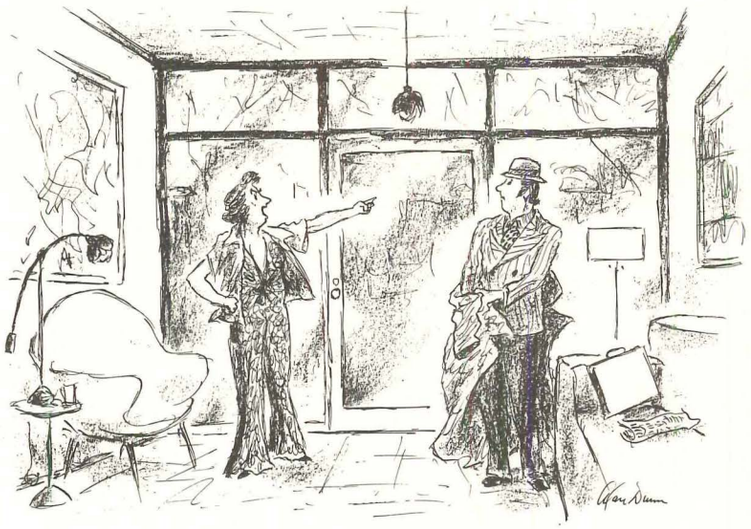
Will it really work? That depends to a very great degree on the amount of support that the programs receive at the local level—from local A.I.A. chapters and each individual architect. Because if the Task Force and HRC succeed, they will have succeeded because local architects volunteered their services to solve local problems, raised money locally to finance them, and got local support from local government and local citizens.

Here is a real chance for architects to make a major, positive, measurable, right-now impact on the conditions of living in cities and towns across the country; a chance to make at least some impact on the social problems of our times that are so desperately unfair and divisive; and a chance to make it possible for deserving students who otherwise would never have a chance to become effective and valued members of the architectural profession.

On February 27th, in Omaha, HRC is holding its first all-member meeting. Someone from your chapter has been named as representative. If you share the goals of the Task Force on Professional Responsibility to Society, why not tell your chapter representative? If possible, volunteer your time and/or money. But at least volunteer your support and enthusiasm. It's a beginning.

——*Walter F. Wagner, Jr.*

—Drawn for the RECORD by Alan Dunn



"You and your module! The Joneses are now living in a capsule!"

Common sense about the content of catalogs

Some catalogs are—from the point of view of supplying the information an architect or engineer needs—very, very good; and some, as everyone knows, are horrid.

What makes a good catalog good? Sweet's Division of McGraw-Hill Information Systems Company—with the cooperation of the A.I.A. has (and three cheers for them) gone to an awful lot of trouble and expense to find out exactly what architects and engineers need from and want in catalogs, and will be issuing a series of 310 Guidelines during 1971, broken down by product category, that will make it easy for any manufacturer to include the right content in his catalogs. Sweet's calls it "the building product manufacturer's basic working tool in the development of building product catalogs completely satisfying architects', consulting engineers', and specification writers' information needs throughout the design/specification process. . . ."

The Guidelines were developed painstakingly. Sweet's began with the 16 division format of the Uniform System and defined 310 product categories.

With that beginning, Sweet's employed 15 architects, spec writers, and engineers on a consulting basis and they, with Sweet's Architectural Services Department, developed the first rough drafts of the 310 Guidelines. These were each extensive documents. The draft of Guideline 9.23 Resilient Flooring, for example, ran eight typed pages of what should be included in a resilient flooring catalog—from general description of product, manufacturer, and advantages of use; to product applications, technical design data; installation details; comparative cost range/price lists; suggested architectural specs; guarantees; maintenance instructions; and availability by area.

After review and polishing by Sweet's, each of the Guidelines were then submitted to one or more of a panel of 280 practicing professionals who reviewed, evaluated, and either approved or recommended modification of the Guideline. Finally, Guidelines were sent to leading manufacturers in each product category for their review.

The first of the resulting Guidelines will soon be available free and on a non-proprietary basis by contacting Architectural Servives Manager, Sweet's Division, McGraw-Hill Information Systems Company, 330 West 42nd Street, New York, New York 10036. The rest of the Guidelines will be made available as completed during 1971.

There have of course been general generic checklists for the design of catalogs before. And CSI's SpecData 1 calls for a specific format for literature. What's different in the case of Guidelines is that they provide a carefully studied list of what the user needs, and leaves it (quite properly) to the manufacturer to make what he thinks is the most effective use of the Guideline.

In all, it seems to me, a most valuable aid and service to the profession at a time when the need for information on products and materials is needed faster and in more detail than ever before.

Again, three cheers for Sweet's.

Project Air-Reclamation: a unique effort by a publisher

There is, of course, nothing new about air pollution. It's been around—in dangerous concentrations—since the beginning of the Age of Industrialization. In the April 1937 issue of RECORD—which also included an article on the newest ideas in classrooms complete with cast iron desks and a demand for a lighting intensity "of at least 15 footcandles"—the editors published a four-page article on "The War Against Air Pollution." Well, air pollution has been getting worse, and we and others are writing more and more about it, but we've got (I'm happy to say) a publisher who is doing something.

On page 33 of this issue is an announcement signed by RECORD's publisher, Blake Hughes, which announces what I believe to be a unique offer:

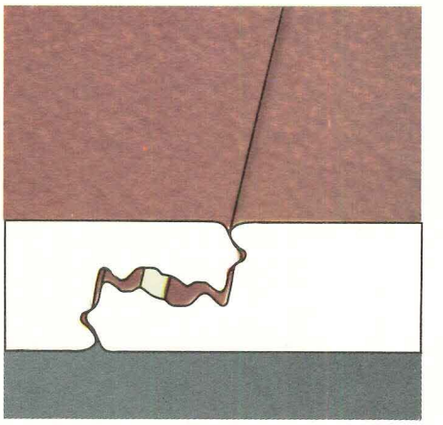
Since "it would be a most constructive development if architects, and the engineers who work with them, were more fully informed on anti-pollution systems and equipment designed for use in all types of buildings . . . with the hope of rendering a professional service, ARCHITECTURAL RECORD is offering . . . one full black and white page free to any manufacturer of equipment specifically designed to reduce outdoor air pollution. . . ." Well, there are conditions (you can read them on page 33) but that's the gist of what seems to me a most valuable service to the profession. Editors hardly ever say anything nice about publishers (who set budgets and keep telling editors to cut costs and be more efficient and all that), but on this occasion this editor would like to say "Three cheers for our publisher and his personal effort to do something about air pollution."

In next month's RECORD

Child care centers and community health centers are a bold new concept in the health care field. There are few of them—for example, there are now in the whole country only about 25,000 day care centers for children (public or private) and many are woefully substandard; but there is of course a tremendous need. Thus, according to Edward Zigler, director of HEW's Office of Child Development, "The growth of day care will be the single greatest new development in the next five years in Federal programming." The March Building Types Study will examine a number of such centers, along with health centers in poor and ghetto neighborhoods.

Also in the issue: The last major office building complex to be designed by Mies, the clearest article I've read yet on the use of computers in architecture, and so (as usual) on and on. —*W.W.*

Sterling Heights High School; Warren, Michigan; Architect: Wakely-Kushner Assoc.



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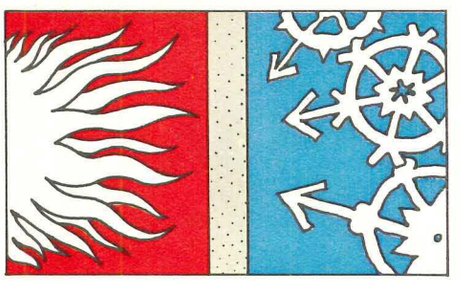
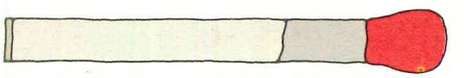
FOAM-LINE: An architectural wall system with urethane insulation plus porcelain enamel at a cost within range of an ordinary insulated and painted panel.

Foam-Line's low cost is possible because of a brand-new, continuous, in-line foaming, bonding and finishing process Robertson developed. This new process, plus Foam-Line's low installation costs, account for the tremendous savings. But there's more, including:



THERMAL PERFORMANCE: Heat transmission through Foam-Line is three times lower than conventional masonry. The U factor: .08. The secret: the 2″ thick urethane core and the non-conductive side joints.



U.L. LISTED FOAM-LINE is the first panel to qualify for listing in a new category established by Underwriters' Laboratories, "Insulated Wall Panels." File R-5541.

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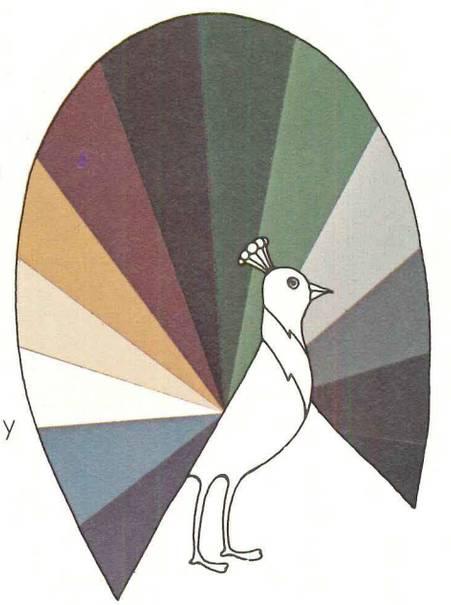
ALL THIS FOR $3 SQ FT* INSTALLED: To find out what Foam-Line will cost on your building, write H. H. Robertson Company, Room 1113, Two Gateway Center, Pittsburgh, Pa. 15222.



ROBERTSON

* Costs shown are based on average material area, complexity and installation. For a quotation on a specific project, contact your local Robertson representative.

For more data, circle 5 on inquiry card

What makes this ceiling system right for this job?

Roanoke Municipal Building ☐ **Architect-Engineer:** Hayes, Seay, Mattern & Mattern, Roanoke, Va. ☐ **General Contractor:** John W. Daniel & Company, Inc., Danville, Va. ☐ **Mechanical Contractor:** H. A. Gross, Inc., Roanoke, Va. ☐ **Electrical Contractor:** G. J. Hopkins, Inc., Roanoke, Va. ☐ **Ceiling Systems Contractor:** Shields, Inc., Roanoke, Va.

The invisible way it heats and cools, for one thing.

The ceiling system is Armstrong C-60/30 Luminaire. And though it heats and cools the Roanoke Municipal Building from top to bottom, there's not a distracting air diffuser or return-air grille to be seen. (Armstrong's unique Supply-Air Linear Diffuser makes it possible.) You might say the Luminaire story is a combination of function and esthetics. A striking modular system that handles air, light, and sound, while it offers rated fire protection, sprinkler-head adaptability, and the kind of flexibility that makes it always ready for tomorrow. We'd like you to know more about Luminaire and the wide range of other Armstrong Ceiling Systems. Write for a copy of our folio. Armstrong, 4202 Rock Street, Lancaster, Pa. 17604.

Armstrong CEILING SYSTEMS THAT WORK

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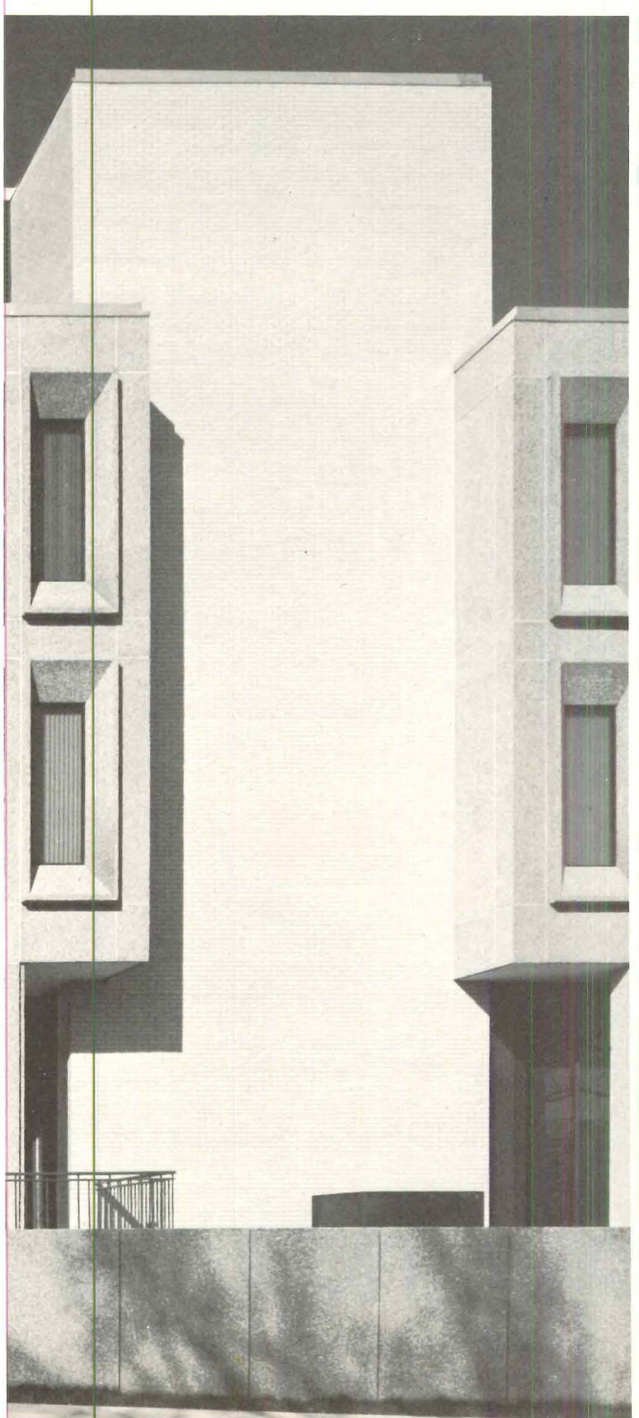

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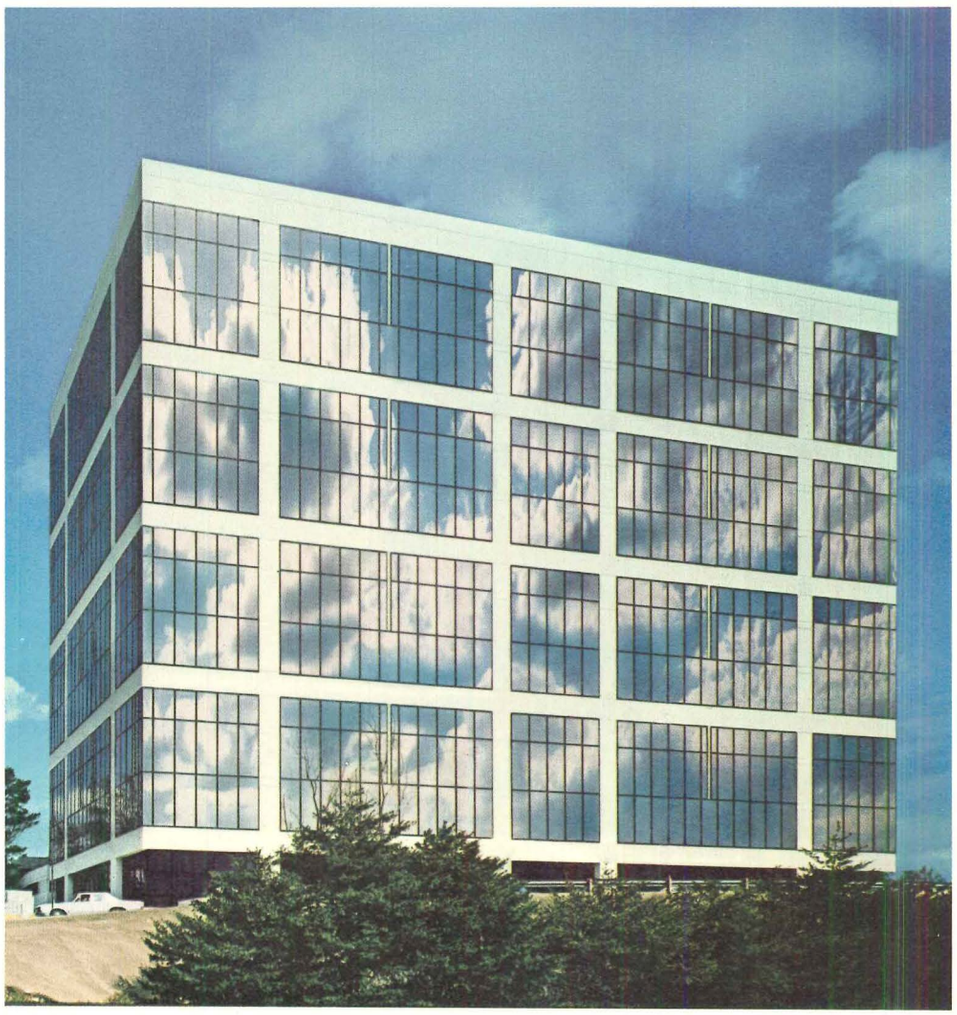

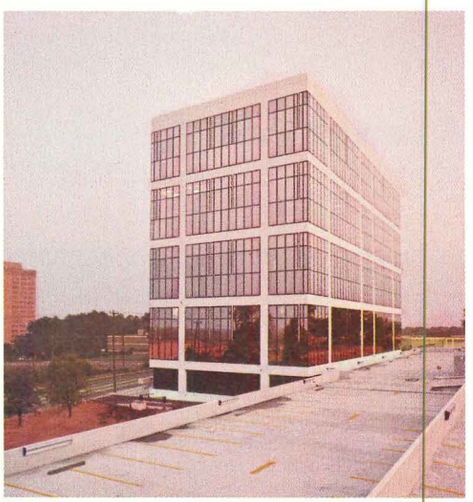

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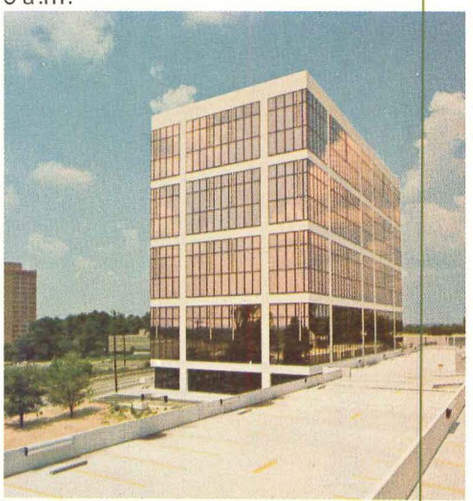

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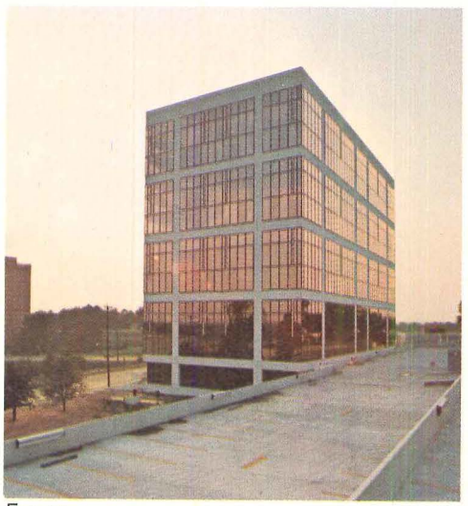

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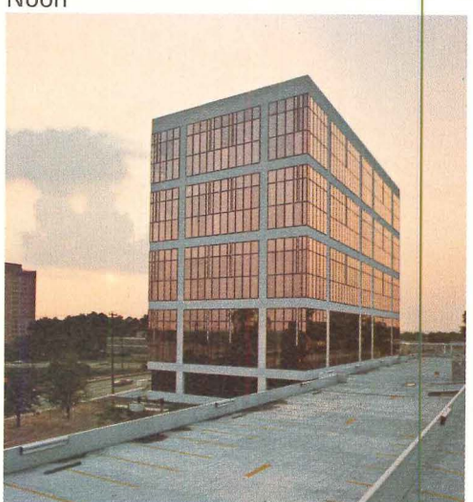

6 p.m.

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He chose PPG's *Solarban® Twindow®* Unit, and used it as an active design medium. The reflectivity of the *Solarban Twindow* Units insures that the building facade will never be static. Its color, tone and reflective patterns will change as often as the sky tones, light intensity and cloud patterns change.

In addition, the architect and mechanical engineer found that the performance of the glass would offset its higher cost by contributing to savings in HVAC equipment and operating costs.

The architect attributes the design success of his building to the fact that he recognized this idea when he began: "Glass should not simply be something you use to see through. Glass is an active design medium."

See PPG about *Solarban Twindow* Units—or the others in our family of Environmental Glass for your next building. Early in the design stages. There's a PPG Environmental Glass that you can use as an active design medium to meet any esthetic consideration, solve any environmental problem and provide a solid return on investment. Write PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

PPG: a Concern for the Future

Developer: Office Planning Associates, a Division of Cousins Properties Incorporated, Atlanta
Architect: Toombs, Amisano & Wells, Atlanta

For more data, circle 6 on inquiry card

PPG INDUSTRIES

8 a.m.

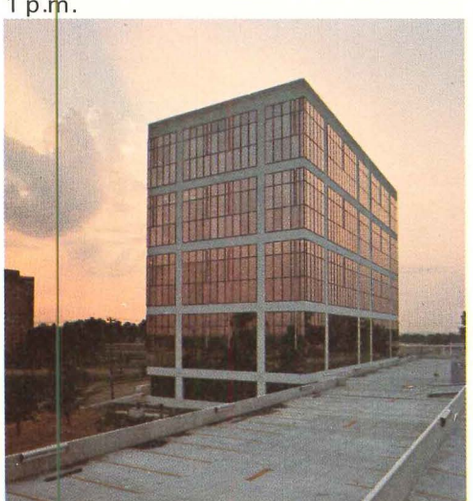
10 a.m.

11 a.m.

1 p.m.

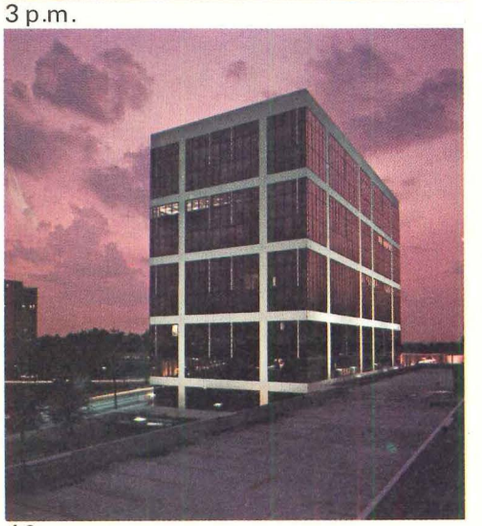
2 p.m.

3 p.m.



7 p.m.

8 p.m.



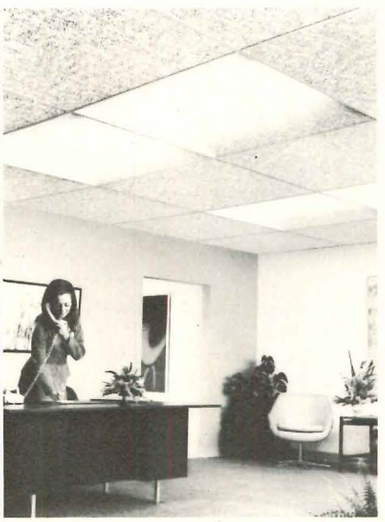
10 p.m.

Contempo-Wall is as flexible as tenants' requirements.

It's the Gold Bond Demountable Partition System that lets you divide space and rearrange space at will. All components are demountable and reusable. Partitions come in four heights: floor to ceiling, cornice, bank rail, and low rail — all with Durasan® vinyl-surfaced gypsum wallboard. Abrasion resistant. Washable. Choose from a wide range of woodgrains and colors . . . including textures of burlap, stipple, and grass cloth. For details on Contempo-Wall® and other products shown here, write National Gypsum Company, Dept. AR-12G, Buffalo, New York 14225.

OTHER CONSTRUCTIVE IDEAS FROM NATIONAL GYPSUM, THE ANSWER PEOPLE.

Tonico® Cumulus Acoustical Panels help solve the problem of noise. They have an NRC of .65-.75 and a 35-39 STC range. They're noncombustible, and have a richly textured finish for any interior design.



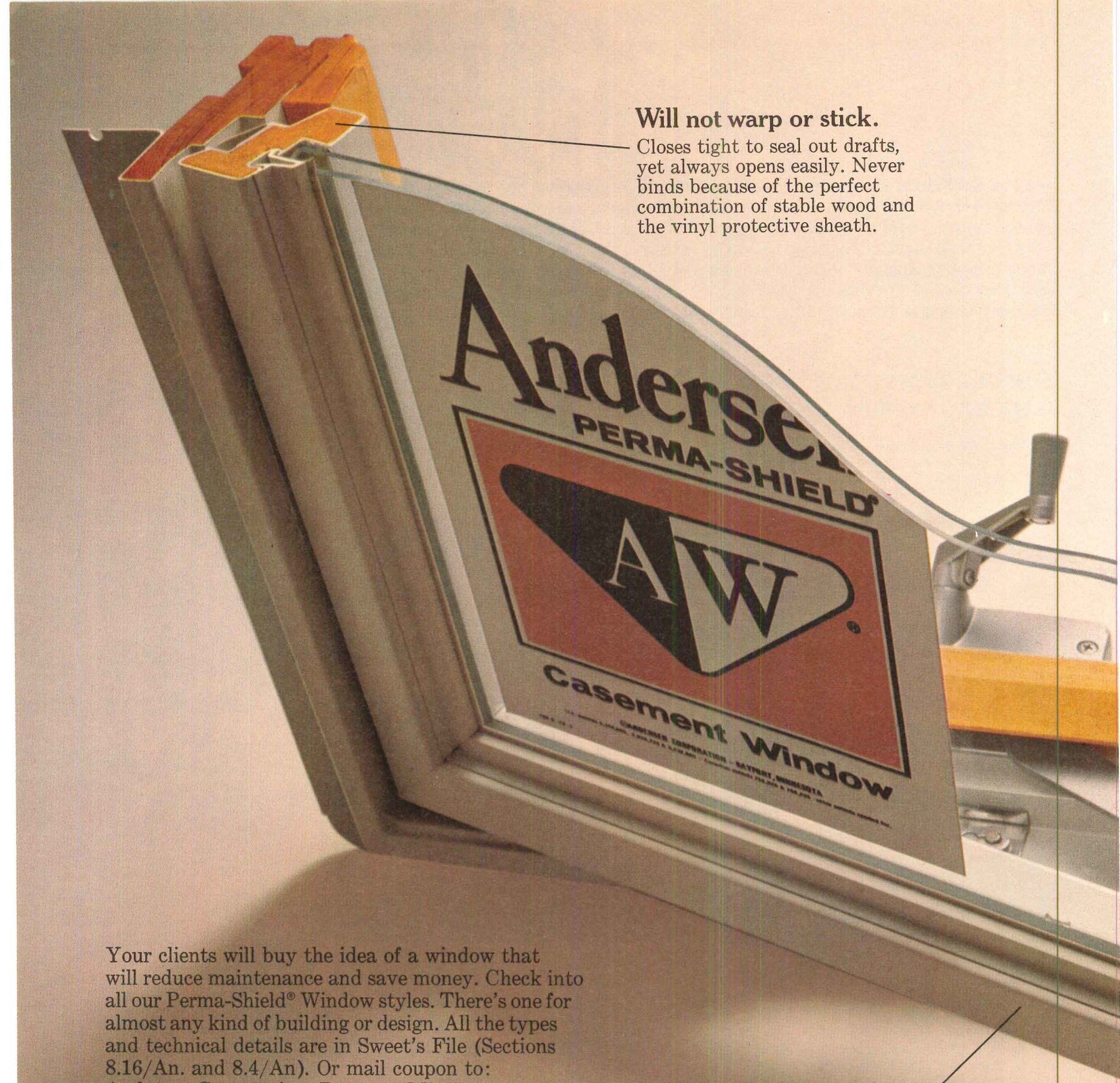
Gold Bond Panel Vault Light Fixtures and Tectum® Acoustical Panels are the answer to a decorative ceiling, that is acoustically efficient and easy to erect. Panel Vault Light Fixtures are equally adaptable with any Gold Bond Acoustical Panel.

Durasan Vinyl-Surfaced Gypsum Wallboard Panels are one answer to low-cost maintenance. They're rugged, abrasion resistant and washable. Durasan is available in a wide range of textures, colors, and woodgrains.

Gold Bond Metaledge Corewall™ is the answer to the fast, lightweight, low-cost enclosure of elevator shafts and stairwells. Two-inch thick, two-foot wide long-length panels of gypsum have metal edges for attachment, rigidity, and increased fire resistance.

Gold Bond®
BUILDING PRODUCTS

For more data, circle 7 on inquiry card



Will not warp or stick.
Closes tight to seal out drafts, yet always opens easily. Never binds because of the perfect combination of stable wood and the vinyl protective sheath.

Your clients will buy the idea of a window that will reduce maintenance and save money. Check into all our Perma-Shield® Window styles. There's one for almost any kind of building or design. All the types and technical details are in Sweet's File (Sections 8.16/An. and 8.4/An). Or mail coupon to: Andersen Corporation, Bayport, Minnesota 55003.

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Doesn't need painting or scraping.
This tough, durable vinyl protective shield won't peel, crack, or blister, nor rust, pit, and corrode like metal—ends costly maintenance.

☐ Send me literature on all your Perma-Shield Windows.
☐ I'd like your architectural representative to call on me.

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Firm _____

Address _____

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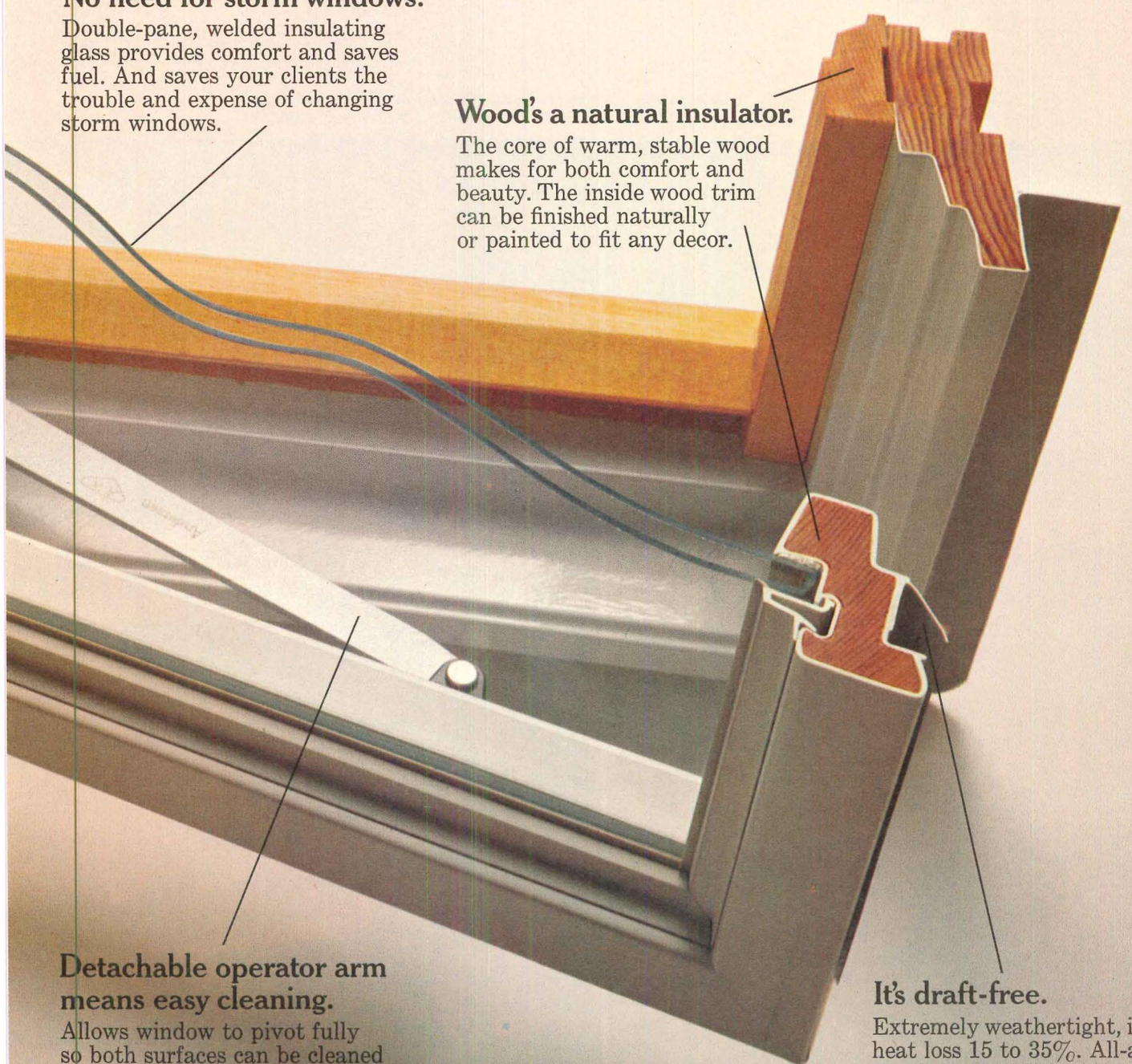
Andersen Windows™
Window beauty is Andersen.
Andersen Corp., Bayport, Minnesota 55003

Here's the window that takes care of itself.

No need for storm windows.
Double-pane, welded insulating glass provides comfort and saves fuel. And saves your clients the trouble and expense of changing storm windows.

Wood's a natural insulator.
The core of warm, stable wood makes for both comfort and beauty. The inside wood trim can be finished naturally or painted to fit any decor.



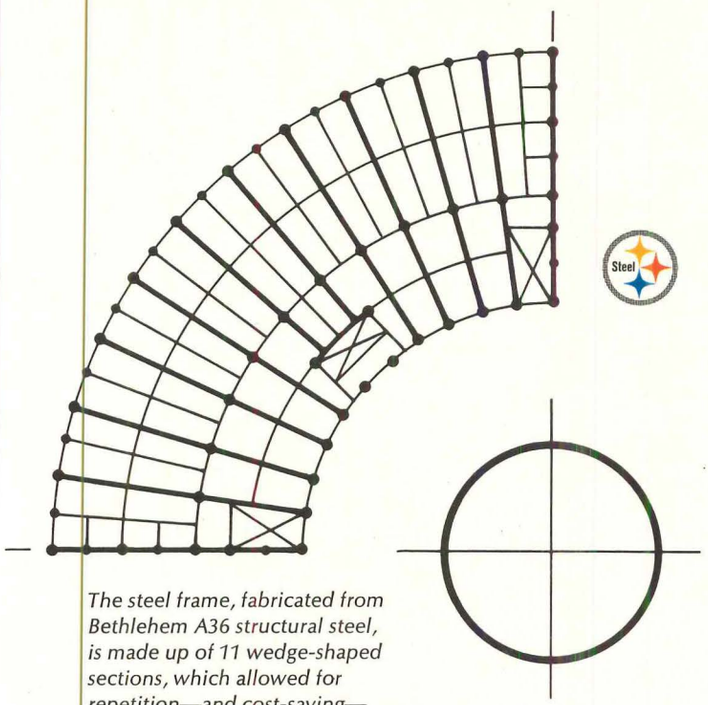
Detachable operator arm means easy cleaning.
Allows window to pivot fully so both surfaces can be cleaned from the inside. And with welded insulating glass, there are only two surfaces to clean, not four.

It's draft-free.
Extremely weathertight, it reduces heat loss 15 to 35%. All-around vinyl weather-stripping always keeps its shape. And chemically-treated wood is dimensionally stable.

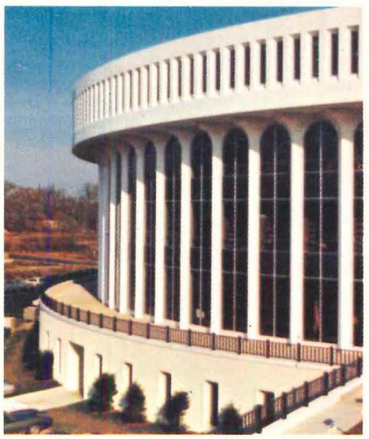
Cost of steel frame lowered

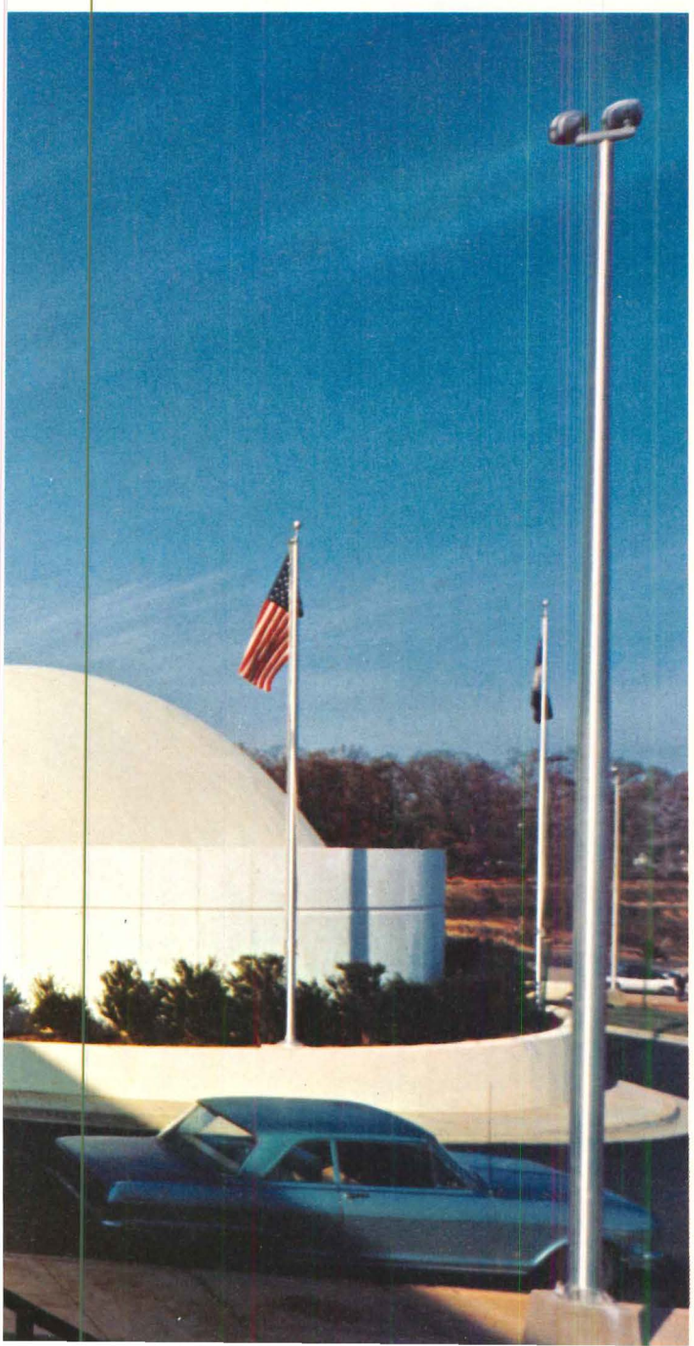
by designing 11 repetitive wedge-shaped sections

Architects: Ward and Schneider, Cleveland, Ohio. Consulting engineers: Barber & Hoffman, Cleveland. General contractor: Hill and Kimmel, Inc., Silver Spring, Md. Steel fabricator: Arlington Iron Works, Arlington, Va.



The steel frame, fabricated from Bethlehem A36 structural steel, is made up of 11 wedge-shaped sections, which allowed for repetition—and cost-saving—in fabrication.





New headquarters building reflects Arlington County's pride in its educational system

The bond issue that authorized the Arlington County (Va.) Education Center called for a building that would "reflect the importance" of the 26,000-student school system. Steel helped the architects achieve a striking building, at a cost below the budget figure.

The basic shape of the Center is an arc. A circular, domed planetarium was used as a radius point, and grid lines extend from that point to form 11 equal wedge-shaped sections in the main building. Here is where steel came into its own. Because of the repetition of the wedge shapes, structural steel could be fabricated using the same shapes repetitiously, at a significant saving in cost. To form the curves of the building, the steel frame was cut and fit from short straight sections. Bethlehem A-36 structural steel was used, and all connections were bolted.

The building takes advantage of a naturally sloping site, allowing for five stories at the outward curve of the arc, four on the inner face. The lowest level contains the school system's data processing center, the ground floor has the rooms most often visited by the public, and the upper three floors house staff offices.

Steel is versatile, adaptable, economical. It can lighten a structure, give it shape, shorten construction time, provide more usable floor space. Want to discuss your next building? The Sales Engineer at the nearest Bethlehem office is available to you at any time.

BETHLEHEM STEEL

The Arlington County Education Center has 58,800 sq ft of floor space including the Planetarium building. The Center was built at a cost well below the budgeted figure.

The no-show carpet.

Even 36 million people at McCarran International Airport can't make a carpet of Antron® look worn and dirty.

At Du Pont, we were sure Antron* nylon was the ultimate carpet fiber for any heavy traffic use. But we were absolutely positive after we got the following report from Bonded Services, the maintenance firm at McCarran International Airport in Las Vegas:

"The carpeting is wearing like iron. One area has been subjected to more than 36,000,000 traffics in over four years and it has yet to show a single sign of wear.

" 'Antron' has proved highly resistant to the appearance of soil. The actual cost of maintaining the carpeting versus tile has been at least 40% saving in labor and material. At this date, we don't anticipate replacing the carpet. It might even double our original five-year wear prediction."

Can you have any doubts after this kind of rave? Wherever you're considering carpet, consider "Antron". No matter how light, how bright the color, no matter how hard the wear, a carpet with pile of "Antron" will keep looking cleaner, fresher, newer longer than you ever thought possible. If you have any questions, get in touch with us. Du Pont, Contract Carpet Specialist, Centre Road Building, Wilmington, Delaware 19898. We're convinced. Let us convince you.

*Du Pont registered trademark. Du Pont makes fibers, not carpets.

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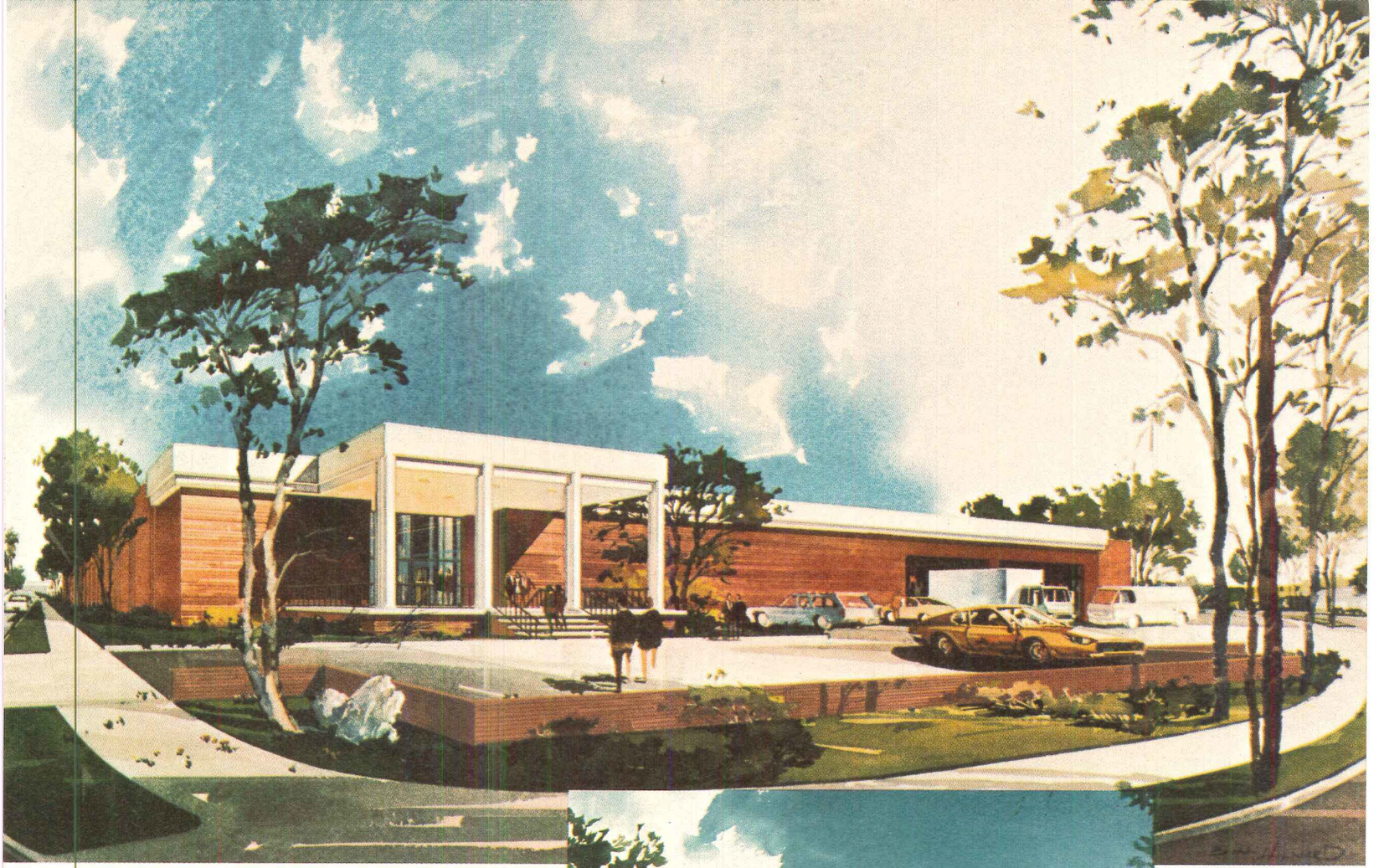


1.

2.

Single source responsibility

Typical designs and occupancies: 1. The 62,000 square foot laminating plant of Pioneer Plastics Corporation. 2. Beck/Arnley Corporation of California, distributor of auto parts. Both designed by Field and Silverman, A.I.A., Beverly Hills, California. 3. Under Sea Industries, 35,000 square feet, a manufacturer of sea diving equipment. Designed by Latt, Jackson & Associates, Inc., Austin W. Daly, A.I.A., Los Angeles. Developer Boise Cascade Building Company, Gardena, California. Air Conditioning contractor, Landmark Heating & Air Conditioning, Torrance, California.

3.

One manufacturer, Lennox, is responsible for the HVAC equipment and controls in this 800-acre industrial park. It's the Dominguez Industrial Park, adjoining Los Angeles. A Boise Cascade development, centered in a 2000 acre industrial complex. Buildings like these, ror light manufacturing or service companies, are custom designed, and available for purchase or lease.

(continued overleaf . . .)

continued . . .

single source responsibility: the Lennox concept

Innovative design themes, creative landscaping and wide traffic arteries add to the park feeling. Special zoning plans keep compatible industries adjacent to one another. Sites range from one acre up.

The developers have standardized on Lennox Air Conditioning and Heating, and one contractor, Landmark Heating & Air Conditioning Company of Torrance, and one source for the service contract, also provided by Landmark.

This standardization offers Boise Cascade important benefits. Design and purchasing time is reduced. Because the system is fully packaged, the cost of purchase is predictable. On-site labor is minimal. Service contracts fix the cost of owning. A full range of equipment is offered. Functional capabilities are known. It is easy to integrate Lennox systems into any plans, for any type of occupancy.

Sleek, low-profile silhouettes preserve the esthetics of the development.

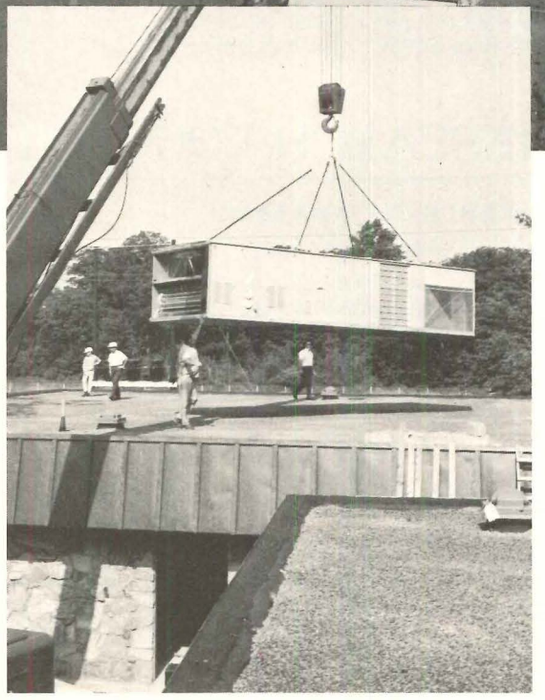
Because Lennox systems are modular, principally rooftop, they pose no problems for expansion. New units can be added as a building grows. Walls can be moved or added as the owner adjusts to change. Single and multizone units provide precisely needed environments for different occupancies . . . offices, production or warehousing.

If you are planning a development, consider the esthetics, the comfort, the economies, the performance of Lennox Air Conditioning and Heating. Write Lennox Industries Inc., 975 South 12th Avenue, Marshalltown, Iowa 50158.

LENNOX®
AIR CONDITIONING • HEATING

For more data, circle 10 on inquiry card

Tri-Lite Manufacturing Company, Inc., manufacturer of light fixtures, occupies this 24,000 square foot building. Architect: Latt, Jackson and Associates, Los Angeles. Located in Broadway-Rosecrans Industrial Park.



Aerial view of 800 acre Domingues Industrial Park, Los Angeles. At present stage of development, there are 225 Lennox gas-electric air conditioning, heating, ventilating units installed on rooftops.

Lennox air conditioning, heating and ventilating units are completely factory-assembled, wired and tested. Choice of: gas, oil, electric or hot water heat with up to 33 tons DX cooling. They are shipped ready to lower onto a Lennox roof mounting frame. Optional Power Saver™ cools with outside air when temperatures are under 70°F.

for architects, engineers, consultants . . .

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Essex House
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Detailed coverage: Sanitation (sewerage and water) • Utilities services • Grading and paving • Landscaping • Auxiliary structures.

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MOBILE HOMES have come of age. Right now they provide comfortable — *and affordable* — housing for more than FIVE MILLION people, in over 24,000 'parks'.

The homes are being produced faster than sites for them are being made available in soundly conceived, well-designed and properly engineered residential environments.

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This spells opportunity for architectural/engineering firms, landscape architects, lenders and other specialists. All are needed to help land developers convert raw land into quality housing. Quickly, and at minimum cost.

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This is big business. Mobile homes account for 67% of new homes selling for under $25,000. Production in 1970 topped 400,000; they were sold at retail for approximately $3 BILLION. Sites are needed for more than *one thousand mobile homes a day!*

Typically, parks cover 30 to more than 200 acres; provide sites for 100 to 700 homes, at costs of from $2500 to $3500 per site. Million-dollar projects are not uncommon.

Specialized preliminary studies and engineering techniques are needed, if costly mistakes and delays are to be avoided. *Is your firm prepared?*

Mobile Homes Research Foundation, with over 20 years extensive involvement, is making the specialized techniques available through a series of seminars for professionals. Nationally recognized authorities share their experience covering every vital step *and answer questions from the floor.* Obviously, attendance can be worth thousands of dollars in time and materials saved on these projects.

Also, enrollees can be listed in a Directory of qualified professionals being compiled by this Foundation for distribution to land developers and others in response to many requests.

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Enrollment will be limited by the facilities. Prompt action is suggested. Use the coupon below, write on business stationery, or to be absolutely sure, telephone (312) 792-3782.

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MOBILE HOMES RESEARCH FOUNDATION

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Please send me brochure and details about the Foundation's SEMINAR checked below:

☐ DENVER
April 15-16

☐ ATLANTA
June 3-4

MOBILE HOMES RESEARCH FOUNDATION Dept. AR-2
6650 N. Northwest Highway, Chicago, Illinois 60631

Gentlemen: Please pre-register me (us) for the Foundation Seminar at Essex House, New York City, March 11-12. (Get-acquainted cocktail party evening of March 10.) Our check is enclosed ☐ ($225 for first registrant of a firm; $200 each for additional enrollees) OR ☐ We will pay on registration at Essex House.

Name(s) _____

Firm Name _____

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Surprisingly sleek, startlingly smooth, truly universal . . . #2800 Series door closer gives sustained high performance in any traffic. Unmistakably Russwin.
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DESIGN CONCEPT: A resort complex on a steep ridge overlooking a bay area, providing the arriving vacationer with a feeling of being absorbed into the recreational environment. Demands of the building program are 1) to create a high density that can afford a maximum variety of activities and service for the inhabitants, and 2) provide an architecture that is both informal and harmonious with the natural beauty of the site.

INNOVATION IN DESIGN. One of a series created for DAP Architectural Sealants. Design and rendering by Richard P. Howard Associates, Architectural Illustrators, Sylvania, Ohio. Harold R. Roe, A.I.A.

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DAP Butyl-Flex® gives all the protection of 20-year sealants in caulking joints where movement is minimal. This accounts for nine out of ten cases where a seal is desired against sun, snow and storm. No other caulk comes close to this combination of long-term dependability and widespread utility. But then no other caulk has the high butyl content of Butyl-Flex. That's why no other caulk matches its outstanding elongation and tenacious adhesion between similar and dissimilar construction materials. For catalog describing Butyl-Flex and other DAP Architectural Sealants, please write: DAP Inc., General Offices: Dayton, Ohio 45401. Subsidiary of *Plough, Inc.*

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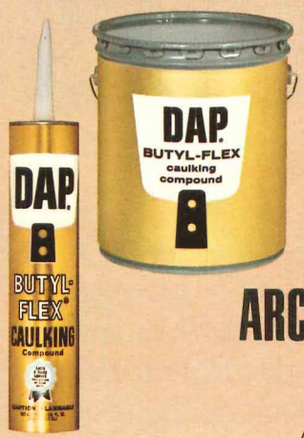

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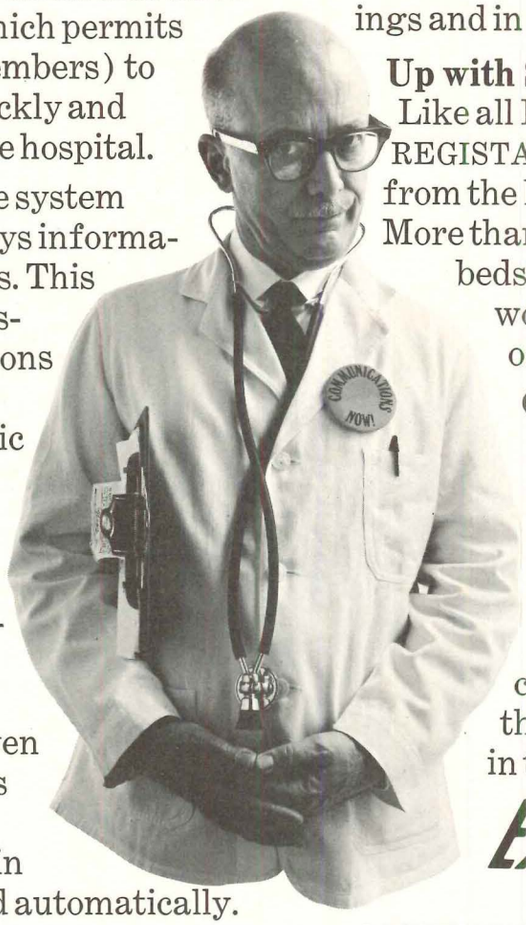
Doctors' Liberation

Executone introduces Doctors' REGISTAT,™ a revolutionary advance in hospital staff registration systems. It makes the registration and display of information at many locations both practical and economical.

Executone REGISTAT is an electronic information handling system which permits doctors (and other staff members) to register "in" and "out" quickly and easily at any entrance of the hospital.

At the touch of a button, the system stores, retrieves and displays information concerning their status. This information may also be displayed at the Communications Center, Emergency Room, Surgery, and other strategic locations throughout the hospital.



Communications Now

The moment a doctor registers "in", his waiting messages are displayed on the REGISTAT board. Up to seven standard messages, such as Call Office, Call Operator, Call Service, can be stored in the system and transmitted automatically.

More Power to Pocket Page

If Pocket Paging is included in the system, the staff member takes a pocket page receiver at random from the storage rack and registers it with his number. From that moment until he returns the unit, REGISTAT will automatically associate the staff member with that particular receiver.

Down with Rising Costs

The only answer to rising costs is to multiply the effectiveness of hospital personnel. This is the immediate result of Executone's new REGISTAT system. And the system is easy and economical to install—both in existing buildings and in new construction.

Up with Service

Like all Executone hospital systems, REGISTAT is backed by on-premises service from the local Executone organization. More than 370,000 Executone-equipped beds in hospitals throughout the world testify to the dependability of Executone products and services.

Call your Executone man for complete information on REGISTAT and on Executone Hospital Communications Programming—a systems approach that helps you plan the application of REGISTAT and other modern communications equipment throughout the hospital. Or mail in the coupon below.

Executone

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In Canada: 331 Bartlett Ave., Toronto.

☐ Please send me complete information on REGISTAT.
☐ Have your representative phone for an appointment.

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ADDRESS_____
CITY_____ STATE_____ ZIP_____

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Cabin Crafts carpet specialists eyeball your needs—not just your sale.

Face it! Carpet is basically a blind item. Meaning there are thousands of ways to go wrong with thousands of yards of carpeting.

That's why you need a Cabin Crafts specialist. He helps you arrive at the right decisions by eyeballing your needs with skill. Knowledge. And integrity. Instead of just giving your sale a fast look. And once he's looked the situation over, he'll make recommendations based on fact. Not fancy.

More important, he can really deliver on his recommendations. Because he's backed by a line of carpeting with tremendous breadth of selection. A wide variety of colors, textures, styles and weights. So when he says you need something tough and practical, or thick and plush, he'll show you a whole collection of carpets. Tufted especially for that job. And all will bear prices your budget can live with.

Yes, our man is a different breed of cat. He's a *real* specialist. One who'll look your needs over. Then look you straight in the eye . . . and give you straight answers. That's why he's working for Cabin Crafts. That's why he should be working for you.

West Point Pepperell
CARPETS
Dalton, Georgia 30720

Mr. Campbell J. Petty
Advertising Manager
WestPoint Pepperell Carpets
Dalton, Georgia 30720

ACRILAN Monsanto 2000+

Please send me more information on your carpeting and your specialists.
Have your specialist contact me ☐

Name _____ Street _____

Title _____ City _____ State _____ Zip ____

Company _____ Phone _____

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NEW I.B.E.W. OFFICE BUILDING located in Atlanta adjacent to the city's Sports Stadium.
Building owner: International Brotherhood Electrical Workers.
Architects-Engineers : Stevens & Wilkinson, Atlanta
General Contractor: H. W. Ivey Construction Company, Atlanta
Window-wall Fabricator: Southern GF Company, Atlanta

Another concrete example of

AllianceWall®

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Striking color accent was achieved for Atlanta's new I.B.E.W. Building with AllianceWall porcelain-on-steel insulated panels. Specifically selected were AllianceWall earthen tone, matte finish, Terra Cal colors which combined perfectly with the pre-cast concrete to create a structure of unusual beauty and durability.

Today AllianceWall porcelain-on-steel panels are available in virtually any color giving imaginative architects a valuable new dimension in design. These remarkable panels require practically no maintenance. Their smooth, non-porous surface will not retain dirt, grease or stains. Colors stay bright and new looking without fading or appearing to age.

For complete information including specifications check *Sweet's File* or write to: ***AllianceWall Corporation***
P. O. Box 247
Alliance, Ohio 44601

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ANNOUNCING: A PUBLIC AND PROFESSIONAL SERVICE BY ARCHITECTURAL RECORD

A memo to architects and engineers from the publisher

Subject: **PROJECT AIR RECLAMATION**

When an entire nation sees, smells and inhales a problem, the need for publicizing that problem becomes secondary to devising solutions to it—and communicating them to the right people.

Impetuous promptings to do something about pollution are understandable as it finally dawns upon an unsuspecting populace that unless effective action is taken, accelerating technical progress promises at best a poisonous prosperity. What the situation now demands, however, is more enlightenment on products and systems, available or under development, for protecting and reclaiming our environment.

In this regard it would be a most constructive development if architects, and the engineers who work with them, were more fully informed on anti-pollution systems and equipment designed for use in all types of buildings.

Architect and engineer expertise is essential to equipping new and existing buildings to meet anti-pollution standards. Moreover, architects and engineers bring to private projects a deeply reflected sense of responsibility to the public and the environment. As professionals they are the primary advocates of quality design solutions to quantitative building problems. Today, backed by clearly foreseeable legislative action and the pressure of public opinion, they are in a better position than ever before to persuade their clients to invest in the most efficient anti-pollution systems.

Unfortunately, effective dissemination of needed information to the design professions—and the stimulus that would provide to the introduction of effective anti-pollution systems—is dependent to a degree on editorial and advertising budgets. Therefore, with the hope of rendering a public and professional service, Architectural Record is offering upon application to the publisher one full black and white page free to any manufacturer of equipment specifically designed to reduce outdoor air pollution on the following conditions:

1. The manufacturer must feature a comprehensive solution to an air pollution problem in a building and, where applicable, include test data relating to prevailing standards and codes. (Note: components are not eligible unless presented as part of a total system and specialized process equipment is excluded.)
2. The manufacturer will assume full responsibility for the accuracy of all statements.
3. The manufacturer has national distribution and agrees to supply promptly to architects and engineers full information on his system.
4. The publisher of Architectural Record may designate the issue in which the message will appear.
5. All copy will be subject to review and approval by the editors of Architectural Record.
6. The offer may be terminated by the publisher of Architectural Record at any time and without condition.

Blake Hughes

PUBLISHER

Elkay offers problem solvers with three fully recessed stainless steel water coolers. Mounted completely flush to the wall they eliminate corridor obstructions, do not interfere with traffic. They comply fully with the hospital corridor safety requirements established by the "Hill-Burton" program. The exceptional features of Model EFR-12 are shown and described below.

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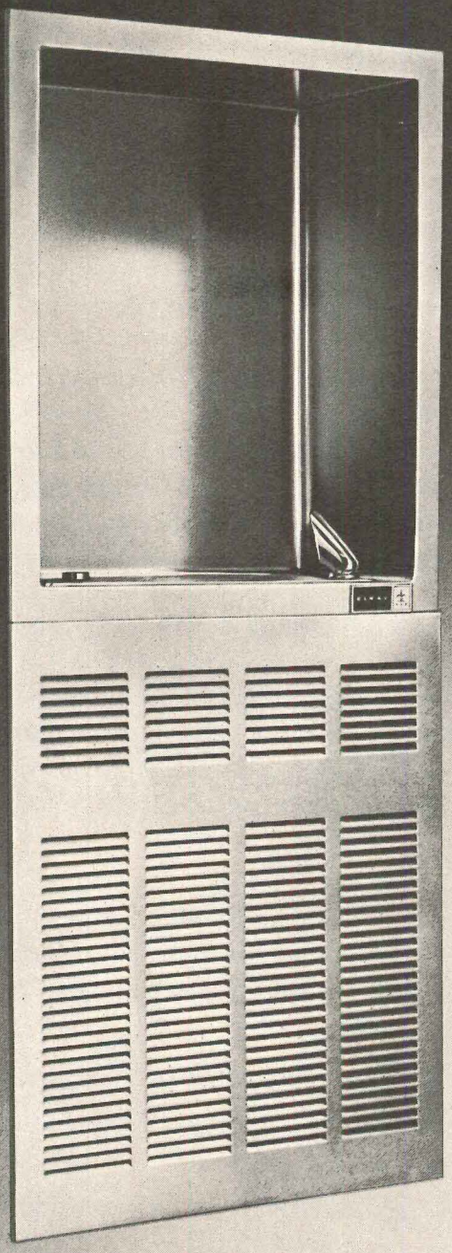
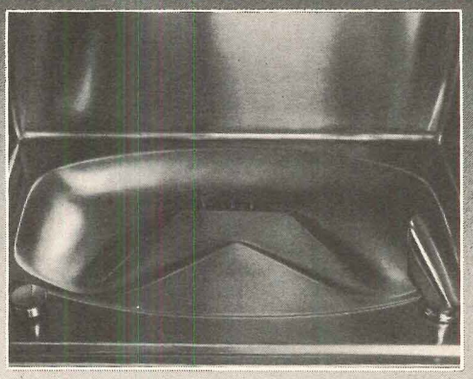




Cascade design, anti-splash basin with hooded stream projector and remote control. Recess design provides ample head room.

Model EFR-12

our 51st year

For complete information write for Catalog No. DFC-4 or call Customer Service Dept., Area Code 312-681-1880. ELKAY MANUFACTURING COMPANY, 2700 S. Seventeenth Ave., Broadview, Ill. 60153

see our catalog in Sweet's (S)

For more data, circle 20 on inquiry card

News in brief

Architect-designed construction rebounded in November, according to the F. W. Dodge index, to 254 (1957-59 equals 100). This was about average for the year, but the extremes of 1970 were as high as 312 and as low as 200.

HUD has announced half a dozen construction starts in Operation Breakthrough, and all prototype work is expected to be underway soon. This phase involves building of about 2,000 units. Local fears of "overhousing" and race have been problems in certain areas. Congress gave HUD $15 million more for research and technology in fiscal 1971, raising the R. and T. budget to $45 million, still $10 million short of the Administration's request.

The new housing bill that squeaked by in the final days of the 91st Congress contains a controversial New Towns provision deleted earlier by the House of Representatives. This permits HUD, with Presidential sanction, to plan and execute new community demonstration projects on Federal land. The bill also makes funding much easier for Operation Breakthrough-type programs.

Congress has voted nearly $2 billion in building funds for the defense services: $999 million for general construction, $716 million for family housing, $95 million for planning and design, and, notably, $75 million for pollution abatement.

Sprayed-asbestos fireproofing has been banned in Philadelphia. New York City is also considering banning asbestos-spraying, which has been identified as a possible cause of cancer. Further, air circulating in plenums and duct work where asbestos has been sprayed can carry the fibers into work areas and lobbies, endangering health, according to a Philadelphia Board of Health spokesman.

HUD Secretary George Romney recently joined critics of present construction industry bargaining processes, attacking unions for imposition of restrictions on new technology and for their closed nature. But A.F.L.-C.I.O. president George Meany argues that on-site cost of labor as a percentage of the cost of a house has gone down in the past two decades, while land and money costs have risen sharply. Mr. Meany complains the Administration has ignored these factors.

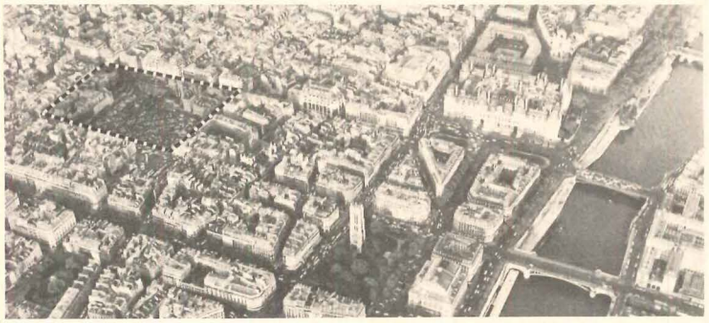
The United States Supreme Court has thrown out a case in which architectural licensing examination criteria were criticized as too vague. The suit, Henkes vs. Fisher, was brought in Massachusetts, and the Supreme Court ruling has the effect of upholding current Massachusetts examination procedures, which have come under attack in the last year (March, 1970, page 36; June, 1970, page 37).

William D. Ruckelshaus, head of the new Environmental Protection Agency (December, 1970, page 23), is losing no time in indicating he'll make polluters uncomfortable. One of the Administration's first major moves was to reconvene the Federal-state Lake Superior Enforcement Conference to determine the acceptability of Reserve Mining Company's pollution abatement plans. He says the Minnesota firm dumps over 60,000 tons of taconite tailings into Lake Superior every day.

The Royal Institute of British Architects will award its 1971 Gold Medal for Architecture to Hubert De Cronin Hastings, of The Architectural Press, Ltd. It will be the first time the medal has gone to a publisher. **John C. Parkin has retired as chairman** of the National Design Council, Government of Canada; Mr. Parkin's work includes Toronto-Dominion Centre and York University; he is president of the Royal Canadian Academy of Arts.

"Architecture U.S.A.", a major exhibit of 130 color-photo light boxes, is touring Poland. The exhibit was sponsored by the United States Information Agency and covers about 100 buildings by 60 architects. **Purchase Campus, State University of New York,** is the subject of an exhibit at New York City's Museum of Modern Art which will open on April 6. Master-plan architect Edward Barnes and seven other architects have designed 14 buildings, all to be shown in models and drawings.

Applications for the $8,500 Rotch Travelling Scholarship are due March 11 c/o Francis B. Sellew, 54 Canal Street, Boston, Mass. 02114; **applications for $3,000 Cintas Fellowships,** open to Cubans residing outside of Cuba, are due by April 1 at the Institute of International Education, 809 United Nations Plaza, New York, N.Y. 10017.



International contest announced for large Paris site

France is holding an international competition for the design of a new cultural center devoted to contemporary arts on the site of Les Halles in central Paris. The center will include a library, a museum of modern art, exhibition halls and a theater. First prize is 250,000 Francs (about $45,000). Registration must be received in Paris by February 26. Applicants should send a statement that they are registered architects with their request for files, also a bank check of 200 French Francs to: Monsieur le Régisseur d'Avances/Plateau Beaubourg, Délégation pour la réalisation du Centre du Plateau Beaubourg, 25 rue de la Bienfaisance, Paris 8e, France. An anonymous mailing address, such as P.O. box, must also be included.

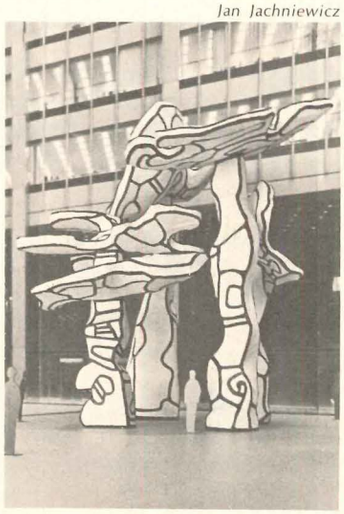
Jonathan Hale

Richardson station to be destroyed in New London renewal

The town of New London, Conn., as part of an extensive renewal plan which intends to open its waterfront to pedestrians and convert its main street into a traffic-free mall, is planning to demolish Henry Hobson Richardson's Union Station, one of his last buildings. "Architecturally and physically, it's a blight on the city," says the director of the city's Redevelopment Agency, Robert Turk.

The station was rejected by the National Register of Historic Places (listing on the Register is strong protection in any area where Federal funds are involved) because it was already scheduled for demolition. It stands at the foot of the city's main street, partially blocking the river view, "dirty, obsolete, and totally incongruous to the new plan." Neither the Redevelopment Agency nor the planning consultants, Purcell Associates, of Hartford, Conn., believe an alternative use for the station might be found. How long the building lasts depends only on construction of a new facility nearby.

Jan Jachniewicz



40-foot Dubuffet sculpture will complete Chase plaza in New York

A sculpture has at last been found to fill the space left for it in Skidmore, Owings and Merrills' 1956 design for New York City's Chase Manhattan Bank building. The 40-foot black and white painted sculpture was designed by French artist Jean Dubuffet and donated by David Rockefeller. It will be made of glass fiber and plastic resin on a steel and aluminum frame. It represents "trees belonging to the mental realm," according to the artist, whose other building-size designs are on exhibit at the Chicago Art Institute.

Factory-made components cut house costs

Using ready-made components currently on the market, designer Roger Rasbach has built a luxury demonstration home next to the Houston Astrodome, where the National Association of Home Builders recently met. Luxurious—four bedrooms, three baths—but cheap (relatively): $32,000-$35,000, the average U.S. three-bedroom price.

The "Computer House" as it is called, has four-by-eight-foot wall panels of polyurethane foam faced with plywood, made by Modular Dimension of California, and a synthetic tile roof made in New Zealand and is built on a steel slab. A plan emphasizing privacy from neighbors permits a smaller than normal lot size; however, the saving of 75 per cent in construction time, due to the use of components, was the main cause for the reduced cost, according to Mr. Rasbach.

Ben Schnall

Louis I. Kahn to receive A.I.A. Gold Medal

Louis I. Kahn, F.A.I.A., will receive the Gold Medal, the American Institute of Architects' highest award, at the A.I.A.'s June Convention in Detroit.

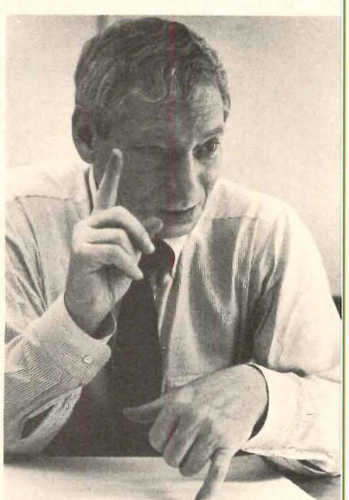
Louis Kahn has been a leading figure in American architecture almost since he began practice in 1935. During the late '30's, he organized the Architectural Research Group of 30 architects and engineers who planned housing, slum clearance, and city redevelopment for Philadelphia. He then became associated with the late George Howe, F.A.I.A., and the late Oscar Stonorov, F.A.I.A. (June, 1970, page 36) in what many still consider the best housing projects ever constructed.

He taught at Yale from 1947 to 1957, and has taught at the University of Pennsylvania since 1957. His influence as a teacher and theoretician have been as profound as his influence as a practicing architect. His sense of wonder and his personification of buildings—"it wants to be"—are apparent in his recent essay, "Architecture: Silence and Light," in *On the Future of Art* (Viking, 1970): "How marvelous that when I am in a room with another the mountains, trees, wind, and rain leave us for the mind, and the room becomes a world in itself."

He believes the architect must work as an individual and an artist to produce works of great value, and that the architect must avoid over-specialization. In order that a building will evoke certain feelings, he will often reprogram the design. His close work with his client, Dr. Jonas Salk, on the design of the Salk Institute in La Jolla, Calif. (1965) is especially well known.

With the exception of the Yale Art Gallery (1953), designed in collaboration with Douglas Orr, most of his best-known buildings were designed during the last 10 years. They include the Salk Institute, the Alfred Newton Richards research building (1960) and many structures in Dacca, East Pakistan, still under construction. He currently has nine major works in design or under construction.

Louis Kahn came to this country from his native Estonia in 1905, when he was four, growing up in Philadelphia. He studied architecture at University of Pennsylvania.

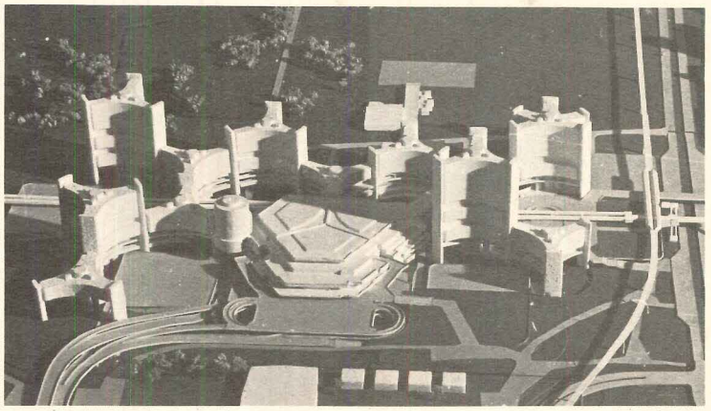


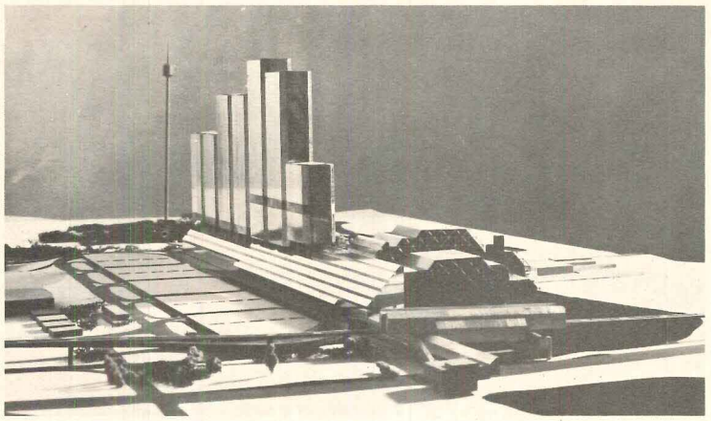
Third "first prize" announced in U.N. City Vienna contest

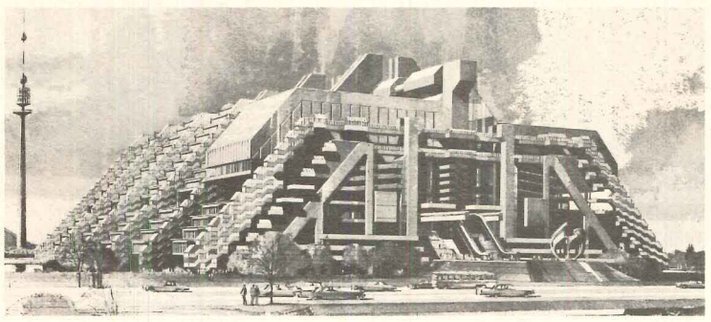
After a world-wide competition and two reviews, a third, and apparently final, winner has been announced in the design of the "U.N. City" office and conference center in Vienna. The final design (top) is by the office of Johann Staber of Vienna, originally one of three runners-up in the 1969 contest.

The first "first prize" (center) went to Cesar Pelli's team at Gruen Associates in Los Angeles (November, 1969, page 42). The design and the three runners-up were chosen from nearly 300 submissions. The sponsors (the city of Vienna and the Austrian government are financing the $120 million project) went into an unscheduled second round of review, resulting in the choice of the British runners-up (bottom), Building Design Partnership. This design was rejected by the tenants, the International Atomic Energy Agency and the United Nations Industrial Development Organization, who were concerned about low operating costs, whereas the sponsors thought more in terms of low initial investment. After another six months of review and negotiation, the British project was dropped in favor of the Viennese design.

That design consists of individual Y-shaped buildings of different height for each agency and its auxiliary areas, and a central complex of conference halls, all linked by a moving sidewalk spine. The site is a park across the Danube from downtown Vienna.





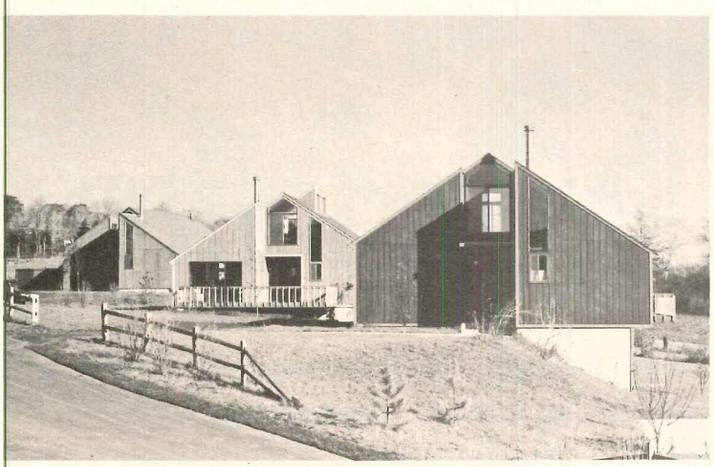


Bradford Bachrach

Sibyl Moholy-Nagy is dead

Sibly Moholy-Nagy, architectural author and teacher, friend (and sometimes foe) of many of the century's best-known designers and architects, died January 8 in New York City at the age of 67. Mrs. Moholy-Nagy's work, which included several books as well as numerous articles in architectural magaines around the world, won her the American Institute of Architects' 1971 Critic's Citation, which she was to have received this June (January, page 37). Her long teaching career included 18 years at Pratt Institute. In the 1930's, she helped establish the New Bauhaus in Chicago (now part of the Illinois Institute of Technology) with her husband, Lazlo Moholy-Nagy, a leader of the original Bauhaus.

Mrs. Moholy-Nagy was born in Dresden in 1903, the daughter of architect Martin Pietzsche, head of the Dresden Academy. She was a stage and movie actress before marrying Mr. Moholy-Nagy, with whom she made several films.



Planned unit development wins praise in Connecticut

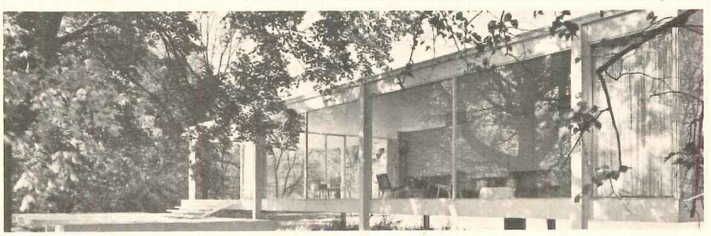
Wesleyan Hills, a 288-acre planned unit residential development in Middletown, Conn., recently received the American Wood Council's "Design for Better Living" award. Its contemporary house designs (above), by Richard McCurdy, design partner in the team of Designers/Builders Inc. have proved so much more popular than the "traditional" versions first offered that the latter have been discontinued. Prices are about $33,000.

Planner Emil Hanslin, of Emil Hanslin Associates, subdivided Wesleyan Hills into "mini-neighborhoods", grouping houses around common green areas. Another 60 acres will be left open. Existing structures have been converted for community use. Stores and a school are planned, as are townhouses and garden apartments.

Al Garrat

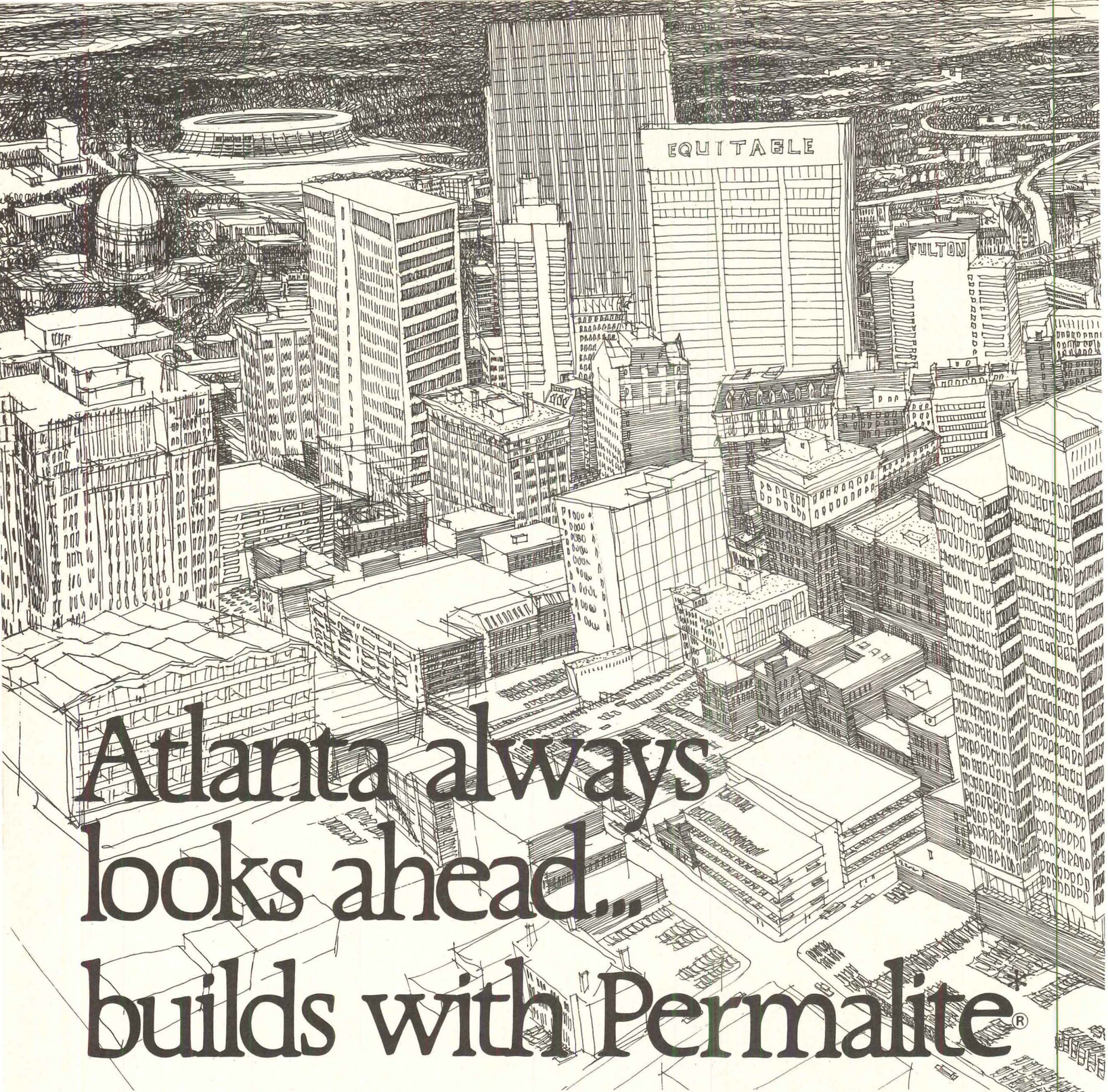
Goodbye, Green Giant

The McGraw-Hill building, RECORD's famous home in New York City, known among its friends as the "Green Giant" and sometimes as the "Green Pagoda," has been sold in anticipation of McGraw-Hill's move to larger headquarters. Raymond Hood designed it in 1930, settling on a blue-green tile exterior after toying with yellow and red. The now-much-admired result caused one contemporary critic to call it "a decided step in a direction which we cannot clearly distinguish at this time."



For sale

Dr. Edith Farnsworth has decided to move to Italy, so she is selling the house Mies van der Rohe designed for her, completed in 1951. The house and its 60-acre site in Plano, Ill., 50 miles southwest of Chicago, are priced at $235,000. The Chicago firm of Baird and Warner are handling the property.



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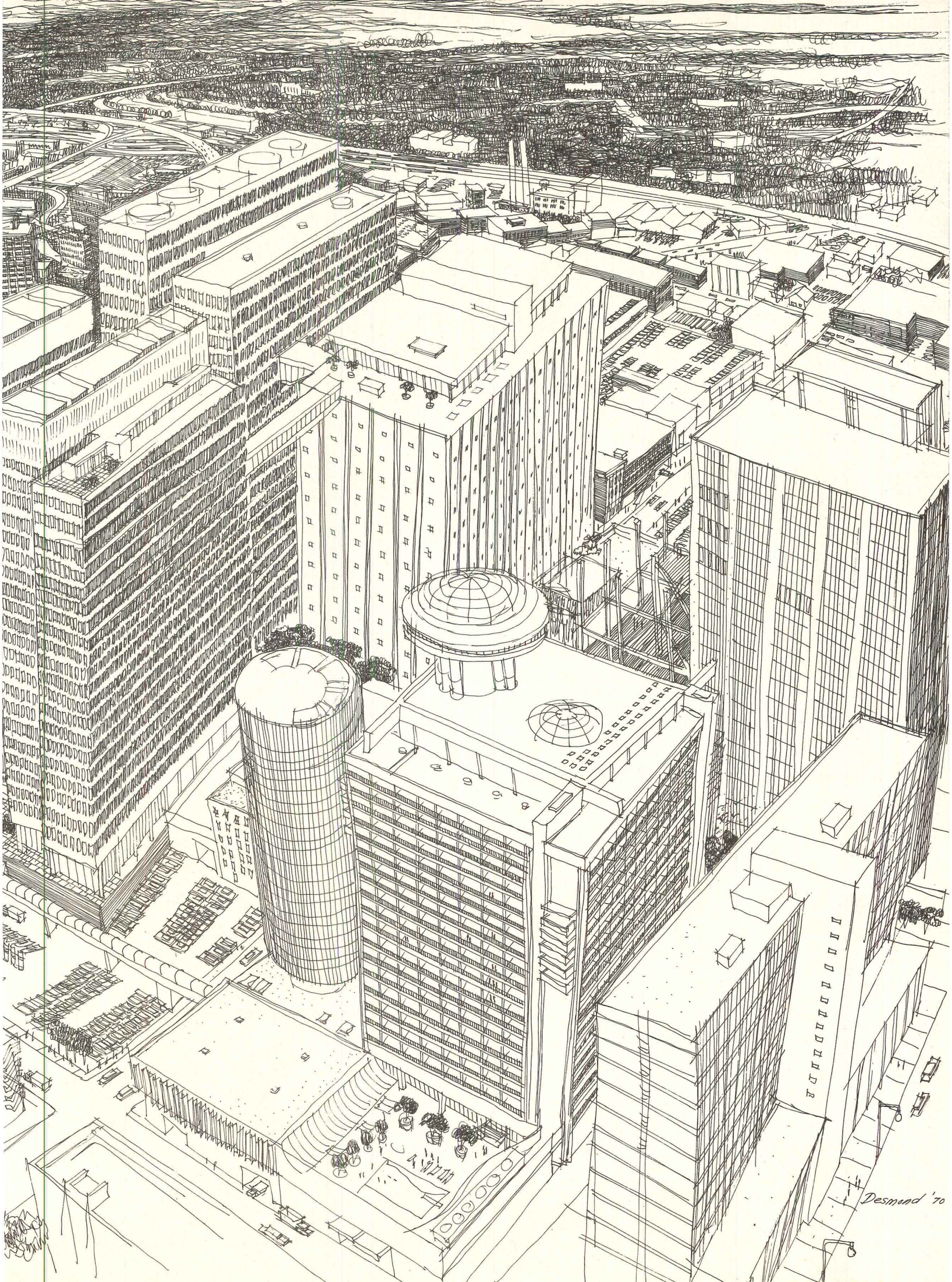
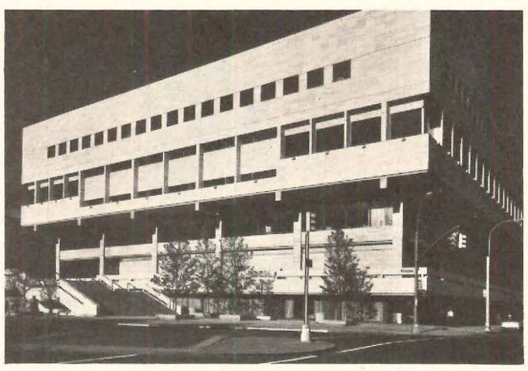

Desmond '70

Alice Tully Hall, The Juilliard School

Dover delivers

orchestra lifts for the three performing halls of The Juilliard School



THE JULLIARD SCHOOL, New York, N.Y. Architect: Pietro Belluschi—Eduardo Catalano and Helge Westerman, associated architects; Frederick Taylor, Robert Brannen, Joseph V. Morog and Austris Vitols, project architects. General Contractor: Walsh Construction Company. Dover Oildraulic orchestra lifts installed by Burlington Elevators, Inc., subsidiary of Dover Corporation.

With the recent opening of The Juilliard School in Lincoln Center, Dover completes the largest and most elaborate project involving stage lifts ever conceived.

Each of the three performing halls of The Juilliard School has an Oildraulic® orchestra lift designed, built and installed by Dover. The largest has a curved platform measuring 14 by 61 feet, and a lifting capacity of 33,000 lbs. While primarily for optimum positioning of orchestras, the lifts also provide for extensions of the stages for theatrical performances.

Elsewhere in Lincoln Center, Dover installed an elaborate system of seven 8 by 60 foot lifts in the Metropolitan Opera House. These operate in conjunction with scenery and orchestra lifts to provide an ultimate degree of flexibility in operatic staging.

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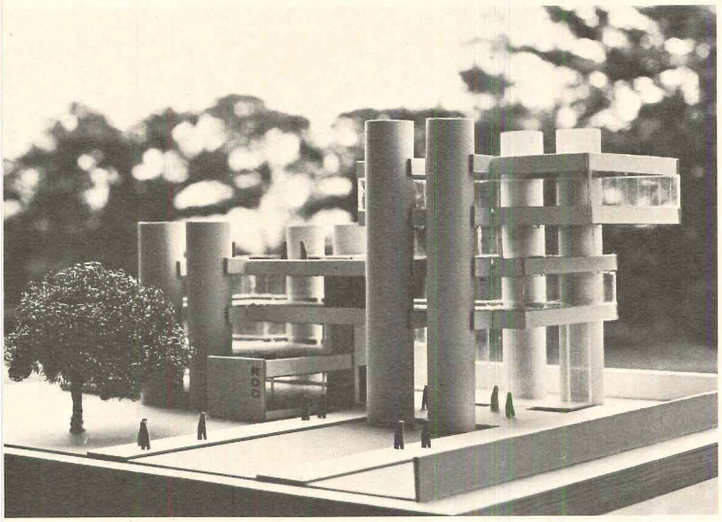
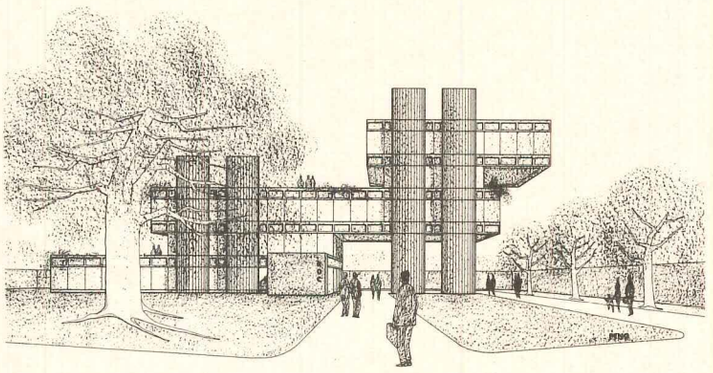
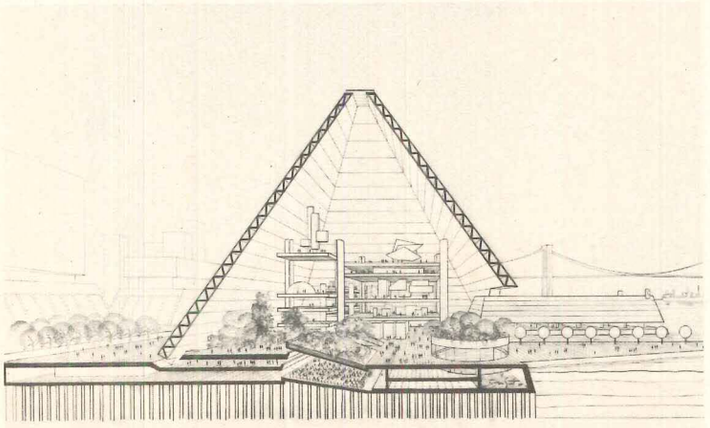
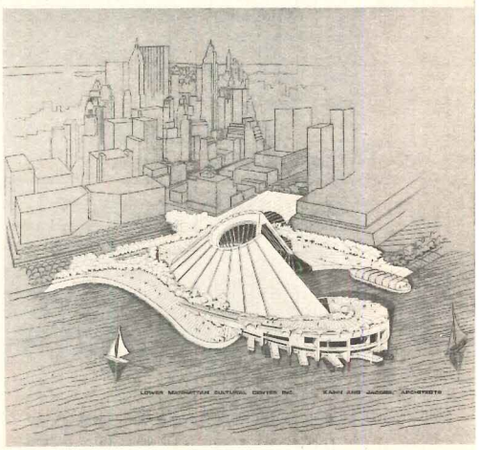




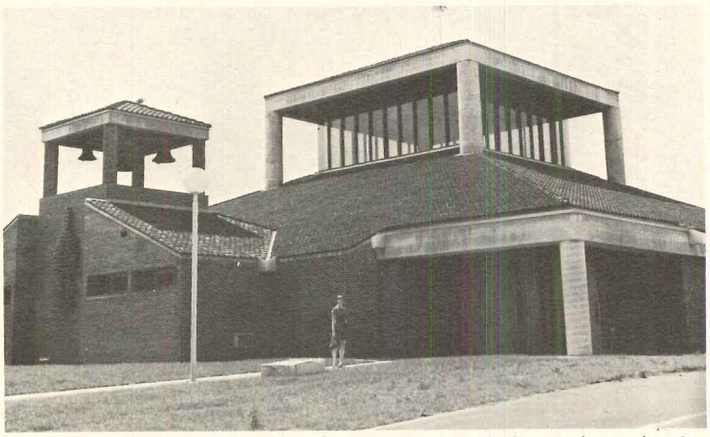
Embassy of the Republic of China, Tokyo, Japan, Y. H. Peng, architect, has a structure of six sets of steel trusses supported by four pairs of circular shafts containing stairs, restrooms and mechanical services. Various offices and functions are distinctly separated. Fifth level terrace can accommodate 800 for parties and ceremonies.

Lower Manhattan Cultural Center, Kahn and Jacobs, architects, Der Scutt associate in charge, is planned to have an interior exhibition space treated as one huge undivided area to be molded by the needs of particular exhibitions using such innovations as inflatable galleries. All art works will be highly sophisticated reproductions. There is also to be a library of reproductions, auditoria, commercial facilities, and piers for mini-museum glass-enclosed barges.

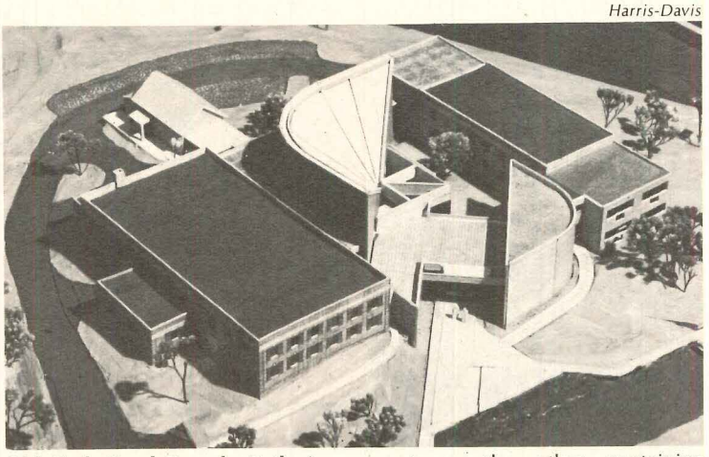




Harris-Davis



St. Thomas of Canterbury Church, Cornwall-on-the-Hudson, N.Y., Roger A. Pellaton of Pelleton and Chapman, architects, received the Gold Medal for excellence in ecclesiastical design from the Society of American Registered Architects. The 600-seat structure was designed to express the new liturgy both functionally and esthetically.

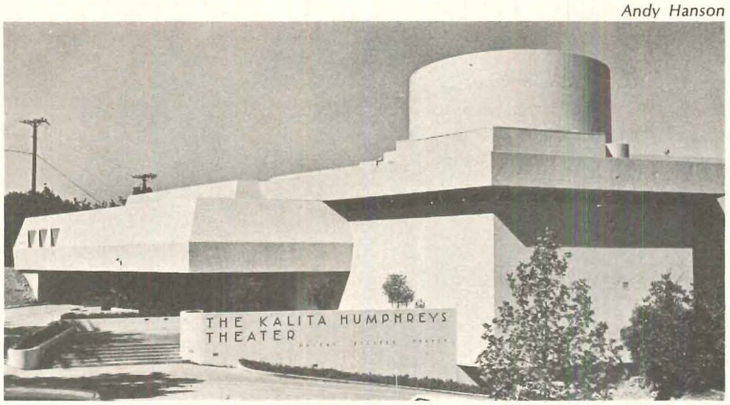


Old York Road Temple Beth Am, Abington, Pa., Vincent G. Kling and Associates, architects, will be composed of two fan-shaped elements, the larger of which will house the sanctuary, the other containing chapel, office, and library. The Temple is on a constricted site between two existing classroom buildings. It is clad with brick.

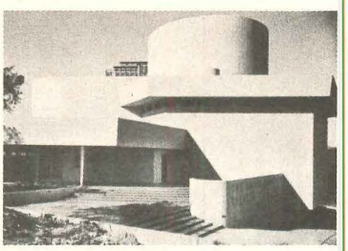
Dallas A.I.A. chapter gives "Milestone" awards for designs of the past decade

Fourteen Dallas-area buildings built since 1960 were cited by the Dallas chapter of the A.I.A. in its third biennial awards competition. Winners not shown were: **residence of Thomas W. Norsworthy,** John W. Mullen, III, architect; **residence of Irwin Grossman,** Duane Landry, architect; **Glass Container Plant,** Beran and Shelmire, architects; **residence of Victor H. Hexter II,** Omniplan Harrell and Hamilton, architects; **Duncanville High School,** Jarvis Putty Jarvis, Inc., architects; **Lakewood Branch, Dallas Public Library,** Fisher and Spillman, architects; **Quadrangle Shopping Center,** Pratt, Box, Henderson & Partners, architects; **The Arrangement,** Craycroft-Lacy & Partners, architects; **Architects' office,** The Pierce, Lacey Partnership, architects. Jurors were: O'Neill Ford of San Antonio, James Martin Harris of Tacoma, and Gyo Obata of St. Louis. Captions below are the comments of the jury.

Andy Hanson



Dallas Theater Center, Frank Lloyd Wright, architect, W. Kelly Oliver, associated architect (March, 1960, page 161), addition (shown in left photo) by William Wesley Peters, Taliesin Associated Architects, David George, Regan George and Newman, Bradshaw, associated architects is "a small, intimate theater whose curvilinear form produces a functional seating arrangement in which the audience relates well to the stage."



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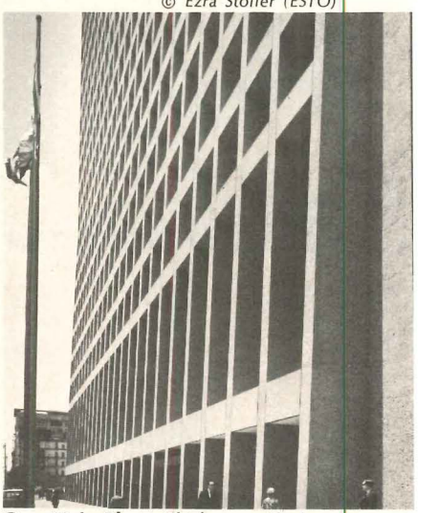

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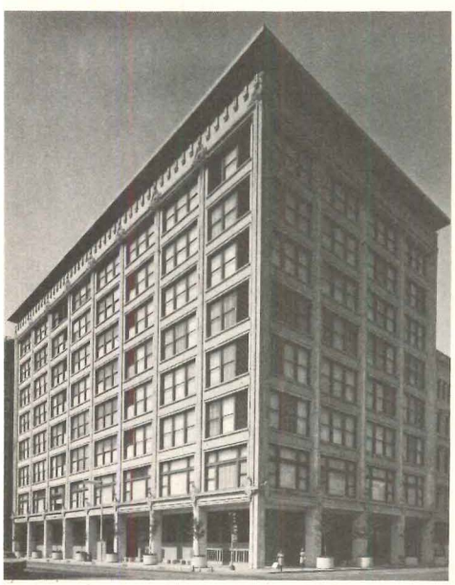
NorthPark Shopping Center, Harrell and Hamilton, architects (December, 1970, page 23). "The quality of construction is very high. Outside massing denotes articulation of interior spaces while achieving totality of mass. Interior mall spaces are human in scale and restrained in use of material. Merchandising devices, such as signs and exhibits, have been well regulated to the total environment."

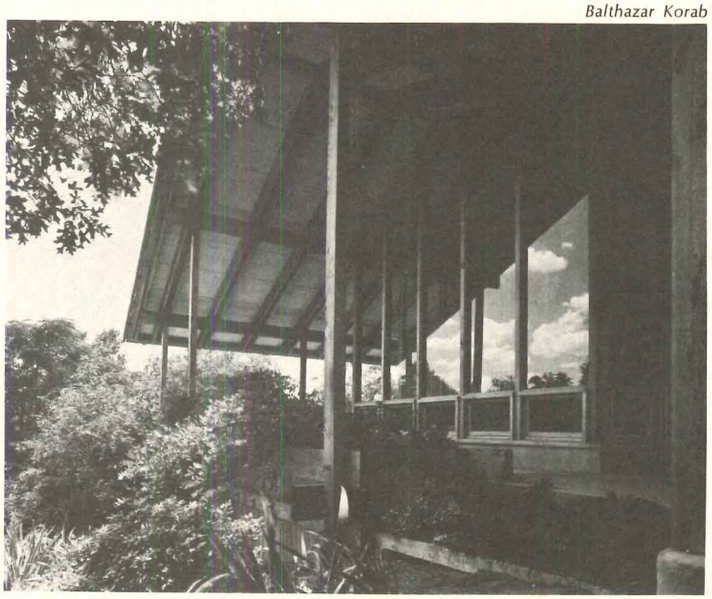
One Main Place, Skidmore, Owings and Merrill, architects with Harwood K. Smith and Partners associated architects. "The proportion of its exterior treatment with its use of one basic material gives it great simplicity and restraint. The use of the lower level with its fountain court and its lively shopping center gives the building a humanizing urban quality."



El Centro College, the Oglesby Group, Inc., architects is "a very commendable solution to rejuvenating a series of existing buildings for an entirely new function while maintaining the exterior integrity of an old established area. The interior's remodeling reflects contemporary spaces and colors to which young persons should respond exuberantly."

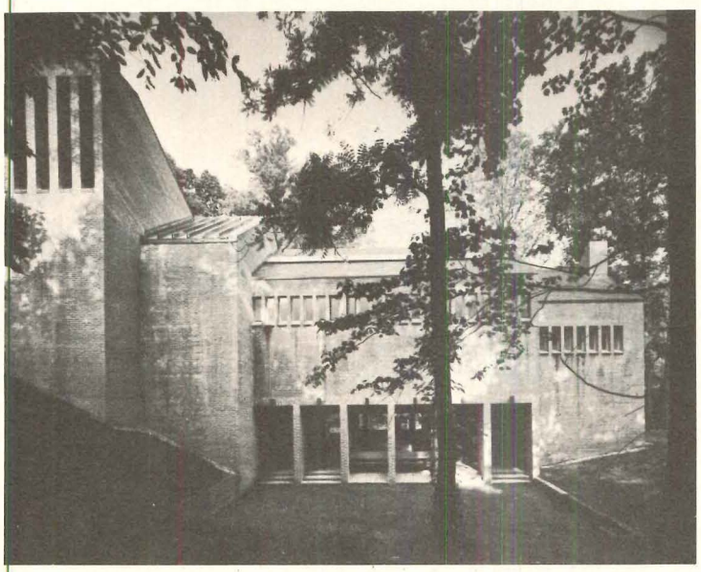
Children's Development Center, Pratt, Box, Henderson and Partners, architects. "The jury was delighted to see this simple and friendly wood building. It would seem most likely that children would quickly identify with its residential character."

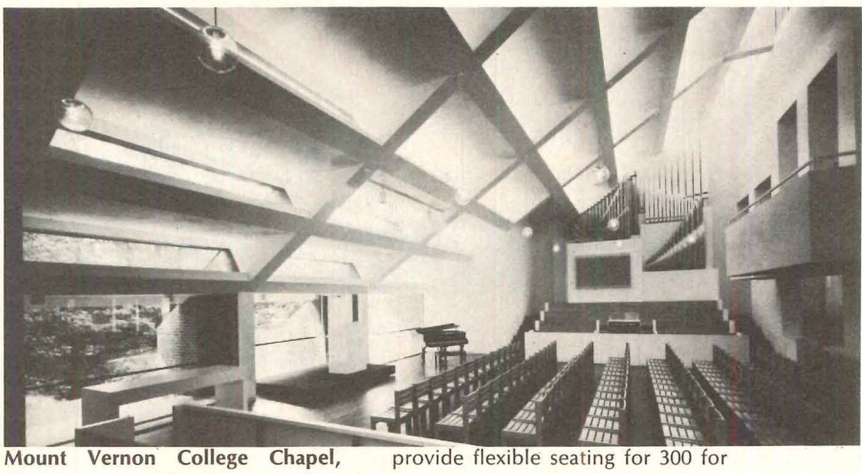
Balthazar Korab



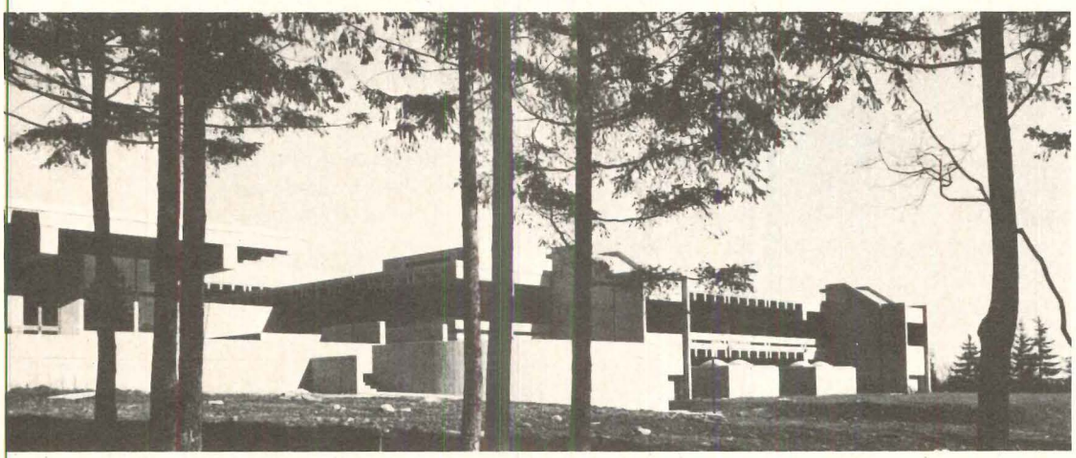
A.I.A. names ten winners in community and junior college awards program

The American Association of Junior Colleges, the American Institute of Architects, and the Department of Health, Education, and Welfare have jointly sponsored the second annual program for Community and Junior College design. Winners not shown are: **Joliet Junior College master plan,** Joliet, Ill., Caudill Rowlett Scott architects; **Allen County Community Junior College new facility,** Iola, Kansas, Schaefer, Schirmer and Eflin, architects; **Linn-Benton Community College master plan,** Albany, Ore., Jeppsen, Miller and Tobias, architects; **Manchester Community College,** Manchester, Conn., Daniel, Mann, Johnson and Mendenhall and Philip J. diCorcia, architects; **Seattle Central Community College master plan,** Seattle, Wash. Kirk, Wallace, McKinley and Associates, architects; and **Washtenaw Community College master plan,** Ann Arbor, Mich. Tarapata-MacMahon-Paulsen Associates, Inc., architects.

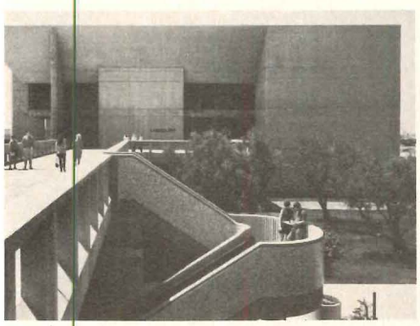




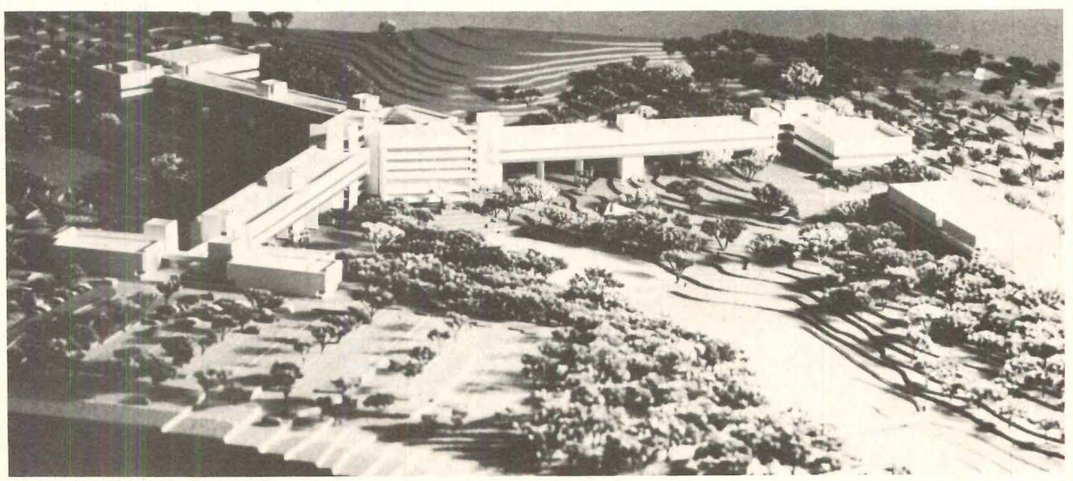
Mount Vernon College Chapel, Washington, D.C., Hartman-Cox, architects, was designed to relate in scale and materials to existing neo-colonial campus buildings and provide flexible seating for 300 for worship, music or drama. It is a linear brick building running across and rising out of a ravine, with entrances at several levels.



Portland Community College, Phases I and II, Portland, Ore., Wolff Zimmer Gunsul Frasca Ritter, architects, provides learning centers for various disciplines, relating directly to the outside with extensive use of glass walls. Building services are separate structures to allow future flexibility. A Mall Complex provides "downtown" with stores, offices and meeting areas.



Cypress College Phase I, Cypress, Calif., Caudill Rowlett Scott, and William Blurock and Partners, architects, is a bi-level campus separating pedestrian and vehicular traffic by a raised plaza which connects all major buildings. Decentralization is accomplished through the use of several academic "houses" with integral eating facilities.



Community College of Allegheny County—Boyce Campus, Monroeville, Pa., Celli-Flynn and Associates, architects, concentrates all common facilities in a central triangle to give a sense of place. Jury: "This is a unique and imaginative response to a difficult bowl-like site. The three linear connector buildings and the central multistory core utilize the site to the fullest."

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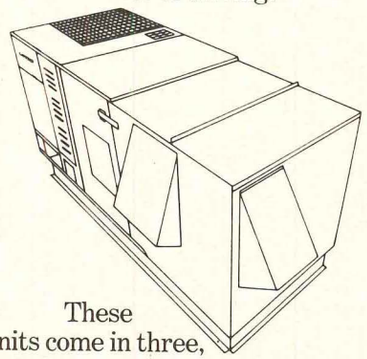

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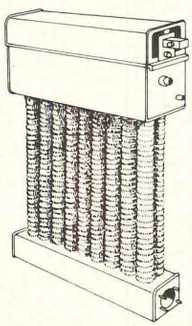

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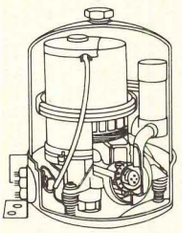

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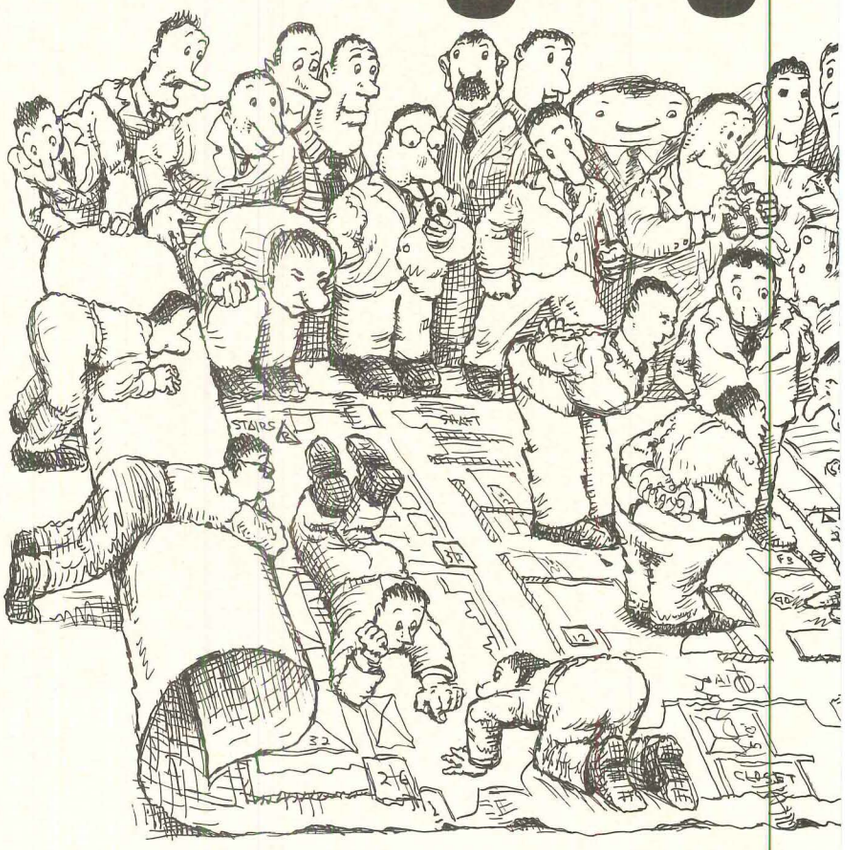

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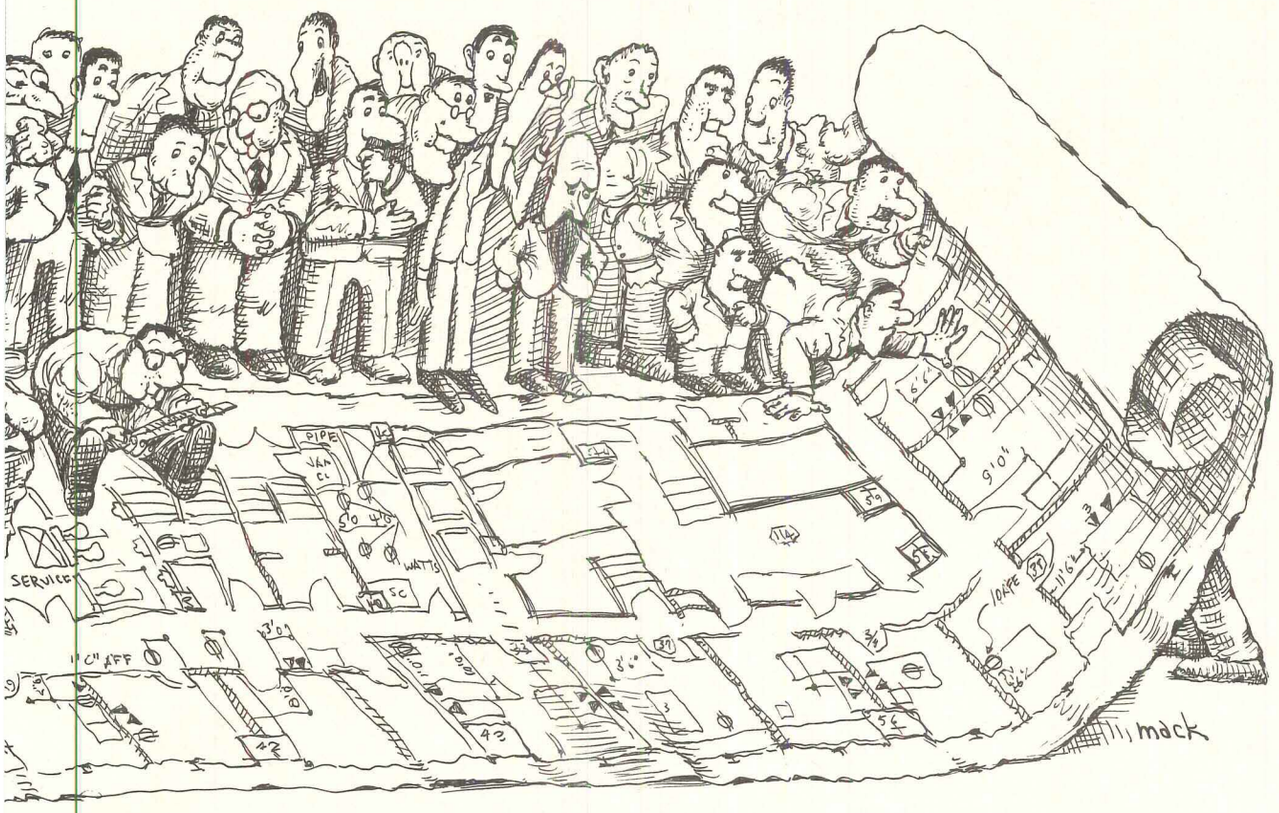

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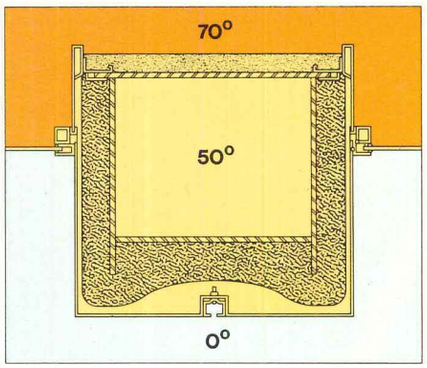
(Left)—Testing a prototype of the wall system by Cupples Products Division, H. H. Robertson Co., checked out the wind loading and thermal performances.

(Center)—Borrowing heat from the building interior, while placing maximum insulation on the outside surfaces of the columns, minimized the problem of thermal expansion of columns.

(Right)—Thirty staff members of Emery Roth & Sons, working in association with Minoru Yamasaki and Associates for eight years, produced over 15,000 sheets of drawings for the World Trade Center project.



Julian Roth, of Emery Roth & Sons, Architects, discusses thermal expansion at the World Trade Center.

"We solved the thermal-expansion problem of the aluminum column *cover* by the simple device of a sleeved joint that provided for movement. But controlling the expansion of the *steel columns themselves* was more complicated. Obviously, when steel columns go up 110 stories, their coefficient of expansion is a critical factor.

"To meet our performance criteria, we had to hold the temperature on the *interior* of the column at *50 degrees when the outside temperature was zero* . . . which normally could have been done by putting enough insulation around the steel.

"However, we had a *dimensional limitation on the space available between the column and the column cover.* So the problem was how to get enough insulation to meet the temperature specification, in the available space.

"In our development work, in association with Yamasaki, we hit on the idea of *admitting* heat in the *back* of the column, while *rejecting* it in *front* with insulation. Our final solution was to use fireproofing with high thermal-insulation value on three sides and with plaster on the back, allowing some thermal transfer from the building.

"The aluminum fabricator contributed much of the testing and research that produced this solution. And it was good that they were able to . . . because architects just don't have the necessary research facilities. All of which points up the importance of close cooperation between well-equipped and well-staffed manufacturers and the building team."

The World Trade Center is a project of The Port Authority of New York. Engineering and development work was carried out under the direction of the Authority's World Trade Center Planning and Construction Division.

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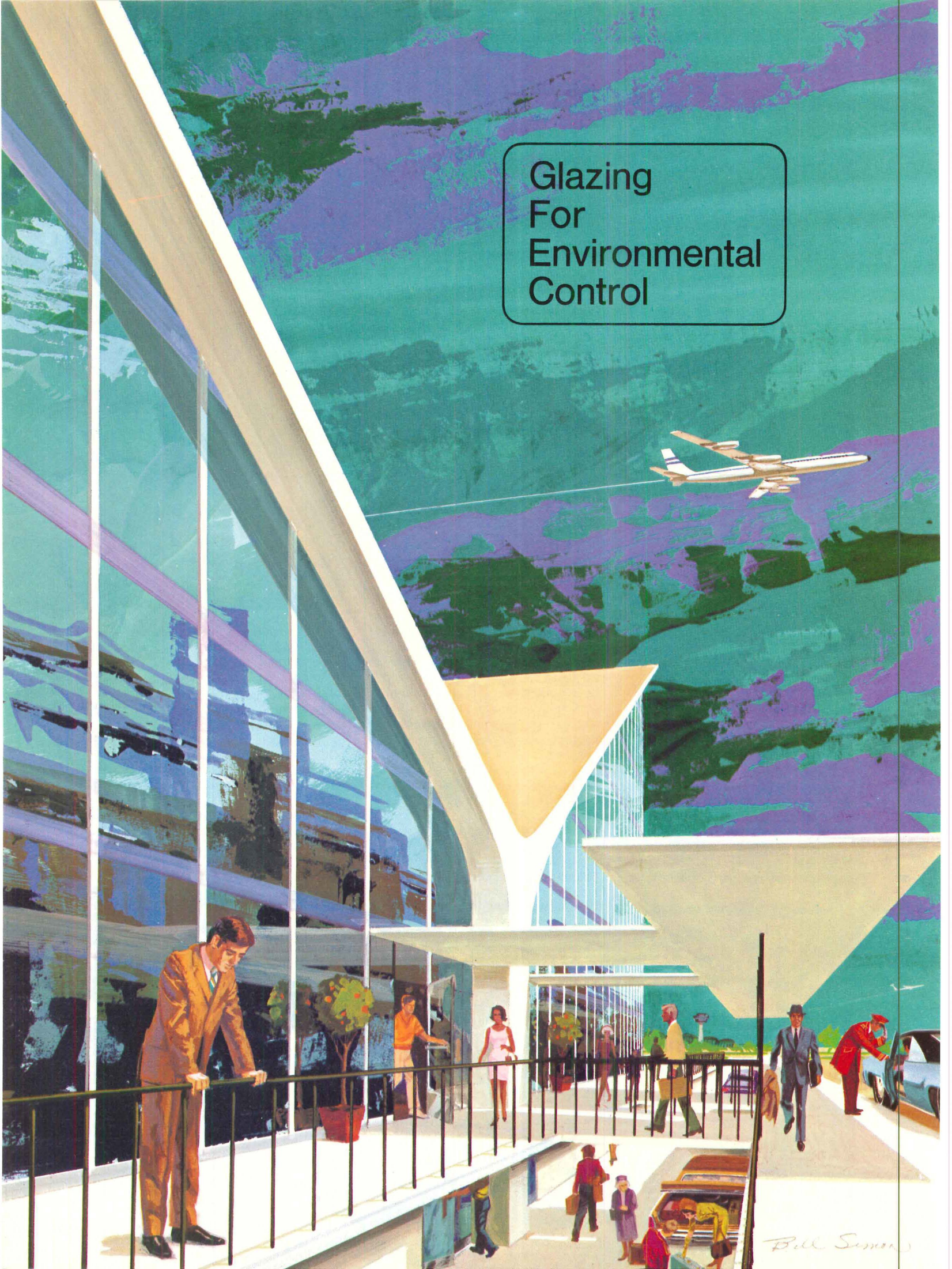
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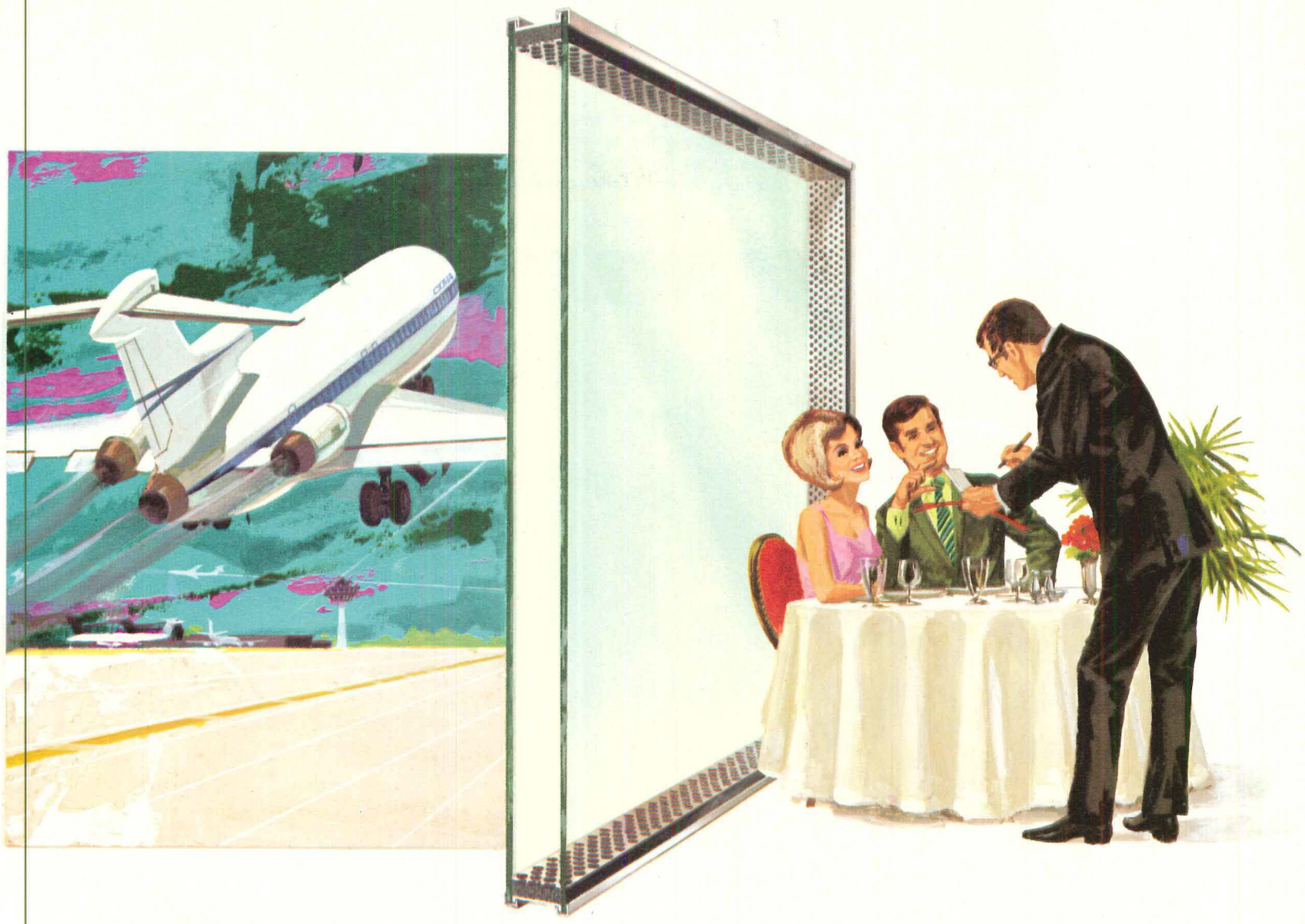

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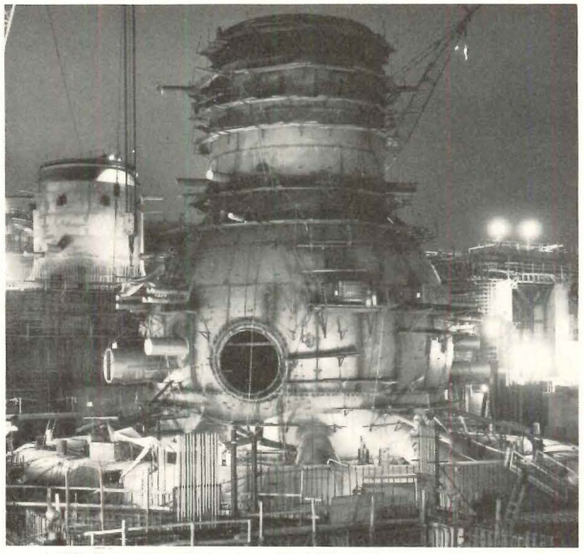

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The Davis Allen Desk.

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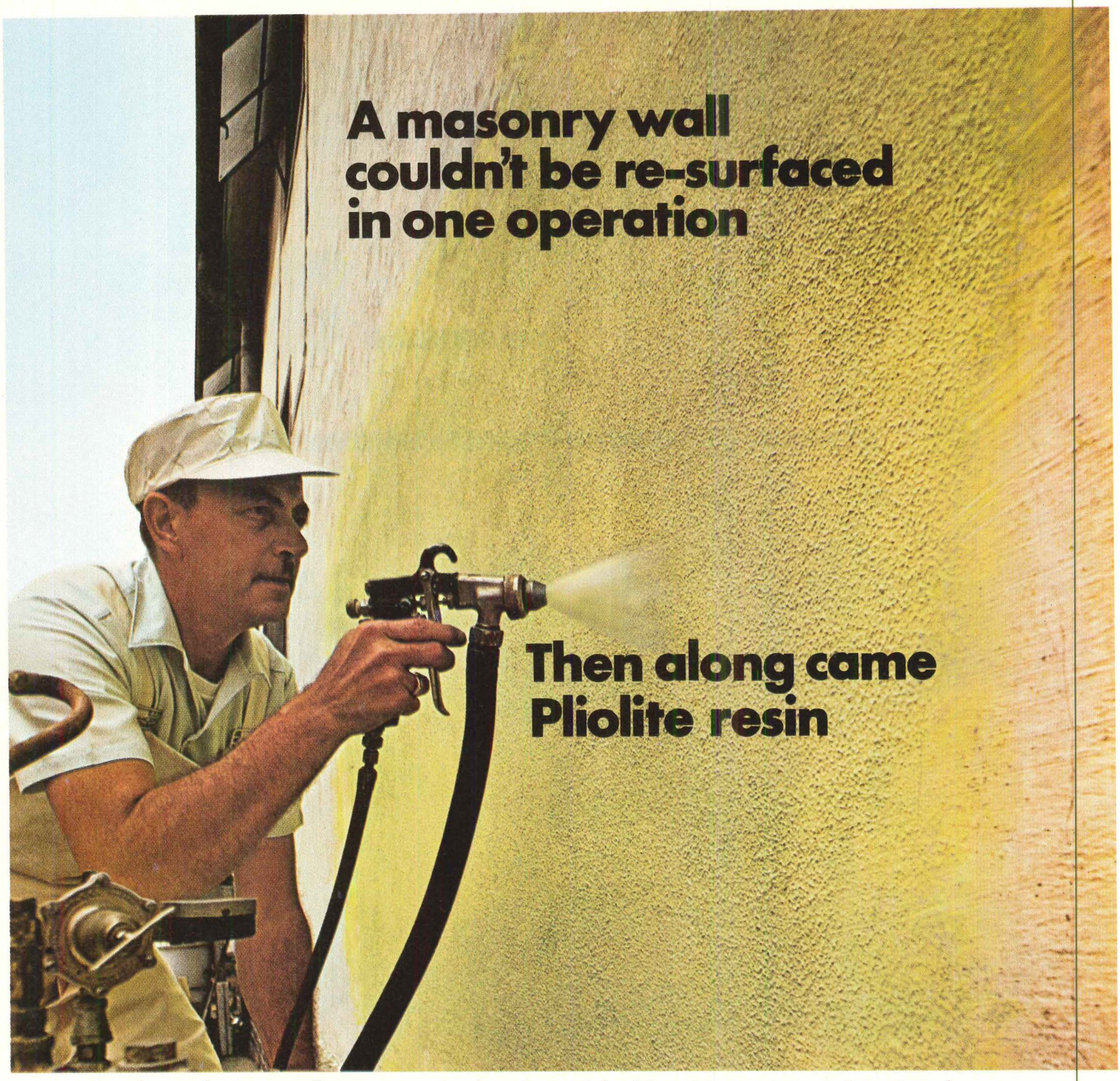
For more data, circle 32 on inquiry card



Re-surfacing of masonry walls was a tedious, multi-step operation of plastering, stuccoing or re-siding.

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Get your selling edge from Goodyear Chemicals

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A new Federal program in professional contracts

Many new design opportunities in the Federal sector for 1971 and beyond were outlined to more than 800 architects, engineers, government officials and others attending the New Federal Program national conference in New Orleans in January. Representatives from eight government departments and agencies formally presented details of their on-going programs, then met in shirtsleeve sessions to answer directly the many questions of architects and engineers regarding complications of doing business with Uncle Sam.

This new approach to man-to-man information exchange was co-sponsored by the American Institute of Architects, the Consulting Engineers Council/USA, and the National Society of Professional Engineers —Professional Engineers in Private Practice. Attendance was double that anticipated, clearly indicating that with work slack in many offices, A/Es were showing more than casual interest in the various Federal design and construction programs and were anxious to learn how they might participate more fully in the upcoming design contracts.

Much interest centered on a first announcement of the new architect-engineer fixed-price contract. General Services Administrator Robert L. Kunzig signed an order January 5 putting the form in general use. All Federal contracting components have agreed to use its general provisions; the special provisions will be modified by each of the 28 agencies employing it. Conferees were advised that the general provision clauses of particular importance to architects were those concerned with disputes, determination of rights of the government, changes and A/E responsibility.

Having surmounted the major hurdle of getting the form processed and into general use, GSA said it would continue to meet with A.I.A., C.E.C. and N.S.P.E. to work out problems of interpretation and application.

Administrator Kunzig insisted there has been a re-dedication to the goals of quality and efficiency in Federal design and construction. In these terse sentences he summarized the new direction.

"I want beautiful Federal buildings. I want a high quality of design. I want a recognition that time is money. I want to save and conserve the taxpayers' money."

Walter A. Meisen, assistant commissioner for construction management in GSA's Public Buildings Service, and in that capacity really responsible for government architecture, followed up with the statement that his agency "has not been getting the best architecture in the past with few exceptions." GSA has decided to do away with the design handbook and drop the number of project reviews to two, both in the architect's office.

One of the most significant changes for architects in the new public buildings program is the decision to assign individual project managers to major jobs. He will have "singular and comprehensive authority" from initial planning through completion. He'll keep the decision-making process swift and flexible, a welcome promise for designers.

There was much attention to design and construction costs and attendant problems in today's markets.

Mr. Kunzig insisted that cost must be dealt with on a realistic basis or government construction would dry up drastically in the next few years. And Gerrit D. Fremouw, director of HEW's Facilities Engineering and Construction Agency, said costs were out of control and getting worse.

On this subject, Harold B. Finger, assistant secretary for research and technology for Housing and Urban Development, went so far as to suggest that recent building trades three-year contract settlements calling for increases of 20 per cent per year need to be rolled back. These built-in escalations are more than twice the wage settlements negotiated in the industrial labor area.

Fees—the ever-present concern for architects and engineers—were touched on by GSA and Veterans Administration spokesmen.

In a new report on construction contracting systems, Public Buildings Service recommends higher design fees than are now applicable; that is, the six per cent level. L. G. Schweickart, deputy assistant administrator for construction at VA, noted that there can be no break from the six per cent limit until Congress votes a change. He added: "As an escape from our dilemma, we are taking another look at our policy with respect to the services which must be included in the six per cent fee and unless we are restrained from doing so, we will follow the practice of other agencies of including within the six per cent only those services directly related to the development of the construction contract documents."

Mr. Fremouw (FECA/HEW) pointed out that the separate funding of pre-design project planning to distinguish the planning process from the A/E fee schedule would likewise require legislative changes. This was one of the several recommendations coming out of a recent FECA workshop in which the HEW agency had sought the counsel of architects, engineers, planners and contractors in connection with administration of the multi-billion dollar schools and hospitals construction effort. FECA hopes to turn these large building programs to systems building and a certain aggregation of market potential. Life/cycle costing is also a prime consideration in the new HEW approach to providing health and educational facilities, as is systems building and management control. These slants on volume building place the government's A/Es in the position of spending more time and effort on performance requirements and less on particulars of solution, say the FECA spokesmen.

Robert W. Blake, the agency's chief of research and development, phrased it this way: "The bidder taking responsibility for completion of design and construction is in a position to strive for an economic and competitive solution in his own interest, and in the interest of supplying a competitive price to the government. Upon completion of the technical data package, the architects' and engineers' work is essentially done." At government option, however, he will participate in an advisory and consultant role and assist in analysis and evaluation of completed operations.

Here, then, are the dimensions of some of the major Federal Government programs. The outline will be affected markedly, of course, by the terms of the fiscal 1972 budget, recently submitted to Congress:

Public Buildings Service: The volume of its own design and construction activities approaches $200 million annually and it does an additional $100 million for other Federal

agencies. The design workload, including all work in progress, has been running at close to $600 million. PBS, like many other Federal contracting agencies, is trying desperately to speed up the process of design and construction. Phased construction, the dovetailing of design and building operations so initial work can begin before final drawings are prepared, already is in application at GSA. Drawings go into construction as they are completed. PBS officials would like to have more money to spend on new structures to catch up with a mounting demand backlog for nearly all types of buildings. But a parsimonious Congress will not be "breaking loose" any large design and build sums soon.

Facilities Engineering and Construction Agency of HEW: Operates 26 construction programs under 12 separate laws. In Federally assisted work, U.S. pays about one-fourth of in-place cost. This amounts to $1 billion this fiscal year on 581 projects. (These are new jobs.) FECA's grant total now in design and construction is nearly $11 billion covering 3,900 individual projects. HEW presently supports with Federal funds over 50 per cent of all national health facility construction and 30 per cent of all national educational facility construction. In direct Federal building, HEW executes about $50 million worth of work annually in special purpose categories such as laboratories, hospitals, clinics, centers and schools. The backlog in general purpose space (built by GSA's PBS) is estimated now at $120 million. One of FECA's goals is to develop consistent, uniform A/E standards and procedures. FECA, in its new endeavors, is striving for reduced total cost and life cycle costing, reduced time for both design and construction, and the improved quality standards for user, architect, engineer, economics, operation and maintenance. In its current efforts to reach these ultimate objectives, FECA is emphasizing four "specific action" areas: comprehensive planning, systems building, value engineering and construction management. The last (CM) is to provide construction expertise in early project stages to make the construction concept and cost control concurrent with development of the design concept.

Housing and Urban Development: The various programs were outlined in broad detail by Harold B. Finger, Assistant Secretary for Research and Technology. He detailed Operation Breakthrough which seeks to encourage volume construction of all types of housing in wide price ranges by building prototype projects using the systems approach. This is part of HUD's effort to stimulate production of the 26 million dwelling units needed in this decade. Mr. Finger cited the widely recognized problems of short money, land scarcity and high cost, labor's escalating wage settlements and the proliferation of local building codes. In this atmosphere too little research has been accomplished toward improving the building processes, he feels.

Explaining the motivation for Operation Breakthrough, Mr. Finger said that in this relative void of incentives available to the housing business for improvement in the entire housing process, action was required by the Federal Government. HUD's research and technology program (including OB) was given $45 million for the current fiscal period, only $10 million short of the original budget submission. Site development work is progressing at all locations in this program and HUD expects construction of the prototypes to be completed by the end of this year. Because of broadened population trends affected by housing needs, housing offers large economic opportunities, Finger said.

Federal Aviation Administration: New landmark legislation projects a 10-year commitment of $14 billion in Federal funds to expand the nation's aviation system. This will build airport capacity with trust funds to meet a critical shortage. Hundreds of new airports will be built and many existing facilities improved. For the first time focus will be on total, over-all planning of an entire aviation-related environment. The law provides $280 million each year for airport development from 1970 to 1975, generating a total of $2.8 billion in total program for construction and improvement. This is $500 million more than the total generated during the 23-year history of the Federal-aid airport program. An added $15 million will be available each year to aid public planning agencies in preparing airport master and systems plans. The Federal program regulations have already been published. Airline terminal work will not be covered directly under the program, lessening the interest of architects to some extent, but increasing terminal work indirectly.

The new law makes available, subject to appropriation, $250 million for each of the five years for facilities and equipment to expand the capacity of the national aviation system for both commercial and private flying interests. Much of the money will go for automating and otherwise improving FAA's domestic networks of 20 air route traffic control centers. The need is great; FAA estimates that the number of general aviation aircraft handled by the centers will increase four-fold in the next decade.

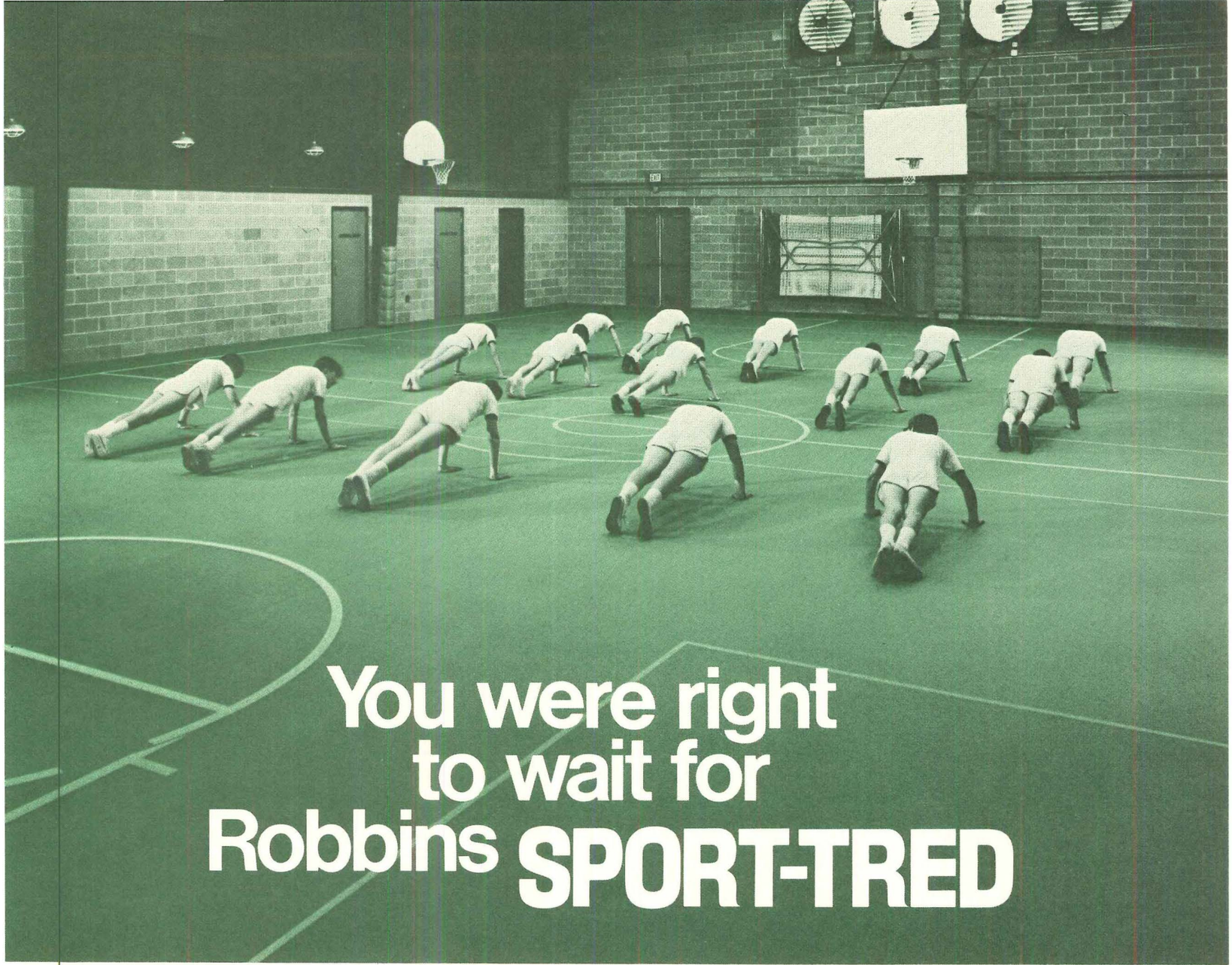
Post Office: Under terms of the new Postal Reorganization Act, PO's Construction Engineering Facilities Department is planning to spend $700 million annually over the next four to five years for new construction alone. Deputy Assistant Postmaster General Robert E. Isaacs called the capital acquisition authority thus provided: "the final cure" for problems of expansion and modification in the years to come. The new Postal Service is authorized to create and sell $10 billion worth of postal revenue bonds; up to $2 billion can be issued annually, $500 million for operating expenses and $1.5 billion for capital purposes. The Department's projects are planned and implemented to turn the traditional seven to 10 year planning and construction period into three years or less.

PO, like PBS, is using phased construction and construction management and has injected the new development of turning to the Army Corps of Engineers to handle supervision of some of its larger projects. Final arrangement has been made for ACE to supervise four, and three more are understood to be in negotiation. As explained, the Corps will not be replacing general contractors on these jobs but will assume management only from PO. There is no stated fee schedule in the Postal Service procurement regulations, but spokesmen at New Orleans said the payment was based on the professionals' system of fee scheduling. Isaacs stated that the new approach at PO assures the opportunity for the Service to pay A/Es "a right and reasonable fee for the services performed rather than a restricted fee. We are now discussing this point in our task committees and have recommended that the fee be the minimum fee as established by the architectural and engineering societies of the state and area of the project." Those interested in PO work were advised to submit Standard Form 251 with brochure to Mr. Isaacs' office in Washington.

The Department of Commerce, Veterans Administration and the new Environmental Protection Agency also presented their programs. VA's systems and modular approach to design of medical facilities was illustrated. San Diego and San Antonio hospitals and medical facilities at Denver, Cincinnati and Kansas City were cited to show the agency's development and use of innovative ideas directly during the design process. VA also uses an extensive research and development program to advance its own building technology. Studies have been made in air conditioning techniques and in systems integration. In line with other Federal agency trends, VA also is using simultaneous preliminary planning and program development, critical path method, value engineering and phased construction in its hospital program.

EPA's representative, Richard Vaughan, director, Bureau of Solid Wastes Management, detailed the new Resources Recovery Act, explaining its provisions for manpower studies, research on recovery of useful materials and energy from solid wastes, a national disposal sites program for hazardous wastes and the grant programs.

Acting Assistant Secretary of Commerce for Science and Technology Richard O. Simpson told of National Bureau of Standards' efforts—through a National Conference of States on Building Codes and Standards—to provide a national basis for building regulations by which the 6,000 code jurisdictions can be consolidated into a smaller number. *—Ernest Mickel*



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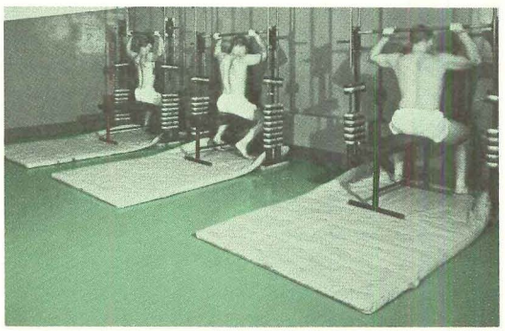

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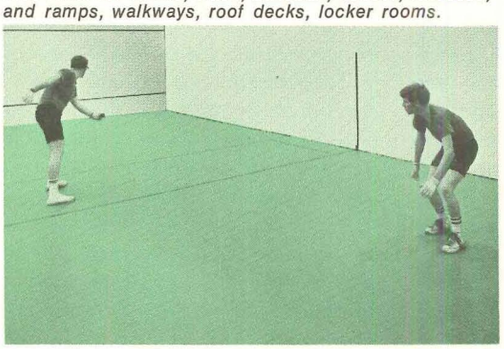

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Robert M. Young
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Apartments: adapting to a changing market

Except for the gypsy, the squatter, and those whom society has sheltered at its own expense for one reason or another, a person obtains housing in one of four ways: he buys it (or the materials to build it), he rents it, he inherits it, or he moves in with someone who has it. Those who buy, and those who rent predominate statistically and determine the nature of the market.

Although it has long been common practice that people both rent and buy single family houses, it used to be pretty certain that, if someone lived in an apartment, he rented it. As early as 1950, though, over 20 per cent of the people who lived in multi-unit structures owned them. By 1960, this figure was closer to 30 per cent. And, since the cooperative and condominium form of apartment ownership didn't really come on strong until the decade of the 1960's, the 1970 Housing Census should show an even more dramatic shift in this direction.

As a result of population characteristics, apartment living generally gained in popularity during the decade of the 1960's. A look at household and family formations over this period shows that almost 45 per cent of the net increase in households occurred in the age brackets under 25 and over 65. These are the groups—families just starting out, and retired couples—that tend to prefer the relative ease of maintenance and lower cash outlays that apartment living offers.

But, an alternative that offered the benefits of both low cash outlay and ease of maintenance, the mobile home, was also gaining strength during this period. The mobile home carried an additional feature: it could be bought. The desires of many of the "under-25's" and "over-65's" for a financial stake in the place in which they lived found an outlet here during the 1960's. From a rate of roughly 100,000 units a year in 1960, mobile home shipments reached a level of more than 400,000 units last year. Put another way, mobile homes went from seven per cent of all shelter produced in 1960 to 22 per cent last year. The mobile home's success was heightened by the onset of tight money, which curbed the output of both single family homes and apartments for much of the latter part of the 1960's. In fact, many who were in the market for a new home were left with no other reasonable alternative.

While it's true that the inroads of the mobile home on the housing market were made at the expense of both apartment and conventional single family structures, it can be argued that, in terms of prospective customers lost, the apartment was hurt more severely. Even though the cooperative and condominium form of ownership grew quite rapidly during the sixties, fulfilling the "need to own" for many, they were too inflexible to meet the needs of all potential customers. Instead of having the under-25 and over-65 markets almost entirely to itself, apartment builders had to share those markets with the mobile home.

It is more than a coincidence that during the decade of the sixties, close to 45 per cent of the growth in households came from the under-25 and over-65 age brackets, and just under 45 per cent of the new housing produced was in the form of either apartments or mobile homes. A measure of the mobile home's success here is the fact that in 1960, it accounted for slightly more than one-fourth of the combined apartment - plus - mobile - home total produced that year. Last year, the mobile home proportion was almost 40 per cent of that total. This does not mean that apartment building fared poorly during the 1960's though. The number built in 1970 was more than *twice* what it was in 1960. It could have fared better, however, without the inroads of mobile homes.

Most of the gains in the number of households in the years ahead will be coming from the 25 to 34 age bracket. In fact, between 1970 and 1975 over half of the gain in the total will originate in this group. In this age bracket, the family is growing and beginning to be a little better off financially. The house with the yard becomes both a more appealing and a more accessible prospect. And, somewhere in this age bracket, around age 30 or so, a "go or no-go" decision is made: look for a house or a bigger apartment—or a bigger mobile home.

Apartment construction appears to be reacting to this new demographic twist. Just as the cooperative and the condominium form of ownership represents a response to the consumers' desire for equity, or a financial share in his home, recent shifts in apartment structural patterns reflect an attempt to increase the options open to the "new" consumer. The situation facing this new consumer is something like this: Should I look for a house, which offers lots of living space and a yard, but costs a lot of money and has a long commute attached, or a bigger apartment, with slightly more living space, and no yard, or maybe a communal yard, but for less money and probably less commuting time? The choice is never clearcut.

To attract this consumer, apartment *units* are becoming larger. As recently as five years ago less than half of the apartments built had two bedrooms or more. Last year, that figure was creeping up on 60 per cent.

Apartment *buildings* are getting both bigger *and* smaller. Apartment units in buildings containing 50 units or more accounted for almost one-third of the total last year; they accounted for only one-fourth of the total as recently as five years ago. Conversely, units in small five- to nine-unit garden type apartments accounted for roughly 20 per cent of the total units built last year. Five years ago this figure was closer to 15 per cent. In effect, we're building both more in-town units with the benefits of little or no commute and easy access to the cultural facilities of the cities, *and* more garden type structures, which offer some of the advantages of suburban living, but at a lower cost than the single family home.

Confined as it is to suburbia or, increasingly, exurbia, and limited in the amenities it can offer, the mobile home is at a distinct disadvantage in this type of a market. The conventionally built home will be attracting a lot of buyers. But, when all is considered; the unique ability of the apartment to offer a home for sale, *or* for rent, in *either* the city or the suburbs puts it in a unique position in the years immediately ahead. We must add to this the fact that stepped up government aid to replace deteriorated urban housing will have the greatest impact in the apartment area. The apartment should be the fastest growing of all residential building types—and that includes mobile homes—in the early years of the 1970's.

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INDEXES AND INDICATORS

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EXPLANATION OF RECORD INDEXES

The building cost indexes in the table at right compare current costs to those of the base year, 1941, within each column-category for each city. They do NOT compare prices or actual construction costs of one category vs. another. You cannot say, for example, that masonry-frame construction costs more than steel because the index is higher. You can say that masonry costs have increased slightly more *from their own base year.*

Building cost indexes

The information presented in the tables indicates trends of building construction costs in 33 leading cities and their suburban areas (within a 25-mile radius). The table to the right presents correct cost indexes for non-residential construction, residential construction, masonry construction and steel construction. Differences in costs between two cities can be compared by dividing the cost differential figure of one city by that of a second city.

The table below presents historical building cost indexes for non-residential construction; future costs can be projected after examining past trends.

All the indexes are based on wage rates for nine skilled trades, together with common labor, and prices of five basic building materials are included in the index for each listed city.

1941 average for each city = 100.00

FEBRUARY 1971

Metropolitan area	Cost differential	Current Indexes non-res.	residential	masonry	steel	% change year ago res. & non-res.
U.S. Average	8.5	339.1	318.4	332.8	325.1	+ 7.27
Atlanta	7.8	428.4	403.9	417.2	411.7	+10.13
Baltimore	7.9	355.6	334.3	346.4	339.9	+ 8.21
Birmingham	7.2	314.0	292.0	306.9	301.2	+ 2.08
Boston	8.7	333.7	315.3	330.6	321.6	+11.56
Buffalo	9.2	381.9	358.6	375.6	365.1	+10.12
Chicago	8.8	392.4	373.1	380.1	374.7	+ 8.57
Cincinnati	9.0	353.9	332.9	348.3	340.0	+ 7.12
Cleveland	9.8	386.3	363.5	378.8	370.9	+ 6.22
Columbus, Ohio	9.0	369.1	346.5	359.8	353.4	+ 8.67
Dallas	7.7	330.9	320.4	323.0	317.4	+ 6.16
Denver	8.4	373.0	350.9	370.4	358.0	+ 8.73
Detroit	9.5	382.4	364.3	381.5	368.7	+ 7.08
Houston	8.1	327.8	307.8	320.8	314.6	+ 6.81
Indianapolis	8.8	313.6	294.4	307.8	301.2	+ 3.38
Kansas City, Mo.	8.2	320.1	302.4	312.9	307.2	+ 6.84
Los Angeles	8.1	370.7	338.8	359.3	353.7	+ 5.32
Louisville, Ky.	8.1	332.3	312.0	325.6	319.3	+ 7.13
Memphis	7.8	326.4	306.5	319.1	312.5	+ 6.10
Miami	8.6	358.3	341.3	352.0	343.9	+ 7.41
Milwaukee	9.2	394.4	370.3	390.5	377.7	+ 6.17
Minneapolis	8.9	365.9	344.2	360.2	350.7	+ 9.18
Newark	9.0	341.6	320.8	336.2	327.9	+ 9.75
New Orleans	7.9	323.9	305.7	319.1	312.1	+ 7.36
New York	10.0	375.3	348.9	363.0	355.6	+ 6.39
Philadelphia	8.5	351.2	334.5	344.7	336.5	+ 8.10
Phoenix	8.2	187.7	176.2	181.6	180.1	+ 5.78
Pittsburgh	9.1	331.6	312.0	327.1	318.8	+ 5.37
St. Louis	9.2	349.7	330.1	346.6	335.1	+ 6.22
San Antonio	8.0	139.0	130.6	136.2	132.6	+ 8.99
San Diego	8.2	138.2	129.8	135.6	132.5	+ 7.67
San Francisco	9.0	476.4	435.4	469.8	456.6	+ 5.58
Seattle	9.0	351.5	314.6	349.5	335.2	+ 7.71
Washington, D.C.	7.7	313.4	294.3	306.4	300.3	+ 8.16

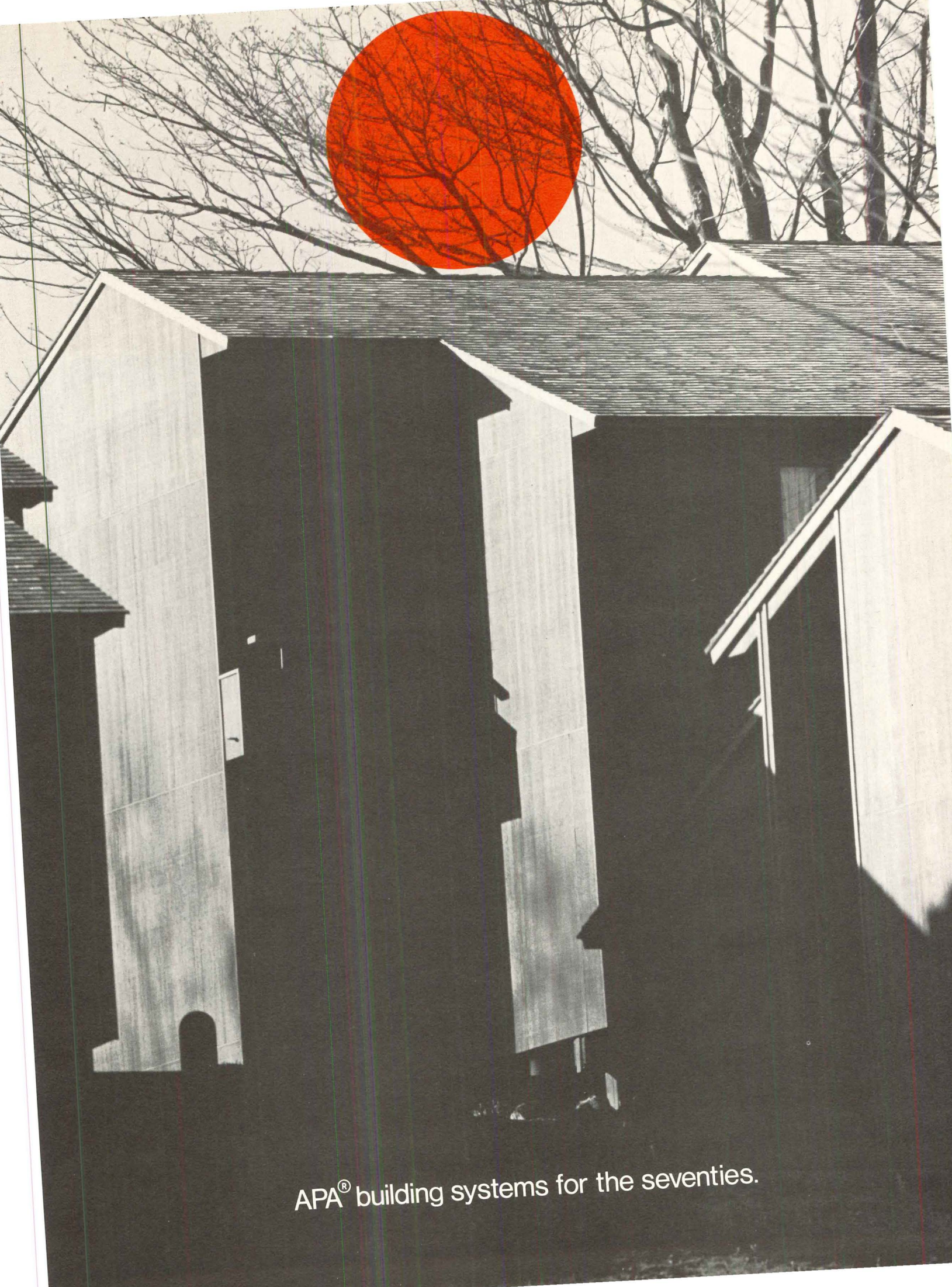
Cost differentials compare current local costs, not indexes.

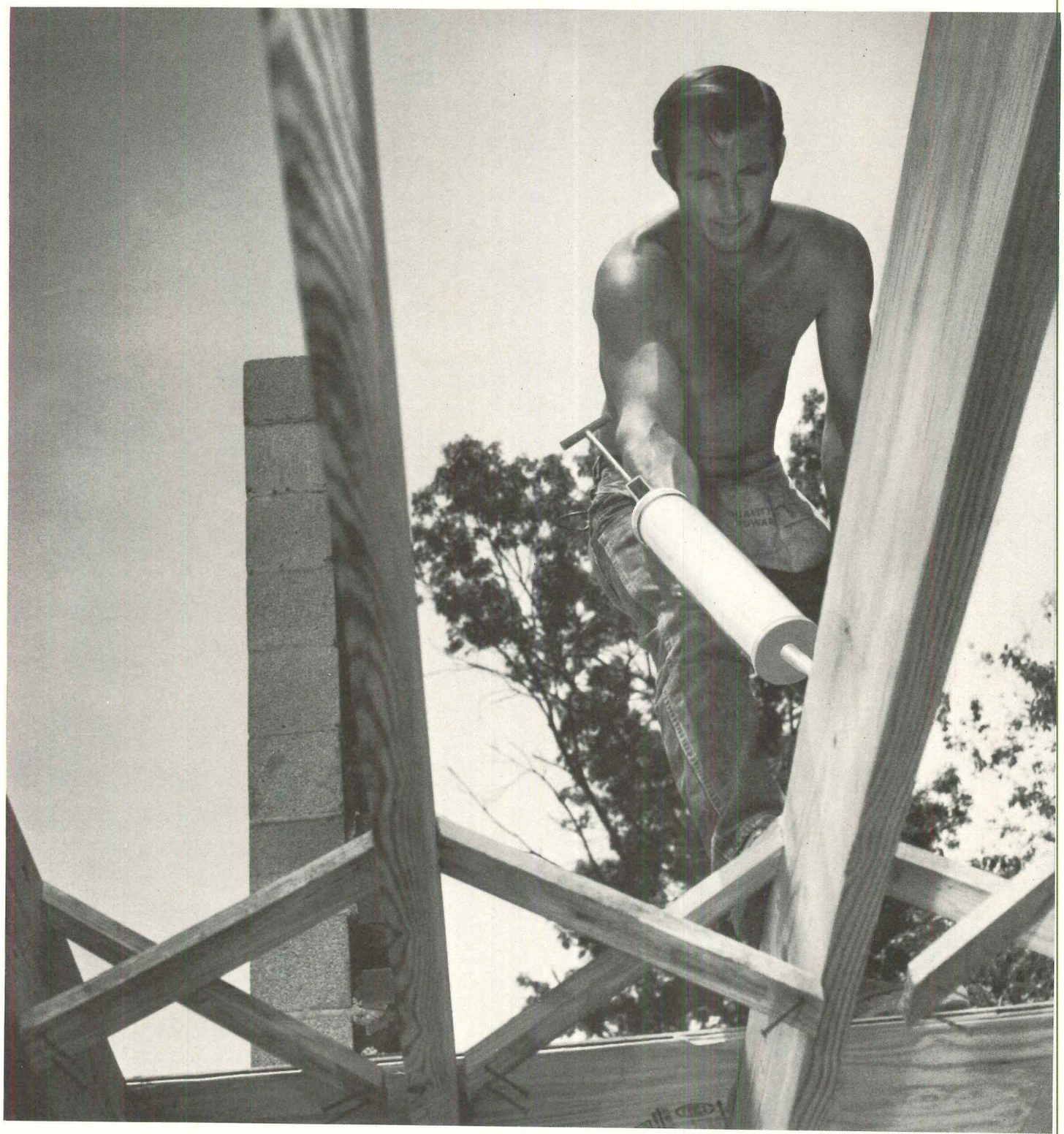
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1962	1963	1964	1965	1966	1967	1968	1969 (Quarterly) 1st	2nd	3rd	4th	1970 (Quarterly) 1st	2nd	3rd	4th
Atlanta	298.2	305.7	313.7	321.5	329.8	335.7	353.1	364.2	365.9	382.8	384.0	399.9	406.2	408.1	422.4
Baltimore	271.8	275.5	280.6	285.7	290.9	295.8	308.7	311.4	313.0	321.8	322.8	323.7	330.3	332.2	348.8
Birmingham	250.0	256.3	260.9	265.6	270.7	274.7	284.3	288.4	289.9	302.4	303.4	303.5	308.6	310.2	309.3
Boston	239.8	244.1	252.1	257.8	262.0	265.7	277.1	278.2	279.6	294.0	295.0	300.5	305.6	307.3	328.6
Chicago	292.0	301.0	306.6	311.7	320.4	328.4	339.5	340.4	342.1	354.9	356.1	362.2	368.6	370.6	386.1
Cincinnati	258.8	263.9	269.5	274.0	278.3	288.2	302.6	309.8	311.5	324.8	325.8	332.8	338.4	340.1	348.5
Cleveland	268.5	275.8	283.0	292.3	300.7	303.7	331.5	334.9	336.7	357.1	358.3	359.7	366.1	368.1	380.1
Dallas	246.9	253.0	256.4	260.8	266.9	270.4	281.7	287.2	288.7	307.6	308.6	310.4	314.4	316.1	327.1
Denver	274.9	282.5	287.3	294.0	297.5	305.1	312.5	317.9	318.5	337.9	339.0	343.4	348.4	350.3	368.1
Detroit	265.9	272.2	277.7	284.7	296.9	301.2	316.4	326.8	328.5	351.8	352.9	355.2	360.5	360.6	377.4
Kansas City	240.1	247.8	250.5	256.4	261.0	264.3	278.0	281.0	282.3	294.5	295.5	301.8	306.8	308.8	315.3
Los Angeles	276.3	282.5	288.2	297.1	302.7	310.1	320.1	323.7	325.4	343.0	344.1	346.4	355.3	357.3	361.9
Miami	260.3	269.3	274.4	277.5	284.0	286.1	305.3	309.6	311.2	328.3	329.3	338.2	343.5	345.5	353.2
Minneapolis	269.0	275.3	282.4	285.0	289.4	300.2	309.4	310.6	312.2	330.1	331.2	341.6	346.6	348.5	361.1
New Orleans	245.1	248.3	249.9	256.3	259.8	267.6	274.2	285.5	287.1	296.6	297.5	305.4	310.6	312.2	318.9
New York	276.0	282.3	289.4	297.1	304.0	313.6	321.4	324.9	326.6	343.4	344.5	351.1	360.5	361.7	366.0
Philadelphia	265.2	271.2	275.2	280.8	286.6	293.7	301.7	304.6	306.2	320.0	321.0	328.9	337.7	335.7	346.5
Pittsburgh	251.8	258.2	263.8	267.0	271.7	275.0	293.8	297.0	298.6	310.0	311.0	316.9	321.6	323.3	327.2
St. Louis	255.4	263.4	272.1	280.9	288.3	293.2	304.4	306.8	308.3	323.7	324.7	335.2	340.8	342.7	344.4
San Francisco	343.3	352.4	365.4	368.6	386.0	390.8	402.9	415.6	417.5	439.9	441.1	455.4	466.9	468.6	465.1
Seattle	252.5	260.6	266.6	268.9	275.0	283.5	292.2	296.1	297.5	316.8	317.8	325.4	335.1	336.9	341.8

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0÷200.0=75%) or they are 25% lower in the second period.


APA® building systems for the seventies.



The no-squeak floor is coming on strong. Quietly.

Plywood and glue makes stiffer floors for townhouses and apartments in Raleigh.

"By eliminating one layer of floor system, I saved on material and labor. By using 5/8-in. tongue and groove plywood on 2x8 floor joists, I'm getting a stiffer floor than I had with the 2x10's I used on other units," says J. R. Adams, of Adams-Bilt Homes, Raleigh, North Carolina.

That's what the APA® Glued Floor System has done for his two-story, 70-unit apartment addition (left) and 370-unit townhouses.

The system consists, simply, of glue-nailing a single layer of plywood to wood joists.

Floor and joists are fused into a T-beam unit. APA tests (1 below) show the entire floor is stiffer. And joist size can often be reduced.

Properly constructed, APA Glued Floors can eliminate squeaks because the glue rather than nails carries the stress.

"2·4·1® plywood for glued floors makes a hell of a selling feature" in southern California.

The speaker: Carl A. Rudnick, now director of multi-family housing for Levitt & Sons of California, Inc.

The subject: several premium single-family homes he built as an independent southern California contractor.

"Thick plywood is impressive to customers. And 1-1/8-in. 2·4·1 gives them all the stiffness and resiliency they want in a quality floor. Cost-wise it works out to be competitive with concrete slabs.

"I don't get any complaints about floors squeaking, either. That's why I field-glued 2·4·1 in the home I built for myself."

Rudnick specifies tongue and groove 2·4·1 plywood on 4x6 girders 4 feet o.c. He first applies glue, then nails each panel with 8-penny barbed nails. He cross-blocks at each 4-foot section. Vinyl, parquet or carpeting goes over the plywood.

APA Glued Floor System cuts costs and callbacks in Columbus, Georgia.

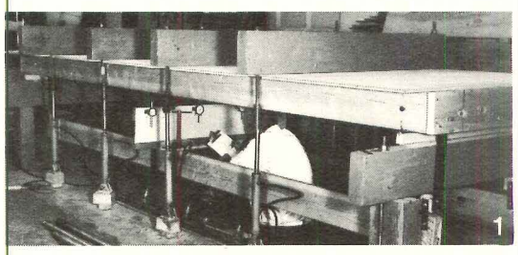
Contractor Bryan Rust, vice president of Hilton Builders, Columbus, Georgia, uses field-glued floors because:

"Glues made possible our changeover to the single-layer floor. And the system has kept floor defects to a fraction of what they were with conventional methods.

"Nailing problems are all but eliminated. And we only have to nail on 12-in. centers. With this time savings and a single-layer floor, our labor costs are much lower," said Rust.

Suggestion: Use of a hand-made spacer (2 below) assures a 1/16-in. gap quickly and consistently between end and side joints of panel.

"We couldn't have found a better way to put a floor together . . . for both cost and quality," he said.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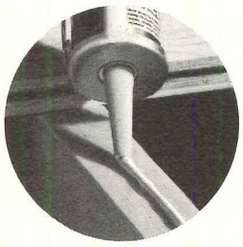

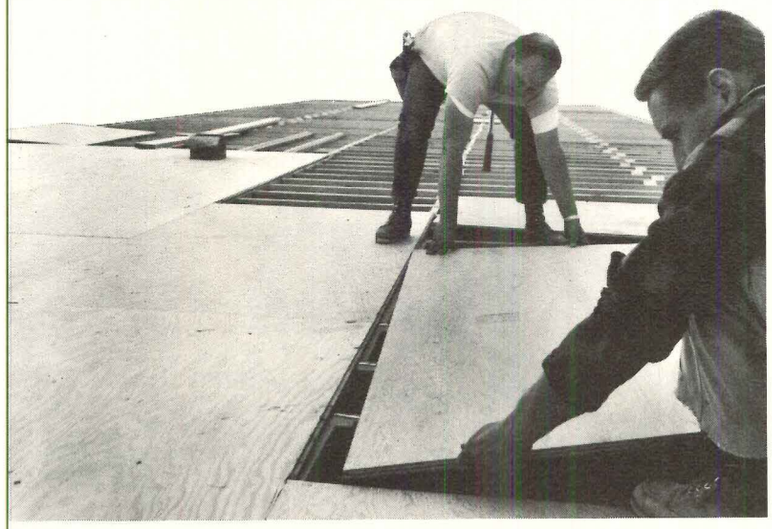

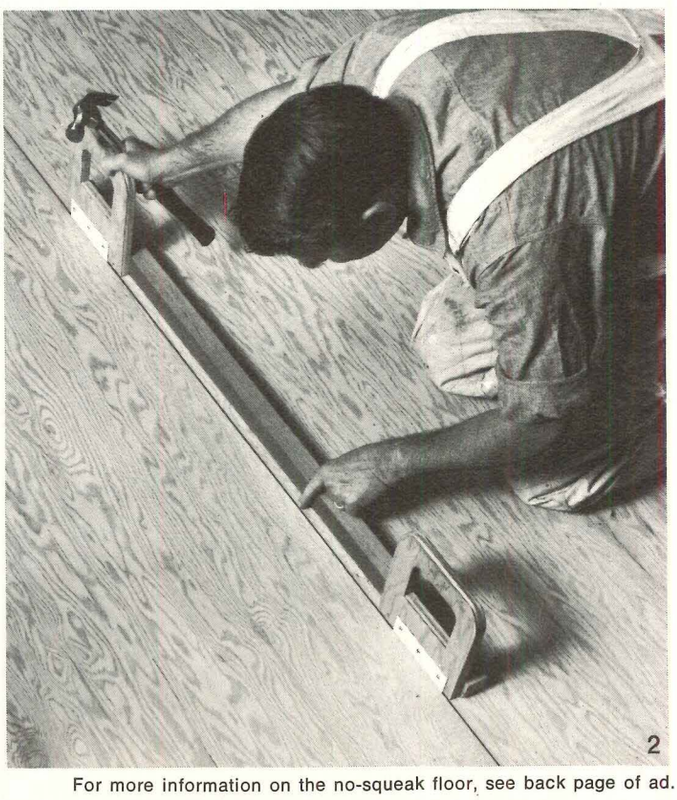
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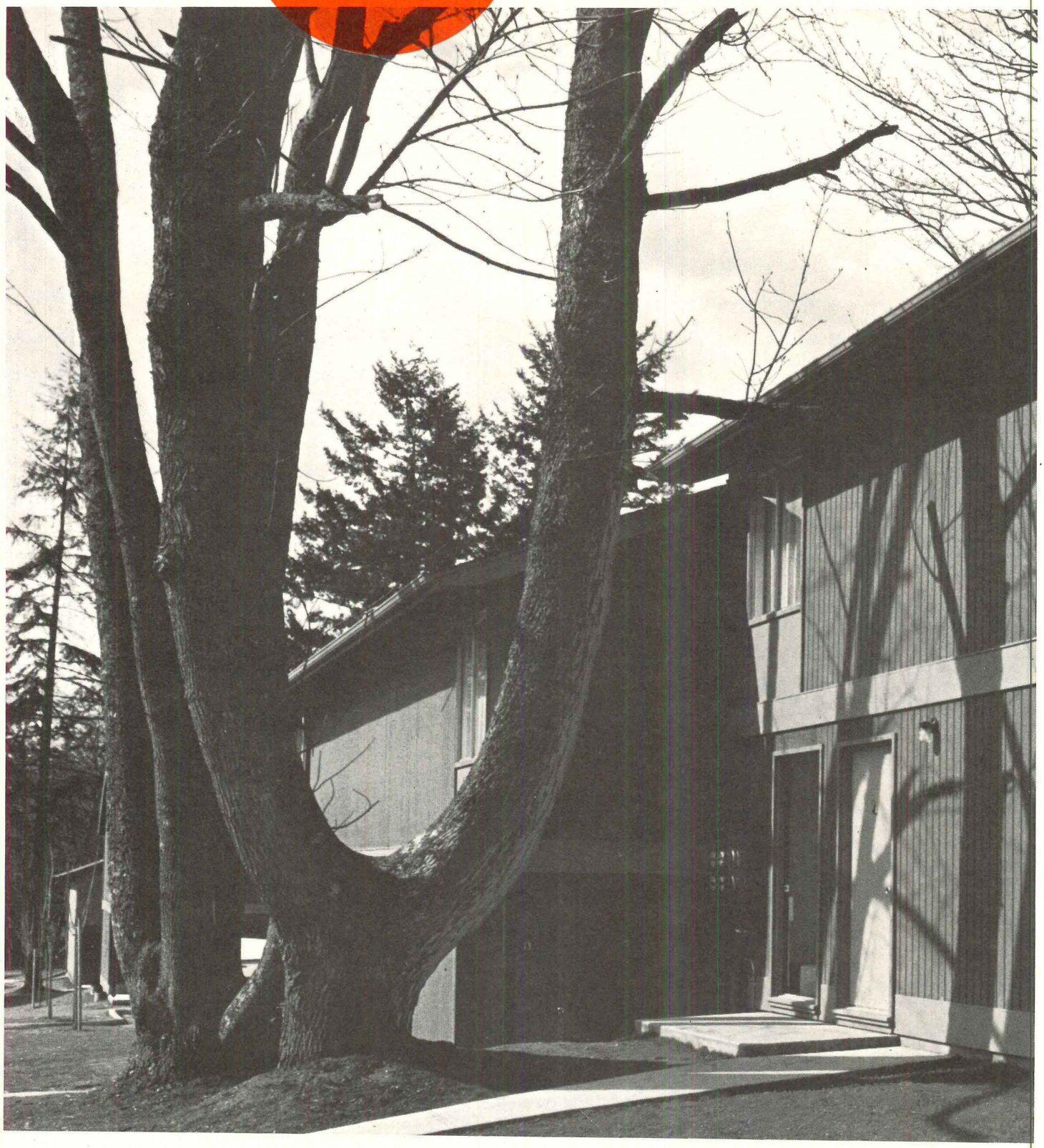
For more information on the no-squeak floor, see back page of ad.



Textured plywood is more than just another pretty face.

Stained Texture 1-11® single-wall for low-income apartments in Seattle.

United Homes Corporation and architect Larry Metler prove at left that low-income housing can be a nice place to live.

The Cascade apartment project for King County Housing Authority "was built around the trees rather than over them," said Metler, of McCool-McDonald & Associates, Seattle.

Five-eighths-inch APA Texture 1-11 plywood as combination siding and sheathing was specified for cost and appearance. "We were satisfied with both," said the architect.

The single-wall construction with plywood siding nailed directly to the studs eliminates one application step.

Plywood was also used for the subfloors and roof sheathing, according to Preston Sherrod, job superintendent.

The 108 units are operated under a pilot turnkey "lease-back" program. United Homes built it; sold it to Mead Samuel and Co., Inc., which in turn leases it to King County Housing Authority. Rent is based on tenant income.

Stained Texture 1-11 single-wall for luxury condominium in Oakland.

Here's proof (1 and 2 below) APA Texture 1-11 plywood siding in a single-wall system can work as well for a sophisticated condominium as it does for the low-income apartment at left.

It's Hiller Highlands, an award-winning $20 million, 67-acre condominium community in Oakland, California.

Architects Callister and Payne specified T 1-11 plywood stained in basic earth tones of buff, brown and red.

Contractor was Weldwood, Inc.

Textured plywood as combination siding-sheathing can cut costs as much as 40 percent. It requires little maintenance. Takes staining beautifully. And comes in 40 styles.

Plywood inside and out creates quiet, beautiful dwellings in Port Ludlow, Washington.

Units of this condominium at Port Ludlow (Hood Canal) in Washington State sold for $30,000 to $47,000. They are part of The Admiralty Resort. (See cover and 3 below.)

Pope and Talbot Development, Inc., demanded premium construction. And got it:

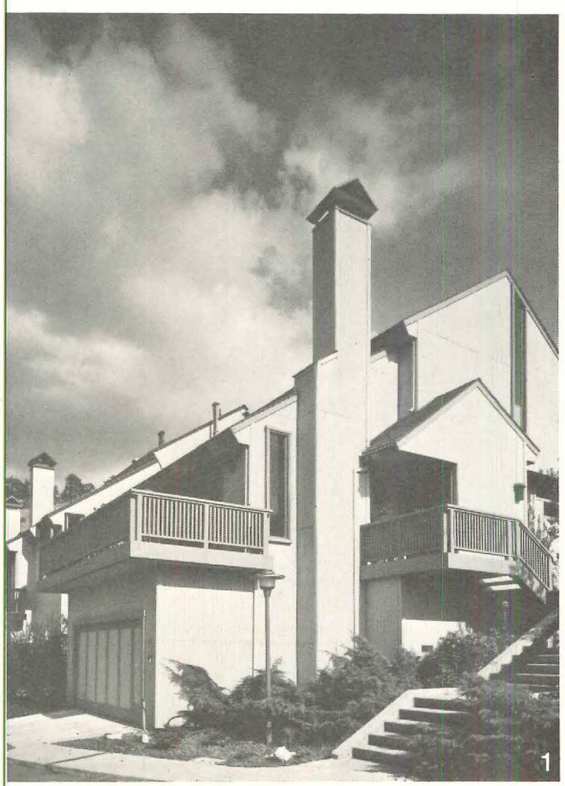
Siding is rough-sawn textured plywood, over plywood sheathing. The combination adds the warmth of wood and structural rigidity – plus a good sound barrier for airborne noises from outside.

Cedar shingles over plywood roof decks offer further sound-deadening characteristics.

Plywood subflooring with underlayment gives firm footing and is an ideal base for sound-deadening resilient floor covering: vinyl and carpeting.

Architectural firm: Naramore, Bain, Brady and Johanson, Seattle.

Builder: Solie Construction, Bremerton.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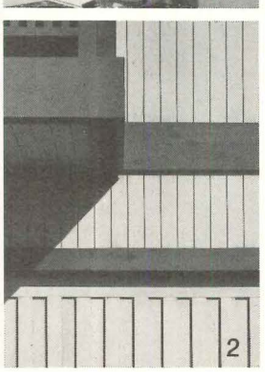
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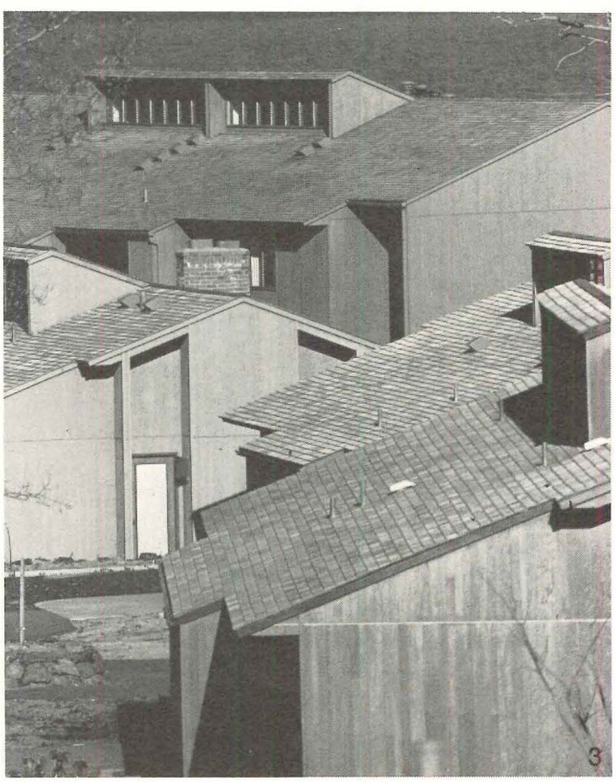
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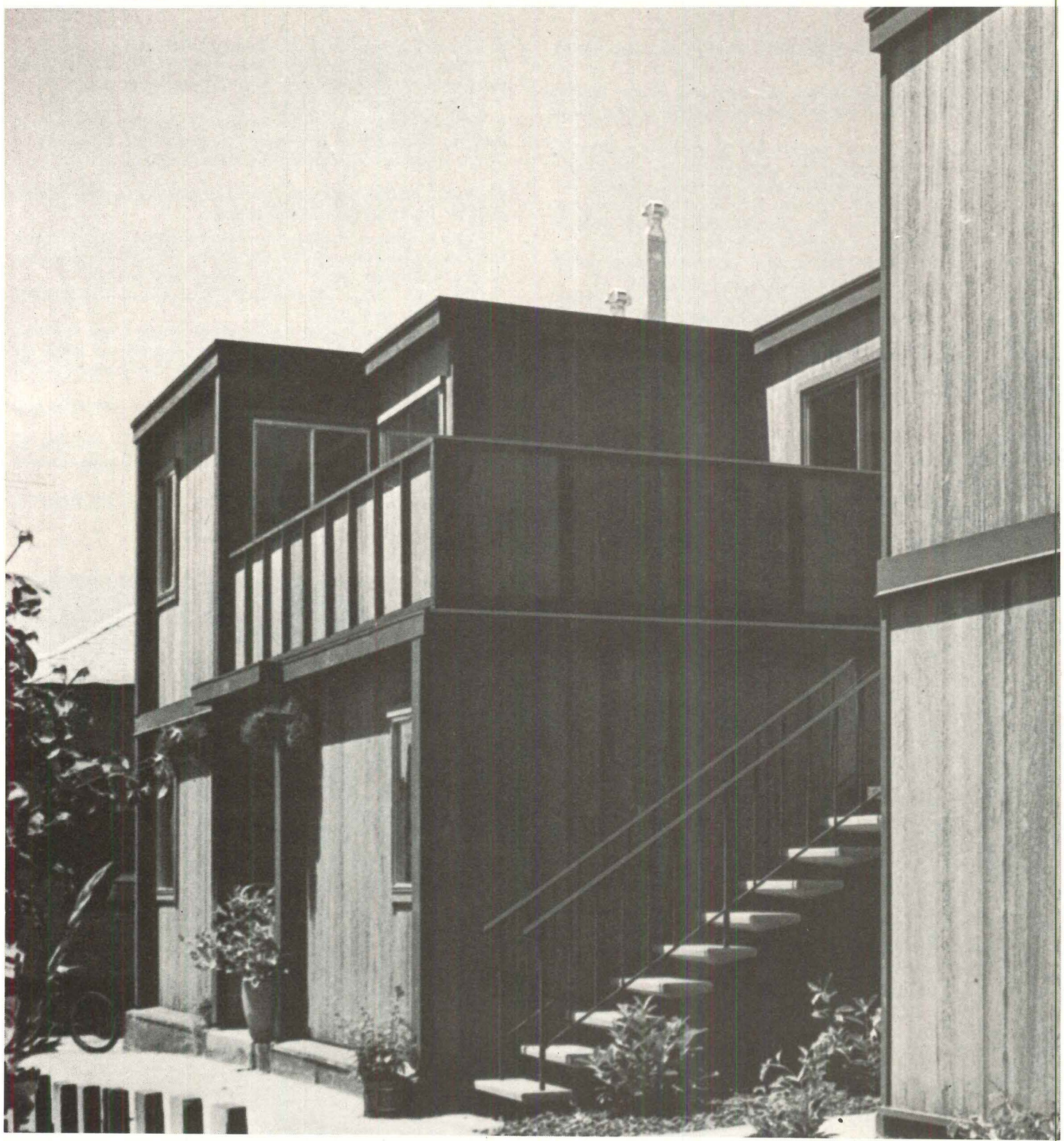
For more information on textured plywood see back page of ad.



Enter industrialized construction, hellbent for hurry-up housing.

Post and plywood panel components with a utility core in Berkeley.

The $11.50-per-sq.-ft., two-family home at left is based on a patented building system which includes an entirely new joining method, plywood components, and a service utility core. It was developed by Technology Consortium, Inc., Berkeley, California.

Prefabricated plywood panels are insulated with polyurethane foam, joined to 4x4 corner posts anchored to the slab (1 below). Based on room-sized, rectangular cells formed of panels and upright posts, each post provides vertical support for respective ends of up to four panels. The system can be used for multi-story, detached, and clustered dwelling units.

Exterior walls are 3/8-in. plywood, with texture-painted sheathing grade plywood interiors. Floor panels are polyurethane core skinned with plywood on top and bottom.

The utility core is pre-assembled, delivered to the site as a unit and anchored in place.

How student housing stacked up at the University of Massachusetts.

Modular, wood-framed plywood housing for married students at the University of Massachusetts cost $12 per sq. ft. including everything but land.

The factory-produced modules were prefabricated at Guerdon Industries' Magnolia plant, South Hill, Virginia, and trucked to Amherst, Massachusetts. Plywood's diaphragm strength and nail-gluing helped them take the jolts of the 800-mile haul.

Exterior siding and key interior walls and ceilings are textured plywood. Fold-up roofs are stressed skin plywood panels with finished roofing. Removable panels permitted on-site inspection of mechanicals (diagram 2/photo 3 below).

Architects are Armstrong and Salomonsky, Richmond, Va. Developer-owner is Glen Development Co., Washington, D.C.

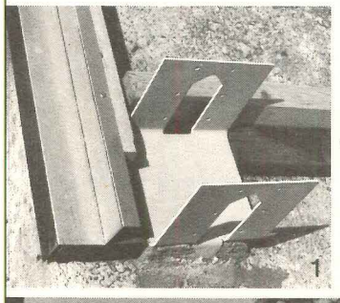
High volume assembly line and glued components in Wausau, Wisconsin.

Schuette Brothers can turn out a completed, quality-built home in a single day. The homes range from $6,000 to $30,000 and 850 sq. ft. to more than 2,500 sq. ft.

Key to high production is a pre-assembled mechanical core (4 and 5 below), built on a stressed skin plywood pallet that becomes part of the floor system. Floor and roof components are fabricated in the factory. Plywood is electronically glued to the top and bottom of the floor joists to make stressed skin floor panels.

Roof panels are similar, but plywood is on one side only. Prebuilt plywood wall units are preprimed with one coat of stain.

Wausau also produces multi-family structures using the same assembly line procedures.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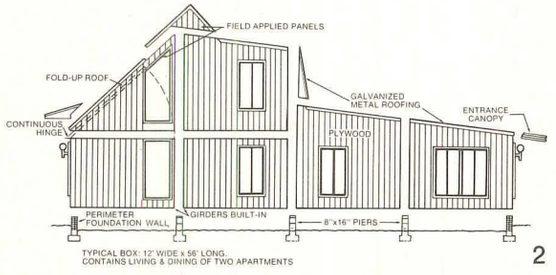

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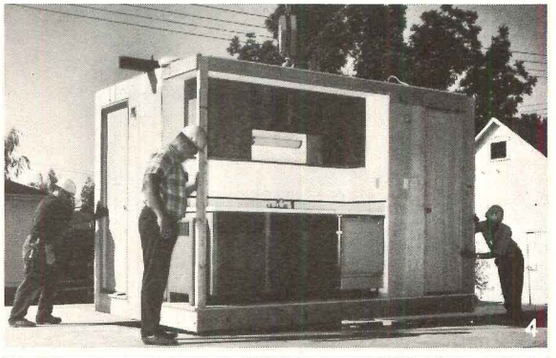
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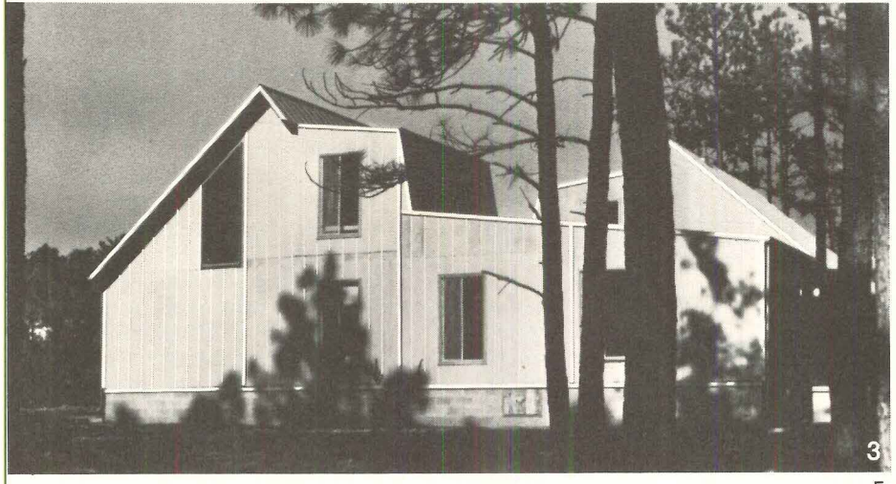
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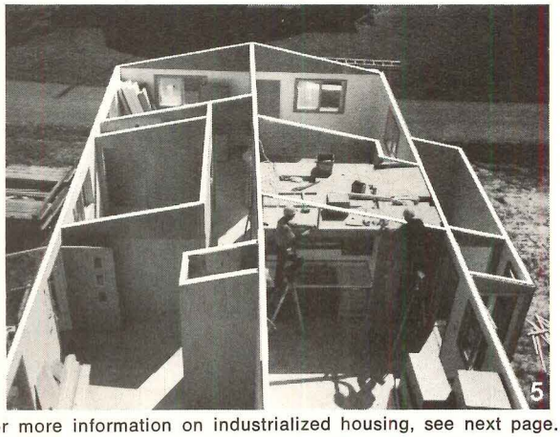
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For more information on industrialized housing, see next page.

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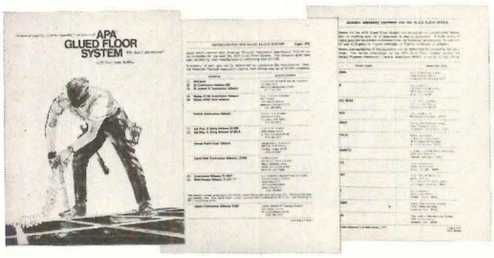

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- New 16-page manual on the no-squeak, APA Glued Floor System. How to make a stiffer floor, faster. Design data. New span tables. Cost comparisons. Applications sequence photos.
- Glue recommendations and equipment supplier lists.

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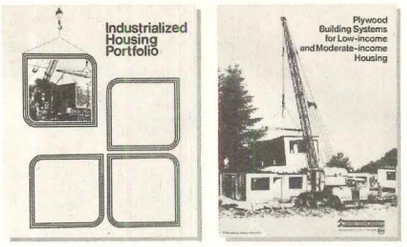

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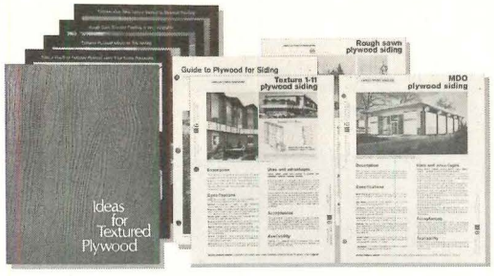

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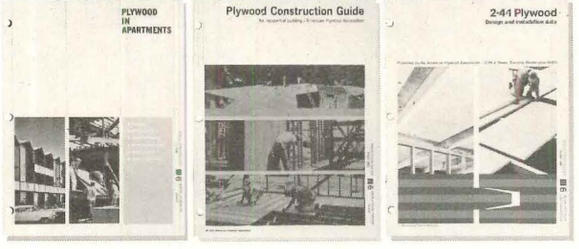

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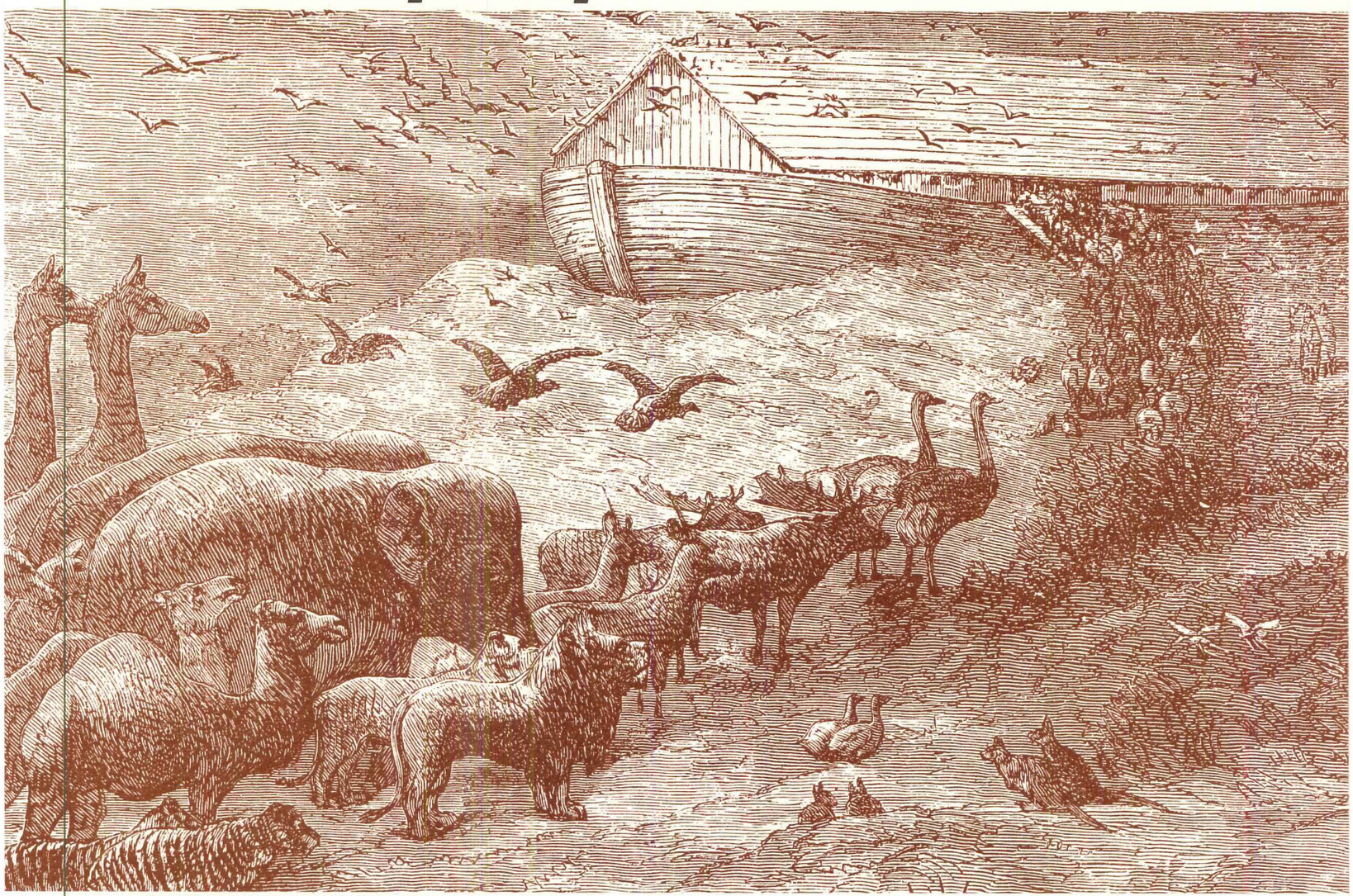

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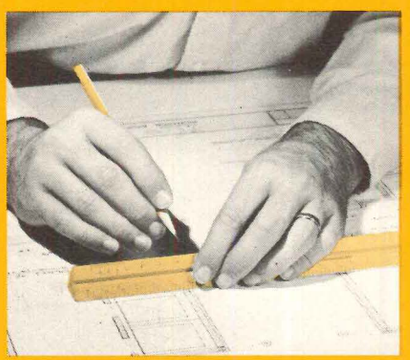

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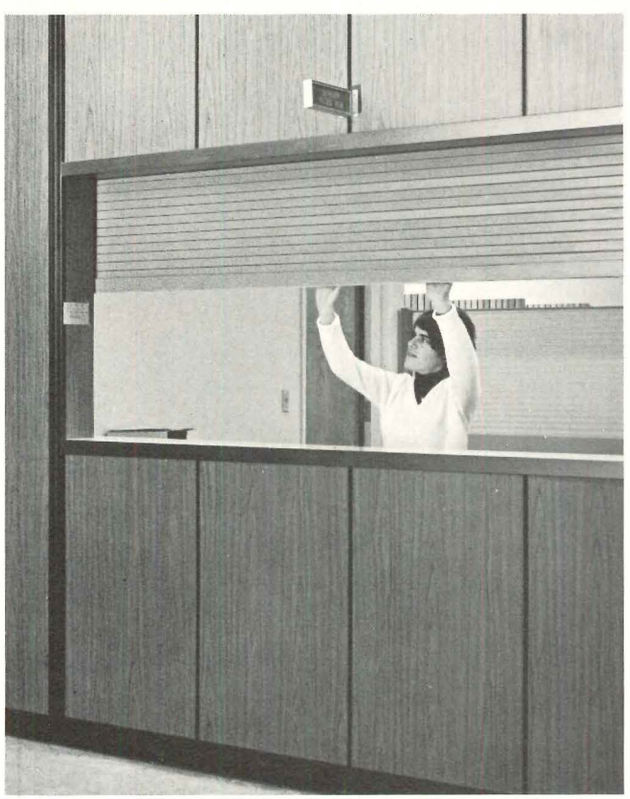

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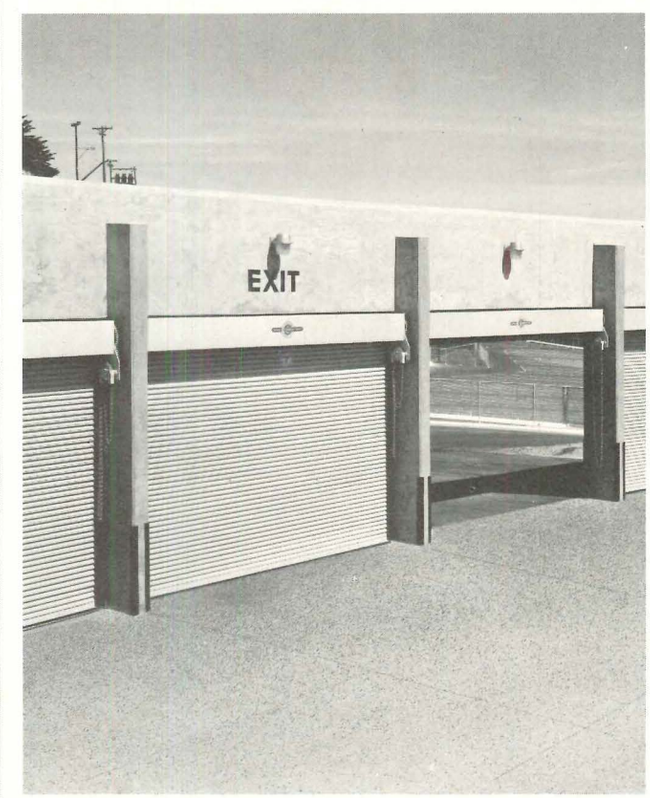

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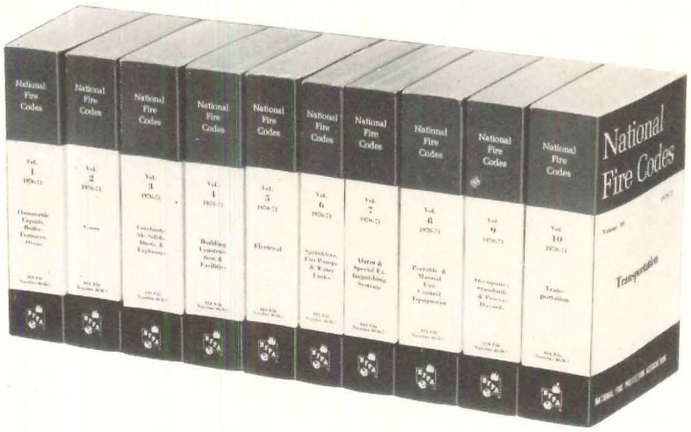

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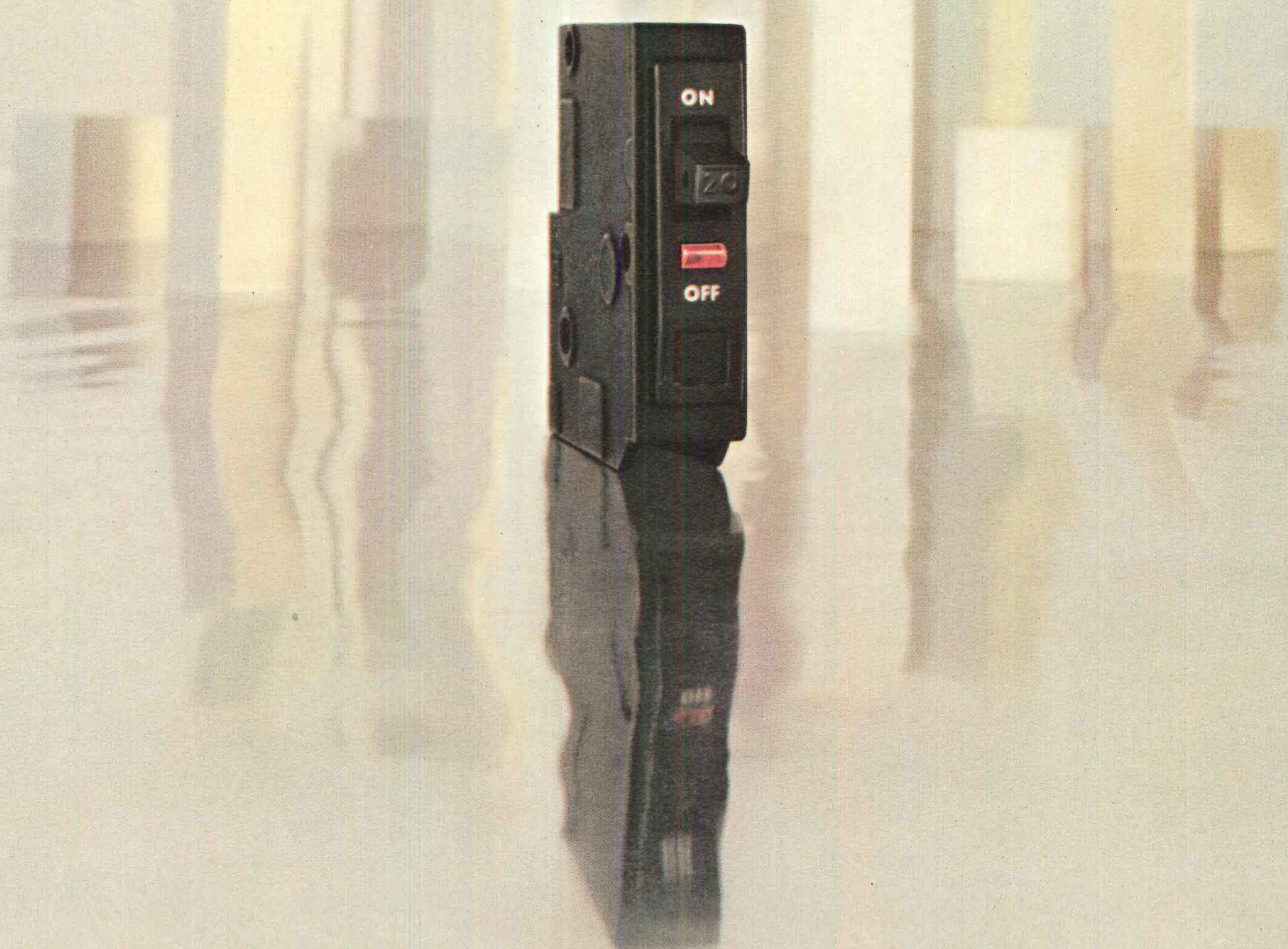

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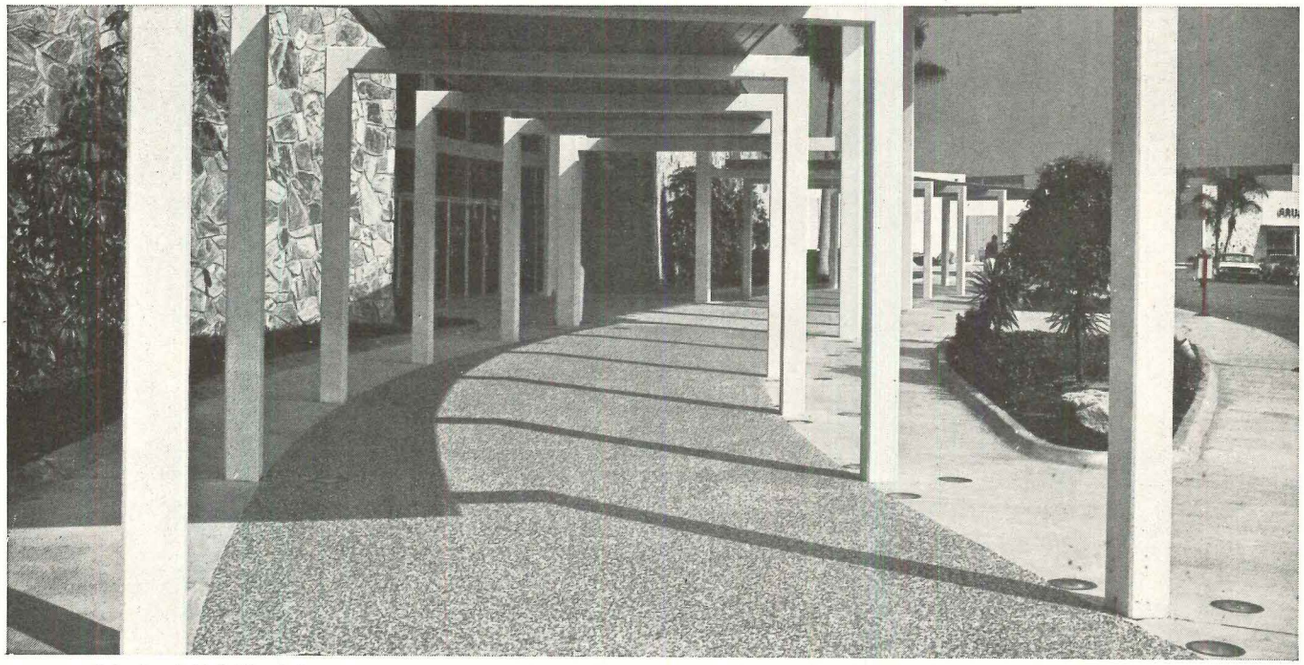

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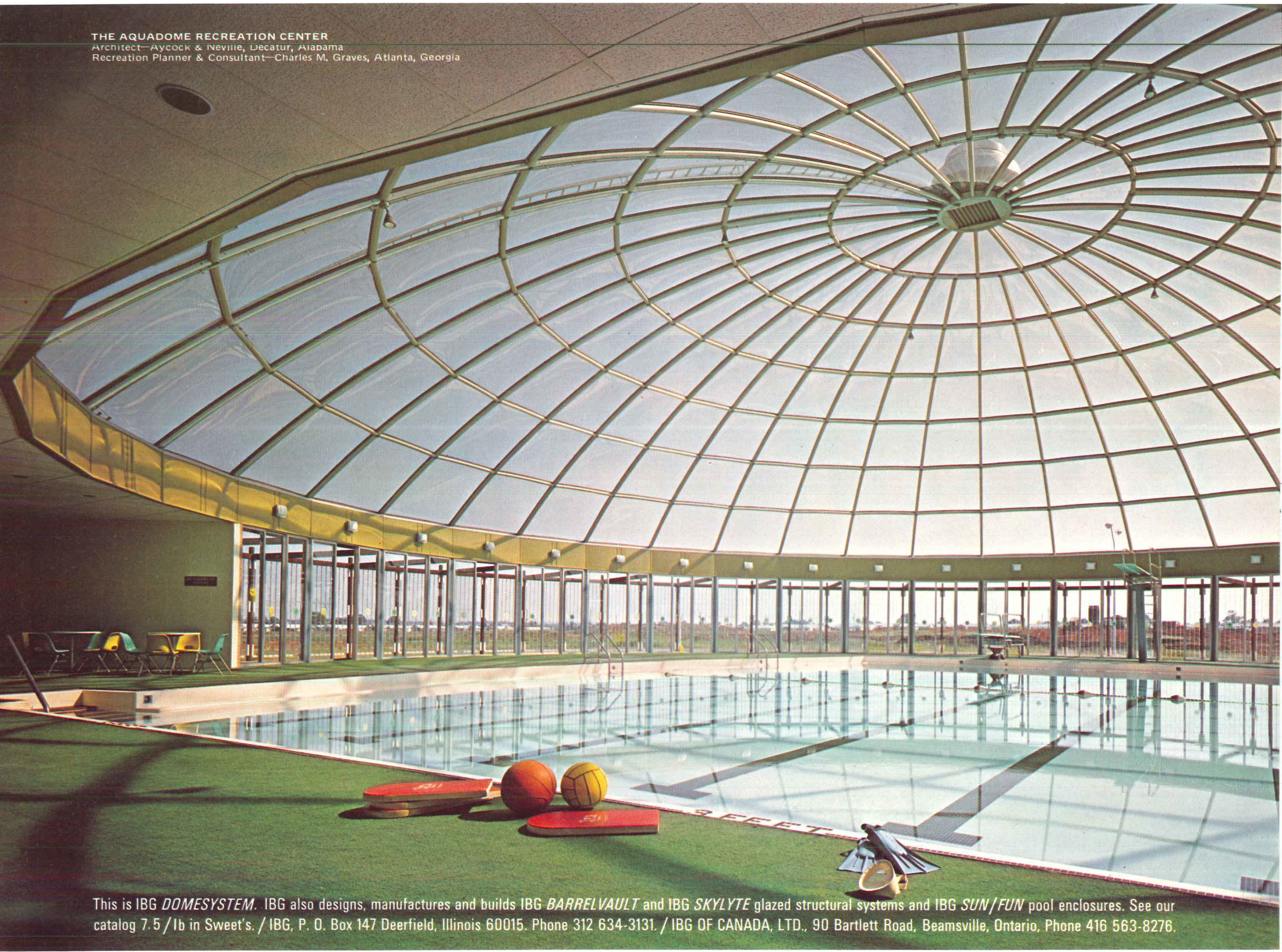

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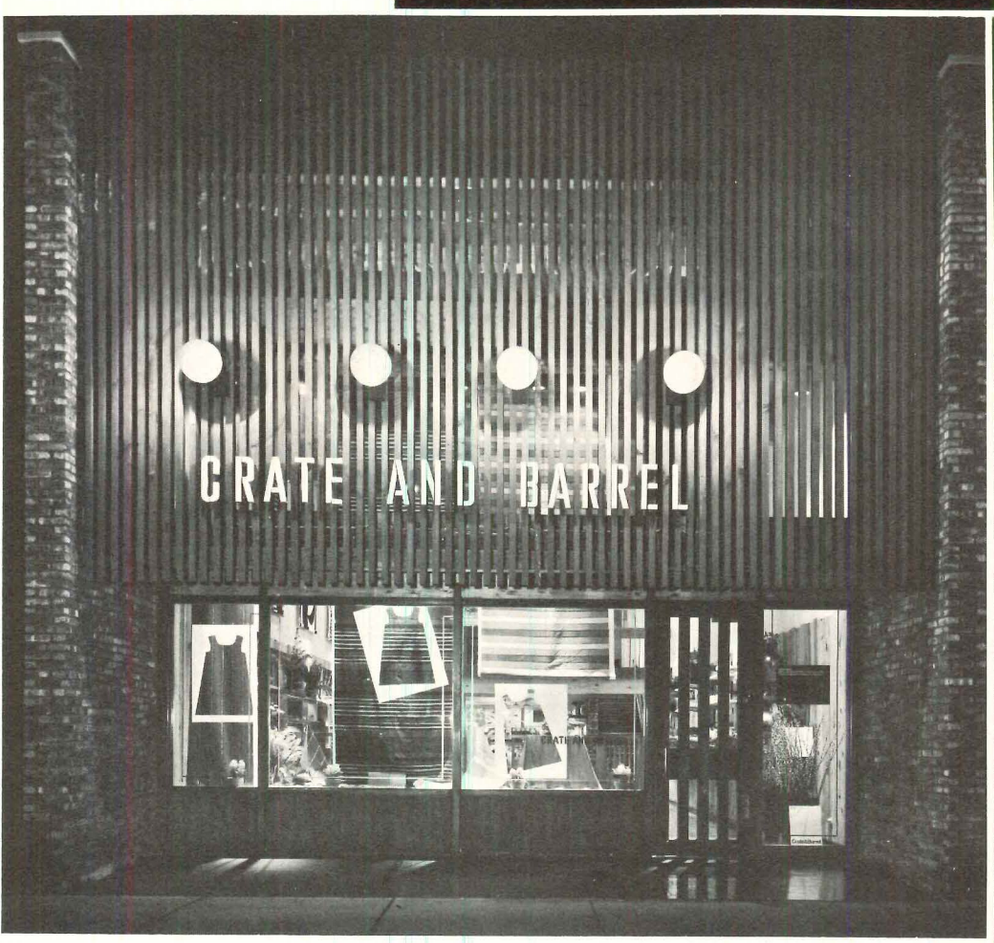
CLARITY
BOLDNESS
INTIMACY
FLEXIBILITY
COMPLEXITY
ECONOMY
EFFICIENCY
INVENTIVENESS

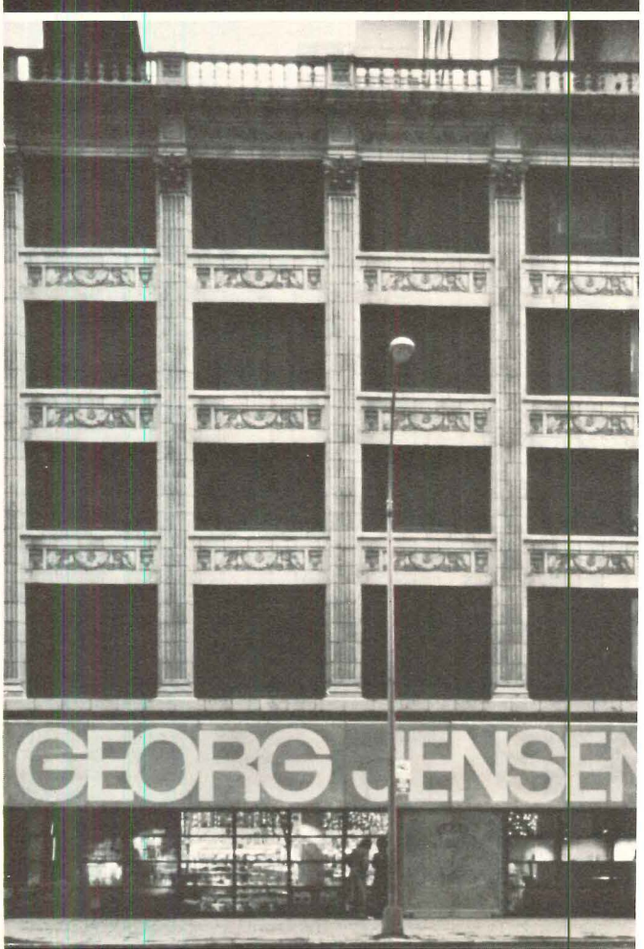
DESIGN FOR MERCHANDISING

The qualities described by these eight words have a place in almost any design project. But especially in design for merchandising. Using eight outstanding examples that range from tiny boutiques in a New York department store to a revitalized 19th century commercial block in Denver, this Building Types Study attempts to explore the problems and opportunities in store design facing today's architects. It begins with the esthetic aspects and ranges through planning considerations to the practical problems which must be faced and solved if the store is to be a success. There are some matters in merchandising on which the designer has little influence. All too often the location for the store has already been chosen when the architect is called in, yet no other single decision does more to determine its future prosperity. The sales service offered is beyond his control. And the quality of merchandise, which can change so drastically over the life of a store, cannot be regulated by the designer even though he may feel his taste *ought* to be the norm. It is just a coincidence, incidentally, that the shops included here all sell goods with which architects would love to surround themselves. What the designer can do is to restore to the shopper the sense of delight that a child feels when he runs into the toy department at Christmas-time. After all, shopping should be fun. And shopping that is fun can be profitable, too. Many of the stores you will see on the following pages have produced much more higher income than expected by either designer or client. Extra care pays off in design for merchandising. —*James D. Morgan*

BUILDING TYPES STUDY 418
®

CLARITY





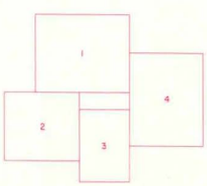
No matter what else he does well, the architect who designs stores must be especially good at drawing customers in from the sidewalk. Agreed that location, service, and quality of merchandise are all important to a store's success, the attractiveness of the facade is still the most important design element. The four stores shown here have each solved the problem a different way but always with clarity: each design conveys the quality of the store quickly; each entrance is easy to find; each has a crystalline vitality that stops the window-shopper in his tracks—especially at night.

Le Dernier Cri, a men's clothing boutique on the second floor of a Madison Avenue building in New York, took over the first floor space on the street recently in order to make their presence more obvious. Interior designer Allyn Berchin's solution, upper left, does that and much more. His simple, large-scale sloping exterior of stucco and glass prepares the approaching pedestrian for something special. But the real magnet is a sculptural staircase placed diagonally into the store and with a brilliant yellow panel extending all the way to the ceiling of the second floor.

Crate and Barrel, in Chicago's Old Town, far left, had to be compatible with its somewhat over-preserved 19th century neighbors yet clearly say "contemporary design" to the pedestrian. Architect Richard Acott has used wood and warm masonry to make a good balance between the two. Although the entire facade is glass, the wood screen over the upper portion shields it from morning sun and yet is open enough for the two-story space to be apparent on the exterior at night. The clear light globes illuminate the sign but do not detract from the screen's transparency.

The crowded sidewalks of Madison Avenue near 57th Street in New York presented architect James Stewart Polshek with special problems as he designed the new Georg Jensen store. He has turned them to advantage by developing a design that concentrates the shopper's attention on a 14-ft-high band across the bottom. Below the bold logotype a multi-purpose show window, see p. 102, is contrasted with a pair of metal doors covered by a large bas-relief of the Jensen crest. The scale of the displays in the windows is kept deliberately small so that those hurrying by see many objects freely placed, each speaking for itself.

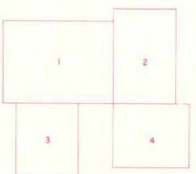
Robert Mittelstadt's design for Streeter and Quarles West, a San Francisco sporting goods shop also placed in an old building, is based on maximum transparency. The brilliantly-lit interior with its colorful merchandise is separated from the street by the least-substantial glass wall possible. The enormous lettering on the window and on the transparent beam in front of it, the banner and the colors all draw attention to the store without diluting the openness of the design. Furthermore, the transparency of the new store, surrounded by a solid framework of classical architecture, provides a bold contrast with the other stores.

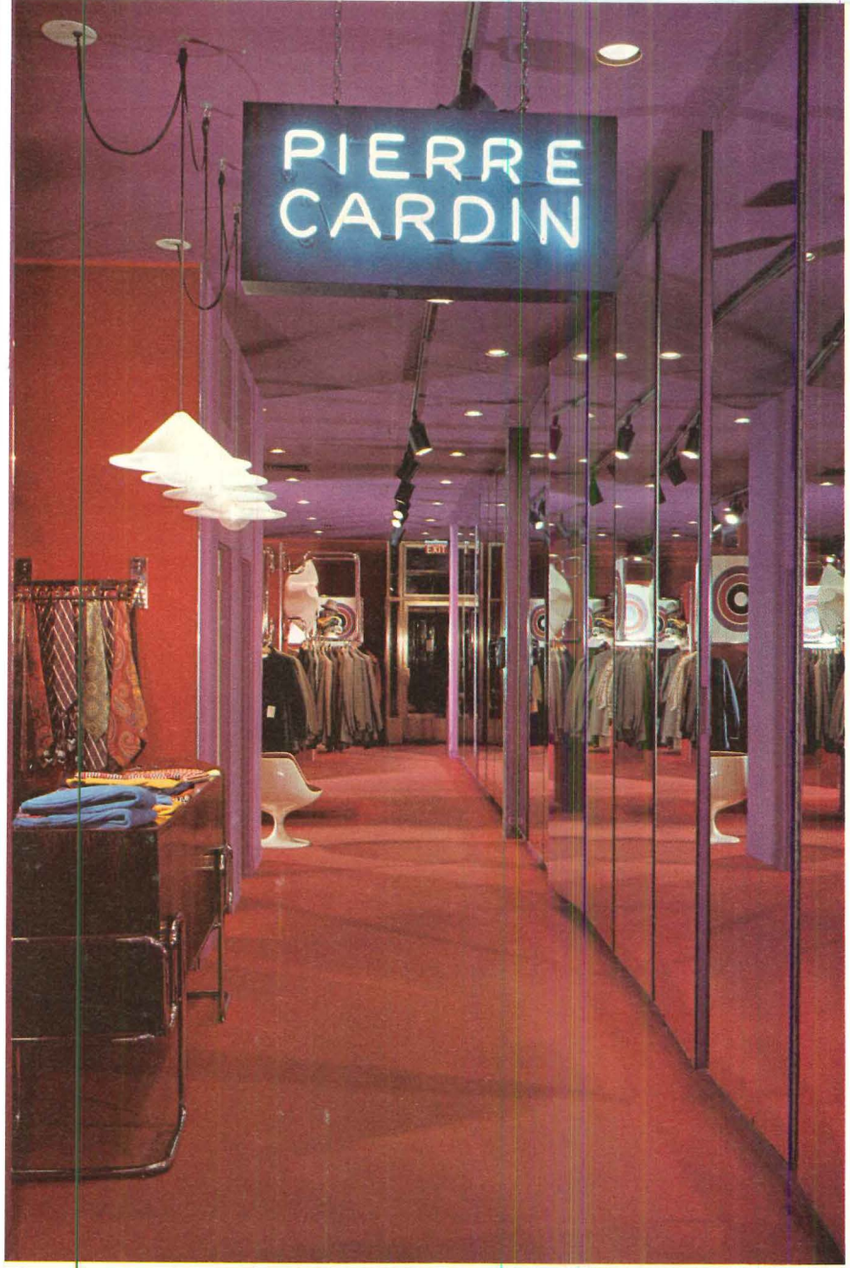


1. Le Dernier Cri, Otto Baitz photo
2. Crate and Barrel, Bill Engdahl, Hedrich-Blessing photo
3. Georg Jensen, Van Brody photo
4. Streeter and Quarles West, Joshua Freiwald photo

BOLDNESS

1. Streeter and Quarles West
   Jeremiah Bragstad photo
2. Bonwit-Teller, Otto Baitz photo
3. Woolf Bros. Subway
   David Phillips photo
4. Le Dernier Cri, Otto Baitz photo





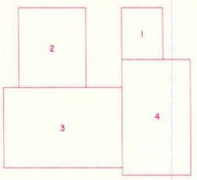
Boldness, long understood as an effective visual selling tool by roadside retailers, is the newest design technique in presenting high-quality merchandise. It does not always work. But when bold color and graphics are coupled with thoroughly disciplined functional and spatial concepts, the result can be a compelling magnet for those who respond to an exciting, up-to-the-minute environment.

Both of the shops on the opposite page use visual images in the interior which the shopper has first seen from the street. The giant photo-murals of sportsmen in action and vivid colors inside Streeter and Quarles West are used to draw people in. Then they guide them through a series of inter-related floor planes (see plan, p. 98) which might be confusing without such large-scale reference elements. The over-all effect, once inside the store, is quite restrained. But no matter, by then the brilliant colors of the sports equipment and clothing take over to attract the buyer's eye.

Allyn Berchin uses the soaring yellow panel in Le Dernier Cri's staircase to not only draw people in off the street but to pull them up to the second floor where most of the merchandise is to be found. The powerful color and diagonal geometry of the stair (see plan, p. 104) are contrasted with severely restrained colors and textures on the facade and the lower selling floor to heighten the customer's desire to go upstairs.

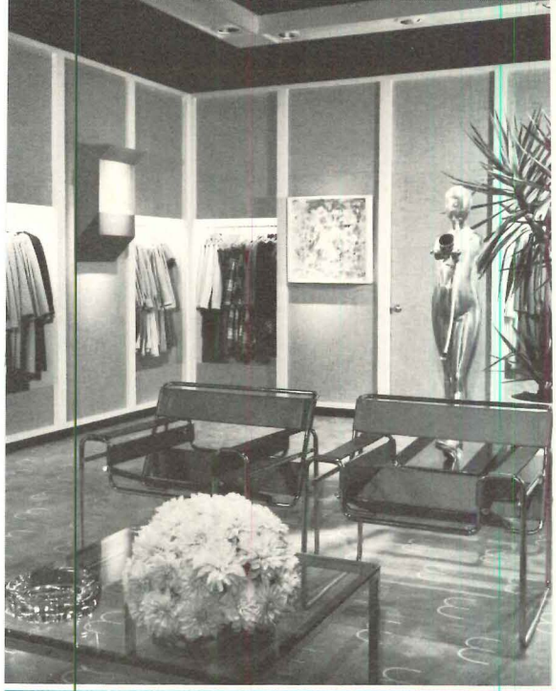
Although Bonwit-Teller's Pierre Cardin boutique in New York, left, does have a door to the street, most customers enter it from the main floor of the store, unprepared for its barrage of color. One of an extraordinary series of specialty shops created by interior designer Harry Hinson for the Fifth Avenue store, this tiny boutique is a fitting jewelbox for the high-fashion men's clothing it contains. Mirrored doors are used on a continuous clothes storage wall along one side of the corridor. They effectively double the space, reflecting floor and walls covered with red goat-hair carpeting, purple ceiling and large bull's-eyes painted on ingenious hanging racks. The suits, in more subdued colors than those of the room, stand out against the ordered geometry of the design.

Woolf Bros. Subway, Kansas City is a living example of design reversing severe merchandising and functional problems. Located in the basement of an addition to Woolf Bros. on the Plaza, an extremely staid shopping center, the youth-oriented cavern has in fact become the busiest part of the store. Architect Norman De Haan's solution was to use very bold color and forms, left, along with a flexible fixture system to provide a space which can respond to the enormous changes that can take place in this type of retailing. The Subway also contains a fast-food restaurant, a dating center, a photography studio and meeting rooms to emphasize its interest in attracting and serving young people.



1. 2. Bonwit-Teller, Robert Riggs photos
3. 4. Georg Jensen, Van Brody photos

INTIMACY

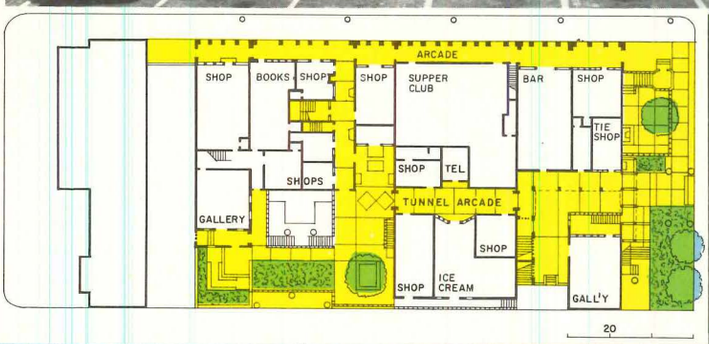


There is not much an architect can do to enrich the atmosphere of a discount store or a supermarket; it's sad but it is a fact. Until recently, mass selling techniques seemed to be the only valid ones for future merchandising. But in the last few years, something has happened: whatever the reasons, and they range from moral to economic, people who once sought possessions in quantity now buy much more selectively. That means they shop more carefully, they pay attention to the quality of their purchases and they respond to the quality of the stores in which they shop.

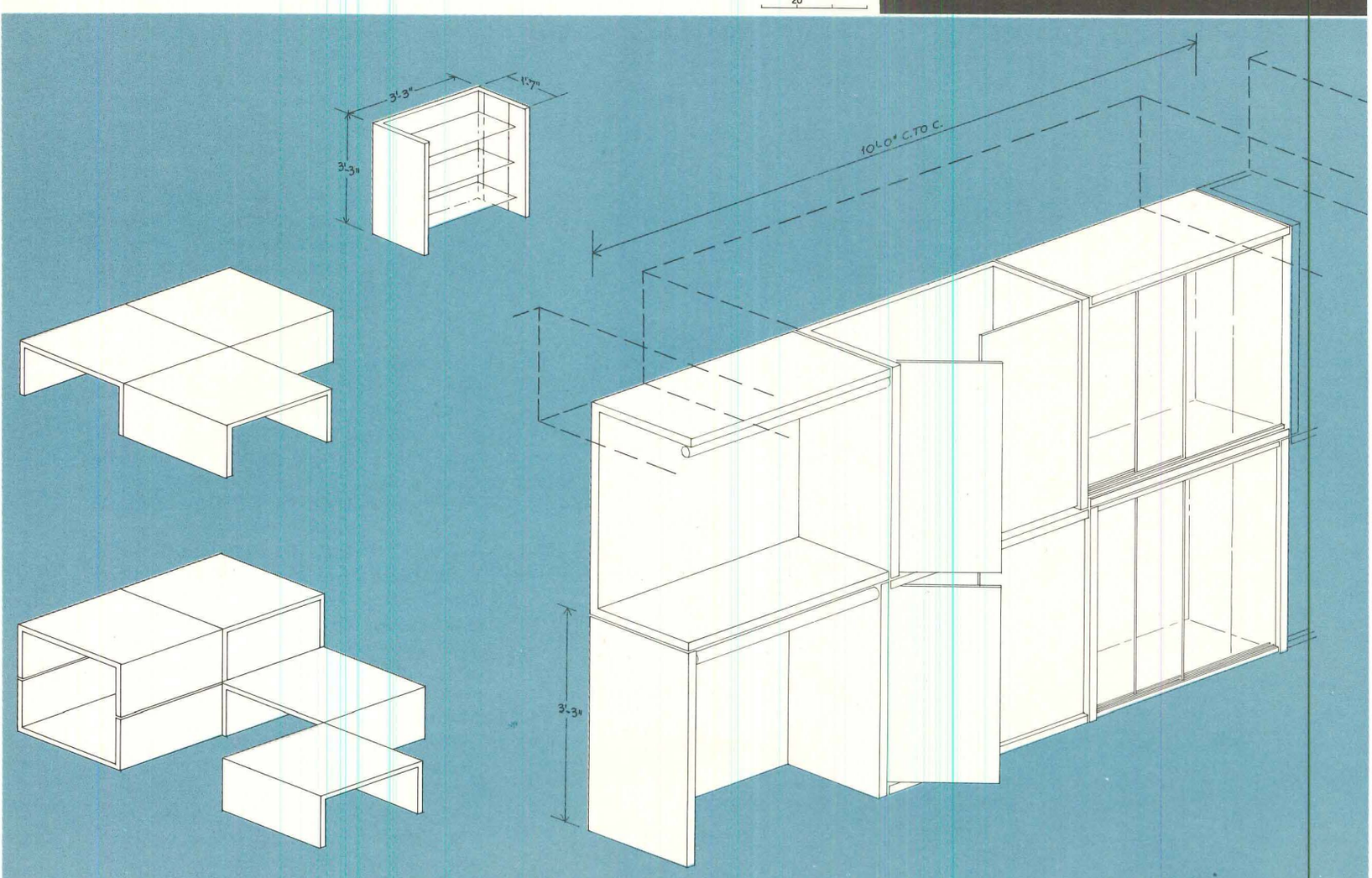
Intimacy is a quality found not only in the tiny, off-beat boutique, but in any store which cares enough about the merchandise it offers to consider the feelings of the customers it hopes to attract. The selling spaces shown here are part of two New York department stores mentioned earlier. They are internationally known for their merchandise and their service. To continue that tradition and to broaden their appeal to newly discriminating buyers, each has developed a series of highly individualized selling spaces.

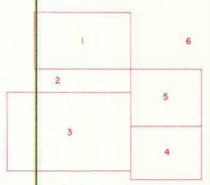
The B. H. Wragge boutique, devoted to women's sportswear, is another design for Bonwit-Teller's New York store by Harry Hinson. Around three sides of a 41-foot by 19-foot space adjacent to one of the large selling floors, upper photos, Hinson has built a series of closets, in effect, each two-feet-eight inches wide. During busy selling seasons, all of these niches are filled with clothes; at other times, a floor-to-ceiling panel, similar to those with paintings, left, and covered with the same fabric, can be placed over any niche, hiding it completely. The vertical white boards and the repeating panels form a quiet but very functional backdrop for the sculpture and elegant furniture that the customer sees when she steps off the elevator a hundred feet away. This inviting room, not unlike the living room of a spacious New York apartment, grossed over $1,250 per square foot in 1970.

When Georg Jensen decided to leave their large Fifth Avenue store for less expensive space on Madison Avenue, they asked architect James Stewart Polshek to make every possible square foot of their new store productive without losing any of the elegance for which the store is known. His solution is full of intriguing ideas for any store designer. But the most pervasive is the sense of intimacy that comes from experiencing a continuous series of distinct spaces scaled to the merchandise. The lofty main floor with haughty floorwalkers is gone. Immediately upon entering a two-story entry, three floors are visible: the basement, far left, by way of a mirrored staircase; the main floor down a step or two and the mezzanine, left. The main floor and the mezzanine have brilliantly-lit, very low ceilings above gleaming jewelry cases and furniture. Each of these spaces has its own character and seems, when one enters it, to be the only one in the store.

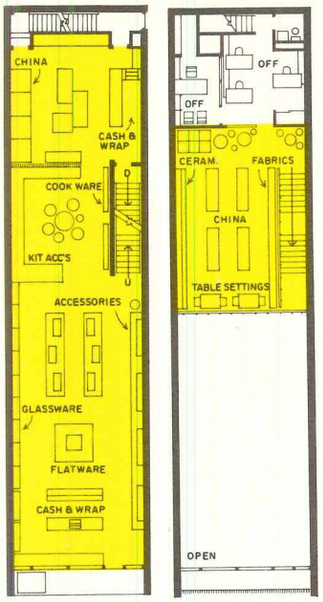


FLEXIBILITY

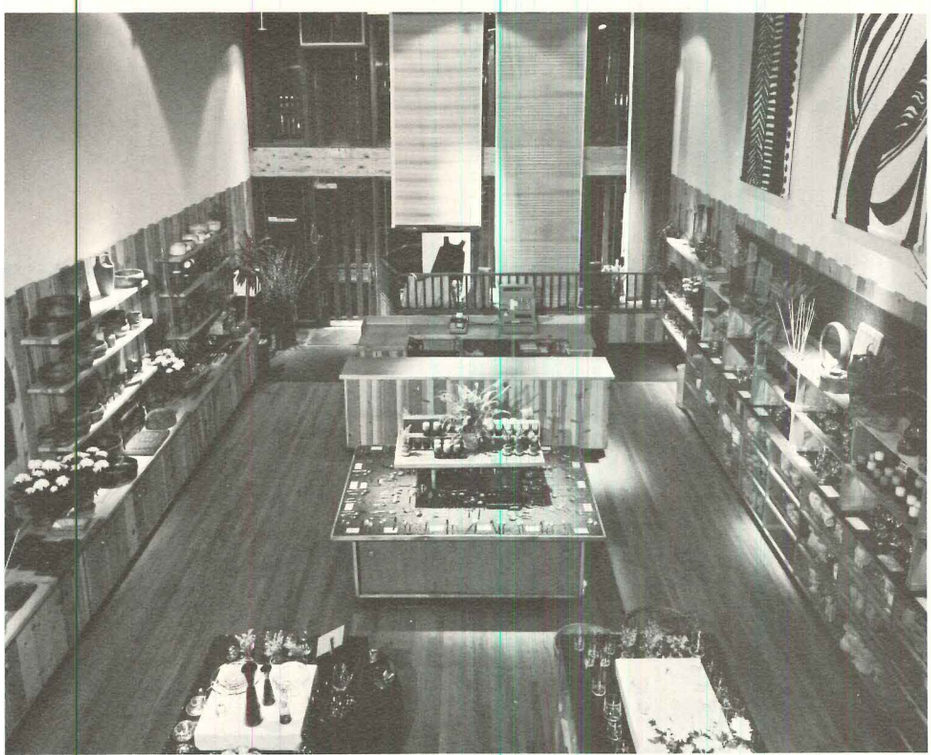


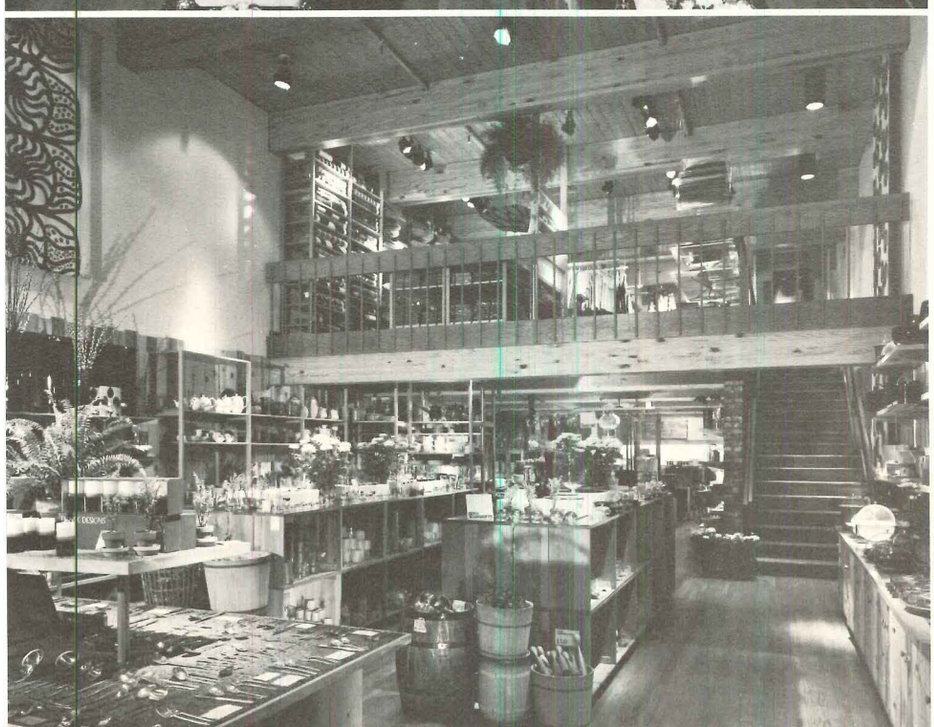


1. 2. Larimer Square, Bruce McAllister photo
3. Georg Jensen
4. 5. 6. Crate and Barrel,
Bill Engdahl, Hedrich-Blessing photos



FIRST FLOOR MEZZANINE



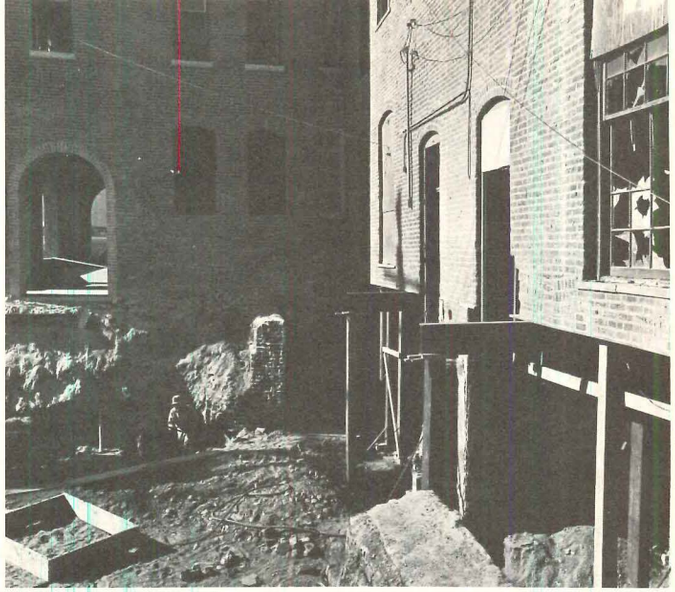


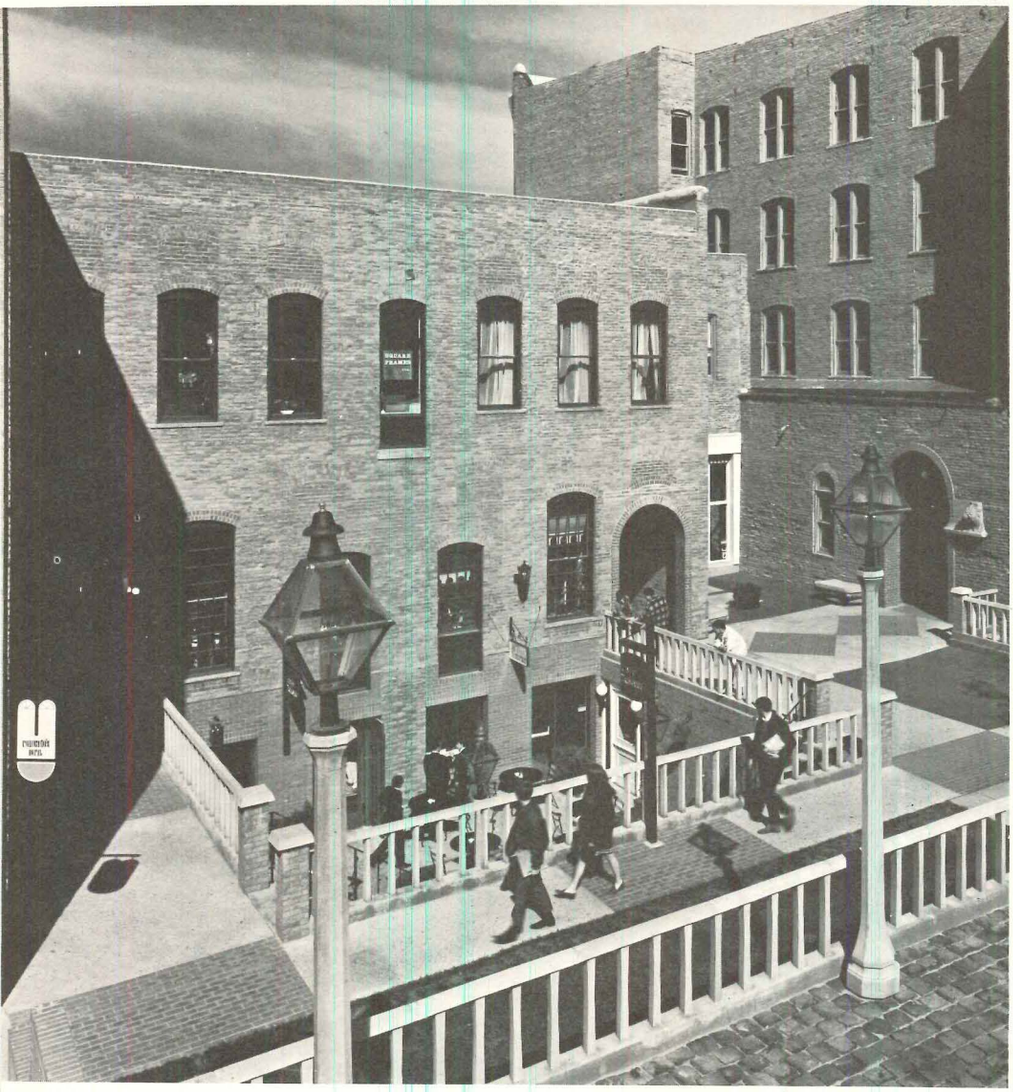
Flexibility in planning commercial space means not only easy changeability but also maximum opportunity for contact with merchandise by the potential buyer. In other words, in shops where the goods tend to sell themselves (and that is the case with all of the shops in this Study), the more completely yet subtly the designer can move the consumer to all corners of the selling area, the more likely it is that the consumer will buy something on impulse. And even if he does not, a pleasant memory of moving about the store will bring him back again when he is ready to buy. Easy circulation, therefore is a most important criterion of good design for merchandising.

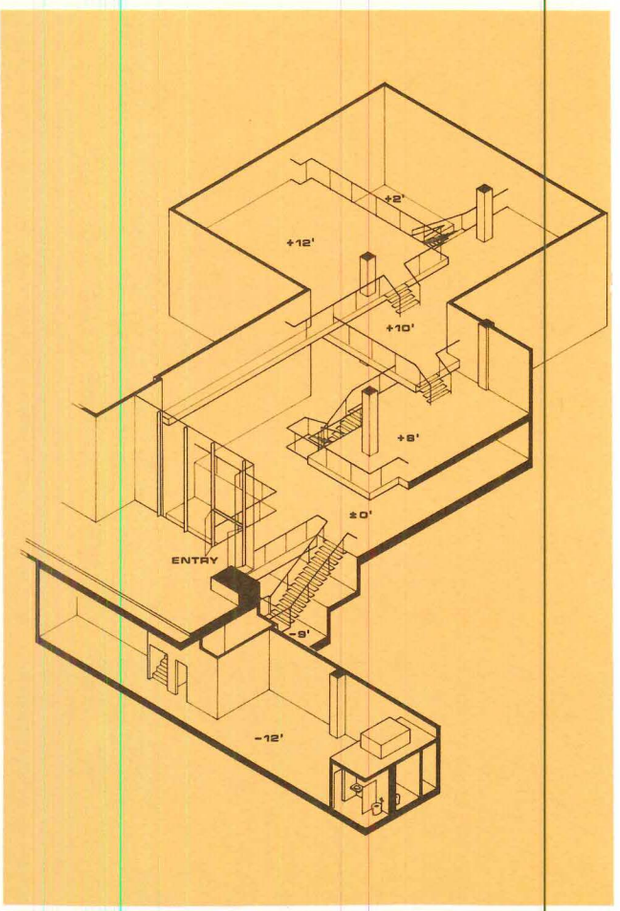
Richard Acott's straightforward plan for Crate and Barrel North, Chicago, a store specializing in elegant housewares and fabrics, allows the buyer to see each display of merchandise individually. The plan and view from the mezzanine, left, show how spacious the circulation paths actually are. Yet at the shopper's eye-level the room seems agreeably full without being cluttered. Thus, with extremely simple means Acott has accomplished a nice balance between the retailer's natural desire to display as much as possible on his selling floor and the buyer's natural desire to be free to browse—that is, to inspect the retailer's offerings without feeling undue pressure to either buy or get out.

The same principle, of exposing customers to a maximum amount of merchandise, was used by Langdon Morris at Larimer Square, a block of 19th century buildings near downtown Denver. The original arrangement of stores, facing on the major street, top in the plan at left, with the rear as service area, has been substantially changed. Not only do some of the shops now open onto the alley, but in his renovation, architect Morris has developed a promenade through the middle of the block onto which many brand-new stores face. These very small boutiques specialize in unusual items such as candles, leather goods or stained glass objects. Of the twenty-eight businesses housed in the renovated block, twelve have new interiors and exteriors by the architect.

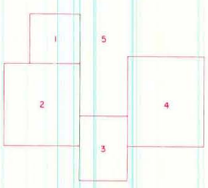
For the long, narrow upper floors of the new Georg Jensen store, James Polshek has done a system of display elements whose flexibility will provide a series of ever-changing small rooms in which to view china, glassware and the other accessories for which Jensen's is so famous. Dropped beams, which contain mechanical equipment and barely clear a tall person's head, span the narrow dimension of the typical floor. The multi-purpose U-shaped units shown opposite are designed to stack three wide between, and two high under the beams, thus permitting the display people at Jensen's to develop a high degree of enclosure between any two beams; in effect any floor can become a series of boutiques. Units can have adjustable glass shelves, sliding door hardware or integral lighting.







COMPLEXITY



1. Larimer Square, Wayne Hecht photo
2. 3. Larimer Square, Bruce McAllister photos
4. 5. Streeter and Quarles West, Jeremiah Bragstad photo

It is not an accident that almost all of the projects presented in this Building Types Study are remodelings in one way or another. Recent economic trends have made many commercial clients re-examine their existing space and resolve to redevelop it for more intensive use. Furthermore, many marginal or abandoned structures are being thoroughly revitalized by careful renovations. The complexities which such projects present can seem insurmountable to the client's eye. But it is here, more clearly than in most construction, that the architect's ability to seize spatial opportunities, as well as to deal with structural anachronisms and functional problems, pays off.

In addition to its excellent planning (p. 96), Larimer Square, Denver, is an example of complexity in renovation turned to advantage through emphasis. Instead of trying to hide the architectural idiosyncrasies behind a smooth new veneer (an unhappy common-place in the nationwide trend to reuse solid old buildings), architect Langdon Morris chose to reconstruct masonry walls and restore architectural details such as cornices, arches and columns. But where such refinements had never existed on the humble rear elevations of the buildings, he was free to build the new arches and openings that his mid-block walkway required in a less literal way. The lower-level courtyard with its outdoor cafe, opposite, required a certain amount of new masonry. The upper photograph illustrates the difficulties which the masons faced as they began their work; careful study of the photograph below it will reveal the sublety with which Morris integrated his new openings into the existing fabric. An interesting juxtaposition of old and new is a tie shop, bottom photograph on the mid-block promenade. It is one of several in Larimer Square completely designed by the architect.

A large but awkwardly-shaped volume (in what was once a major downtown San Francisco department store, now divided into several elegant shops and a parking garage), was the envelope with which Robert Mittelstadt had to work designing Streeter & Quarles West. The drawing, opposite, indicating a total of 24 feet between the lowest and highest levels, also shows how he developed "a series of 'floating' platforms that serve two functions: to provide a labyrinthine attraction for customers and to maximize the sales area." As the photograph on this page shows, the easy flow of the floor levels, one to another, could have a truly magnetic quality for the shopper. Beyond that, he has developed a series of flexible furnishings and fixtures to complement the spatial scheme. As the business grows, he finds himself still involved: tuning the lighting system, designing new fixtures and working with the sales staff on display set-up. But the basic conceptual framework of the shop, which grew out of careful study of the existing space by the architect, has proved to be the most flexible aspect of the design.

ECONOMY

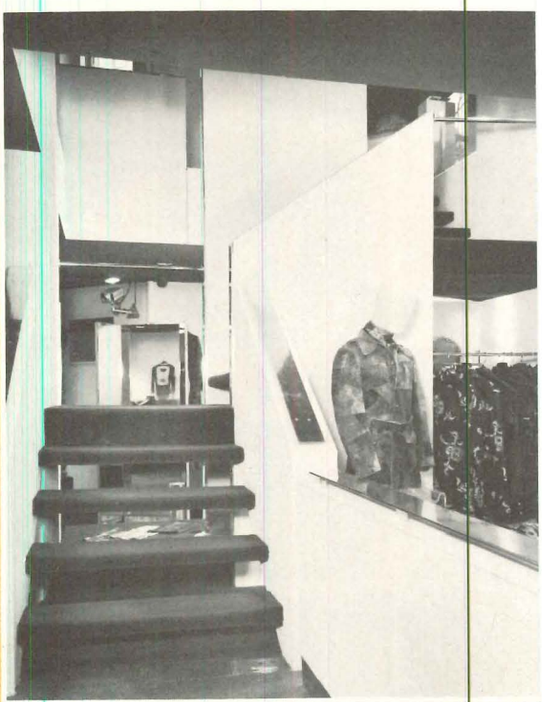
The big question is: how much should the merchandiser spend for capital investment or improvement? It is clear that for the store to be a commercial success, there must be a reasonable relationship between capital investment and future income. After all, economy really means spending wisely, not just minimally. One basic way to define the ratio of spending to expected income is to develop a "merchandising plan," in effect a financial program. By determining at the outset what parts of the operation will produce the best return, the allocation of space within the envelope of the total project can be made based on facts rather than whims or hunches. Past volume patterns, new trends and documents, such as the Departmental Merchandising and Operating Results of the National Retail Merchants Association (a collection of national store averages by departments), all can be used to determine the future volume of various parts of a new operation or to adjust proportions of an existing one about to be remodeled.

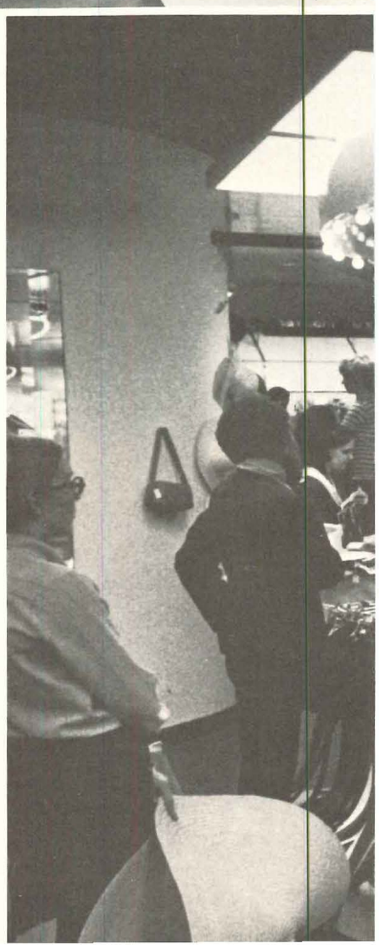
As cost estimates are being prepared for the amount of area or work the project will cover, both designer and client should remember that income will probably increase substantially as a result of the new work. In fact, the NRMA reports "volume increases of 25 to 35 per cent and more after modernizing an existing store, and from 50 to 75 per cent when enlarging and/or moving to a better location." There will be increased expenses also, of course, in rent, salaries, insurance, inventory and taxes. Another important consideration at this stage is the allocation of the total budget to the various parts of the job. The NRMA suggests that as much as 50 per cent may be allowed for the store front with 35 to 40 per cent for fixtures. They point out that each project has different requirements and offer these only as rough guidelines. But it is true that one of the architect's major contributions is to identify, early in the project, the total scope of the work required so that the owner can make provision, not only in terms of the budget but in terms of time, for the temporary operation of his business. All in all, completion of the project's economic design, before physical planning begins, will make the limits of job very clear and will forestall later disappointments for both client and designer.

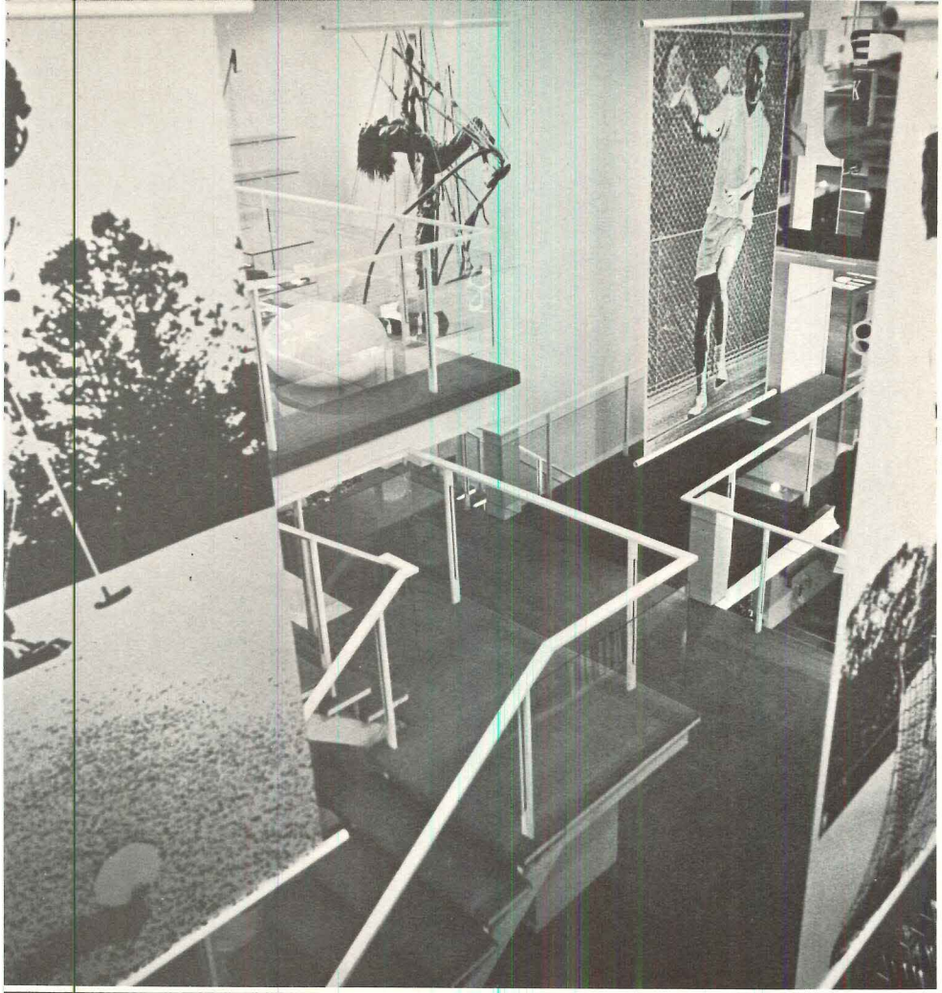
Several of the projects included in this study represent as careful economic design as space design. Le Dernier Cri is an example of an inexpensive and fast job which has transformed a business hidden away on the second floor into one of the traffic stoppers on Madison Avenue. With a budget of $60,000 and a construction period of three months, the renovation has already substantially increased business over a similar period during the previous year. By focusing the money spent basically on the staircase and the facade, maximum effect was achieved with minimal means.

Robert Mittelstadt reports that although the design for the Streeter and Quarles West project exceeded the original budget (the construction cost including carpeting was $154,700) and the owner had to raise additional money, the response to the project and its merchandise has so far exceeded expectations that a profitable future is now assured. The question of whether a merchant should use an experienced store architect or, as SQW did, someone who has done no previous stores, is moot. While the experienced firm will no doubt come up with a more accurate financial program and thus building estimate, it is a real possibility that the fresh ideas of the beginner will compensate by producing a design with unexpected potential thanks to its reception by the public.

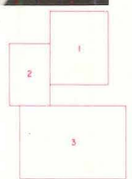
Harry Hinson, as director of design for the entire Bonwit-Teller chain, has had to deal with the problem of accomplishing new construction while maintaining business as usual nearby. He points out that alterations are more costly than new work and that alterations during continued business are even more costly. But loss of income during a total shut-down is even less desirable. So the simple, direct quality of his designs stems from the need to accomplish maximum change with simplest means as fast as possible. Thus to a degree that many architects would find uncomfortable, Hinson produces selling environments that are meant to change. Two levels of flexibility are apparent: the most obvious is operational adaptability as seen in the B. H. Wragge boutique, p. 94 and 95. But in addition there is the idea that the whole area might be ripped out after a couple of years if merchandising trends change, and be replaced by another substantial but thoroughly different structure. While this approach might seem more akin to theatrical set design than to architecture, it proceeds in Hinson's case from the same thorough analysis of function and structural technique as any well-designed building and is all the more impressive for that reason. Ironically, it is a closer approach to the total flexibility that architects agree will be necessary in the future than many architects are now easily able to make in their own work.







EFFICIENCY



1. Streeter and Quarles West, Joshua Freiwalk photo
2. Le Dernier Cri, Otto Baitz photo
3. Woolf Bros. Subway, David Phillips photo

The store is a selling machine. Goods enter the building in quantity, must be inventoried and stored, then placed on the selling floor all with a minimum of effort. Programming for daily efficiency in operation is as much the architect's job as devising the seductive facade. And at best, the bold and clarified form of the store derives directly from a thorough analysis of how it will be used. There are three classes of users: the customers and the merchant-client, of course, but also the employees. They are, after all, the ones who will be spending the most time there. Adequate provisions for employees certainly will pay off in better service, an important consideration to today's shopper.

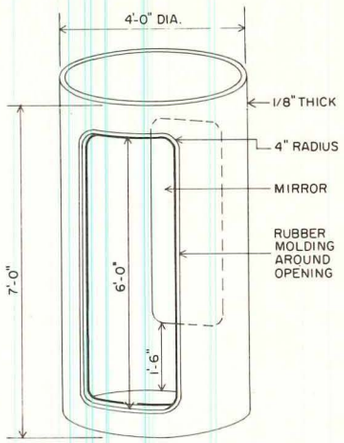
The National Retail Merchants Association, 100 West 31st Street, New York, New York 10001, is an organization that is interested in raising the quality of store design. In addition to a staff of experts available for consultation on various technical matters, the NRMA has recently published a book by architect Charles S. Telchin and Seymour Helfant, "Planning your Store for Maximum Sales and Profit." For the architect designing his first store, the book is a concise primer of information relevant to efficient design. It is available through the NRMA.

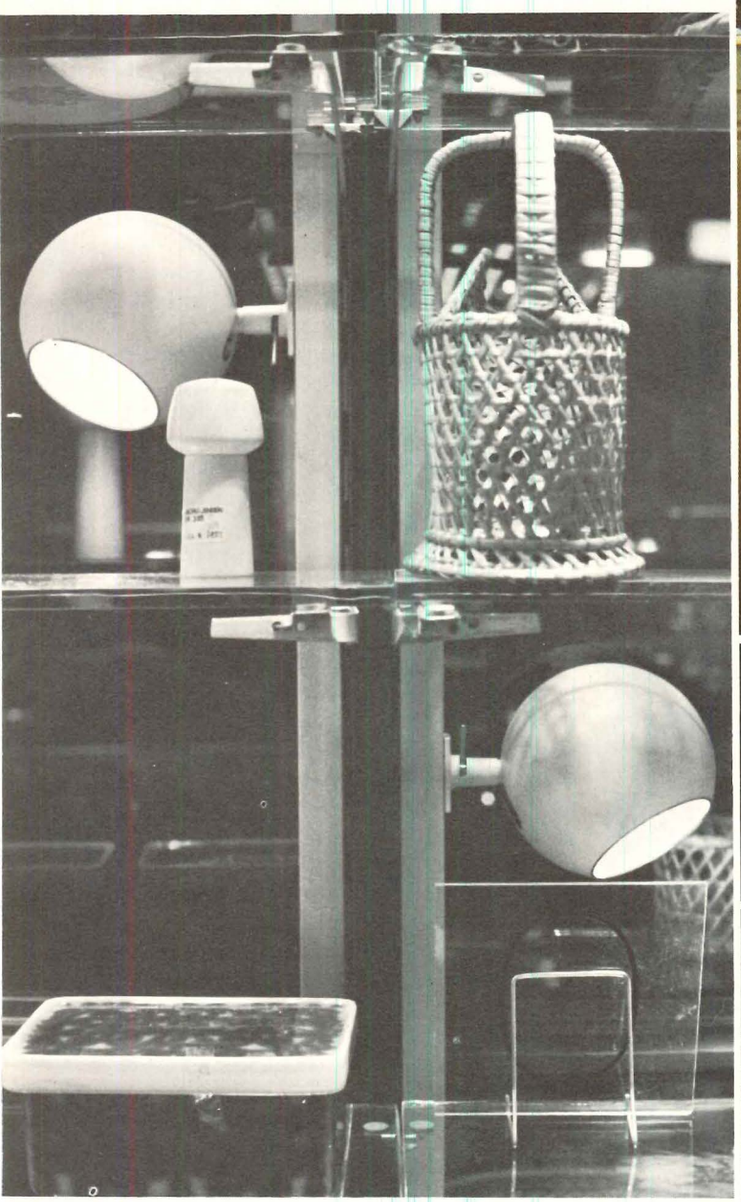
One area often neglected by the designer, note the authors, is the cash and wrap station. Confusion and delay there can destroy all the pleasure of shopping in an otherwise attractive store. In his design for Woolf Bros. Subway, Norman DeHaan has made a very bold element of it, bottom photo. The circular form allows many customers to be serviced at once and provides a central information and control center, the focus of the store.

Another very important consideration in design of stores today, shoplifting prevention, is handled at Woolf Bros. in a flip but effective way. The closed-circuit television screens above the cash desk allow the young customers, says DeHaan, "to see themselves as thief or star." Thus the system becomes self-monitoring at the same time that it amuses those waiting to complete their purchases.

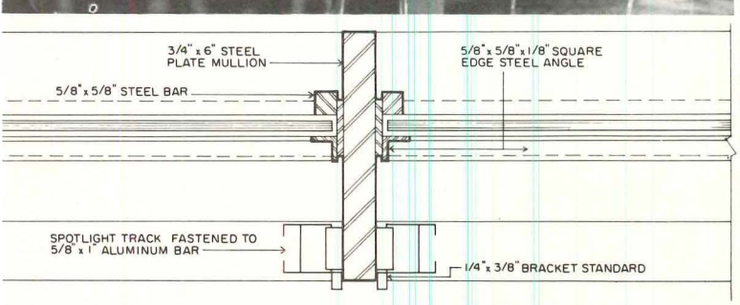
At Le Dernier Cri, unlike many stores, a policy of service only if the customer asks for it necessitates an unobtrusive means of control. The camera in the photo at far left covers the entrance and the stairway while another covers the second floor. Both are monitored at the secretary's desk. If necessary, power for the electric sliding door can be shut off by remote control.

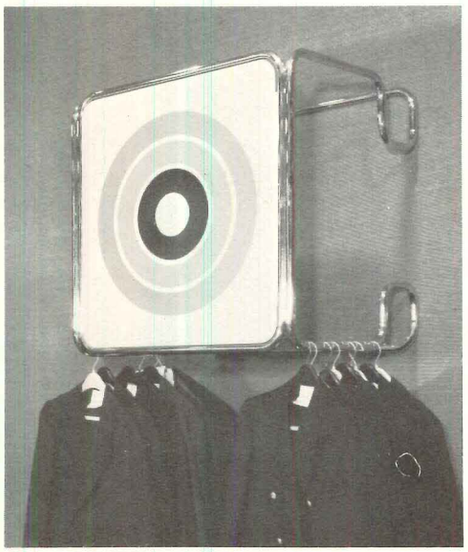
An architecturally inconspicuous device, designed to detect goods from which a special electronically-sensitized tag has not been removed, has been installed at Streeter and Quarles West, top photo. The two white columns, three feet high and eight inches square and flanking the ramp near the entrance, ring an alarm and flash lights when an unauthorized attempt to remove merchandise is discovered.





INVENTIVENESS





Inventive detailing is the key to the truly effective, flexible merchandising environment. Simple and yet versatile details can be found in all eight projects in this study. In fact, almost any of the photographs will reveal the clever solution to a specific problem. But these final three pages focus on particularly intriguing examples of storage, display and especially lighting. The highly portable, bright red changing booth at Streeter and Quarles West, left, nothing more than a section of tubular fiber concrete form, exemplifies the best combination of bold ingenuity and utter flexibility.

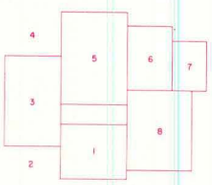
Three quite different but equally straightforward examples of clothing display racks appear on this page. Each can be easily moved or modified as merchandising needs change. Each makes use of materials which, relatively simple in themselves, throw full attention upon the merchandise being displayed. Each puts the goods at the buyer's fingertips.

At Woolf Bros. Subway, top left, a system of chrome-plated industrial pipe structures, fastened to a ceiling grid, provides display fixtures that can be moved about easily and whose configuration of shelves, hanging rods and display panels can take many different forms.

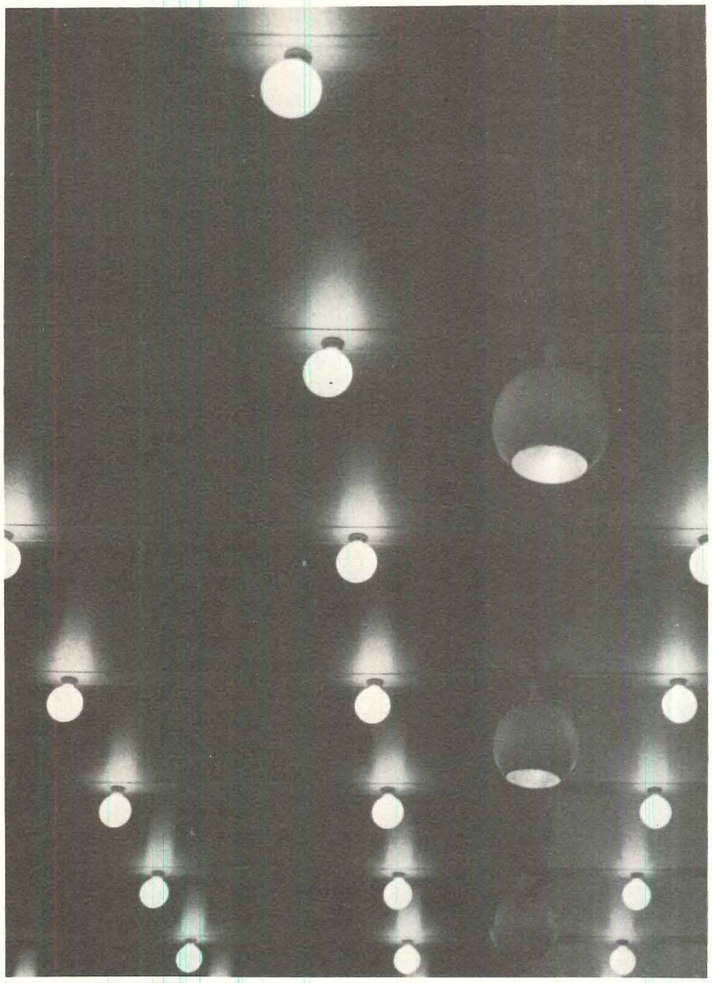
Occasional tables of chromed-steel tubing became clothing racks when hung on the wall in Bonwit-Teller's Pierre Cardin Boutique. A brilliant bull's-eye design on white acrylic replaces the original glass top (see p. 93).

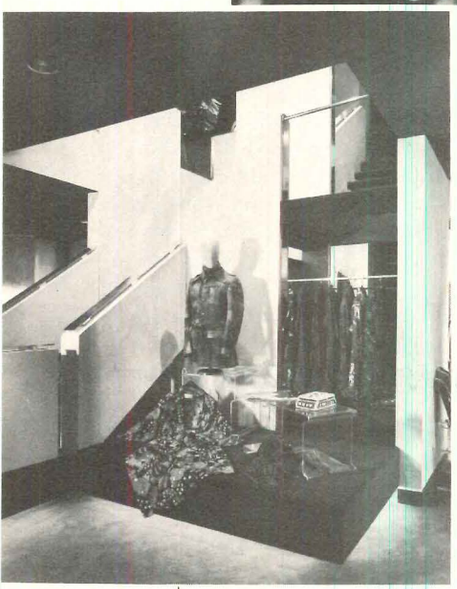
Utterly open and accessible storage and display of merchandise is the basic design premise of Crate and Barrel, (see plan, p. 99). Architect Acott has provided, bottom photo, various types of fixtures on the mezzanine of the store, all hung from the wood ceiling. The tubes and hanging tables in the foreground, of acrylic sheeting, take little away from the merchandise itself and the warmth of the wood construction. As selling patterns change, these inexpensive elements can be easily moved or stored for future use.

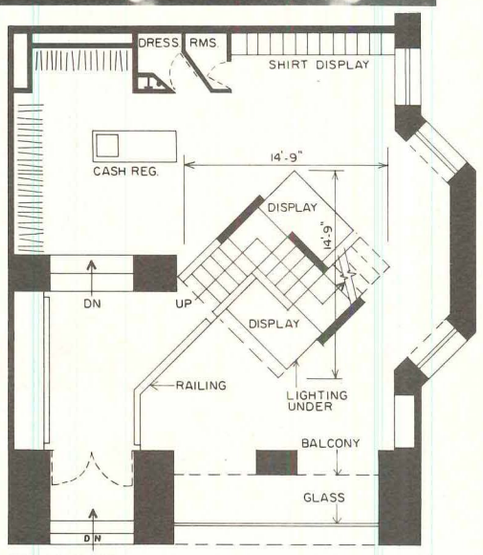
A highly flexible lighting system is one of the most important aspects of design for merchandising. The new Georg Jensen store not only has such facilities throughout the interior but in its display windows as well, opposite page. To implement the small-scale window displays mentioned on p. 91, Polshek has designed a steel window frame that not only includes adjustable fit-



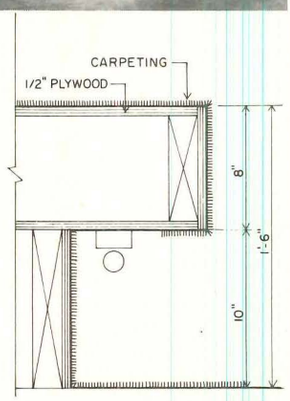
1. 2. 3. Georg Jensen, Van Brody photos
4. 5. Streeter and Quarles West, Jeremiah Bragstad photo
6. Woolf Bros. Subway, David Phillips photo
7. Bonwit-Teller, Otto Baitz photo
8. Crate and Barrel, Bill Engdahl, Hedrich-Blessing photo

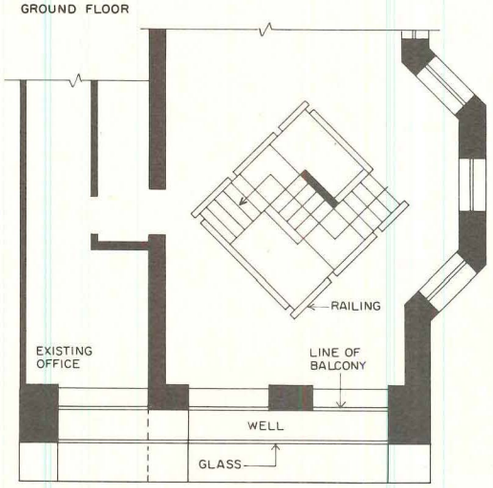




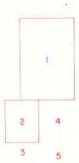


GROUND FLOOR





SECOND FLOOR



1. Georg Jensen, Van Brody photo
2. 3. 4. 5. Le Dernier Cri, Otto Baitz photo

tings for shelves and display boxes but a concealed track and power supply for adjustable spotlights. Thus the window dresser has the means to put proper emphasis on the objects he chooses to display and the flexibility which will encourage frequent substitution of new objects.

In addition to the light beams occurring every ten feet on upper floors of Jensen's, the architect has chosen on the first floor and the mezzanine, very visible from the street, to emphasize the low ceiling, left, with a grid of small exposed bulbs, eighteen inches on center. In addition, at larger intervals, outlets for plug-in spotlights to highlight special pieces of jewelry have been provided. This system and the light beams are also shown on pp. 94 and 95. Actually, examples of flexible lighting can be found in almost every project included here, including a three-phase system at Woolf Bros. Subway: fluorescent two tube high output during midday; one tube low output in late afternoon and incandescent stage lighting only in the evening.

Lighting, this time with fixtures hidden, also plays an important part in the design of the stairway at Le Dernier Cri. A simple detail, bottom left, makes the entrance platform to the store seem truly to float above the existing floor, thus underscoring the effect of the new construction. An extension of the platform used for display, left, is the same size as the square cut in the floor above and also emphasizes the juxtaposition of the new stairway with the geometry of the old store and Madison Avenue as well. The narrow stairway, emphasizing the initimate scale of the shop, works well since relatively few customers are ever shopping there simultaneously.

B. H. WRAGGE AND PIERRE CARDIN BOUTIQUES, Bonwit-Teller, New York City. Owner: *Bonwit-Teller;* interior designer: *Harry Hinson.*

CRATE AND BARREL NORTH, Chicago. Owner: *Euromarket Designs Inc.;* architects: *Richard Acott and Associates;* mechanical equipment consultants: *Mechanical Design, Inc.;* general contractor: *J. A. Boulton and Co.*

GEORG JENSEN, New York City. Owner: *Georg Jensen Holding Co.;* architects: *James Stewart Polshek and Associates*—associate-in-charge: *Dimitri Linard;* project architect: *Joseph L. Fleischer;* project interior designer: *Nancy Jane Hertzfeld;* structural engineer: *Andrew Elliott;* mechanical engineer: *Jack Stone;* lighting consultants: *Kilpatrick and Gellert;* general contractor: *James Inman Construction Corp.*

LE DERNIER CRI, New York City. Owner: *Le Dernier Cri;* interior designers: *Allyn Berchin Design Office*—project designers: *Dave Snyder, Rena Kuhl;* mechanical engineer: *Ralph Caso;* general contractor: *Elan Construction Corp.*

LARIMER SQUARE, Denver. Owner: *Larimer Square Associates;* architects: *Langdon Morris,* associate partner, *RNL, Inc.;* structural engineer: *Vernon Winkel;* mechanical engineer: *John Blank;* electrical engineer: *Harold Dyer;* general contractor: *Kraft Building Contractors.*

STREETER & QUARLES WEST, San Francisco. Owner: *Michael Harrington, Inc.;* architects: *Robert Mittelstadt, Architect and Monte S. Bell*—project design: *Robert Mittelstadt;* structural engineers: *Forell-Chan;* electrical engineer: *Mel Camissa;* photo murals: *Lloyd Johnson.*

WOOLF BROS. SUBWAY, Kansas City, Mo. Owner: *Woolf Bros.;* interior designers: *Norman DeHaan Associates, Inc.*

CREATING CONSOLIDATED CLINICAL TECHNIQUES SPACES FOR AN EXPANDING ROLE IN HEALTH CARE

A proposal for a spatial system through which the mainstreams of health care can flow, independent of the traditional inpatient-outpatient dichotomy

by Sheila Clibbon, A.R.I.B.A., and Marvin L. Sachs, M.D.

A rare opportunity to free hospital organization and design from historically deep-rooted constraints has been created by the authors' research. Their work, supported by private foundations, government, industry and a university medical school, has been totally independent of the specific planning or building projects of any institution or architectural practice.

In their analysis of health care institutions, they point up architecturally inconsistent connotations of conventional department labels: a *laboratory* is a place, *medical records* are things, *outpatients* are people, *obstetrics* concerns a health condition, *radiology* is a group of techniques, etc. What is revealed is a loose federation of bailiwicks, sometimes administratively useful, but not clearly directive for programing or design.

In articles in *The New Physician* for June 1969 (1) and in the Fall 1970 volume of *Health Services Research* (5), Miss Clibbon and Dr. Sachs advocate a like-spaces rather than a bailiwick approach to design. Rejecting the notion of a universal space, they present their conclusion that the core of the hospital may logically be composed of three major systems of like-spaces, each horizontally contiguous and in one layer: on the top the *patient fostering spaces* (PFS), where residential patients are based and dispersed clinical techniques carried out; on the bottom *consolidated clinical techniques spaces* (CCTS), to which both residential and nonresidential patients go for clinical techniques centralized there; and in the middle the *industrial techniques spaces* (ITS), which serve the other two but to which patients never go. Within each of these space systems large changes in use can be accommodated. An associated set of purveying systems facilitates the movement of people, information, commodities, substances and power. The intrinsically adaptable nature of these spatial and purveying systems allows rapid and wide changes in administrative policies.

Essential to the idea of a hospital are patient fostering spaces for the accommodation of patients in beds. Such spaces formerly dominated hospital buildings. But clinical techniques spaces (CTS) are growing rapidly; now in many community general hospitals they are about two-thirds the area of patient fostering spaces, and in a few hospitals they are about the same size as the PFS. As more alternatives to expensive in-hospital care are sought, this trend will continue. The consolidated clinical techniques spaces, proposed as a hypothesis in the article that follows, allow for both flexibility and expansibility.

WHEN the hand-carried bag of instruments and drugs was an apt symbol of medical practice, health services were given at the bedside of the sick at home or in a hospital, and ambulatory patients went to doctors' offices. Equipment was relatively simple and easily moved. Now many techniques of health care cannot be carried out efficiently except in a stable setting, to which the patient, whether or not ambulatory, must go. Changes in the degree of mobility and of centralization of clinical techniques have a crucial influence on rational design and on future adaptability of health care facilities.

Our specific meaning for the word *techniques* implies collections of resources; that is, various kinds of people, information, commodities, equipment, substances, and power in a space designed to accommodate them, administratively synchronized to meet any of the purposes of health care. Clinical techniques are those which involve live human subjects.

The growing number of complex clinical techniques has led to their concentration in relatively large health care facilities, where they are performed in two locations: one patient-based, which we call patient fostering spaces (PFS), where techniques are brought to the patient; the other technique-based, to which the patient goes. The latter we call clinical techniques spaces (CTS). When a number of clinical techniques are brought together in horizontally contiguous spaces, we call these consolidated clinical techniques spaces (CCTS).

Clinical techniques and organizational units

Most clinical techniques can be used for a variety of purposes, and there usually is a choice of techniques available to meet a given purpose. The technique of introducing a hollow needle into a vein, for example, may be used to withdraw blood for diagnostic purposes or to inject medications for therapeutic purposes. Thermography may be used for showing impaired blood flow to a limb or for locating the placenta, two different diagnostic purposes. Temperatures can be taken with mercury-in-glass thermometers or with thermocouples, two different ways to meet one purpose. Hyperbaric oxygenation can be used in the treatment of gas gangrene, with radiation to treat certain tumors, or with surgery in the treatment of some congenital heart defects, one technique applied with others to three different therapeutic purposes. Patients susceptible to bedsores might be placed on a special flotation device, such as a water mattress, as a preventive measure; and those who already have bedsores can be treated by the same technique. A new technique may develop from research to accomplish a specific purpose yet ultimately prove more useful to serve an entirely different purpose.

Many difficulties in discussing clinical techniques are due to inexact word usage or to application of the same word to a technique, to a purpose it may serve, or to an organizational component, such as a department. The state of anesthesia, for example, is clearly the purpose of a variety of techniques (such as the administration of gases by inhalation, injection of solutions, or the application of electrical currents to the brain). The word "anesthesia," then, is not only the purpose but also a collective term for a group of quite different techniques, as well as the name of a department of the hospital. This department is in one sense purpose-oriented. Some departments, such as radiology, are more technique-oriented, handling closely related groups of phenomena regardless of the purposes for which they are used. The distinction between technique and purpose is an essential step toward clarity in programing and design.

It would make reference much easier if a technique nomenclature were devised that avoided all words indicating a purpose or an organizational unit, but this would be jargon unsuited for ordinary communication. We want to speak of centralized techniques without implying departments, yet we must use many conventional departmental names for ease of understanding. We refer, therefore, to surgical, anesthetic, delivery, radiological and physical medicine

These studies, reported from the Department of Community Medicine and the Department of Medicine, University of Pennsylvania, and the Architectural Research Unit, University City Science Center, Philadelphia, have been supported by the Sears-Roebuck Foundation, the U.S. Public Health Service, (Grant HM 00210) the U.S. Steel Foundation, Merck Sharp & Dohme, general research funds of the School of Medicine and funds of the Department of Community Medicine of the University of Pennsylvania.

techniques, all of which presently exist in most hospitals, centered in discrete departments. The basic techniques of history-taking, physical examination and discussion are condensed in the term "consulting" used in Fig. 1 Key.

We refer to "physiological monitoring and measuring," which includes a great variety of techniques, and we refer to "specimen taking," a group of clinical techniques for obtaining samples of body fluids or solids from the patient. Techniques in these two categories especially may be partially conducted in a decentralized way —in the patient fostering spaces, for instance. For the sake of simplicity, we have lumped together ultra-sound, infra-red, and many other clinical techniques under the term "other techniques".

Many techniques, like specimen taking, are presently accommodated in the laboratory (or clinical pathology department) for the lack of somewhere else to put them. These spaces are dominated by the "specimen processing" techniques, which are not clinical, since they are done in the absence of the patient. They are properly what we call industrial techniques and they are a part of the third major space system, the industrial techniques spaces (ITS). Purposes are intangible, techniques concrete. From the point of view of building design it is the techniques that count, for they determine the kind and arrangement of spaces.

Historical evolution and contemporary organization of clinical techniques spaces

About a century ago two powerful influences affected hospital design. Fear of contagion led to segmentation into increasingly isolated pavilions, and differentiation of the medical profession led to the organization of many pavilions into specialty bailiwicks. Each chief set up the clinical techniques he needed in spaces within or adjacent to his ward. Many of these "adjunct" facilities were duplicated in the traditionally separate building for outpatients and in emergency departments. This replication of small adjunct clinical facilities was no burden in hospitals which were overwhelmingly devoted to wards for bed patients.

In pavilion hospitals of a century ago, the floor space devoted to CTS was a very small fraction of that for the PFS. But gradually the CTS expanded, especially since the early nineteen-fifties. In most contemporary hospitals the CTS occupy half as much area as the PFS, and in some the CTS equal or exceed the area of the PFS. To think now of the CTS as adjunct to the PFS is anachronistic; quite the reverse is true today. Whether patients come into hospitals to stay or as day or other non-resident patients, they now come primarily for the clinical techniques available.

The organization of centralized clinical techniques spaces in recent hospitals follows one of two main approaches to the design of health care facilities. One ap-

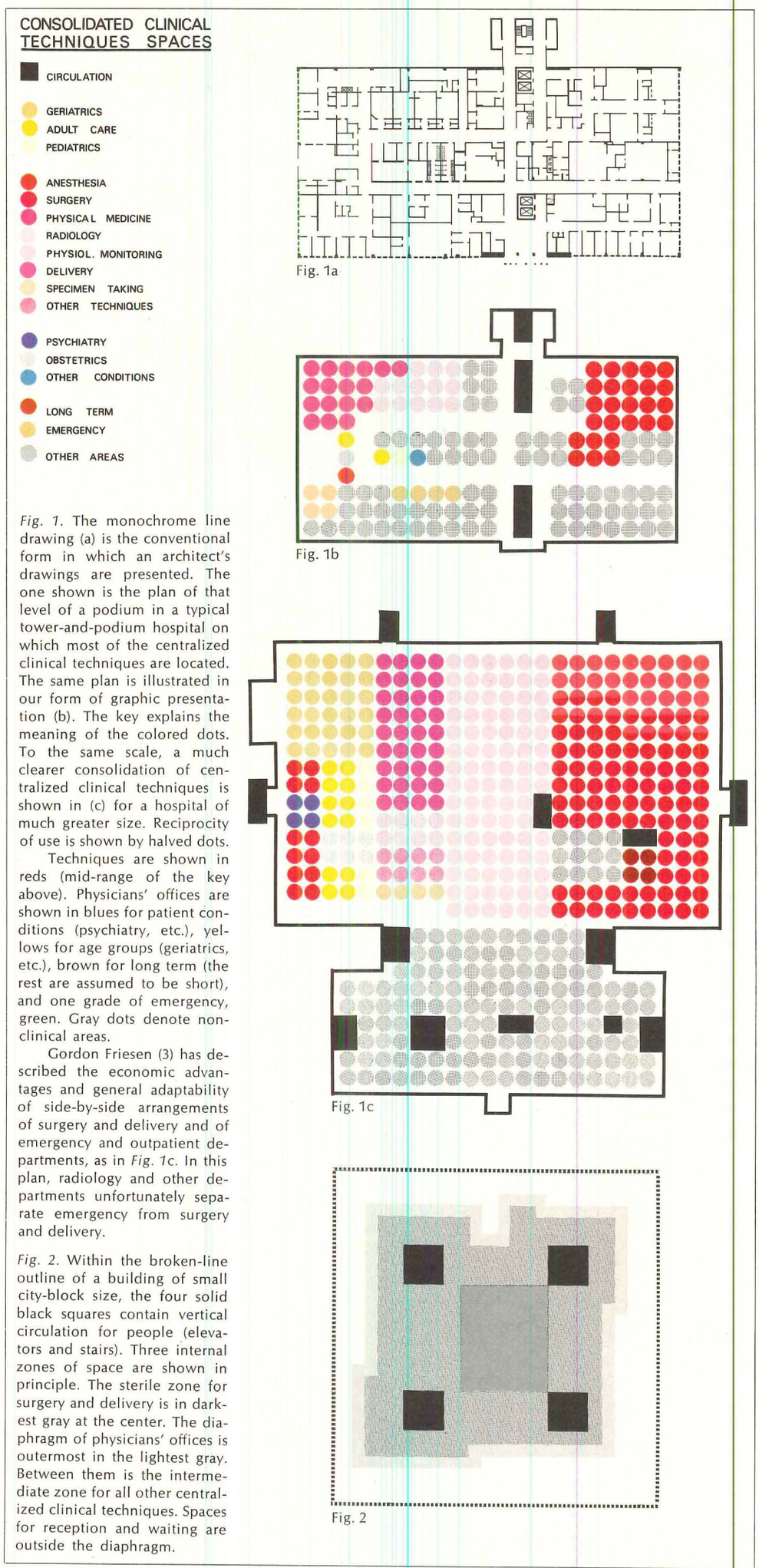


Fig. 1a

Fig. 1b

Fig. 1c

Fig. 1. The monochrome line drawing (a) is the conventional form in which an architect's drawings are presented. The one shown is the plan of that level of a podium in a typical tower-and-podium hospital on which most of the centralized clinical techniques are located. The same plan is illustrated in our form of graphic presentation (b). The key explains the meaning of the colored dots. To the same scale, a much clearer consolidation of centralized clinical techniques is shown in (c) for a hospital of much greater size. Reciprocity of use is shown by halved dots.

Techniques are shown in reds (mid-range of the key above). Physicians' offices are shown in blues for patient conditions (psychiatry, etc.), yellows for age groups (geriatrics, etc.), brown for long term (the rest are assumed to be short), and one grade of emergency, green. Gray dots denote non-clinical areas.

Gordon Friesen (3) has described the economic advantages and general adaptability of side-by-side arrangements of surgery and delivery and of emergency and outpatient departments, as in *Fig. 1c*. In this plan, radiology and other departments unfortunately separate emergency from surgery and delivery.

Fig. 2

Fig. 2. Within the broken-line outline of a building of small city-block size, the four solid black squares contain vertical circulation for people (elevators and stairs). Three internal zones of space are shown in principle. The sterile zone for surgery and delivery is in darkest gray at the center. The diaphragm of physicians' offices is outermost in the lightest gray. Between them is the intermediate zone for all other centralized clinical techniques. Spaces for reception and waiting are outside the diaphragm.

proach consolidates all facilities associated with each administrative unit or bailiwick and can be called bailiwick planning. The other approach groups techniques requiring similar facilities into what we call consolidated like spaces.

Bailiwick planning is demonstrated in several recent types of hospital organization. In the T-shaped hospitals of the early nineteen fifties, the outpatient department was at ground level and each floor above was a bailiwick, its PFS component in front. The CTS or "adjunct facilities" at the back were shared by both "inpatients" and "outpatients." Perimeter-plan hospitals, air-conditioned successors to the T, have PFS along the edge of each floor, surrounding mixed CTS which are used by the corresponding group of outpatients. This requires a nearly constant ratio between PFS and CTS. Forced ratios of spaces and necessary replication of certain facilities are disadvantageous, but the freezing of bailiwick structures is more detrimental. Reorganization of departments is inhibited and separation of groups of patients emphasized in street-system hospitals also, even though an appropriate organization may be established initially and new departments easily added.

Also in evidence in contemporary hospitals is a like-spaces approach to design, oriented to grouping techniques requiring like facilities regardless of who needs them.

During the last twenty years, the tower-and-podium hospital has developed as a popular solution to the design of large institutions in the United States. Nursing units (PFS) have been layered in towers of identically shaped floors, and the facilities to which patients must be taken for clinical techniques (CTS) have undergone a process of consolidation into part of a spreading podium of "loft" type building at the base, usually in somewhat less than one level of a typical two-level podium. Both elements, the PFS and CCTS, are linked by improved means of vertical circulation.

The consolidation of CTS has been incomplete. Stumbling blocks, only gradually recognized, have been drug dispensing and specimen processing, two industrial techniques usually mixed up with the CCTS, possibly to help even up the areas.

Another example of the like-spaces approach is LeCorbusier's Venice Hospital proposal, designed entirely of loft spaces punctuated here and there by courtyards. Of the three levels, the top is clearly PFS, but there is some confusion about the allocation of CTS and ITS on the lower two levels. In the translation of his technical report (2) LeCorbusier said, "The second level is the floor for preventive care, specialties and rehabilitation. It is the level of medical technology." This was not defined as clinical, so not only is specimen processing included but, surprisingly for the nineteen sixties, so is sterilizing, causing an unnecessarily complicated commodity handling problem.

Distribution and expansion of techniques in the CCTS

The same color dot graphic system used in *Fig.* 1 for podia of two recent hospitals is applied in *Figs.* 3 (right) *and 4* (next page) to our proposal for consolidated clinical techniques spaces. *Fig.* 3*a* uses the same outline as *Fig.* 2 (at larger scale) with the addition of a thin solid black line square representing the glass line well within the broken-line square which represents the edge of the building. The dots show an arrangement of largely conventional departments. Surgery, delivery and anesthesiology are in the sterile zone. To the right in the intermediate zone is emergency and specimen-taking, and, counterclockwise, other techniques, physiological monitoring, radiology and physical medicine. The diaphragm, consisting of the outer row of dots separated by black lines, has obstetrics one side and surgery the other side of the emergency entrance and, clockwise, pediatrics, psychiatry, extended care, and adult medicine. A variation shown in *Fig.* 3*b* has an irregular glass line, articulating some of the special facilities, such as snack bars, which form part of the waiting zone. As the consolidated clinical techniques expand, the glass line is moved out *(Fig.* 3*c).*

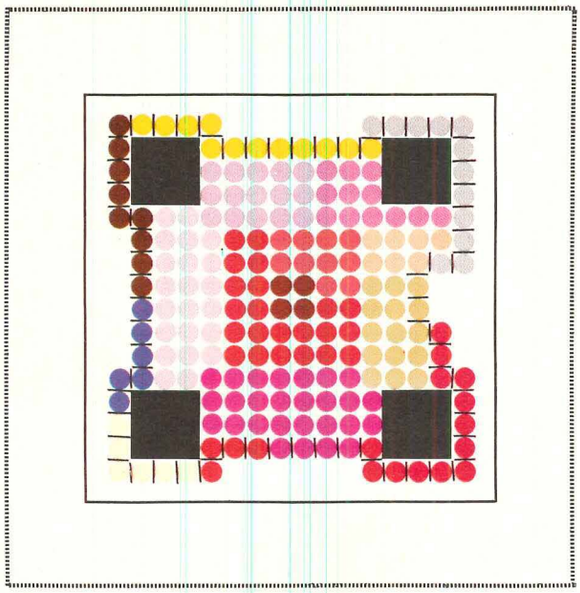


Fig. 3a

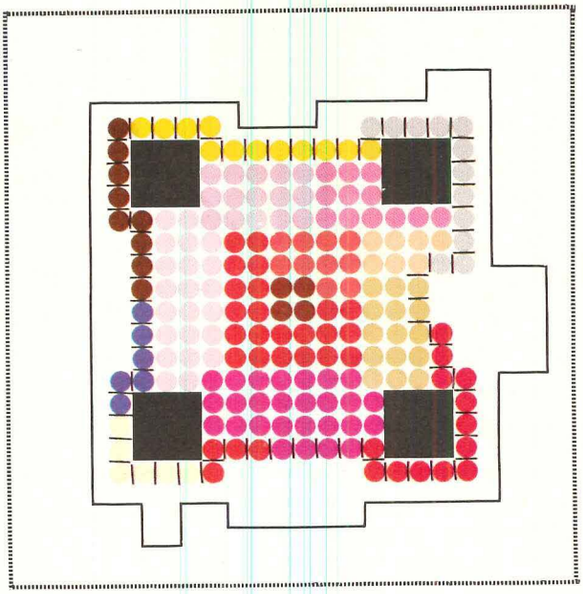


Fig. 3b

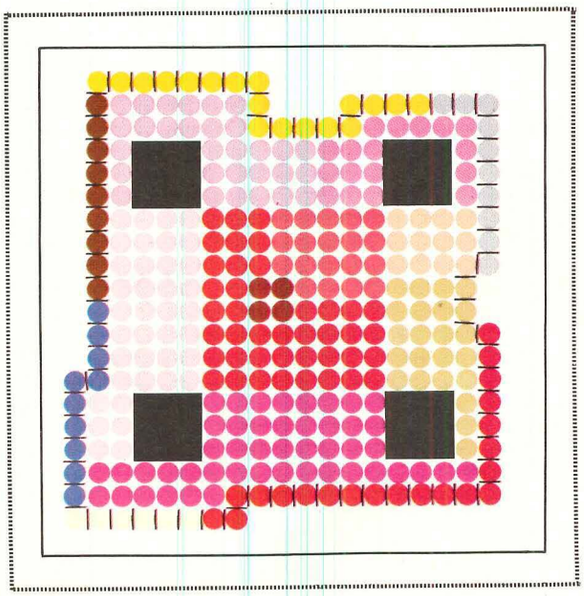


Fig. 3c

A different arrangement is shown in *Fig.* 4 (next page). Radiology is extended to flank the emergency section, which is at the middle of the right side of the drawing. The halved dots indicate areas of flexibility of allocation and expansion along the edges of the various techniques spaces in the center and intermediate zones. Those in the diaphragm could represent subspecialties like pediatric surgery. This arrangement further contributes to a view of emergency as being dealt with not so much by a separate department as by emergency services operated by the relevant departments extended to converge around the emergency entrance.

(Caption continued next page)

Changes in medical practice affecting requirements for future CCTS

Most medical care in the United States is delivered in or through the offices of doctors, and most of the offices are outside large health care facilities. In his consulting and examining room, the practitioner of medicine deals with a number of clinical techniques, but most practicing physicians must send patients to a centralized CTS for radiological and other special techniques. There has been a movement toward consolidation of solo practice offices into group practice clinics in the vicinity of or even within the hospitals in which the physicians practice. The advantages of economy in travel time, of access to clinical techniques spaces without independently duplicating them and of easier direct communication with colleagues are important. Another strong trend has been an increase in utilization of emergency rooms in hospitals for non-emergency health care.

Increases in demand and cost for health care, shortages of manpower, and many other factors are creating pressure for major changes in our health care system. "Alternatives to hospitalization" are frequently proclaimed urgently needed. In the future, the need for day care will increase and the centralization of clinical techniques for all of a physician's patients will become more common. The effect will be more non-resident patients to be accommodated adjacent to an increased CCTS.

A new proposal for consolidated clinical techniques spaces

In our previous paper on patient fostering spaces (reference 1), we proposed as an example a low-rise hospital building square in plan, about the size of a city block, with the PFS occupying the top floor. Using the same schematic example, the CCTS, which is at or near ground level, is shown in simple outline in *Fig. 2*. The shaded portions illustrate our principle of internal zones as described in the caption. The outer zone in light gray, what we call the diaphragm, is primarily a band of physicians' consulting suites through which waiting non-residential patients are filtered at selected points to the intermediate and sterile zones of CCTS. One of the filtering points in the diaphragm is opposite the emergency entrance, assumed in this example to be in the center of the side to the right, where patients in need of delivery or emergency surgery are provided with immediate access to the sterile zone, obviating the need for duplication of facilities or extensive travel. For disaster situations, the emergency waiting area can be extended to include all the waiting spaces as triage and holding areas.

Residential patients arrive in the intermediate zone from the PFS via the vertical circulation cores, which are connected by a ring corridor at the CCTS level.

The diaphragm can be pushed out locally to accommodate expansion either of physicians' offices or of the inner zones.

CONSOLIDATED CLINICAL TECHNIQUES SPACES

- CIRCULATION
- GERIATRICS
- ADULT CARE
- PEDIATRICS
- ANESTHESIA
- SURGERY
- PHYSICAL MEDICINE
- RADIOLOGY
- PHYSIOL. MONITORING
- DELIVERY
- SPECIMEN TAKING
- OTHER TECHNIQUES
- PSYCHIATRY
- OBSTETRICS
- OTHER CONDITIONS
- LONG TERM
- EMERGENCY
- OTHER AREAS

(Continued from previous page)

Fig. 4 shows the concept of emergency as a dimension of patient need to be met by all concerned parts of the institution. The administrative nucleus of this responsibility would be in the screening section of the diaphragm and in the section of the intermediate zone behind it, which is shown devoted to a group of "other techniques," such as applying dressings. In this arrangement, anesthesia, while still between surgery and delivery, is immediately accessible to the ring corridor for other patients.

Emergency care, considered more as a collection of services drawn upon than as an autonomous department, is indicated by gray tone in *Fig. 4b*.

Expansion and development of this arrangement is shown in *Figs. 4c and 4d*. As the center zone expands at one place, it exerts pressure on the neighboring section of the intermediate zone and again on the diaphragm, both of which must be pushed out. If the direction of an expansion is anticipated, allowance can be made to have a technique requiring similarly sized and supplied rooms in the path so as to minimize the alteration work required. Radiology rooms, for example, can be located in the path of a likely sterile zone expansion, both facilities requiring large terminals patterned in a similar way. When a phase of expansion is completed, each group of techniques can remain consolidated in a contiguous space.

The glass line has been moved to the edge of the building above in *Fig. 4c*. Still further expansion is shown in *Fig. 4d*. The glass line has now been moved out beyond the edge of the building above. This is possible to a limited extent, as long as the extended space is confined to the edge

(Top right, next page.)

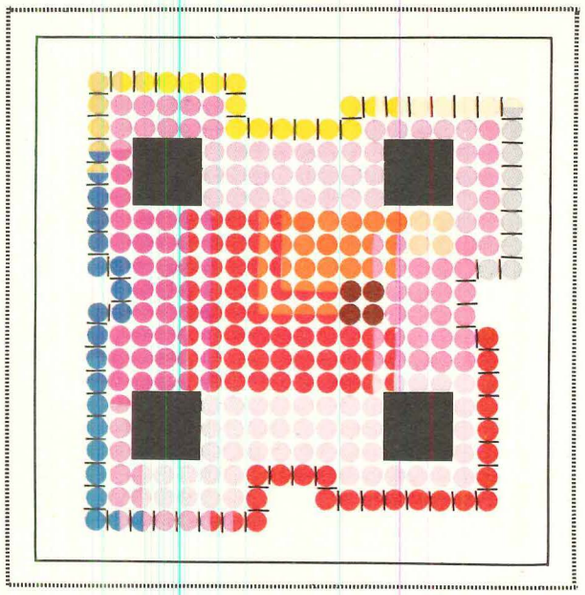


Fig. 4a

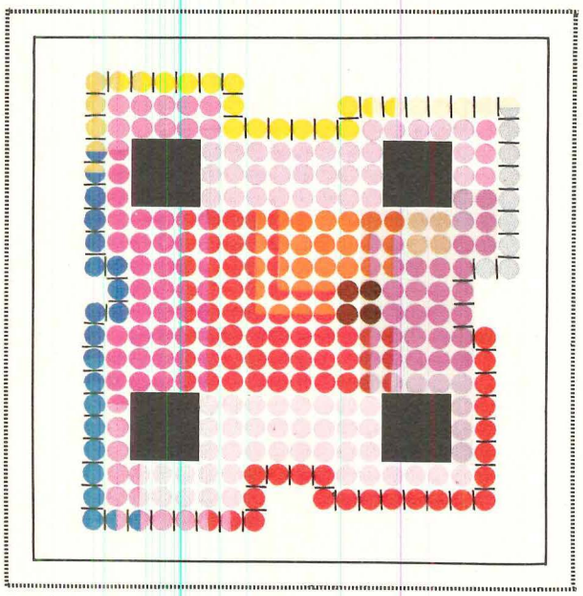


Fig. 4b

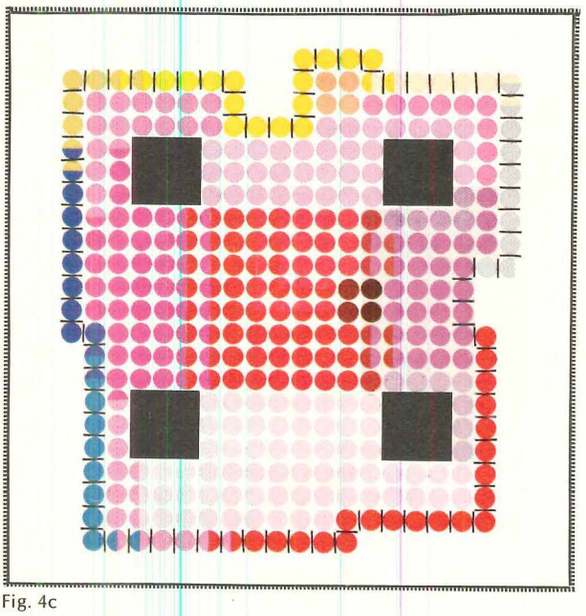


Fig. 4c

No structural alteration is required for such expansions since they merely occupy more of the outer zone waiting spaces. When accumulated expansions render the waiting area too small, it can be pushed out, either locally or totally, again without the need for structural work, until the point is reached when a really major expansion is necessary.

When major expansion does become necessary, some techniques such as certain elaborate rehabilitation and physical medicine techniques, may be removed from the main node and constitute a second node as described in *Figs. 5c and d*, right. When full hydrotherapy facilities are provided, including a swimming pool that may be used by the staff, they take up a great amount of space. The same applies to some occupational, vocational, educational, and diversional therapy techniques. The offices of psychiatrists and geriatricians may take up the diaphragm. Furthermore, both resident and non-resident patients may spend a lot of time in these facilities and be in need of meals and snacks. If these facilities are segregated for psychiatric patients, they may be further separated into a third node *(Fig. 5e)*, but a more likely reason to establish a third node is the need for auditoria and other assembly spaces for educational purposes in medical centers. In a medical center, extensive dining facilities will be required for students and faculty in addition to those for patients and personnel, and these might constitute a node also, together with lounges, libraries, and changing rooms. These personnel functions can, of course, be planned on another level.

To convey some ways this kind of CCTS might be developed, we will illustrate possible arrangements of the sterile zone, discuss the diaphragm and its relationship to the intermediate zone, and show how the reception and waiting spaces, historically grim, can be comfortable and pleasant places for the community and the institution to meet.

Growth potential of the central sterile zone

Anesthesia, surgery, and delivery facilities are provided for in the sterile zone, which is protected from intrusion in its central location on the CCTS floor. Patients enter by direct elevators from the obstetric and surgical PFS or from the adjacent parts of the intermediate zone, diaphragm, and reception spaces which are specialized for handling emergencies.

Fig. 6 illustrates a way of designing and expanding the inner sterile zone at the center. *Fig. 6a* shows an eight-room suite with five allocated as operating rooms and three as delivery rooms. They are each octagonal and arranged in a ring so that patients are wheeled in through entrances on the outer edge, the staff entering from the inner scrub and work space. The outer corridor as well as the inner space is partitioned to prevent movement of people between the surgical and delivery suites,

(From bottom right, opposite.) of the waiting area which does not require servicing from the ITS terminals. Specimen taking has been decentralized into four sections, one for each quadrant, because of the increase in distances with greater size. "Other techniques" are shown more realistically as being separated. The diaphragm has a distribution of physicians' offices without rigid departmental proximities. This situation might occur after years of alteration and expansion which have not been closely controlled. In extreme situations the accidental adjacencies could be like those found in a doctor's office building, some of which, of course, may turn out to be beneficial. Nevertheless, there should be no problem maintaining existing departments, restructuring them, or adding new ones.

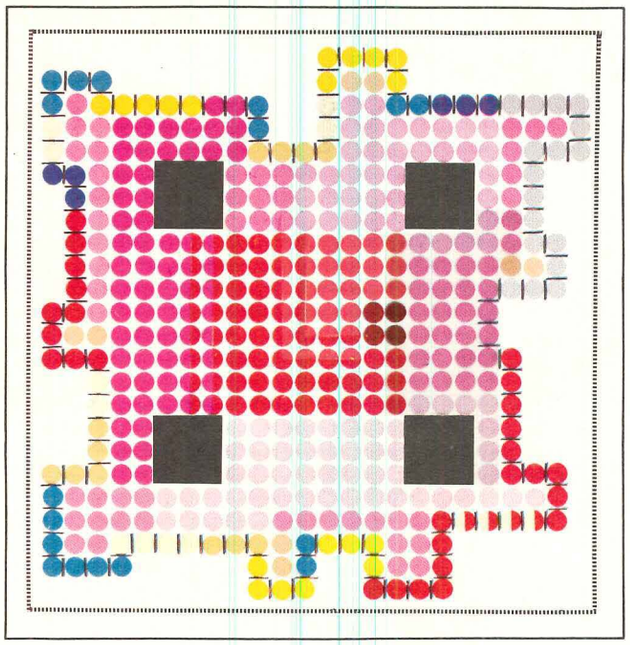


Fig. 4d

Growth by nodes for large scale expansion

All the examples of expansion so far given could be accomplished without major structural changes or additions to the building. *Fig. 5* (right) shows several patterns of large expansion of the CCTS.

Every illustration of the CCTS so far shown has been of a single "node," as in *Fig. 2*, repeated (on a smaller scale) in *Fig. 5a*. *Fig. 5b* is an expansion to correspond with an expanded single-court PFS (1). The multiple node arrangements shown in *Figs. 5c, d and e* correspond with two-, three- and four-court PFS levels respectively. There are reasonable limits to the size of a node from the point of view of the time taken to walk around it, but they can be quite large. When a new one is established, the old one shrinks once facilities have been hived off from it into the new one. The old can then continue again to expand as well as the new one. New nodes may be minor as in *Figs. 5c and e*. Two new nodes which are fairly equal in size may be developed as in *Fig. 5d*. The single node complex in *Fig. 5f* has psychiatric facilities, classrooms, and administrative offices in an outer band of conventional space in accordance with one of the suggested ways of expanding our patient fostering spaces (1).

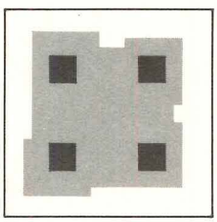


Fig. 5a

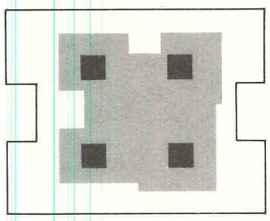


Fig. 5b

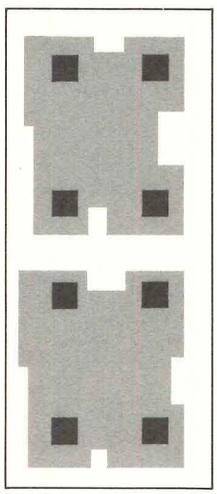


Fig. 5d

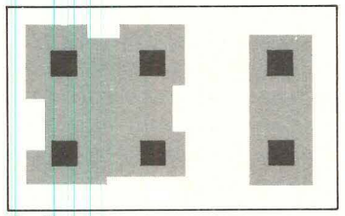


Fig. 5c

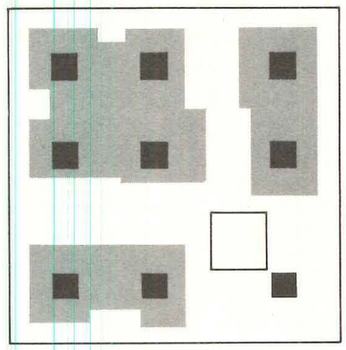


Fig. 5e

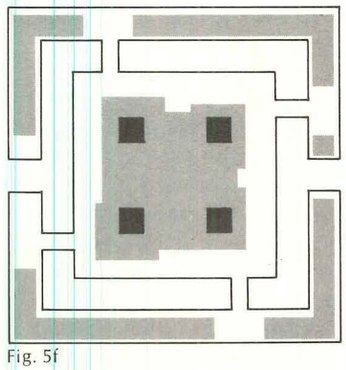


Fig. 5f

although some partitions may contain doors for emergency egress.

The dark squares in *Fig. 6* are terminals which are part of the industrial techniques spaces and through which purveying systems serve the operating and delivery rooms. These large terminals are used for the supply of clean instruments and commodities (X-ray film, etc.); for the removal of used materials; for the supply of conditioned air, water, solutions, gases, vacuum, power; for connection to the information handling system of the hospital, including physiological and building monitoring equipment. The terminals are manpenetrated for maintenance and repairs from spaces external to the CCTS so that work in CTS is not interrupted.

In this example, each of the rooms except those flanking the staff entrance has a face of each of two separate terminals for access to all necessary hatches and panels. The operating table may be placed within the octagon to facilitate viewing read-out panels and monitors and to bring substances and power system controls within easy reach of the anesthesiologist. The two rooms having only one terminal face would be for the simpler procedures. Faces of terminals in the central scrub and work area are used for the purveying systems appropriate to the activities carried out.

Expansion to a 15-room suite is illustrated in *Fig. 6b* which shows 11 rooms for surgery, 3 for delivery, and one which may be used for either. Once the dual-use room is allocated to, say, delivery, doors to the surgical scrub are locked to ensure no accidental entrance from it, unless it is preferred to use both entrances for handling Caesarean sections. In this arrangement, two rooms have three terminal faces for especially complicated procedures. Rather a high proportion of rooms have only one terminal face. If this is not adequate, extra terminals may easily be introduced on the perimeter *(Fig. 6c)*, reducing the number of single-terminal rooms to three, while double-terminal rooms are increased to eight and triple-terminal rooms to four. Adjacent operating rooms can, of course, be provided with a movable partition between them, as shown at the right, to be withdrawn for transplant work.

A further expansion to a 19-room suite is illustrated in *Fig. 6d*. Although it is shown with an allocation of 13 operating rooms, 5 delivery rooms, and one room used for either, this is only one of several possibilities. If the partition on the dotted line farthest to the right in the work area were used instead, the allocation would be 16 operating rooms, 3 delivery rooms, and one room used for either. Use of a center division would provide 9 rooms each to surgery and obstetrics, and one for either. The decision as to which partition to use can be made at relatively short notice, even on a daily basis. Additional terminals may be added to the large and the small versions as well as to the medium-sized one,

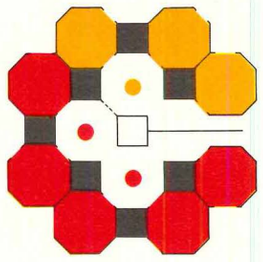


Fig. 6a

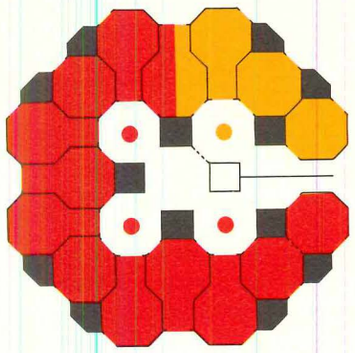


Fig. 6b

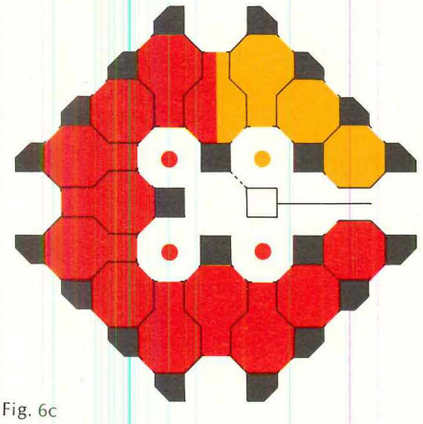


Fig. 6c

Fig. 6. The growth of the center of the sterile zone from small (a) to average size (b) is shown. Additional terminals (c) allow the capacities of the purveying systems to be increased. Further expansion to large size is shown in (d). *Fig. 6e* shows the surgical and delivery suites and anesthesia in their entirety for the medium-sized version shown in *Fig. 6b*. The inside corners of the four circulation cores are shown at the corners of this drawing. (The main ring corridor goes through each of these cores.) There may be a reciprocal elevator system in the circulation cores to the right, the one at the top of the drawing serving the obstetrical beds and the one at the bottom the surgical beds, such that there is always an elevator standing ready at the PFS floor for the one-step journey.

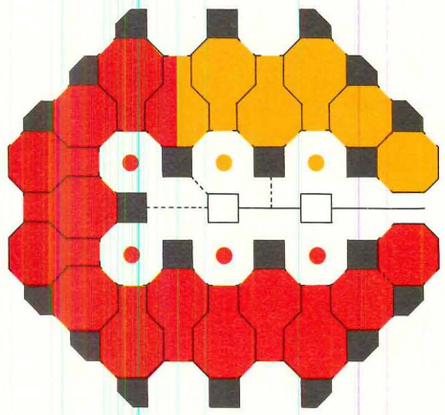


Fig. 6d

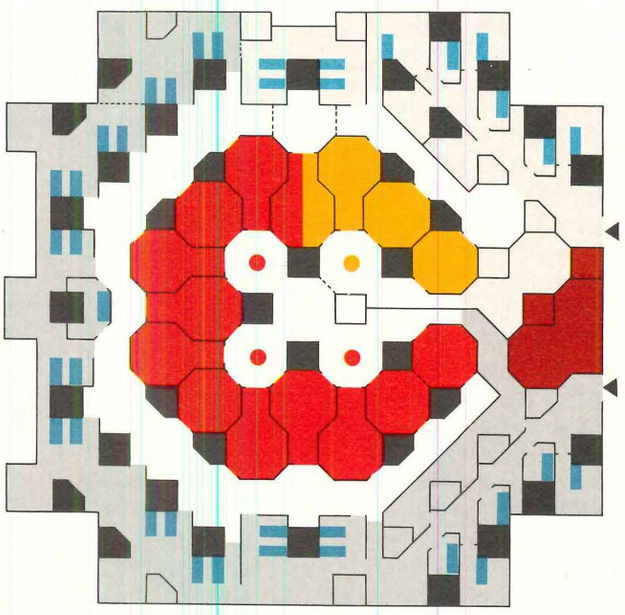


Fig. 6e

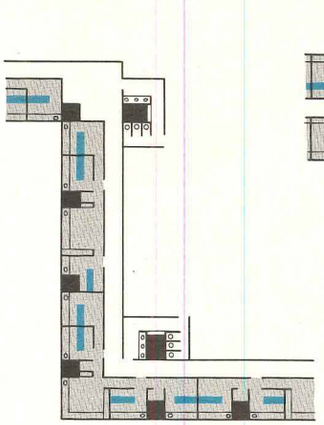


Fig. 7a

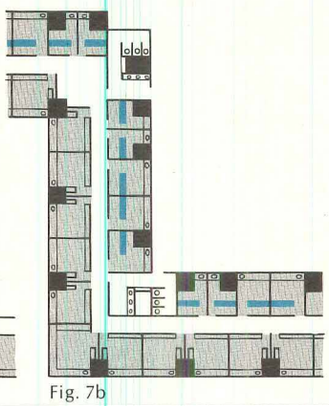


Fig. 7b

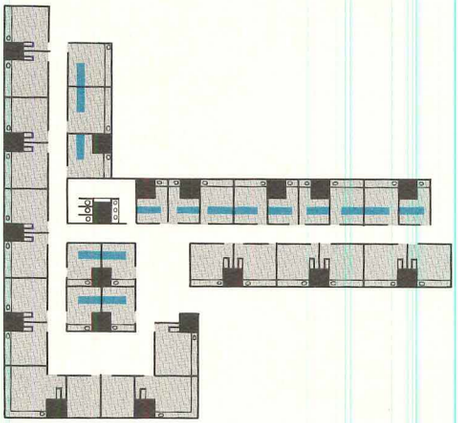


Fig. 7c

Fig. 7. Three versions of the diaphragm are illustrated. The first (a) is served by a corridor having self-contained suites on the outer side, toilets on the inner one. In (b) and (c), physicians' offices are on one side and shared exam rooms are on the other side. This arrangement is more suitable in teaching hospitals where physicians spend less of their time examining patients. A departmental appendix to the diaphragm corridor is shown in (c).

at the sides as well as at the ends, to form the arrangement that would best meet the needs.

Design for direct access to the entire suite shown in *Fig. 6e* (bottom opposite) would be simple. Here we have shown only the entrance to the ring corridor, directly opposite the emergency section.

To the right is anesthesia. Anesthesiologists emerge right into either the surgical or delivery circulation through one of two doors. Below anesthesia in the drawing is the entrance to the surgical suite with nine beds in the surgical prep and holding area, five of them in individual rooms. To the left is the 20-bed surgical recovery area with, in the center of the left side, the cast room. Large terminals like those used to service the operating rooms are provided for each two beds and for the nursing stations. The corridor used for patient entrance is not straight, bleak and forbidding; all operating room doors are sheltered, and there are plenty of bays for holding patients in case of a last minute delay and for private conversations with the patient before entering the operating room.

Above anesthesia to the right is the entrance to the delivery suite, with staff changing rooms between it and the staff entrance to the delivery scrub area in the center. At the entrance to the patients' access corridor is the fathers' lounge. Beyond the delivery entrance is the labor suite of eight rooms and at the top, a four-bed postpartum recovery room. The dotted lines across the patients' access corridor in front of it are alternate positions for operating a partition to divide the two suites, depending on the use to which the octagonal room in the middle is put at any given time. Each labor room has one large terminal, and the three large ones could easily be used for normal deliveries.

All labor, surgical hold and prep, and surgical and postpartum recovery beds are attached to terminals and are so similar that if the ratios between allocation of them prove to be incorrect, there will be no difficulty in arranging divisions at different points. These divisions are in no way permanent; movable doorless partitions may be operated to effect different subdivisions from day to day. There are nurses' stations for every four recovery stations, though it is unlikely that all would be used. Those in the upper left quadrant would be the last to be used, and the dotted lines indicate how some of these can be allocated to postpartum recovery.

If the total allocation of these beds is too great, more space can be given over to other techniques in the intermediate zone approached from the ring corridor; or, if more beds are needed, space can be taken from the intermediate zone. In the large version shown in *Fig. 6d,* an elongation in one direction only is shown, necessitating pushing the ring corridor further out on one side.

Optional arrangements of the diaphragm and the intermediate zone

The band of consulting spaces has been called the diaphragm because it separates the public spaces from the CTS and can easily be expanded or contracted on short notice. No structural changes in the building would be required to move it, and terminals to serve it can be provided wherever they are needed. It serves as a filter, each patient entering at a point close to the doctor he is going to see or near the centralized techniques in the intermediate zone of which he will be subject.

Many variations are possible in developing the diaphragm. One of the simplest versions is shown in *Fig. 7a,* with self-contained suites on the outer side of the corridor, suitable for the staff of a community hospital. They consist on average of three examining rooms to one consulting room, but these ratios could readily be changed. The internal and external bends of the corridor allow variations in the sizes of offices and the number of examining rooms. Each room has access to one face of a small terminal. The terminals, which can be created at various points along a floor grid, accommodate air-conditioning ducts, pneumatic tubes, water supplies and drains, electrical wiring and communications leads. Adjacent benches have sinks. On the inner side of the corridor are shown toilets which may be approached either from the diaphragm corridor or the intermediate zone. They are repeated in each quadrant. The rectangular terminal gives access to plumbing connections for the toilet fixtures.

A double-loaded corridor version is shown in *Fig. 7b.* On the outer side of the corridor are physicians' offices and on the inner side an equal number of general access examination rooms, as well as the toilet accommodations as before. This arrangement is suitable for a university medical center where clinical consultation by the faculty takes up a relatively smaller proportion of the physicians' time. Not all the physicians need examining rooms during the same hours, so their use may be scheduled.

If the diaphragm is departmentalized, appendices to it may be formed in which special facilities may be incorporated, such as secretarial space and conference rooms *(Fig. 7c).*

However the diaphragm is designed, we think of the doctor's office as his personal space, his headquarters in the hospital, with furnishings that please him, his own books and pictures, a place that tells his patients something about him. And those who work closely with him—nurses or secretaries or others—have their work spaces close by.

Physicians' offices may be arranged according to specialty or department, or so that those physicians who frequently prescribe a technique they need to observe can be close to that part of the intermediate zone where it is carried out. All procedures are, however, within reasonable walking distance of all physicians' offices and are on the same level. Those technique-oriented doctors who do not regularly have consultations with patients, such as some radiologists, may not need offices in the diaphragm. If the number of physicians interested in a particular procedure increases, or if the space for a procedure must be expanded, the diaphragm can be pushed out locally to accommodate the expansion as well as to increase the number of offices.

The intermediate zone has characteristics of both the diaphragm and the center zone, and it may have small waiting spaces too. It may contain spaces as elaborately equipped and supplied as operating rooms, as for cardiac catheterization and angio-

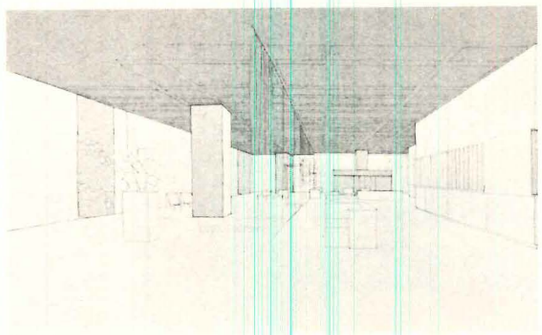


Fig. 8a

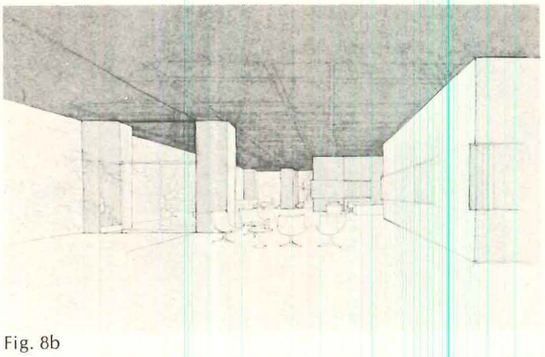


Fig. 8b

Fig. 8. Perspective of reception and waiting spaces beyond the edge of the CCTS diaphragm on the right, (a) at ground level, (b) a later development after the CCTS have expanded further toward the edge of the building.

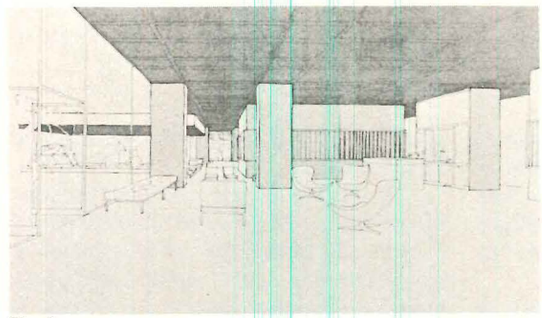


Fig. 9a

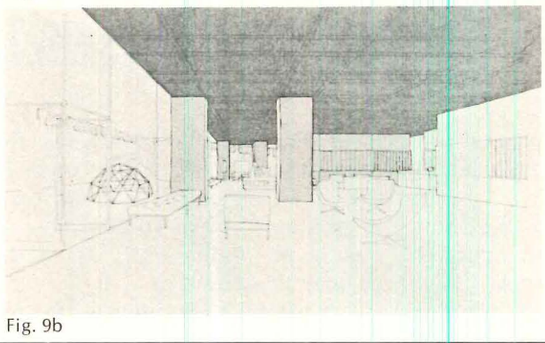


Fig. 9b

Fig. 9. A development after several expansions of a CCTS diaphragm below grade (a), such that the reception and waiting areas have filled out the space to the edge of the building. A further expansion has been accommodated (b) by extension of parts of the waiting areas beyond the face of the building.

graphic studies, and spaces as simple as an average examining room. The variety of intermediate spaces varies with the program.

An increasing role for reception and waiting spaces

The spaces along the perimeter of the clinical floor relate to the CCTS as reception and waiting spaces, but they are intended to be much more. They are where the community and the hospital meet, and they say a great deal about what the hospital thinks of its patients and visitors. Surrounded by windows, this outer zone forms a continuous promenade in which such convenience facilities as coffee shop, snack bar, gift shop, newsstand, public telephones, meditation room, writing area, library, exhibition space, booths for viewing patient educational films and a creche are located. The irregular depth adds to the interest of the space and in no way compromises its efficiency. Its continuity allows easy distribution of patients near appropriate entry points in the diaphragm.

Figs. 8 and 9 show a few ways the waiting spaces might be designed. The first pair illustrate a development at ground level. *Fig. 8a* shows the space at an early stage, with a straight glass line set well in from the edge of the building. The louvred band to the right is the edge of the diaphragm containing physicians' offices and at the far end of the lounge is a small pavilion containing telephone booths flanked by newsstand and gift shop. An expansion is shown in *Fig. 8b* with most of the glass line taken to the edge of the building. This version shows a snack bar to the left. If the total area of the CCTS and waiting spaces needs to exceed that of the patient fostering spaces including their courtyards, such an expansion presents no problem, particularly when this floor is at ground level as shown in these perspectives. There are also possibilities for expansion at a floor below grade. *Fig. 9a* shows how the "moat" which might be formed outside could be landscaped. Where building into the moat is substantial, skylights can be installed, provided adequate landscaped courtyards visible from each lounge area remain. The expansion in *Fig. 9b* is achieved by building out at intervals. In this case, the creche for well children is moved out into an equally visible but less audible and better guarded position. If the CCTS were located on an upper floor, expansion could also be achieved to a limited extent by the provision beforehand of a continuous cantilevered projection which would serve as a balcony in the early stages. If the floor is only one or two stories above ground level, supports for an expansion can be taken to the ground, forming a colonnade.

The proposals presented in this article are not entirely in accordance with all of the recommendations made for what we call the CCTS by proponents of tower-and-podium hospitals. D. L. Price (4) reflects them as follows: "Because of the departmental interdependency of direct patient services for the care of ambulatory patients in our hospitals, the location of these facilities is extremely important. Each must be expansible independently of its neighboring service. Therefore, the outpatient department, emergency unit, physical medicine and rehabilitation service special services . . . (such as electrocardiography, electroencephalography, cardiopulmonary, and clinical radioisotope facilities) . . . ambulatory patient or observation bed unit, and day care center *should be located on an outside wall* and on the ground level." (Our italics.) While many of today's best hospital buildings have been designed on the basis of these assumptions, which do result in a CCTS that is a horizontally contiguous like space, we are suggesting a different way to handle it. Although these ideas have been developed in conjunction with industrial techniques spaces arranged to allow servicing of the terminals mentioned, there seems no reason why the main concepts presented could not be used for the consolidated clinical techniques spaces of conventional tower-and-podium hospitals, or of any hospital building in which these techniques are housed in a single loft floor.

By definition, hospitals have an unavoidable responsibility to provide patient fostering spaces for the care of bed patients. But the mainstreams of health care flow outside patient fostering spaces through clinical techniques spaces, and these streams are converging more and more on hospitals. This has caused great stresses on administrative, financial, and spatial arrangements within hospitals and has altered the way the public interacts with them. Most hospitals need effective, efficient, adaptable and expansible spaces for clinical techniques, easily accessible to non-residential as well as to residential patients. All health care facilities need humane, comforting and hospitable spaces that enhance a warm and cooperative relationship with the community.

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2. De la Fuente, G.: The Venice Hospital Project of Le Corbusier. *Architecture at Rice* #23, 1968.
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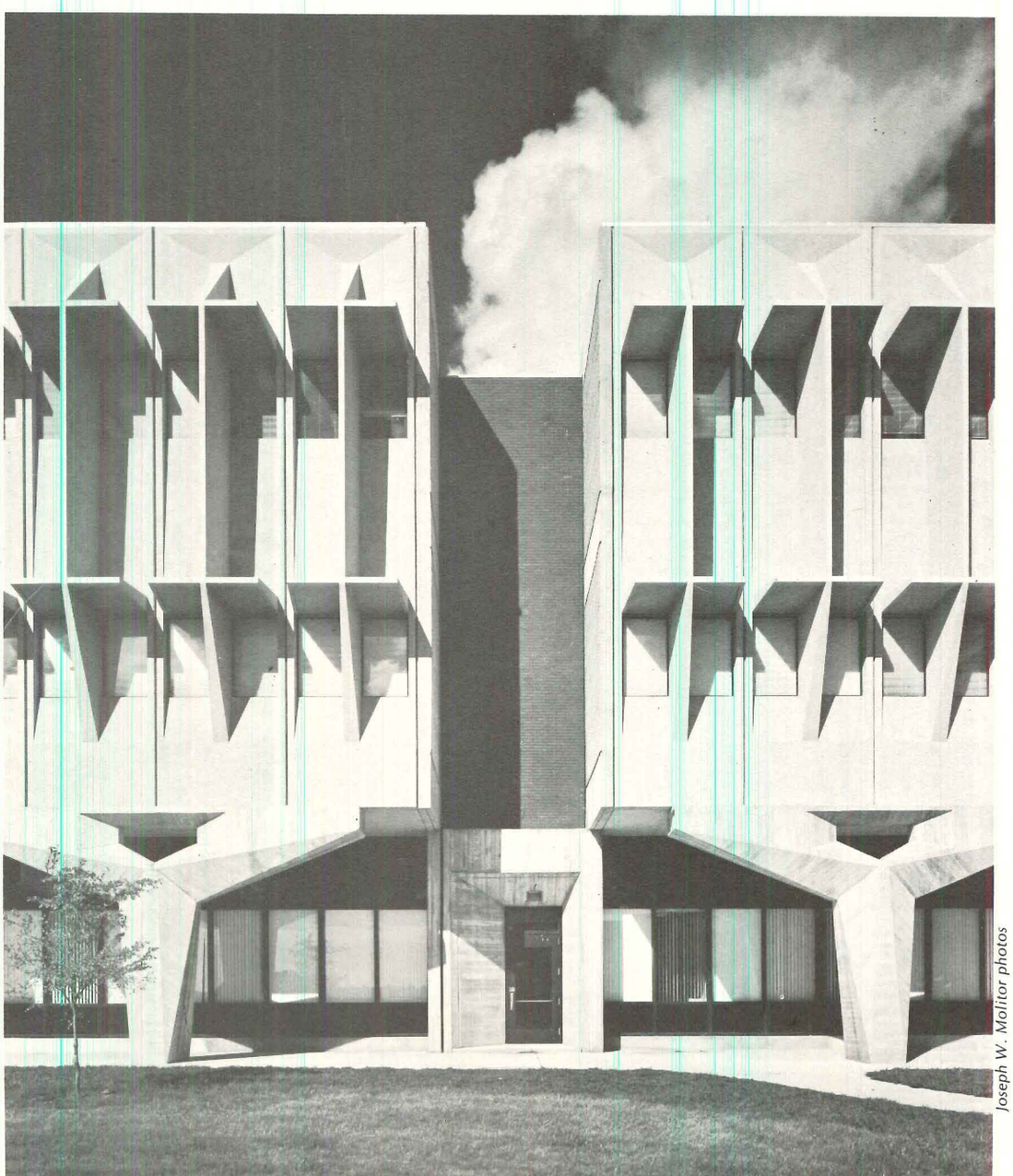
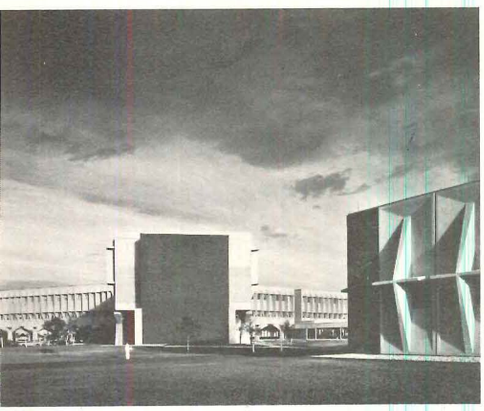
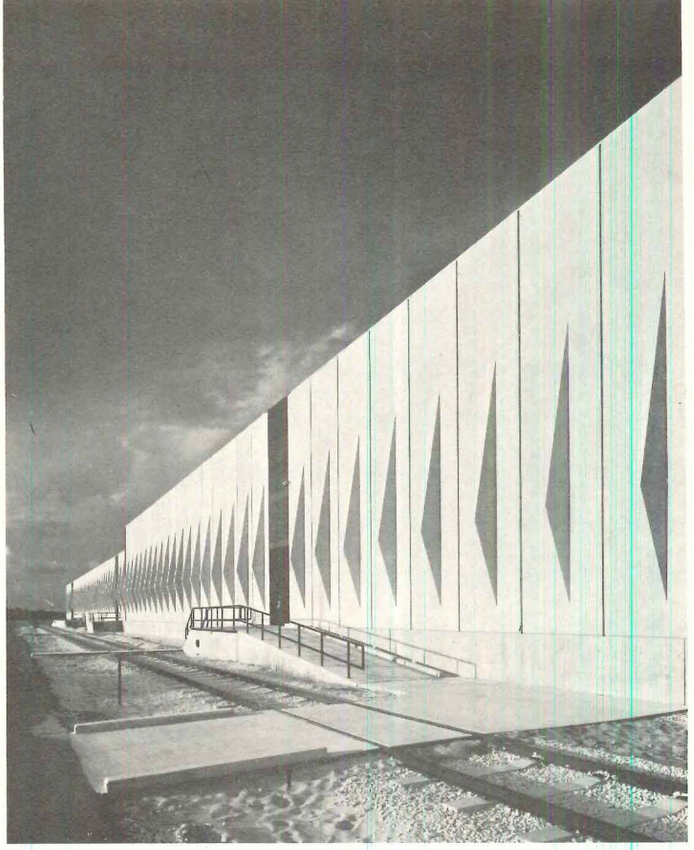
IBM IN BOCA RATON: BREUER BUILDS ON FLORIDA'S FLOOD PLAIN

"Architecture loves repetitive elements," says Marcel Breuer in referring to the visual rhythms these elements create as they bend gently around the "Y-shaped" plan of his new complex for IBM in southern Florida. These rhythms, set in motion by the sun, have much the same dynamism as an Op Art print and some of the same insistence. The precast panels, thirty-five feet tall and stiffened with sun screens, are structural over two floors and carried by tree columns to form an arcade at the building's periphery. In spite of its enormous length (nearly 800 feet), "the office building" say Breuer and associate Robert Gatje, "is accurate to a quarter of an inch." This same precision—and these same repetitive elements—will carry into Phase II now beginning.



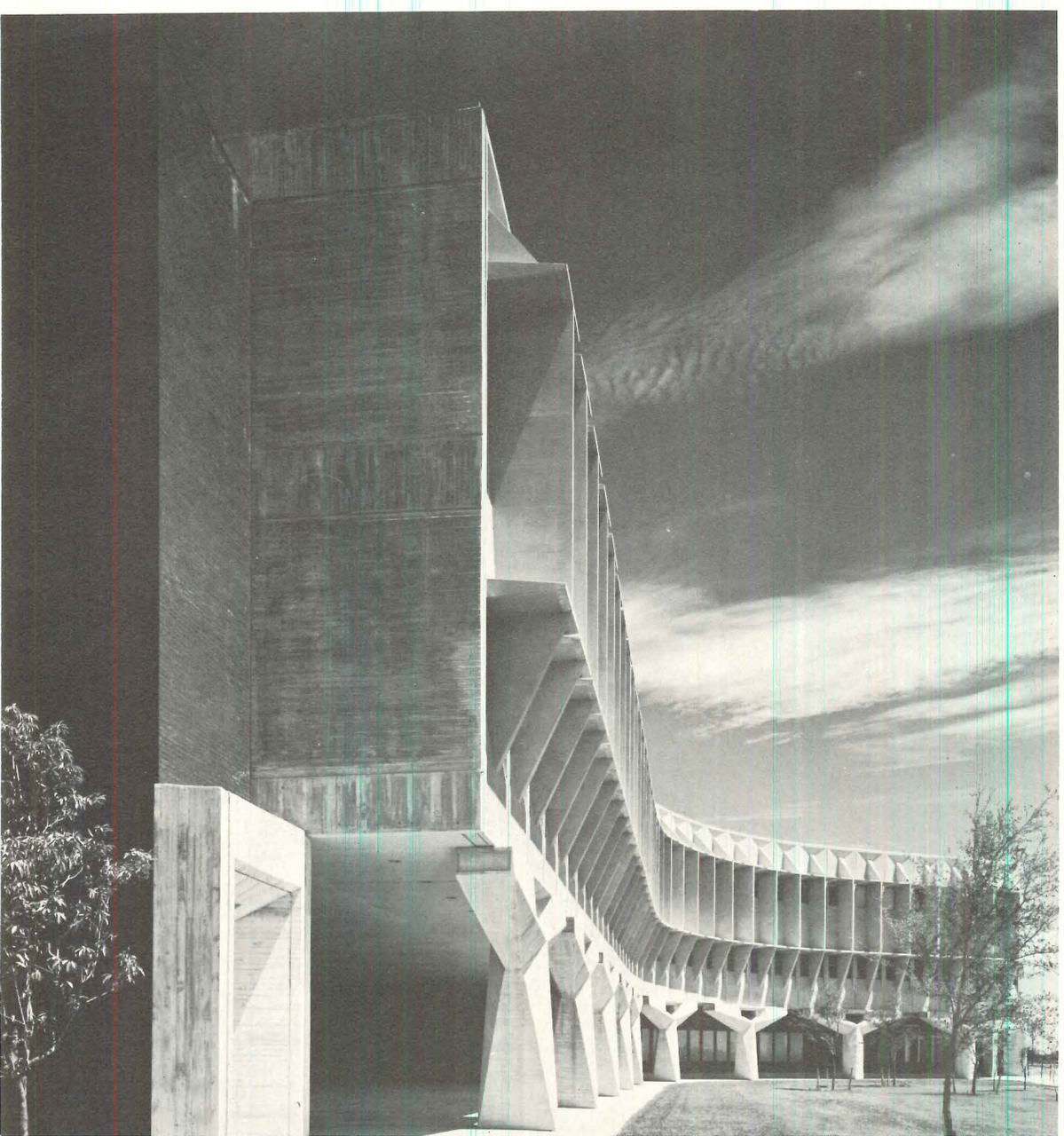
Joseph W. Molitor photos

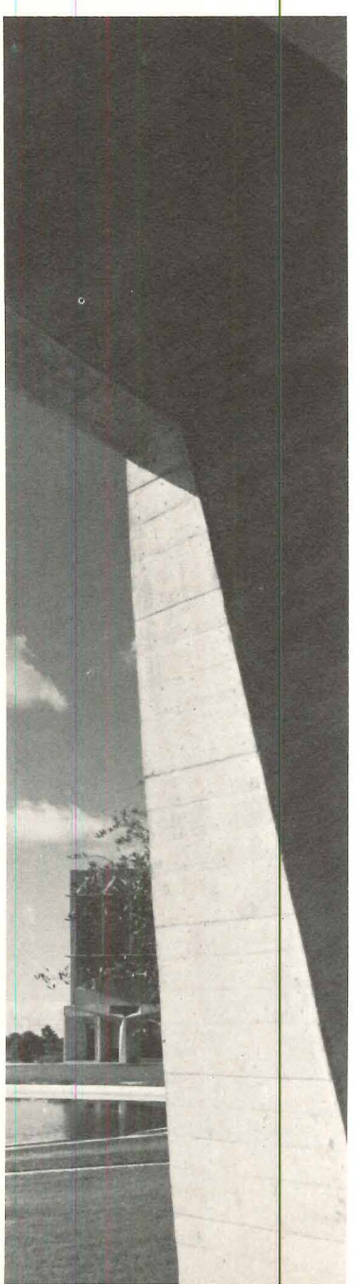




The site, 500 acres of Florida's coastal plain with an average elevation of ten feet, lies in the south Atlantic hurricane belt and is therefore subject to periodic flooding. To protect against rising water, the architects have set first floor elevations at sixteen feet and all parking at twelve feet. To obtain the 450,000 cubic yards of fill this requires, three lakes (two of which exist already) will be scoured out at various on-site locations. These lakes, linked to the sea by a filagree of small canals, will serve to stabilize water levels and provide standing reservoirs for secondary fire protection. A planned extension of N.W. 40th Street will cut the site into two parcels. IBM will occupy the northern sector while the southern portion is held in reserve.

The program required a mixture of offices, laborato-





ries and manufacturing facilities combined to form the first such center for IBM in the Southeast. It was further stipulated that the buildings be arranged to accommodate a somewhat unpredictable pattern of growth. IBM's earlier experience with this type of facility pointed to a horizontal solution and there was sufficient specialization among IBM staff members to suggest the creation of subcenters—each with its own architectural identity. Twin office structures will flank the central lake and a sculptured island is planned for its center. Next to the office buildings are one-story structures for manufacturing and materials distribution. Each is approximately 100,000 square feet and all are linked by an on-level, covered circulation spine designed to accommodate fork lifts. Central shipping and receiving areas are served from a truck yard and rail spur although each building has its own service approach. On-grade parking for 1,600 cars is distributed in clusters around the project and individual lots are treated with drainage swales that provide opportunities for planting.

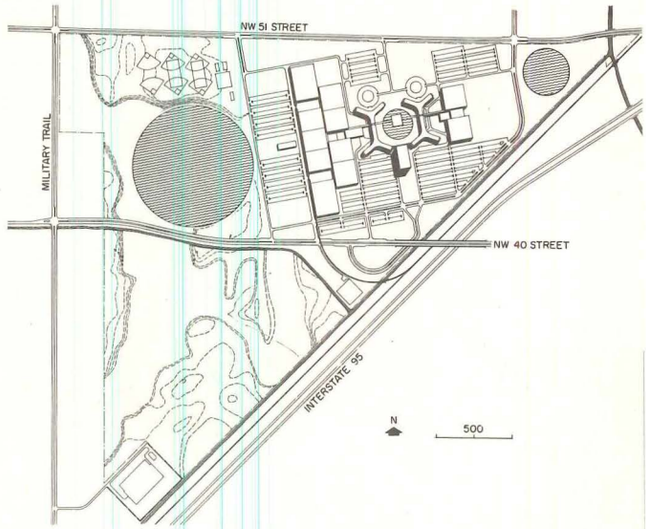
Employee recreation facilities are supplied on the site's northwest corner.

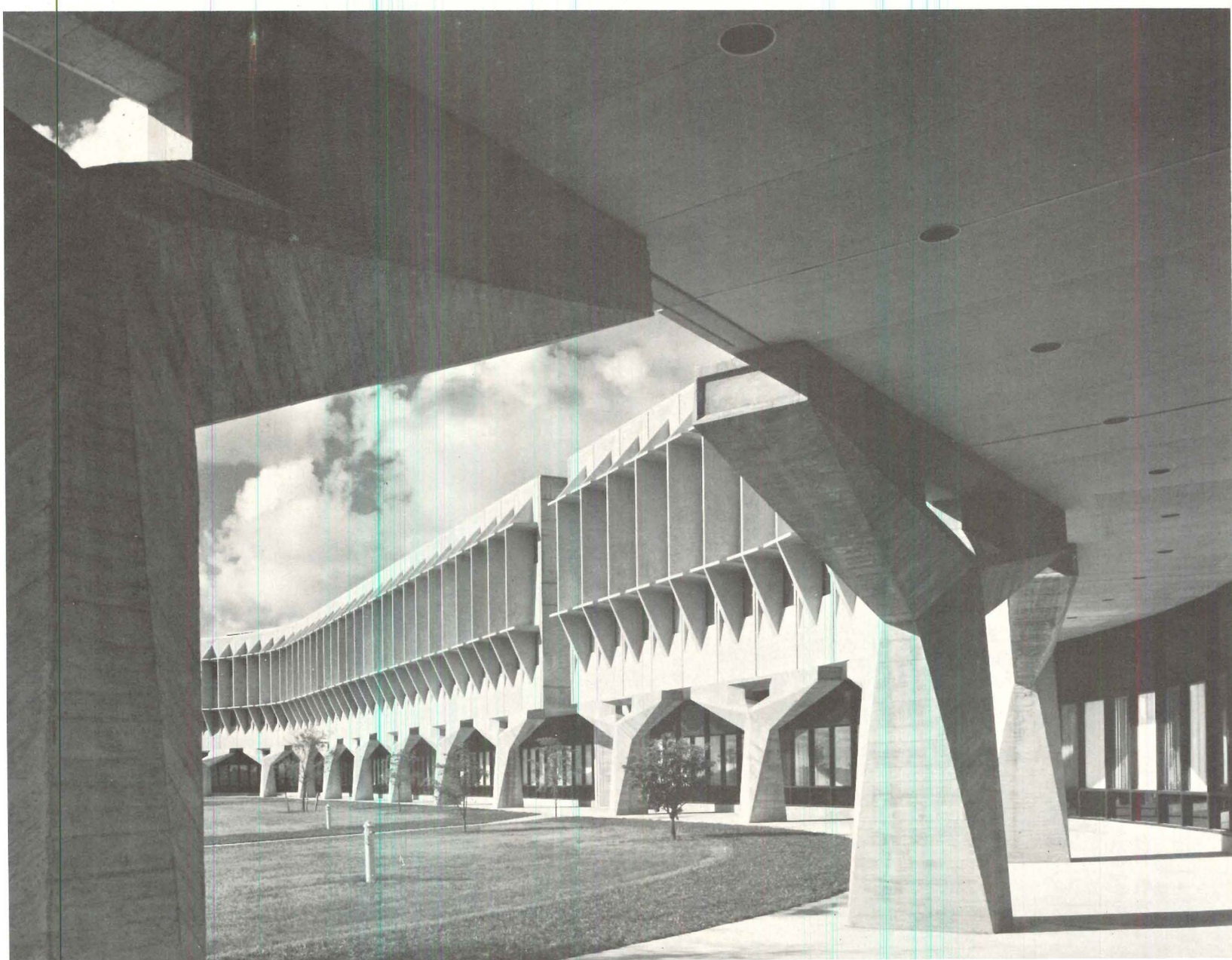
New access roads and interchanges are projected to serve the growing needs of the complex and these are being worked out in careful conjunction with City traffic planners.

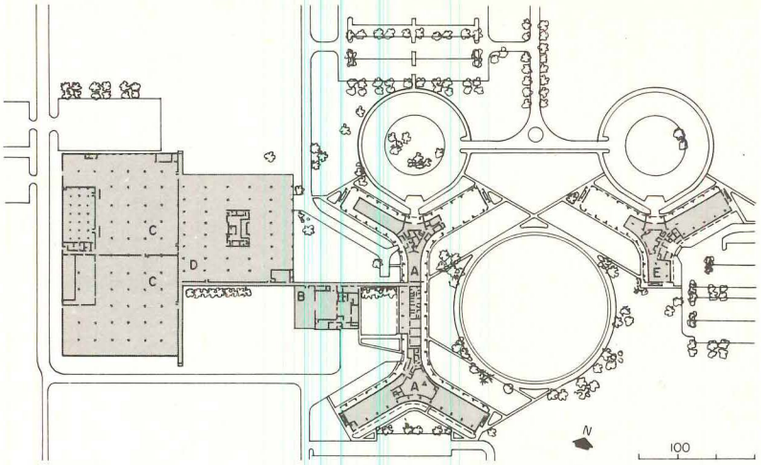
Roof and floor systems are designed with long span, prestressed concrete "tees." Beams and columns are mostly precast. The tree columns, not precast, are poured in reusable wood and steel forms. The upper chord of these elements is post-tensioned with five 1⅜-inch steel bars. Foundations are set on sand especially prepared by "vibro-flotation" to receive these loads and all first-floor slabs are laid directly on grade after normal compaction procedures.

The 60-foot clear span in the office structure offers maximum planning flexibility. Ductwork is modular to facilitate partition moves.

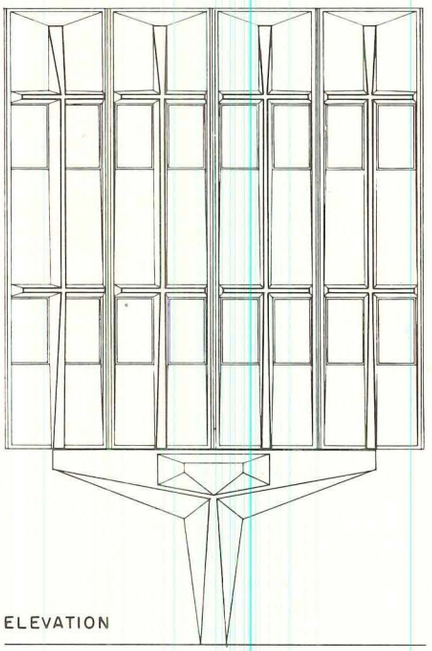
The interiors are direct, handsome, and handled with Breuer's customary assurance. Finish materials, for the most part, are not luxurious. Except in a few prime areas, floors are covered in vinyl asbestos tile. Walls are plasterboard or exposed block. Ceilings throughout are treated with acoustic tile. Colors are used judiciously in furniture fabrics and inventive wall graphics. Most partitions are moveable to accommodate changing internal rela-



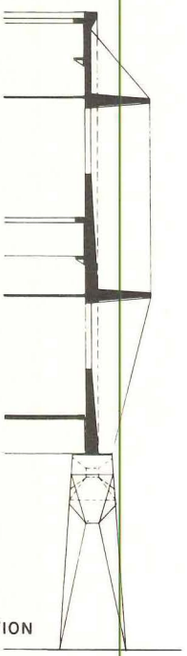




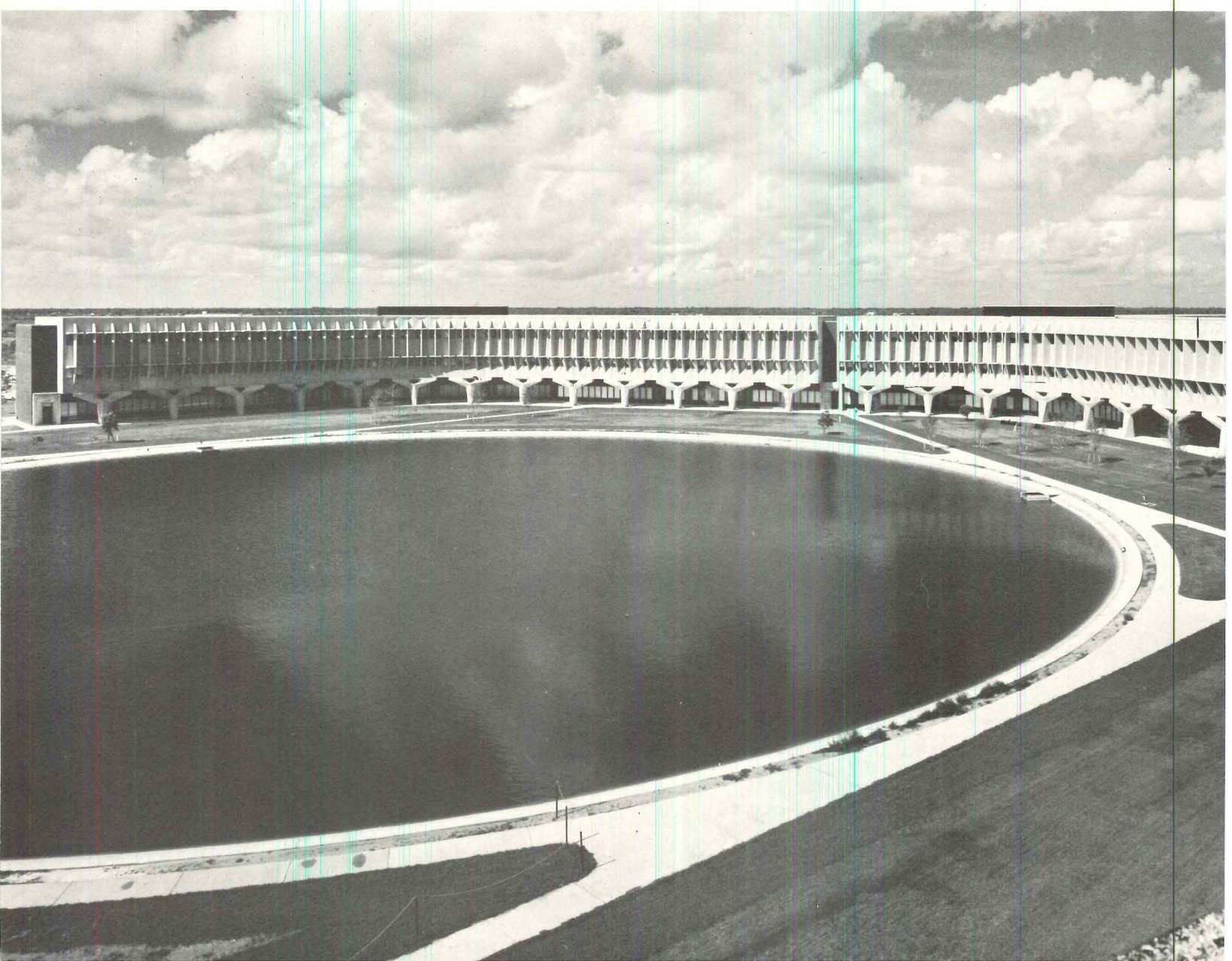
A—*Administration*
B—*Cafeteria*
C—*Materials distribution*
D—*Manufacturing*
E—*Laboratories*



ELEVATION

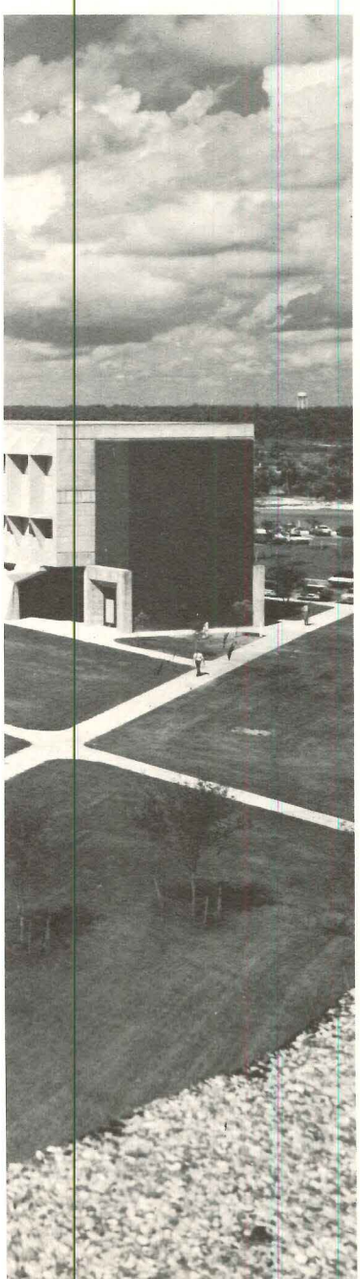


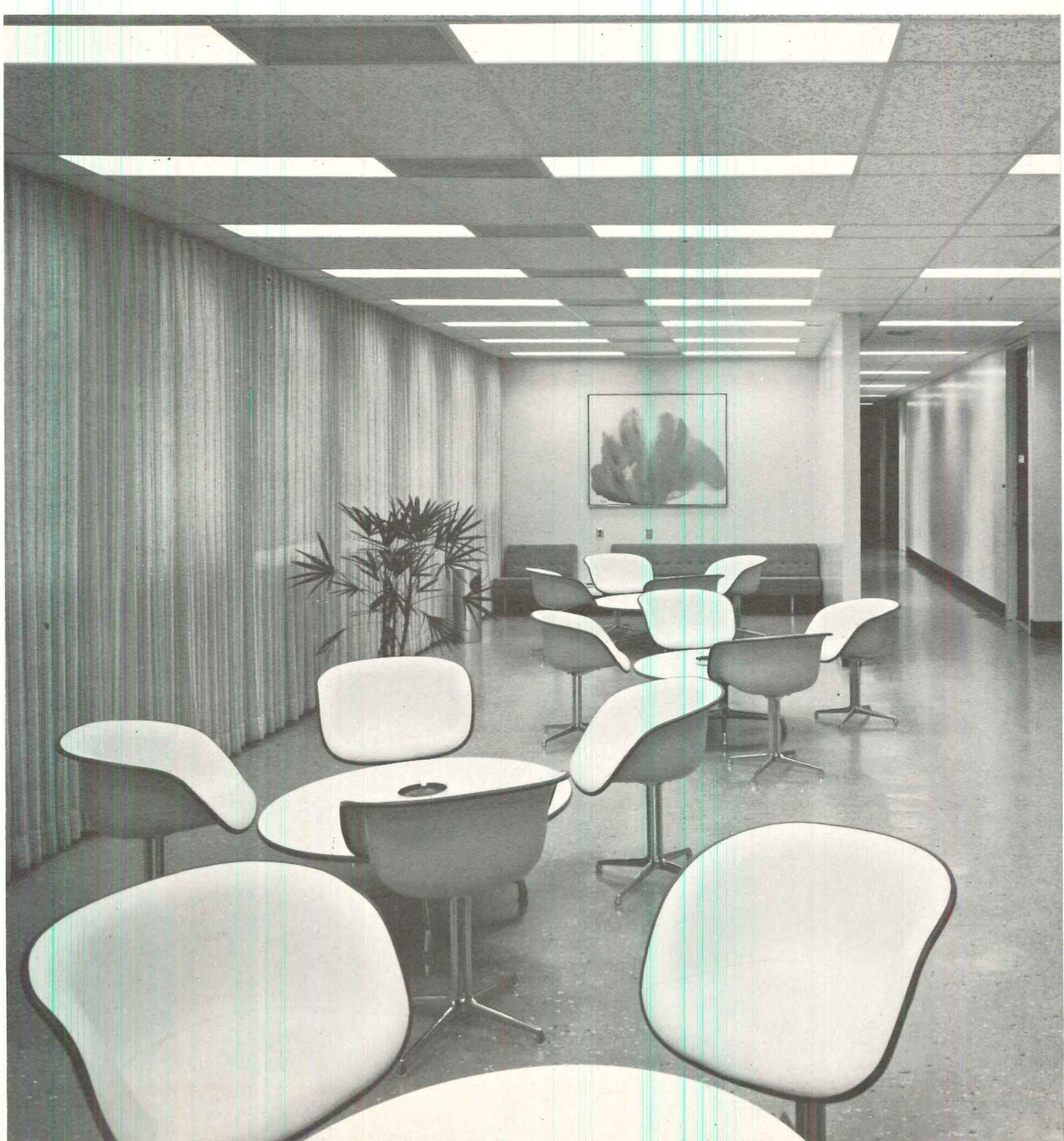
SECTION

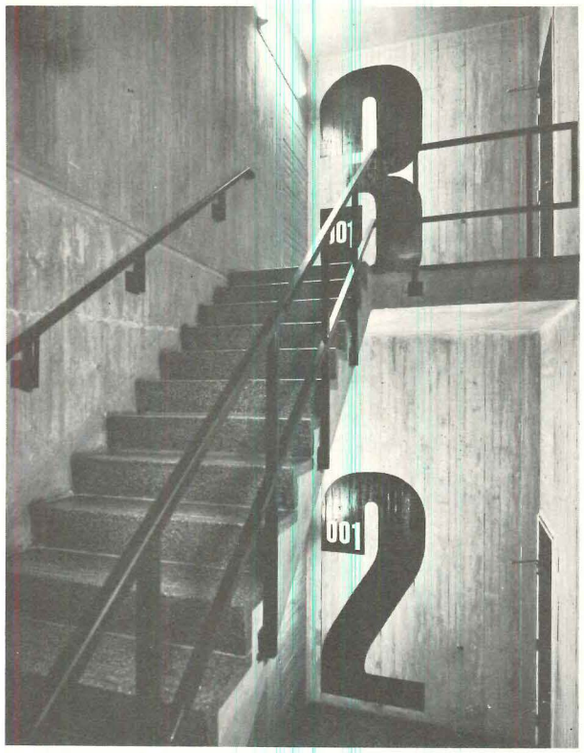


tionships. The concrete work, both inside and out, is uniformly excellent and these buildings represent a technical triumph of the kind we are starting to take for granted from this distinguished office.

Breuer's planning principles are by now familiar. The precast panels and the sculptured tree columns are among his signatures. The "Y" plan, with its potential for growth in three directions, can be traced in slightly varying form from UNESCO (or earlier) through the IBM facility in La Gaude, France (1961) to the new headquarters for HUD in Washington, D. C. (1969). These buildings like Wright's Usonian houses or Faulkner's novels, bear a striking family resemblance. Taken separately, each is vigorous and vibrant. Taken together, they begin to embody an expression of our corpo-





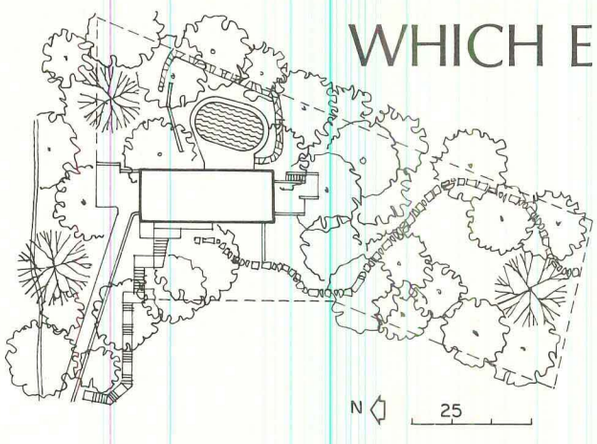


rate and cultural values that, like it or not, tells us a great deal about who we are and where we have been going.

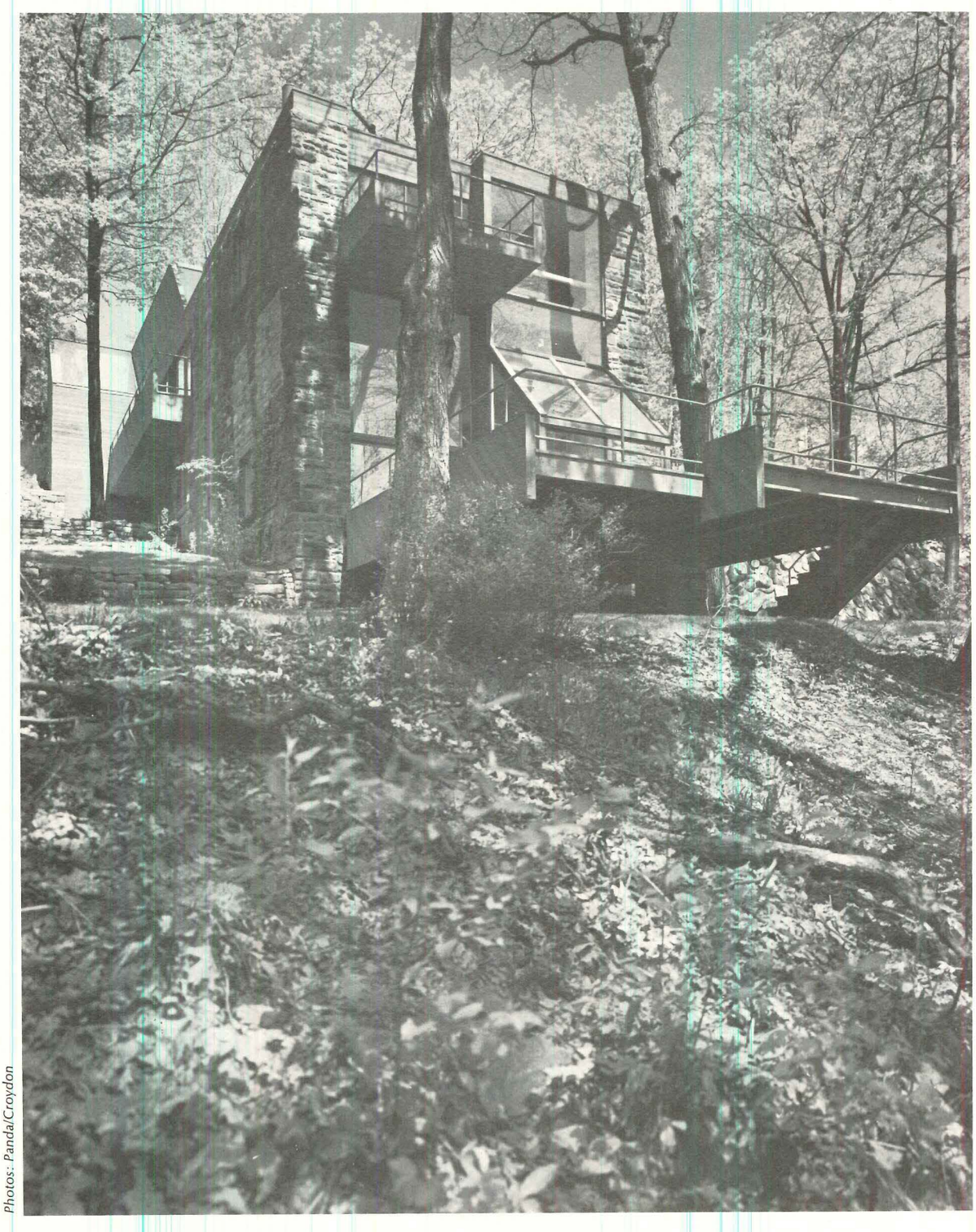
In this connection it is also worth noting that IBM is continuing to commission architects of proven ability and developing with these architects the kinds of working relationships that consistently result in buildings of note.

IBM OFFICE, LABORATORY AND MANUFACTURING FACILITY, Boca Raton, Florida. Architects: *Marcel Breuer and Robert Gatje;* structural engineers: *Severud-Perrone-Sturn-Conlin-Bandel;* mechanical engineers: *Joseph R. Loring and Associates;* landscape architects: *Edward D. Stone, Jr. and Associates;* graphics: *Page, Arbitrio and Resen, Ltd.*

A HOUSE WHICH ENHANCES ITS SITE



In a wooded ravine in the center of metropolitan Toronto, architect E. H. Zeidler has created this remarkably appropriate and liveable house for his own family. The site drops about 160 feet vertically into the ravine, which connects with the Don Valley River, and the architect's prime desire was to create a "non-house disappearing into the natural environment of the sloping hillside". As constructed, the house does this extremely well: it is only really visible from one side—the other facades merge with the trees and the retaining walls, to become part of the natural setting. Old stone walls of a previous house were retained in the new structure, which subtly extends and drops with the contour of the land.

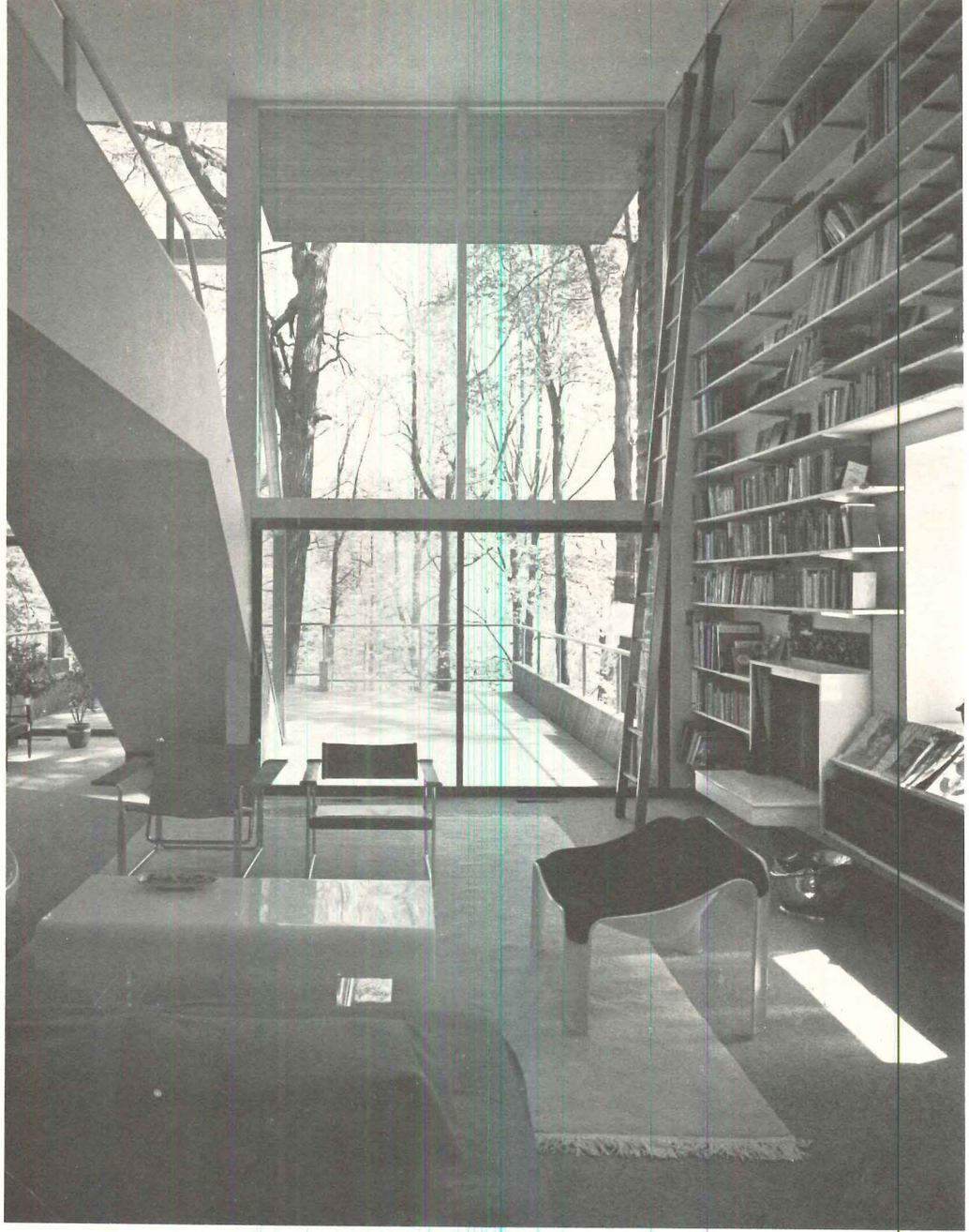


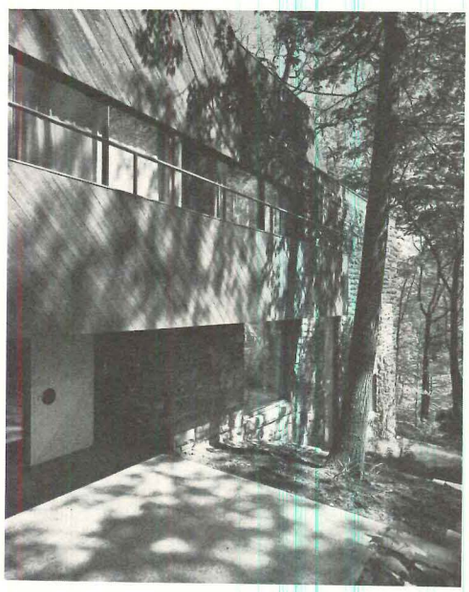
Photos: Panda/Croydon

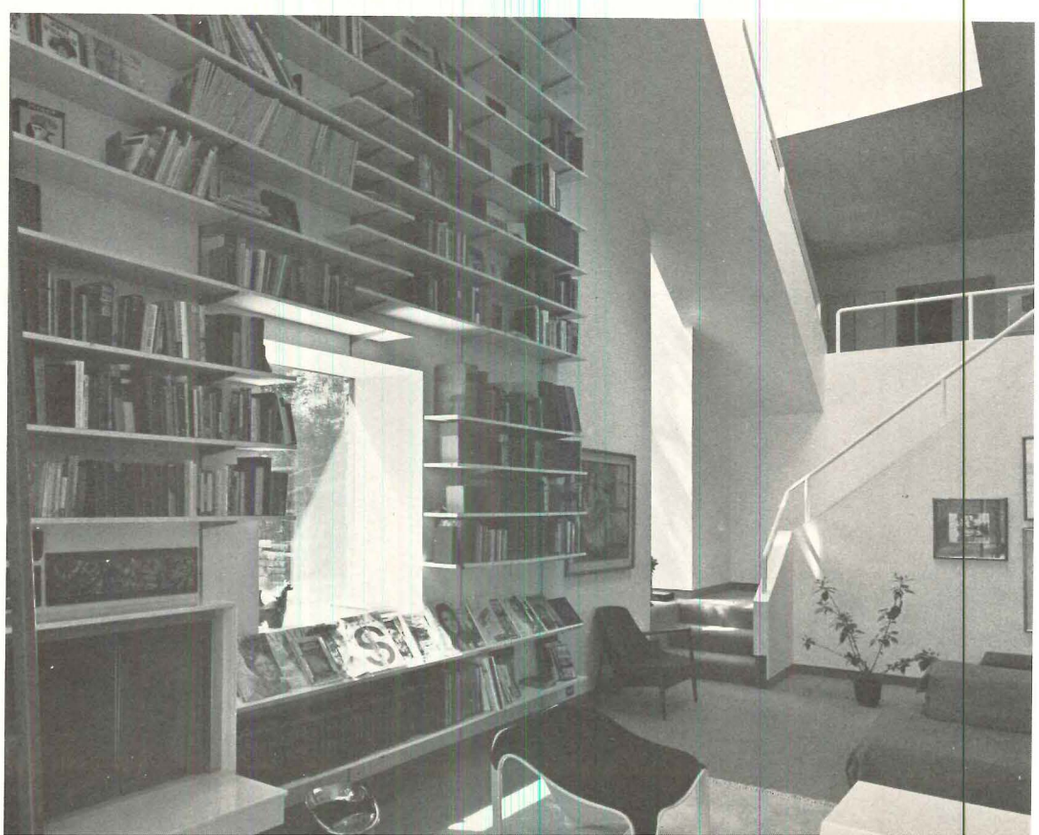
A very unusual organization of the plan has been used to zone living activities, and to make the most of the slope of the land, variable daylighting, and the beautiful views the site affords. Rooms are arranged on four levels and divided into a "children section," and an "adult section," linked at the bedroom level and at the kitchen. The kitchen (the second) level is the life center of the house, with dining, family living and work space (photo below center)—with a formal entrance to the house on one side, and a children's entrance leading to the pool on the opposite side. From the main entrance, one enters into a dramatic four-story space (below, right) replete with windows, glass walls and skylights which frame views of the trees, sky and the deep valley below. The adult living spaces—living room (photos near right), dining room and study (top right)—pivot off the core on succeeding levels, each of which has an outdoor deck or terrace.

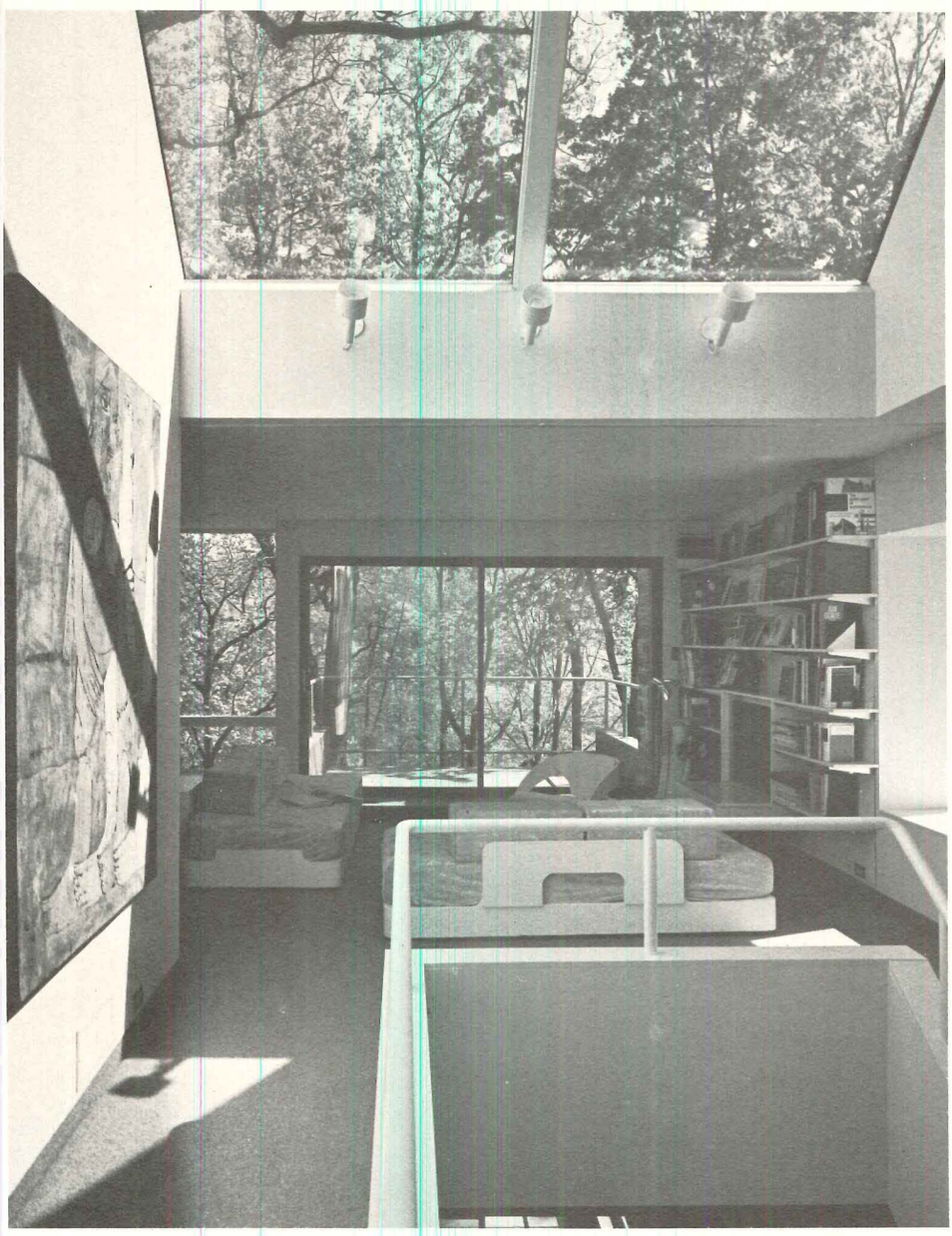
At the top of the hill, only the top-level garage, with a door to the family stair tucked under the overhang, is visible (below). A "secret room" is behind the garage on this top level, reached by a ladder as a play space for the children, and out of bounds for adults, as a "hide-away."

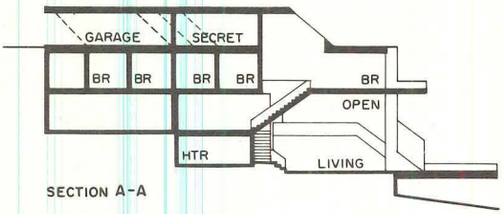
Only two basic construction materials have been used in the house: the existing gray stone (relocated in some instances) and rough mill-sawn cedar. The cedar siding is carried over the roof deck surfaces to give an overall design impression of a series of wood decks stepping down the forested hill. They are broken only by the many skylights which illuminate the interiors. Materials inside the house are as restrained as without—all is neutral gray and white, with people, views and art as color accents in the otherwise monochromatic scheme.



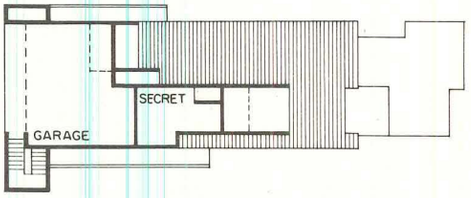




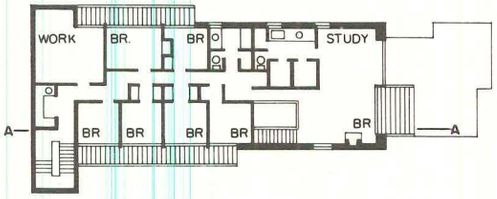




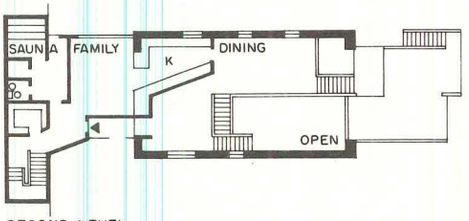
SECTION A-A



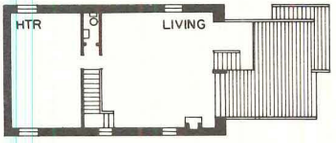
FOURTH LEVEL



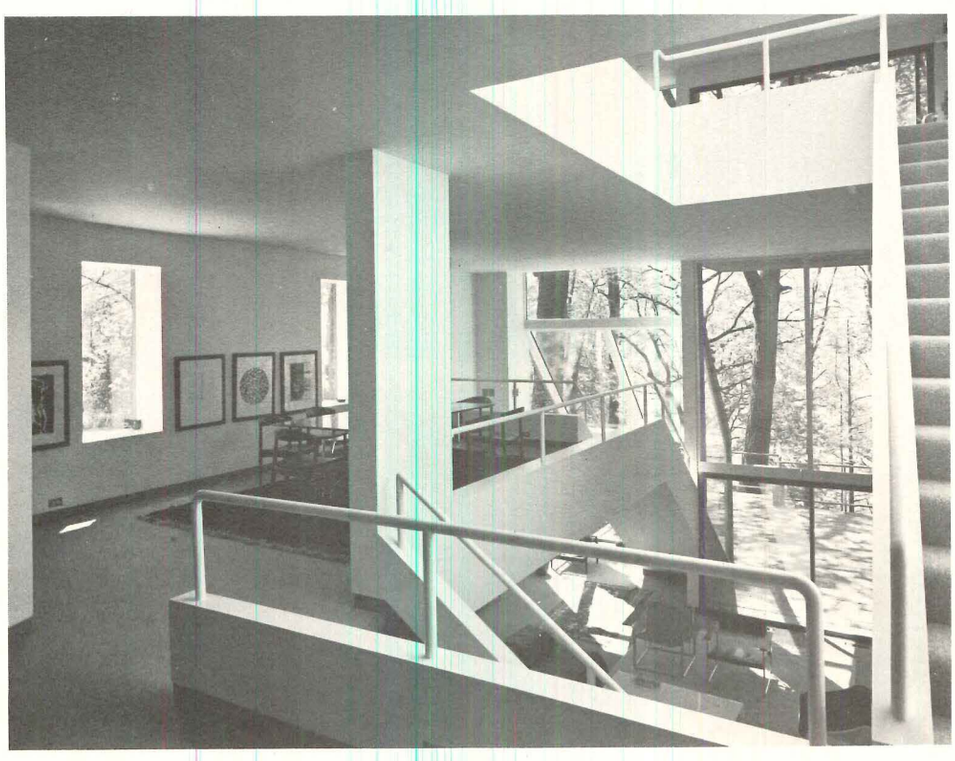
THIRD LEVEL

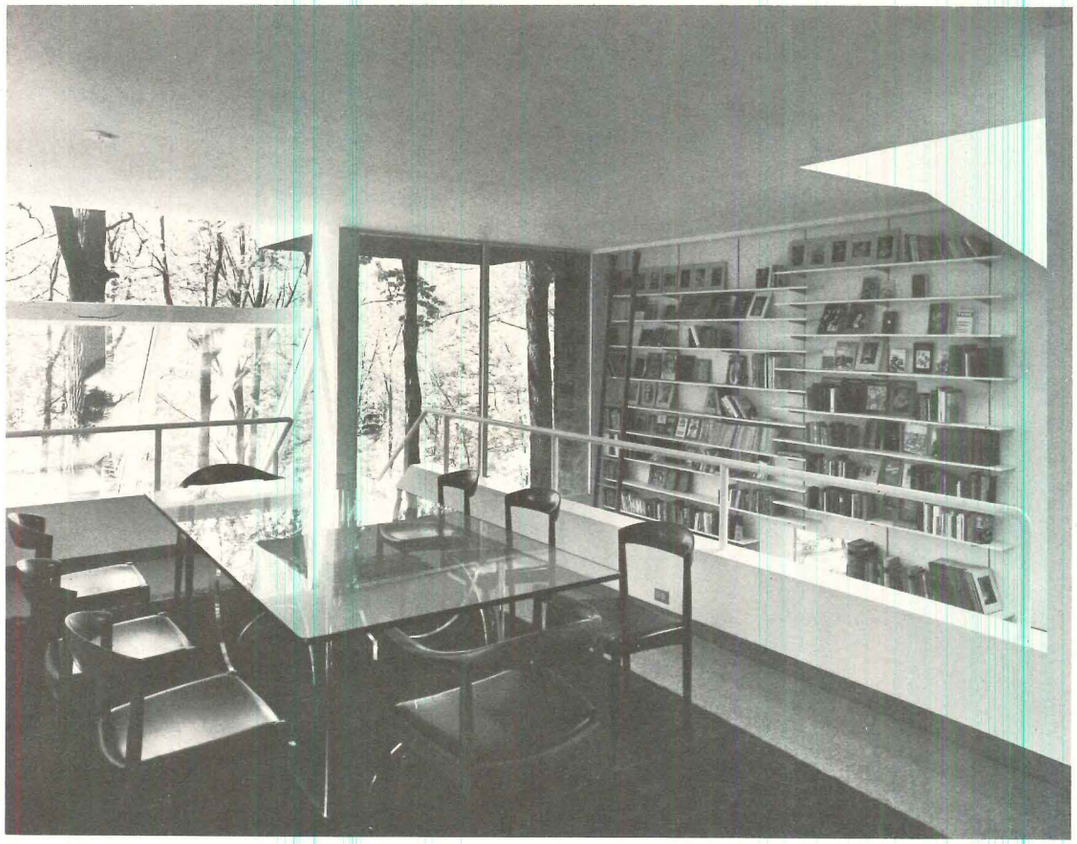


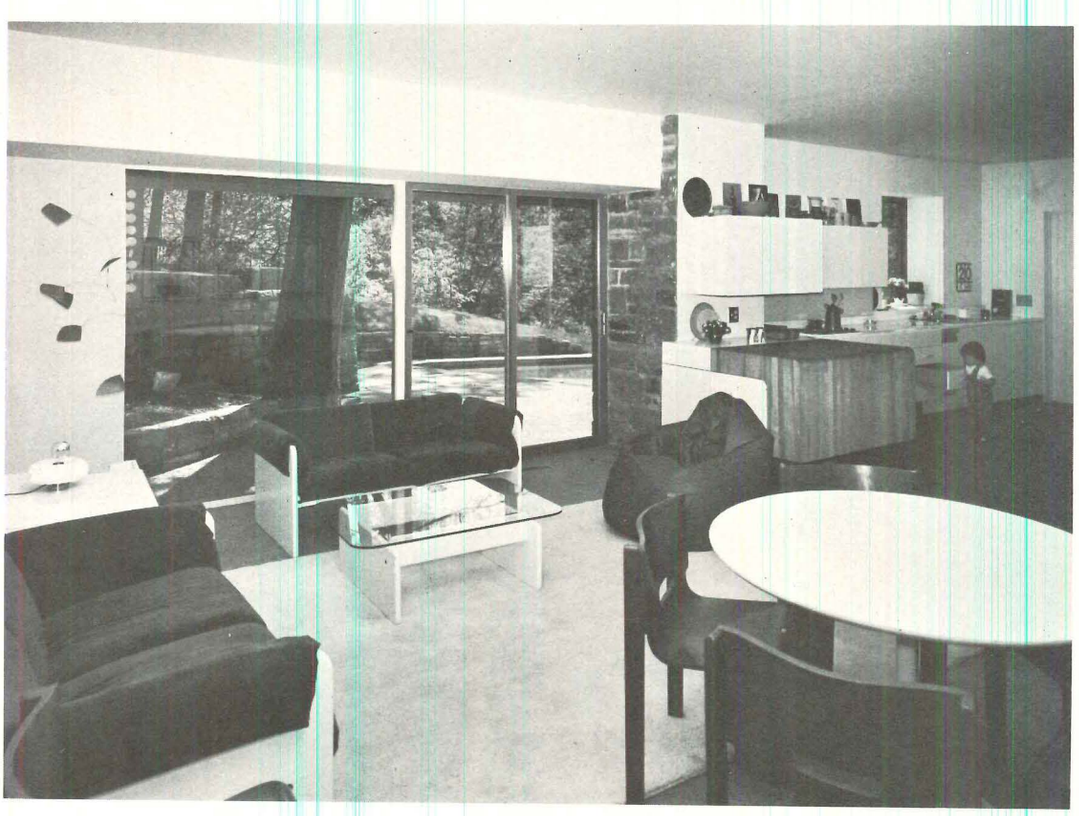
SECOND LEVEL



FIRST LEVEL



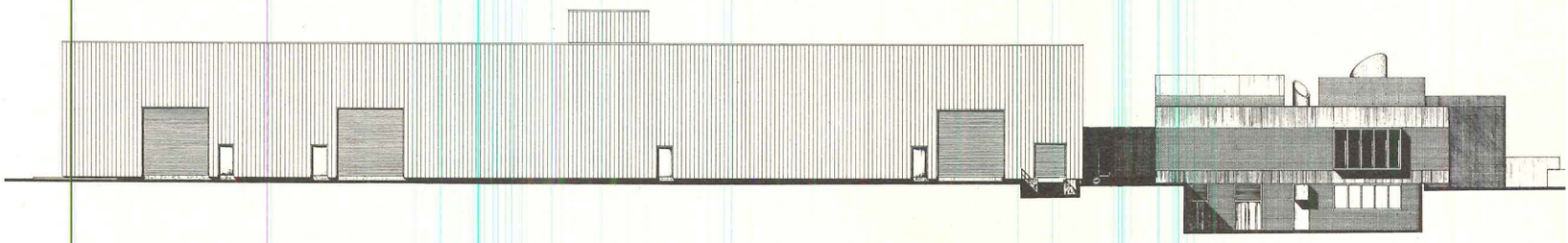




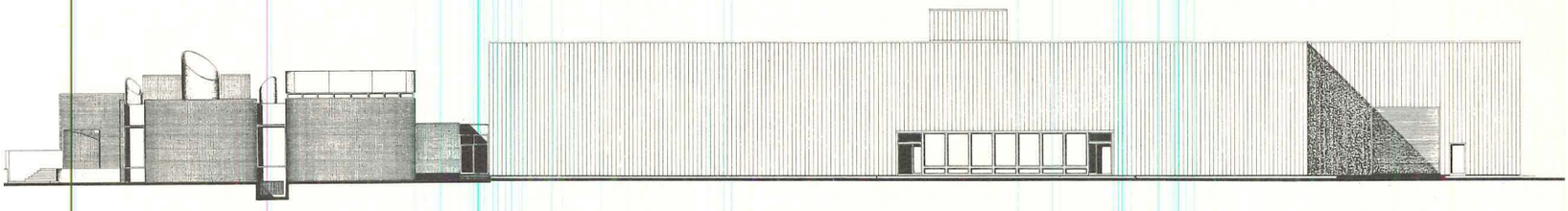
As in many rooms of the house, the formal dining space, shown at top (part of the two-story adult living area), is lined with books to double for study and reading. The family dining space (left) is part of the kitchen, family-living and work space; the glass walls lead to an outdoor terrace and pool. The decks and glass bays that closely link all areas with the outdoors can be seen in the photo below.

Architects: *Craig, Zeidler and Strong*
Owner: *Mr. Eberhard H. Zeidler*
Location: Toronto, Ontario
Designer: *E.H. Zeidler*
Structural Engineer: *Gordon Dowdell*
Mechanical Engineer: *Hardi Craig*
Contractor: *Plorin & Pede*

J.C. Wilson



THREE INDUSTRIAL BUILDINGS

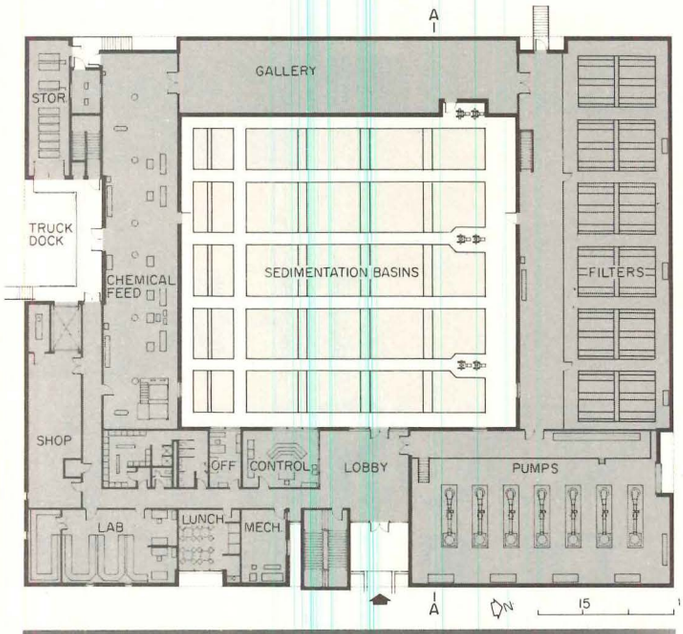


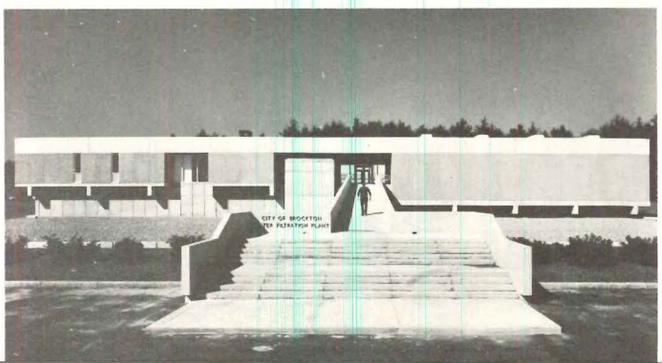
Industrial buildings still provide some of the best opportunities to express those qualities of our culture that modern architecture was invented to express: efficiency, precision, rationality, our desire to understand the structure of things. Industrial buildings were "discovered" by a few architects who were out to change the world in the early 20th century, and industrial facilities were used as examples of the forms those designers liked; forms that were gradually applied to other types of architecture. Unadorned surfaces and spaces dictated mostly by their functions have been appreciated for several decades; now some architects are beginning to doubt that such simplified, mechanistic expressions are appropriate to our culture, or at least to the way people are beginning to *want* to live today. But they still remain appropriate in the field to which they were first applied. With industrial architecture today, we can still believe that efficiency and clarity and economy are the values on which the system should be based, and we can work within the architectural forms and rules invented to express those values. Most industrial buildings make no attempt to express *any* values beyond that of keeping the weather out, of course, except when the owner worries about his building being seen, as well as its being worked in, and hires architects to help him.

The three industrial buildings on the next nine pages—The Brockton Water Filtration Plant, The Monarch Machine Tool Company, and the Pepperell Spring Water Company—are examples of the inventive expression of materials, structure, and function by architects who obviously understand the roots of their visual training, and who helped their clients enormously.

—Robert Jensen

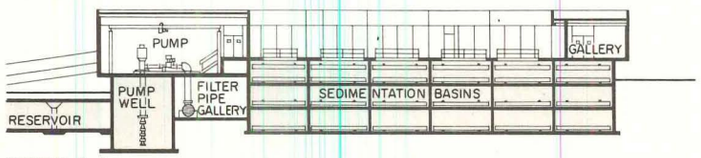
1 BROCKTON WATER: THE INTEGRATION OF PARTS IN A COHERENT WHOLE





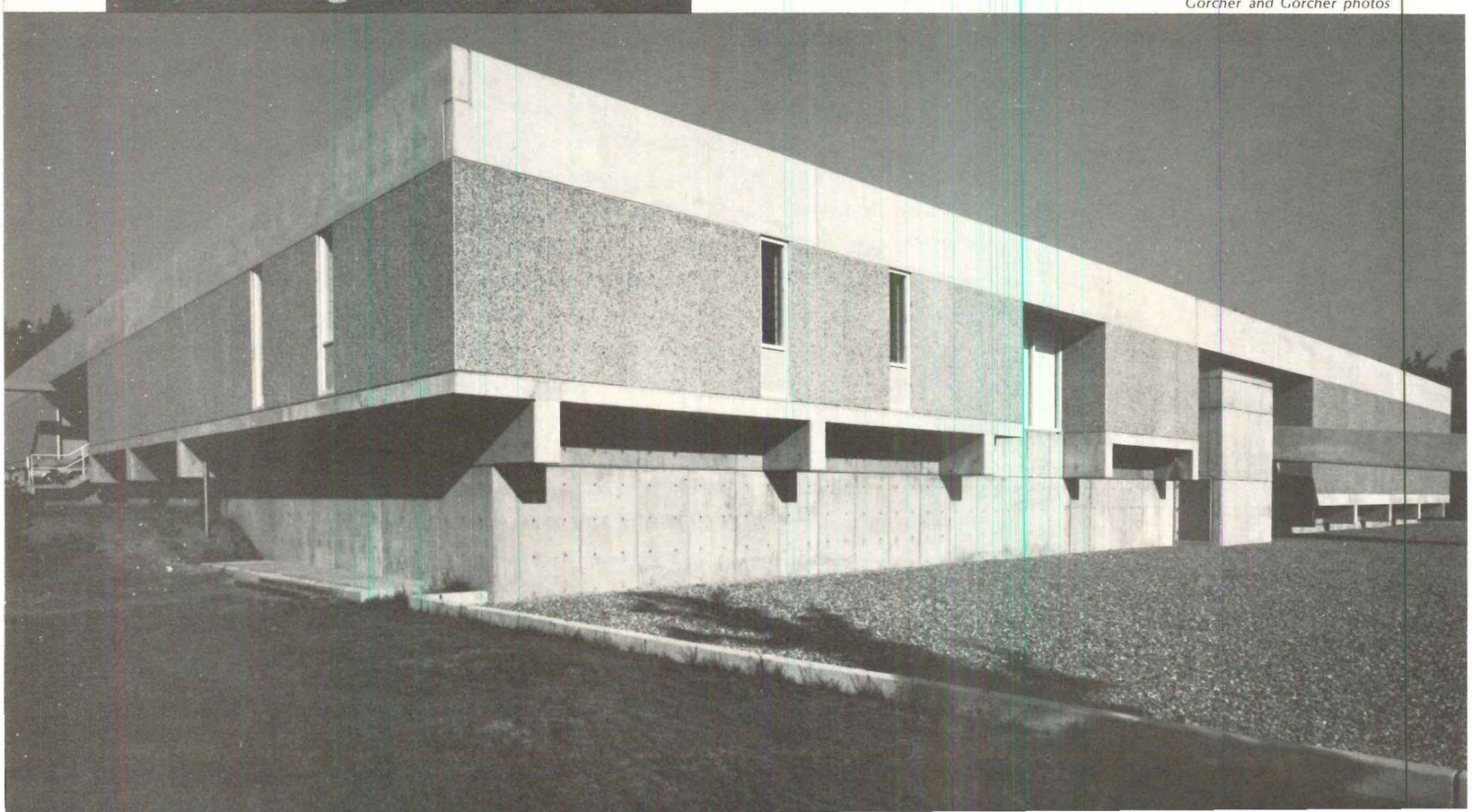
Many water filtration plants have their various elements—filtration beds, pump rooms, reservoirs—spread randomly over their sites, but this one in Brockton, Massachusetts is different. The architects and the sanitary engineers have worked closely with each other to integrate usually scattered parts into a coherent whole so that the plant's heavily wooded site is disrupted as little as possible, and so that the plant may still be expanded in the future. The major portion of the Brockton plant is the "doughnut"-shaped building on these two pages. The spaces for pumps, filters, chemical injection, and offices have been arranged around a large open court housing the sedimentation basins, while the sludge lagoons have been placed away from this core in the trees. Expansion of the core itself will take place through a second "doughnut" structure behind the present one. The facade (below) appears to float over a concrete base and this is appropriate, as the section shows: most of the material underneath the building is water, expressed on the surface by the crushed rock bed in front of the building. The entrance ramp bridges this filtered-water reservoir. People and machinery that need attention occupy the upper portion of the building with its exposed aggregate fascia, while water and piping occupy the lower portion, walled with unpunctured, poured-in-place concrete.

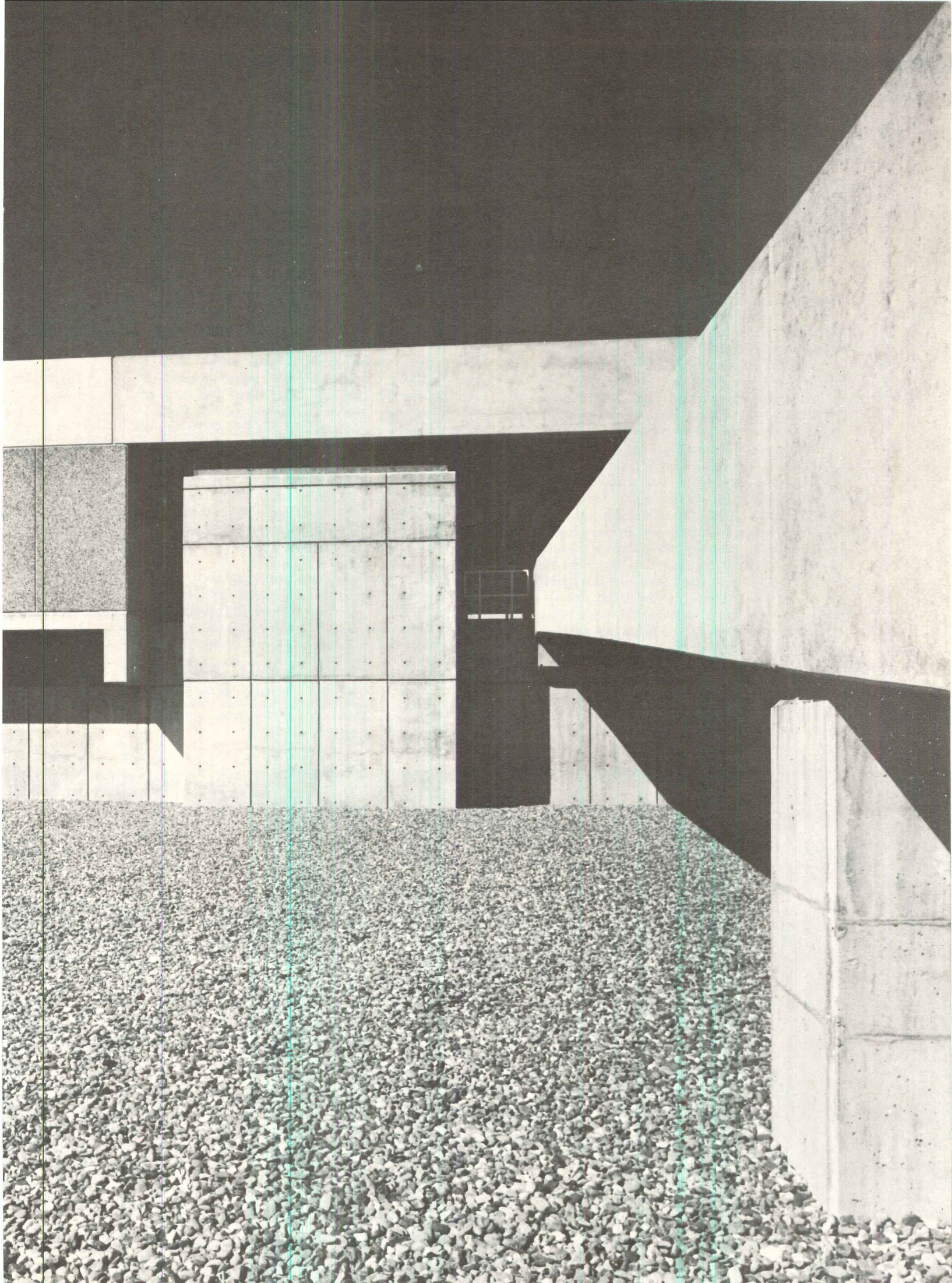
BROCKTON WATER FILTRATION PLANT, Brockton Mass. Architects: *E. Verner Johnson • Robert N. Hotvedt and Associates*. Sanitary, structural, mechanical, and electrical engineers: *Camp, Dresser & McKee;* landscape architects: *Sterling Myrick*



SECTION A-A

Gorcher and Gorcher photos





2 MONARCH TOOL: A FEELING FOR EFFICIENCY, AND MACHINE PRECISION

You sense the controlled proportioning of this industrial plant—its architectural decisiveness—almost immediately, and by the time you have passed it along the highway outside Cortland, New York, or pulled into the drive, you are asking yourself those first questions that good architecture can elicit; . . . who designed *that* . . . what goes on in *there*? It is the Monarch Machine Tool Company manufacturing plant, designed by William Downing Associates of Ithaca, New York, and by arousing your sense of architectural appreciation, the industrial building has done exactly what its owners hoped it would do.

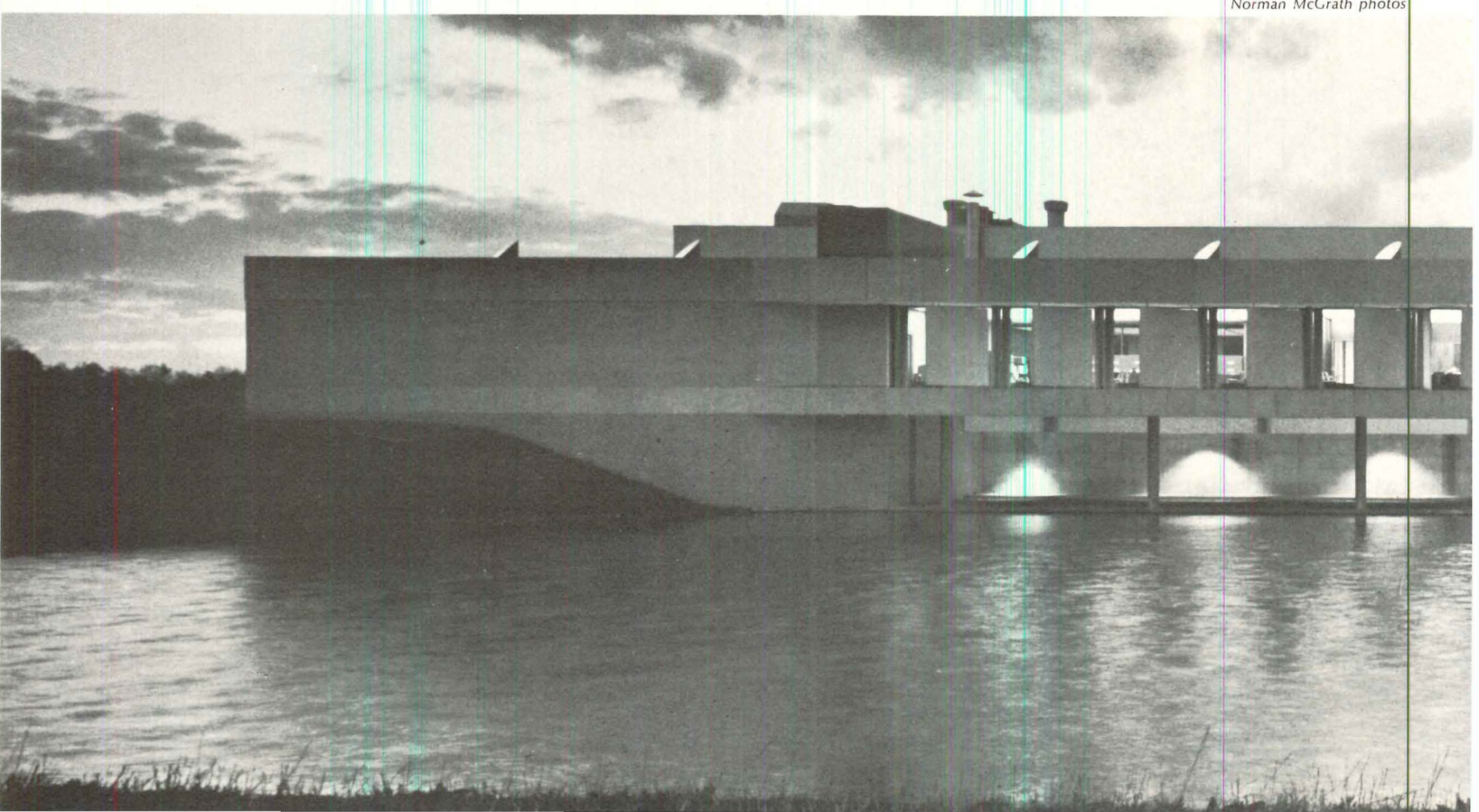
This plant makes machine-fed automatic drill presses to custom specifications. The drill presses are highly sophisticated—e.g., they change their own bits automatically, and are operated by computer-punched paper tape—and they are expensive, often running into six figures. So they are not ordered by telephone; machine tool specialists from other firms come to the Monarch factory to explain their needs, and sometimes work with the Monarch designers for weeks, before finally ordering a drill press. The architecture was planned to represent visually and spatially that same sense of quality, efficiency and skill that Monarch knows it must provide in its machines, and in the processes that produce the machines. The plant is a sales facility as well as a manufacturing facility, and both the client and the architect knew that from the beginning.

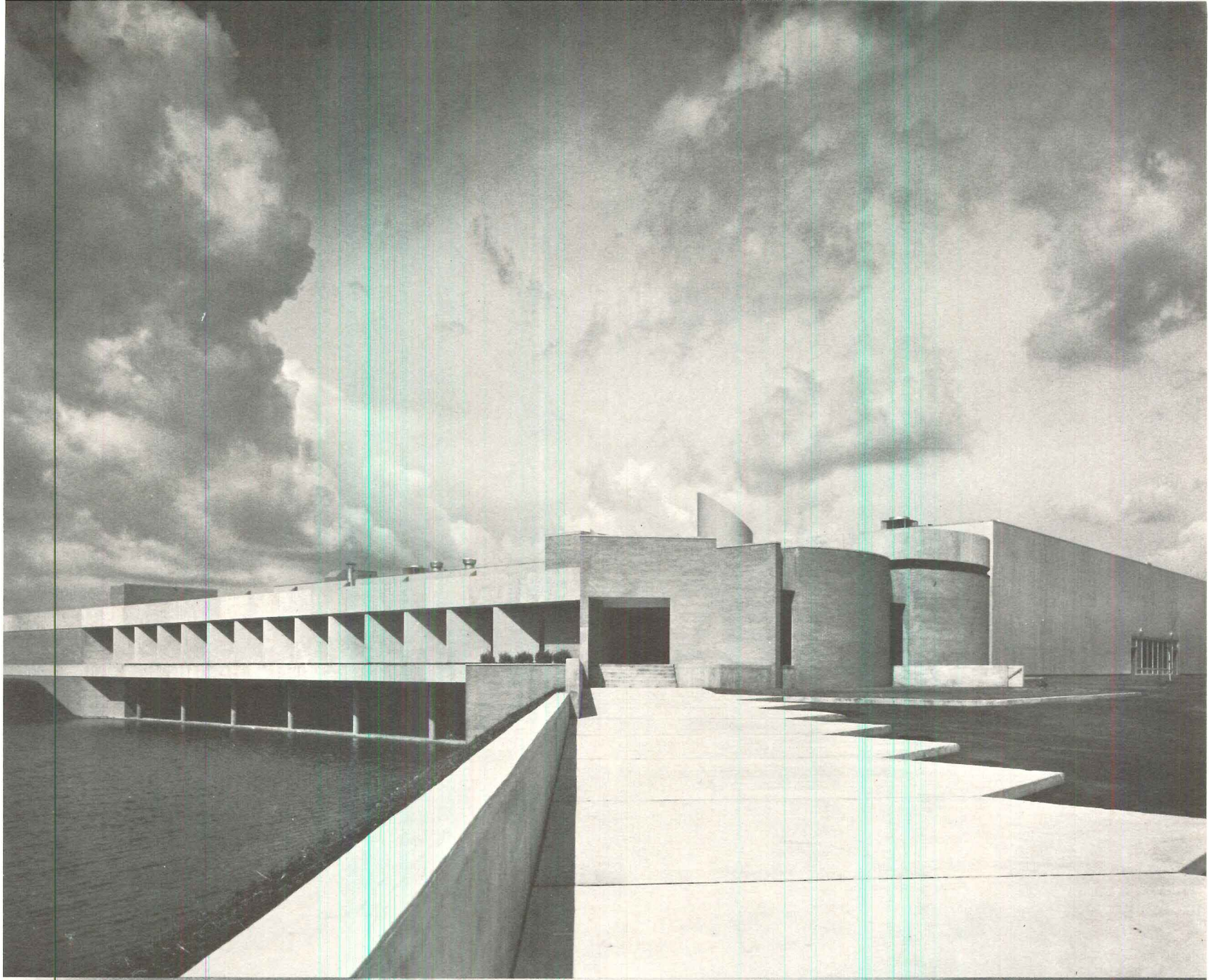
In form the plant is two linked structures, one for manufacturing and the other for engineering and administration. The administrative offices (both photos, this page) are in a long, linear structure sited nearest to the highway, and it is seen from the road across a shallow lake that is the plant's emergency fire protection. The whole plant is laid out on one floor, but the slight slope of the land upward from the highway allows a two-story facade along the administrative wing, with pumps and unexcavated earth at the water level, underneath the offices. Behind the offices are the high-bay factory spaces (see next page), about five times as large as the administrative spaces. Both parts of the plant are steel frame structures supported with exposed wide-flange or pipe columns, but they are expressed differently on the exterior. Where the factory is a simple insulated aluminum panel siding with doors and windows expressed as punched holes, the office portion is a complex mix of masonry infill, concrete fascias and sunscreens, metal columns, skylight hoods, and concrete piloti in water. The offices have a visual affinity to LeCorbusier's architecture that is hard to miss, while the exterior of the factory structure behind is much more like the metal-walled boxes we have come to accept in industrial buildings. But the interior of the factory links it dramatically to the rest of the architecture, as the next page shows. The offices, the factory and the whole site are integrated through a planning grid and a system of proportioning with diminishing modules. The factory uses a plan grid, 50 feet by 25 feet and the office structure uses modules of 25 feet by 12½ feet and 12½ feet by 6¼ feet. The exposed exterior columns of the offices, which jut out of the water, are in line with the column modules of the factory space.

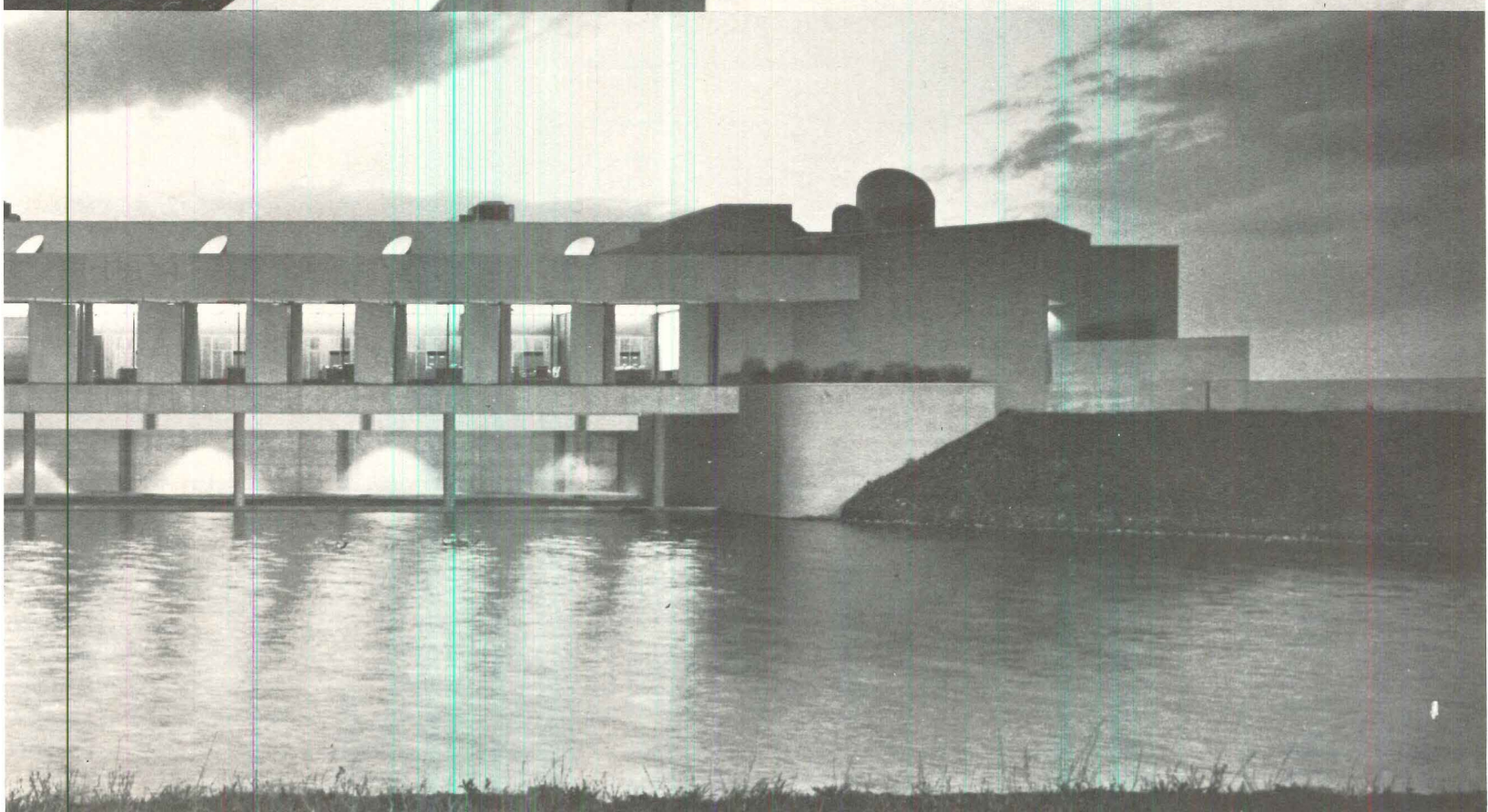
A consistent and controlled rationalism has been employed throughout the whole complex to express in the architecture a machined feeling—close tolerances, parts that fit—that is proper to the plant's function and fulfills its owner's purpose.

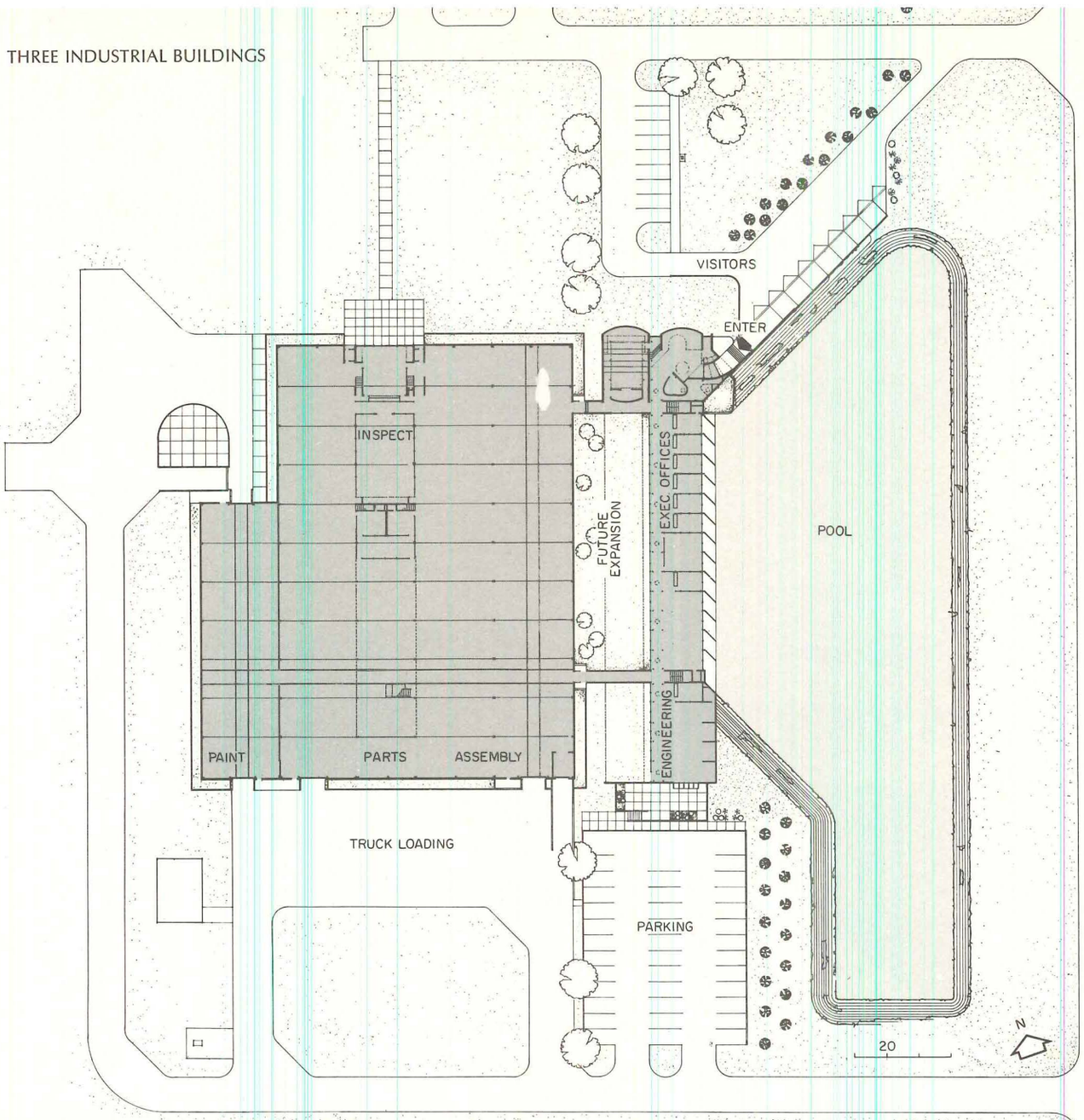
MONARCH MACHINE TOOL COMPANY, Cortland, New York. Architects: *William Downing Associates*—project architect, *William S. Downing, Jr.*: project manager, *Robert R. Ayers*. Mechanical engineers: *Galson and Galson;* structural engineers: *Eckerlin-Klepper-Hahn*

Norman McGrath photos



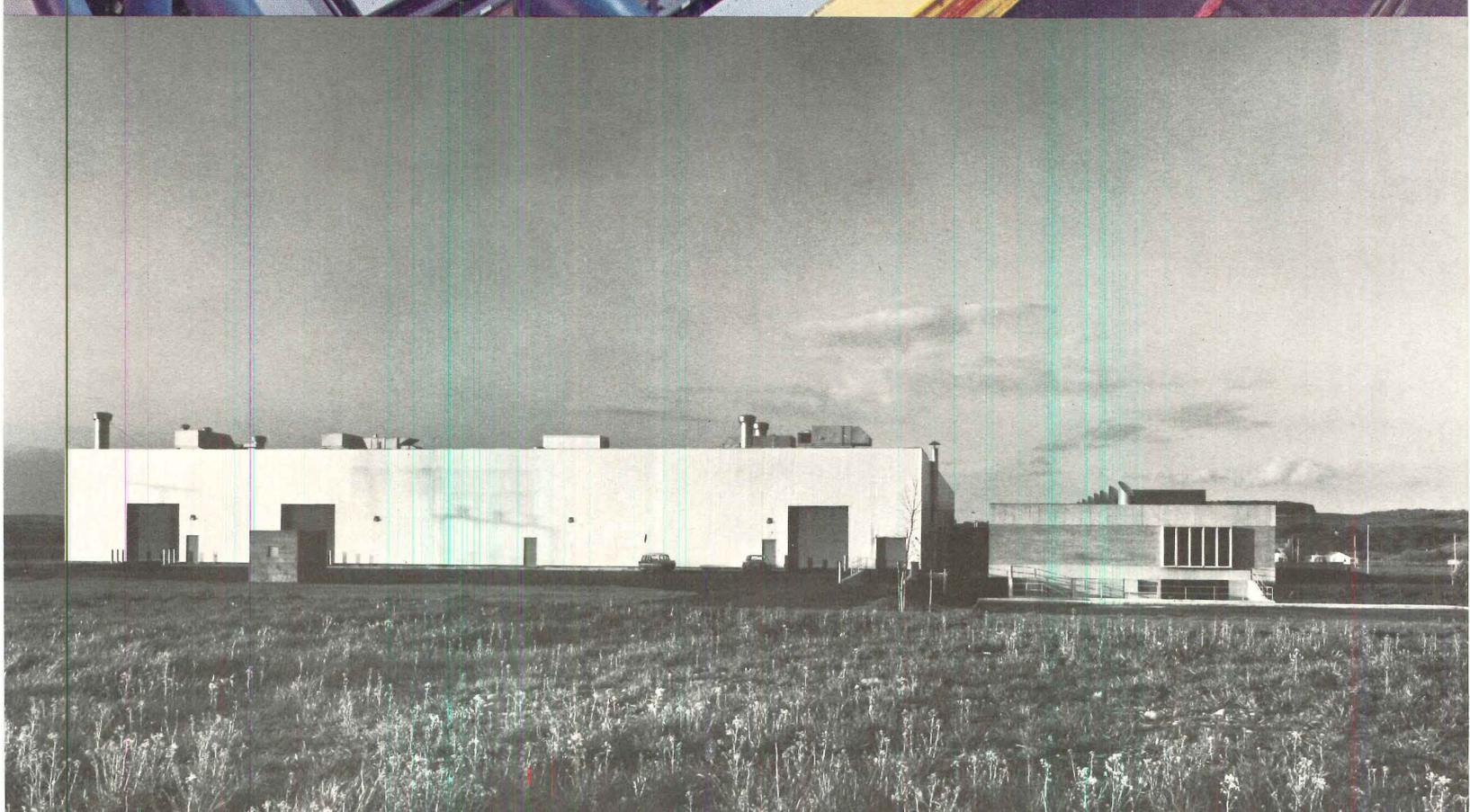




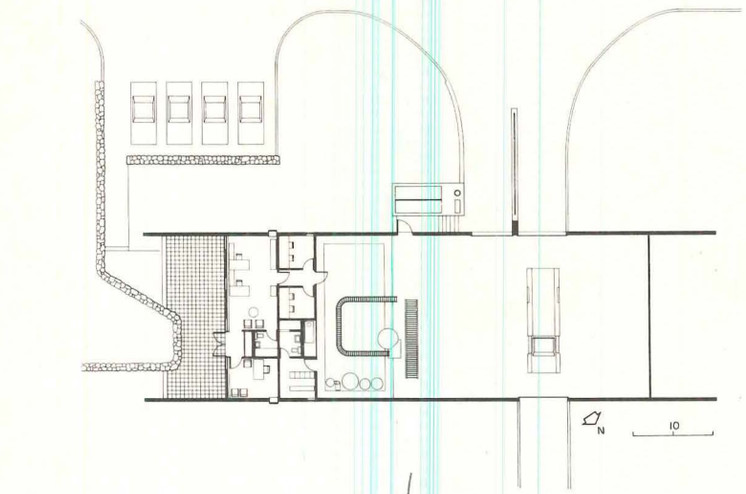


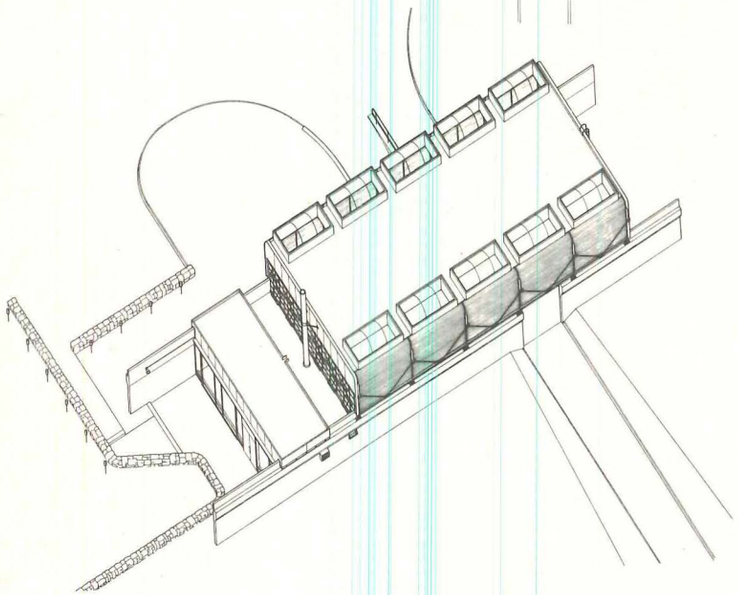
The plan (above) shows the relationship of the plant to the main road and the lake. The lake has been used in place of a large water tower, which is what is usually seen in conjunction with industrial plants. The presence of either one reduces the cost of fire insurance, but a lake was cheaper than a tower would have been, and adds dramatically to the quality of the site. There is a separate entrance to the plant for trucks, which bring rough castings to the plant to be machined. All other parts that go into the drill presses are manufactured within this plant itself. It is not a linear assembly line operation, because no two machines are really alike; parts are manufactured and assembled in parallel.

At left is an office interior, with windows facing into the area allotted for future expansion. Above right, is a photo of the machine shop itself, showing the careful use of paint for color coding and brightness, and showing the immaculate condition in which the plant is maintained.



3 PEPPERELL SPRING: RATIONALITY AND PRAGMATICISM IN A PRECISE DESIGN

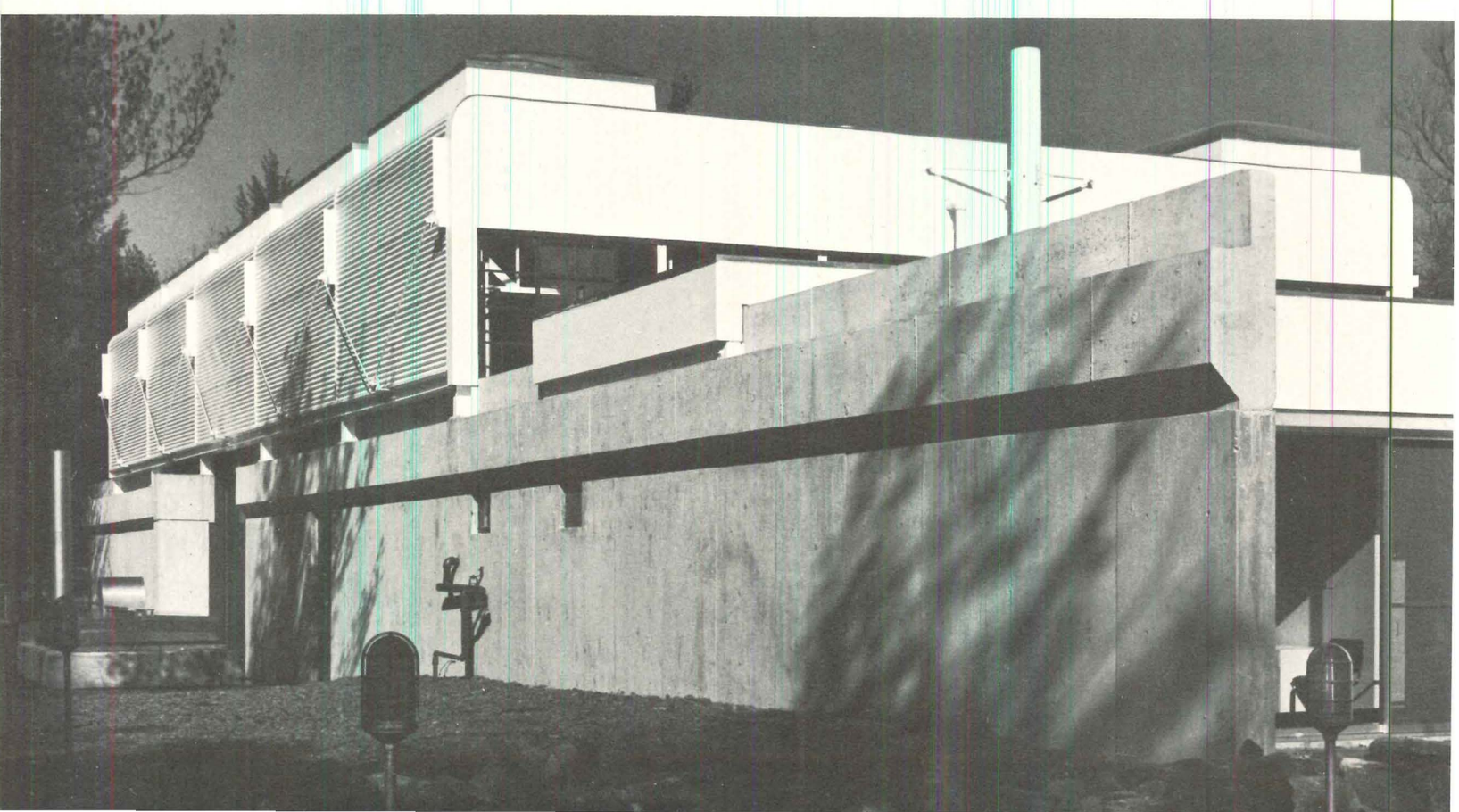




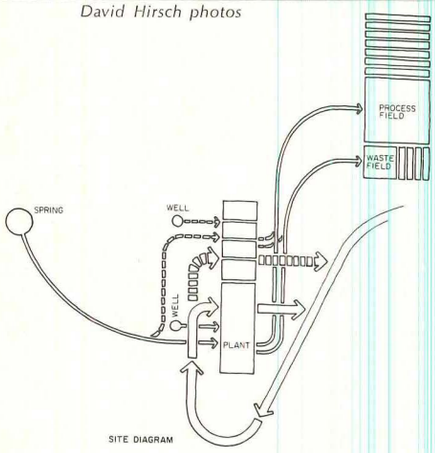
The Pepperrell Spring Water Company bottles spring water for retail sale. It owns 350 acres in northeastern Massachusetts, and it hired the firm of Stifter and Baum to produce an ecological study of the site, to recommend future land-uses and the best location for a new bottling plant, and finally to design the plant itself, shown on these pages.

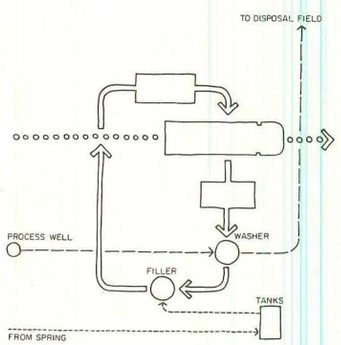
The plant is an essay in the rationality and pragmatism that has guided the whole project. Its functions are organized linearly between two parallel concrete walls that read as extensions of the foundations. They set the pattern for future expansion, and can take continued abuse from fork-lift trucks and heavy pallets. Straddling the walls is a steel superstructure clad in sheet siding, with one roofing system for the high, skylit production space, another for the office and support areas. Because the side walls are used for storage, natural light is gained primarily from the ten rectangular acrylic domes in the roof (isometric left, and color photo, right). By using these domes, the light level inside is nearly the same as outdoors. The metal end walls are designed to be unbolted and re-used when expansion occurs, and the insulated sandwich panels, along with the corrugated aluminum siding, are detailed with a butt-joint at each bay, which permits demounting without damaging adjacent panels. Ventilation occurs through the banks of awning-type windows at both ends of the production space, and the area is heated by gas-fired units suspended from the ceiling, as shown in the photograph, next page. The Pepperell Spring Water Plant has a studied purity that is seldom found in industrial architecture and it is worth close examination.

PEPPERELL SPRING WATER COMPANY, Pepperell, Mass. Architects: *Stifter and Baum, Architects.* Structural engineers: *Structural Design and Research;* mechanical engineers: *Joseph Schneider;* general contractor: *Honkala Construction Co.*

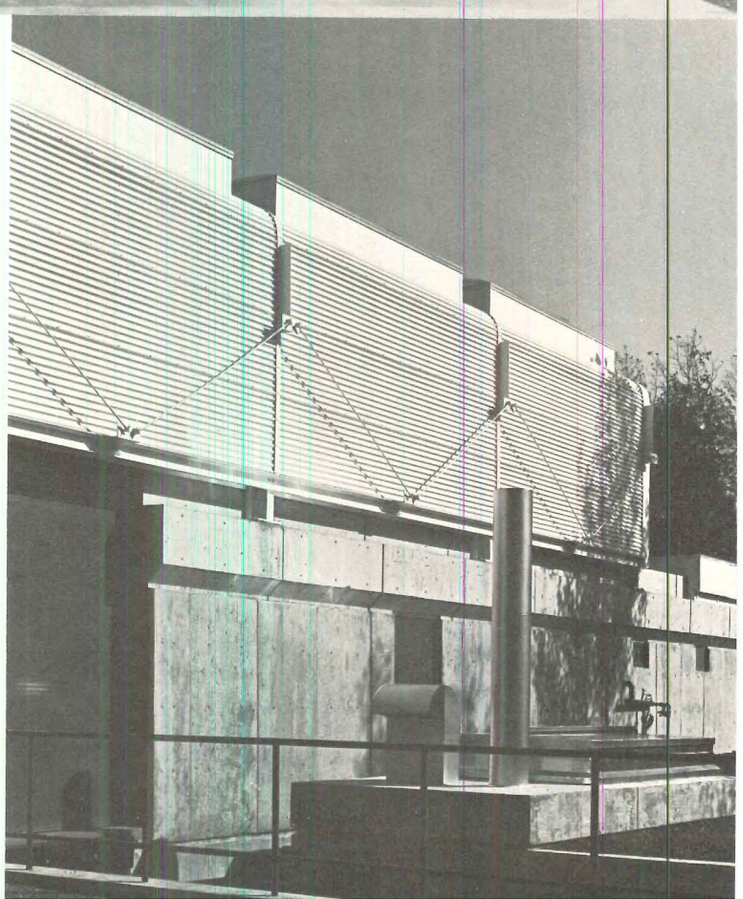


David Hirsch photos



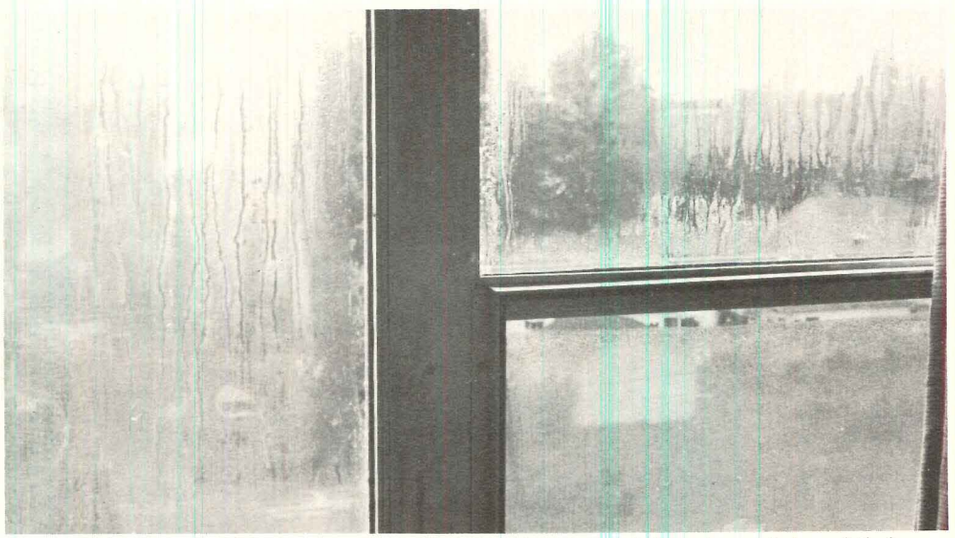


The interior of the main working space (above) and a detail of the exterior siding and concrete wall (right) exhibit the careful articulation of parts and expression of function that pervades the whole building. At left are two sketches showing the processing of water from well to shipping (upper diagram) and the movement of bottles and water within the plant itself prior to shipping by truck (lower diagram). Process diagrams like these were created before any actual building designing took place, and the final ones dictated the building's form. The major objective was that the entire operation—from drawing water to shipping to waste disposal—be protected from contamination in any form.



Needed: a standard for insulating glass

Architects want assurance that insulating glass will not fail because of condensed moisture or contaminants in the air space. Because use of insulating glass has increased greatly, and because new products by new manufacturers are on the market, a commonly-agreed-upon test procedure is urgently needed—applicable to all products and reflecting the wide range of weather conditions they face.



Condensed moisture within the air space—a sure sign that the insulating glass seals have failed.

Groundwork has been laid by industry and consumer groups, in cooperation with Federal agencies, for development of an ASTM standard for the testing of factory-sealed, double-glazed insulating glass units. Presently, there is no universally accepted testing procedure. Some of the larger insulating glass manufacturers have their own in-house "weathering" equipment, as does at least one sealant manufacturer. In Canada the Division of Building Research of the National Research Council developed tests, with industry support, used by the Central Mortgage and Housing Corporation to determine acceptance of insulating glass units, and which, subsequently, were used as the basis for a standard developed by the Canadian Government Specifications Board. The acceptance program has been in force since 1961. In the U.S., a group of independent insulating glass manufacturers formed the Sealed Insulating Glass Manufacturers Association in 1963, and two years later introduced a specification which calls for a series of tests that check the integrity of the seal, subject test units to accelerated weathering conditions (laboratory), and check the ultraviolet radiation resistance of organic seals. A certification program has been initiated.

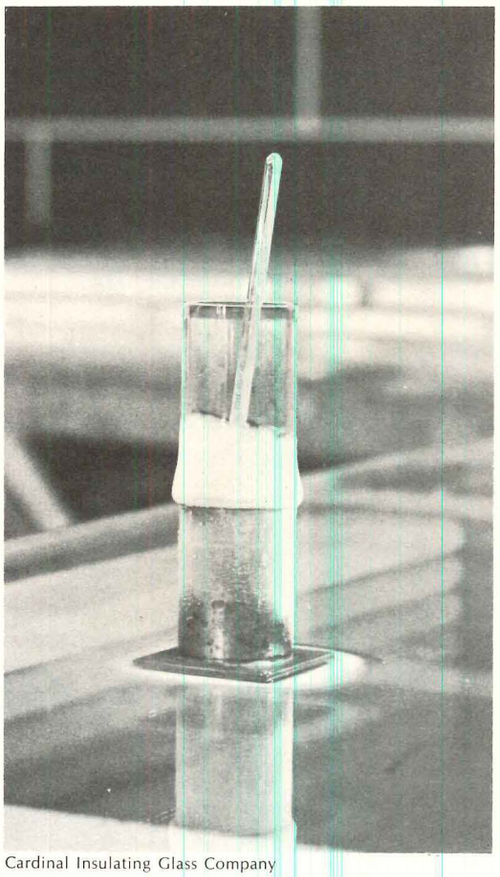
Insulated glass has been sold for 30 years and the last 10 have seen new types emerge

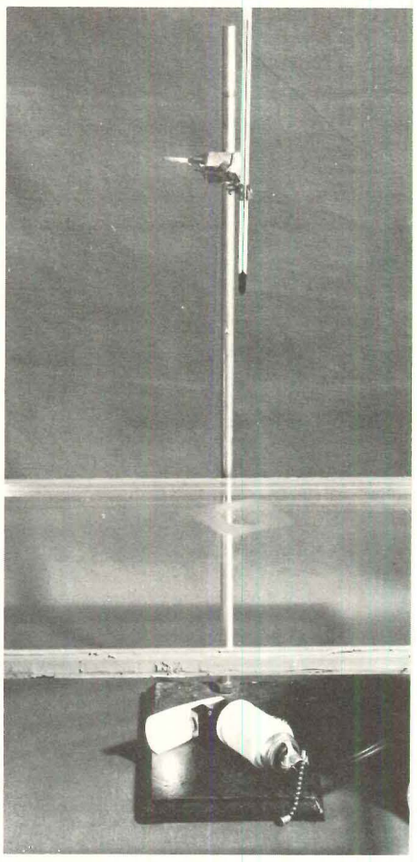
The greatest push for a universally accepted standard has come from various government agencies because of the greatly increasing use of sealed insulating glass units, and also because of the growing number of manufacturers in the field.

Factory-sealed insulating glass units were first made by the large glass manufacturers whose installation recommendations and whose warranties the architect could have confidence in. These companies have had a good record of experience for over 20 years.

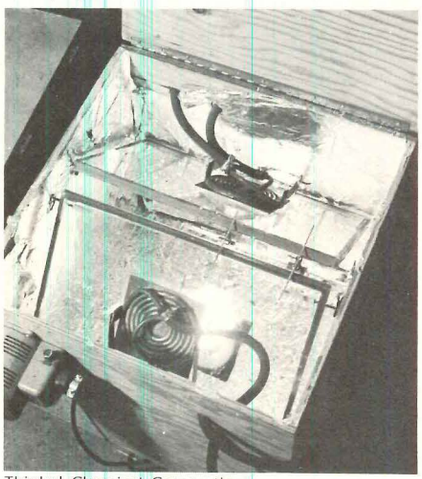
Improved polysulfide technology in recent years made a new type of seal possible which uses fewer materials, is easier to manufacture, and can be less expensive. Because of the basic simplicity of manufacture of these units, inexperienced companies could enter the sealed insulating glass field along with responsible manufacturers. So to protect consumers and to monitor the industry for its own good,

The air space of sealed insulating glass units has to be dry and free from contaminants. Two tests check whether sample units pass or fail.

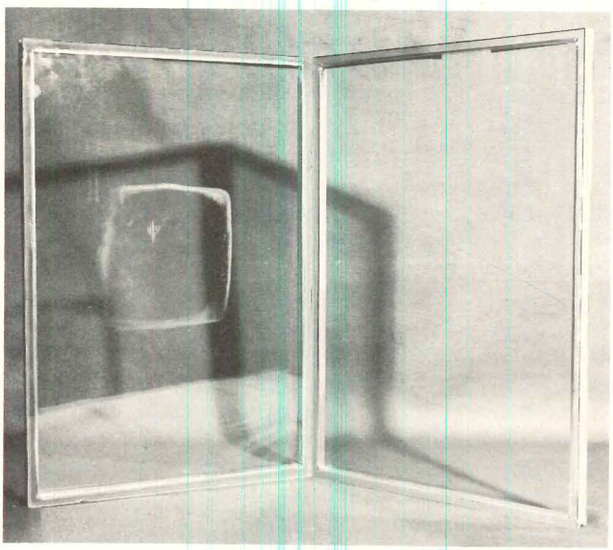




Cardinal Insulating Glass Company



Thiokol Chemical Corporation



The most frequent cause of failure is condensed moisture within the air space. After units have been subjected to accelerated weathering tests, the dewpoint of the air is easily checked as shown above. The apparatus is a glass-to-copper seal cylinder. Temperature is lowered by dropping dry ice into the cylinder containing alcohol or acetone. Cylinder is periodically removed, frost is wiped away, and the test unit, illuminated from below, is checked for condensation. Existing tests generally call for a maximum dewpoint of —30 F or —40 F; or a maximum rise of 30 F from an original dewpoint of —60 F.

Another possible cause of failure is "fogging." This is caused by volatiles, usually from too much diluent in the sealant, being driven off by heat and later condensing on the glass, resulting in the condition shown in the left-hand light opposite. The test apparatus (Canadian version) in use consists of heat supplied by ultraviolet lamps on one side of the sample units, and a copper cooling coil on the other.

SIGMA was formed—the basic purpose being to upgrade and maintain the quality of polysulfide-seal units.

The first types of sealed insulating glass units—those made by the large glass manufacturers—were of three types: 1) glass-to-metal edge in which the inner glass surfaces at the periphery are metalized and tinned so that a lead alloy separator strip can be soldered to the glass (this type has been made for over 30 years); 2) glass-edge seal, in which two lights of glass are fused together at the edge (this seal has been made since 1950); 3) spacer strips, polyisobutylene mastic seal and metal edge for supporting the glass (this type was introduced in 1946, but for 5-10 years the seal has been butyl rubber). With the first two types, the air space between lights is purged with dry air through a small hole in the seal which is sealed after this operation. The third type utilizes a desiccant which is relied upon to dry the air space after assembly.

The polysulfide seal type of units has been marketed for 10 years and more. It utilizes metal spacers and a two-part polysulfide sealant which, first, provides an edge seal, and, secondly, holds the two lights of glass together. Desiccant within the spacer absorbs moisture from the air space.

While polysulfide-sealed units are in some respects the easiest to manufacture, the right materials have to be used, and the units must be assembled under the proper conditions. For example, the polysulfide sealant must be properly formulated; also it must be properly mixed and in the right proportions. An ultraviolet-radiation-resistant polysulfide formulation must be used; otherwise possible loss of adhesion to the glass could occur. Further, the polysulfide must be of a type impermeable to water vapor diffusion. If the product is cheapened by the addition of low-cost diluents, these materials may volatilize later and cause fogging on the inner surfaces of the glass. The glass must be almost surgically clean. The desiccant needs to be "dry." The sealant must be applied evenly. Mismatch of expansion coefficients of spacers and glass should be avoided. Because the manufacturer of insulating glass units cannot control the types of glazing materials used in the field, an oil-resistant formulation of polysulfide sealant should be used. Problem is that oil-based glazing compounds harm ordinary polysulfide.

Once-dry insulating units should remain dry the length of their expected service life. An imperfect seal allows moist air or water to enter the air space when there is a difference in pressure between the air space and the ambient air. These pressures are induced by temperature or barometric pressure changes, or by wind. Further, if the seal is permeable, water vapor may diffuse through the seal. In either case, the moisture may condense, obscuring vision. Beyond this, over a long period condensa-

tion may leave a permanent cloudy film on the glass.

But moisture condensation is of even further significance with respect to the new reflective glasses. It can react with the reflective surface which may change the appearance as well as the effectiveness of the reflective film.

What sort of tests are needed? Obviously field tests are too slow to check out new sealing systems and materials and to monitor production for certification programs. Accelerated testing is needed, but these test methods must be correlated with field performance before they can be used with confidence.

Basically, accelerated tests should reproduce the harmful effects of weather

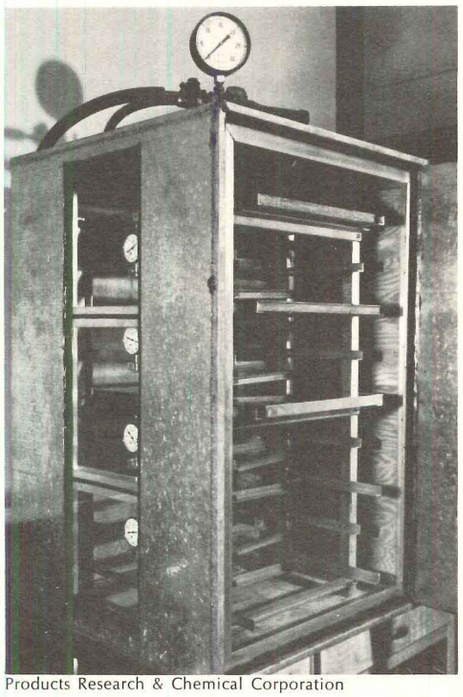
What do the accelerated tests need to check for? The tests that are selected and/or developed must subject insulating glass units to conditions adequately simulating the stressing conditions that the units must withstand during their service life. Stresses leading to seal failures are imposed by pressure differences between the air space and surrounding air; by differential expansion or contraction of components caused by different thermal expansion of materials and by differential temperatures; by wind pressures; and by forces that may develop as a result of faulty installation.

It is recognized, however, that the greatest "stress" on the seal comes from vapor pressure difference between outdoors and the air space. Few failures, for example, have occurred in the dry Southwest.

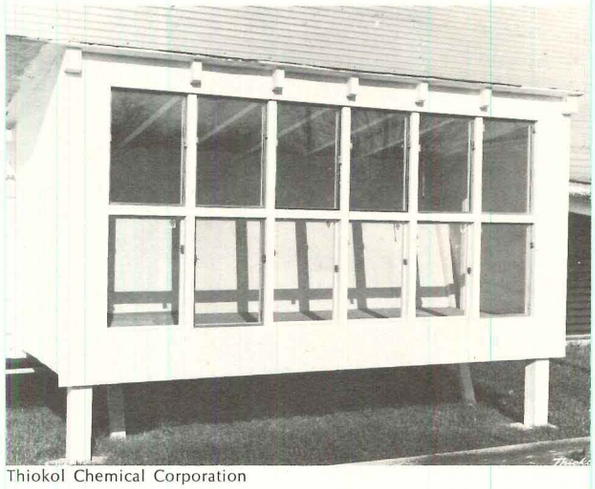
The measure of whether an insulating glass unit is effective is the dewpoint of the air in the air space. This is easily checked, generally by means of a glass-to-copper seal cylinder containing alcohol or acetone to which dry ice is added. With a thermometer, the observer checks the temperature at which condensation first appears on the inside of the glass.

To check the efficacy of insulating glass seals, accelerated laboratory tests use techniques of various sorts to simulate the effects of weather. All tests involve temperature cycling. Some have water-spray cycles; some have high-humidity cycles; some have continuous high humidity. Other tests have been devised to check the ability of organic sealants to withstand exposure to ultraviolet radiation, either with or without water being present. Still another type of test is used to check whether there are volatiles present in the sealant that might cause fogging of the insulating glass unit. The Norwegian Building Research Institute is the only organization to use simulated wind gusts. Originally the test units were subjected only to pressure pulsations, air temperature cycling, and to ultraviolet radiation. But now the Scandinavian specification calls for temperature and temperature cycling, ultraviolet exposure, and wetting and drying of

To make testing practical, accelerated procedures have to be used, but for them to be meaningful, there must be sufficient field correlation.

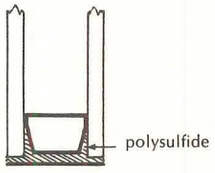


Products Research & Chemical Corporation

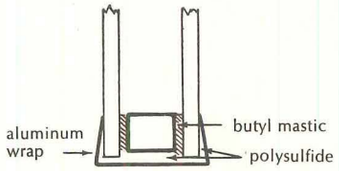


Thiokol Chemical Corporation

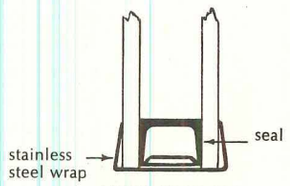
One of the first manufacturers of insulated units found out early that time and cost could be saved by rapid screening of the units via dewpoint measurements and pressure differential tests of seal tightness. The test cabinet, top, left, is used by a sealant manufacturer to test seal tightness. The apparatus, at top, right, is for accelerated weather cycling. It is the apparatus called for in the SIGMA specification, and is similar to the Canadian unit, except that ultraviolet lamps have been added. A field test arrangement is also shown above.



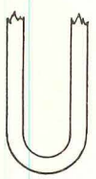
POLYSULFIDE SEAL



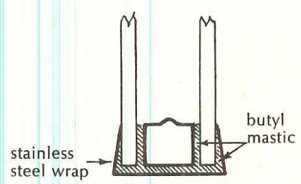
POLYSULFIDE BUTYL SEAL



METAL EDGE SEAL



GLASS EDGE SEAL



MASTIC SEAL

The five types of factory-sealed insulating glass units made in the U. S. are shown above and at left. Original ones are the three above. In the last 10 years, with the advent of improved formulations of polysulfide, this seal has found increasing application. Another type is the combination butyl mastic, polysulfide seal.

the bottom edges of test units via a tray filled with water, once a day.

An ASTM standard must be technically correct and practical at the same time

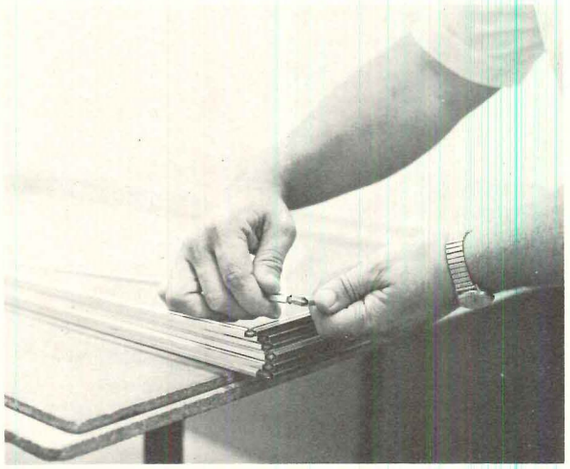
What are the requirements that a commonly-agreed-upon test procedure must meet? First, the tests must subject insulating glass units to all the significant deterioration-causing conditions that are encountered in the field. Secondly, these tests must correlate with field experience so that predictable durability can be deduced from accelerated laboratory tests. Question is: how many cycles of accelerated laboratory weathering tests are necessary? Considerable field test information has been collected by various manufacturers, but the view held by some independent research people is that the information is still too limited to provide quantitative correlations that relate to all the different products and possible field conditions.

Here is where ASTM's aegis could serve an important function. Under independent auspices, where competitive factors are absent, manufacturers would be most likely to let their field test data be used. Thirdly, the tests must be economical to run within a reasonable period of time. Many people in the industry feel that present tests are too costly and too time-consuming. Part of this is attributable to the small number of test units that present apparatus can handle. Fourthly, the test procedures and apparatus must be such that different test laboratories can achieve comparable results. Further, it is very important that the significance of the tests in the standard that is to be promulgated be understandable to the specifier—so that he knows what the tests are for and what they do and do not cover.

To cope with these problems, Committee E-6 (Building Constructions) proposed a six-step program, the first step of which is to be completed by next month: 1) conduct round-robin testing at existing facilities; accumulate and record field experience of these facilities; 2) review results in light of field experience; 3) draft improved test method/ performance standard based upon results of round-robin testing and field experience; 4) design, construct and use new prototype apparatus; 5) compare results of improved prototype apparatus and procedures with round-robin tests; 6) revise test method and prepare draft of a proposed ASTM standard.

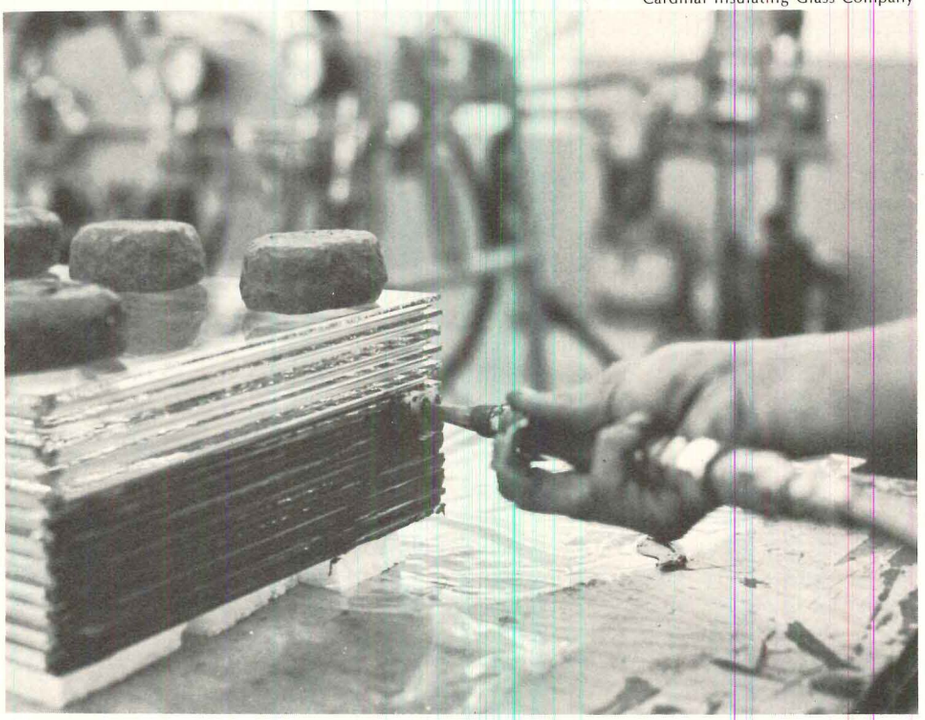
Plans are for the National Bureau of Standards to design and build the improved test apparatus, and to support this activity (cost of the equipment and salary of an NBS research associate) a fund-raising campaign has been initiated among manufacturers of insulating glass and of insulating glass components and from regulatory agencies. Original target date for the draft of a new test method and for a proposed ASTM standard was set for 1973.

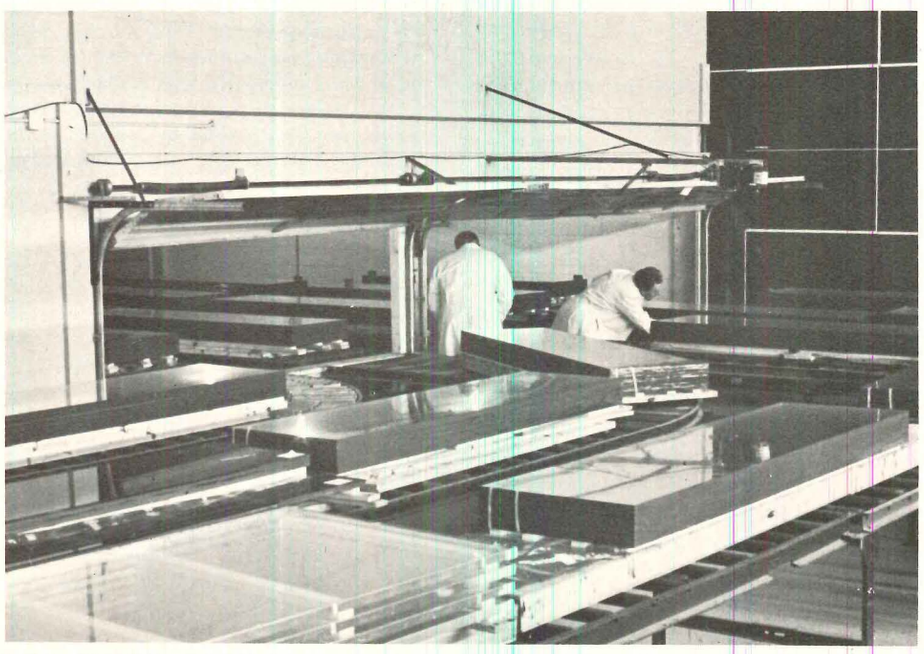
Essential ingredients for a quality product: properly selected, quality materials; careful assembly in a clean, humidity-controlled environment.

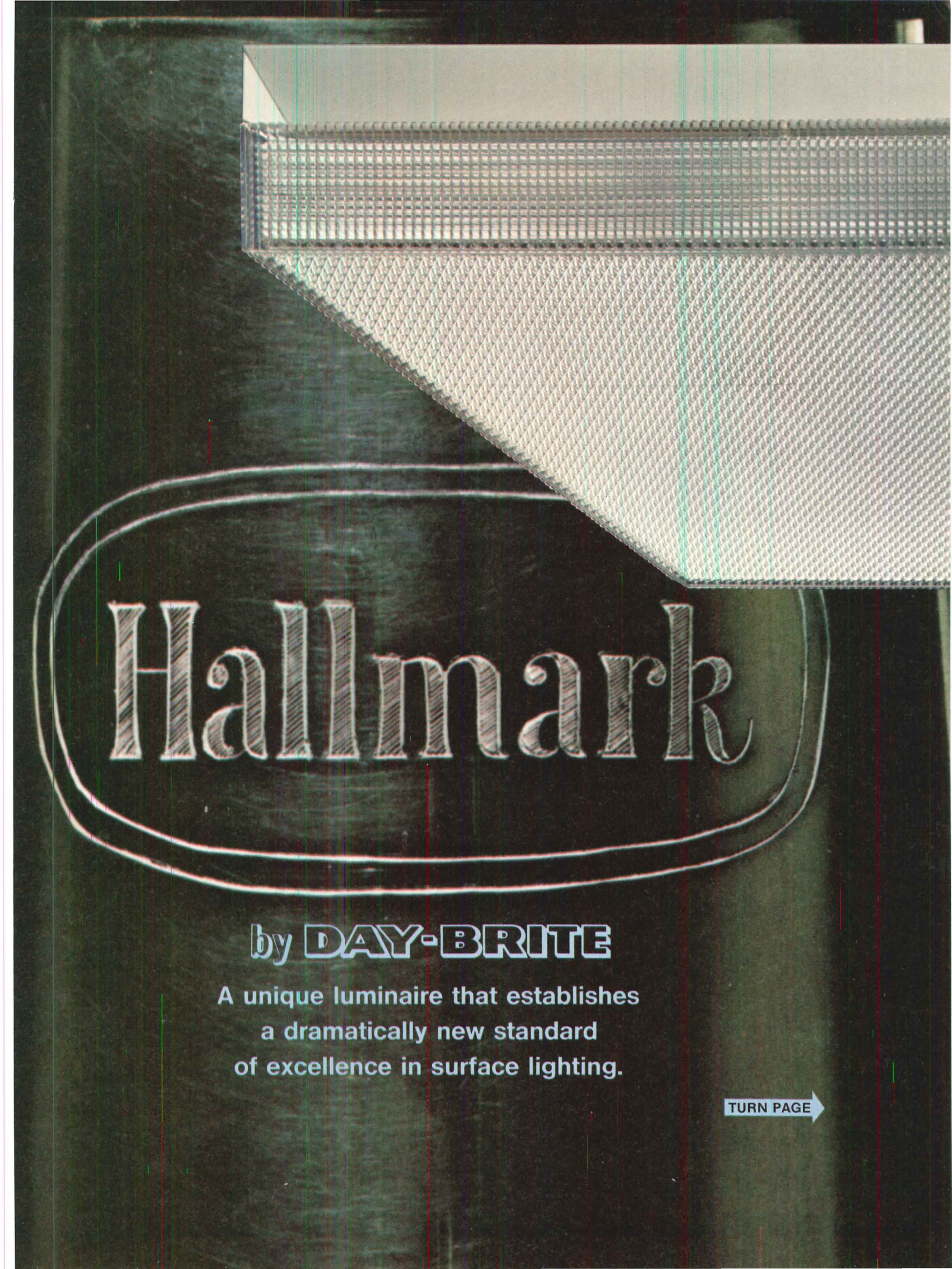


With these organic-seal units, the components consist of two lights of thoroughly-cleaned glass, metal separators, and the organic sealant. Separators are being assembled in the photo, left. Shown below is application of the sealant by means of an air-powered gun. Weights on top press glass and separators together. Shown at bottom is heat-curing step.

Cardinal Insulating Glass Company





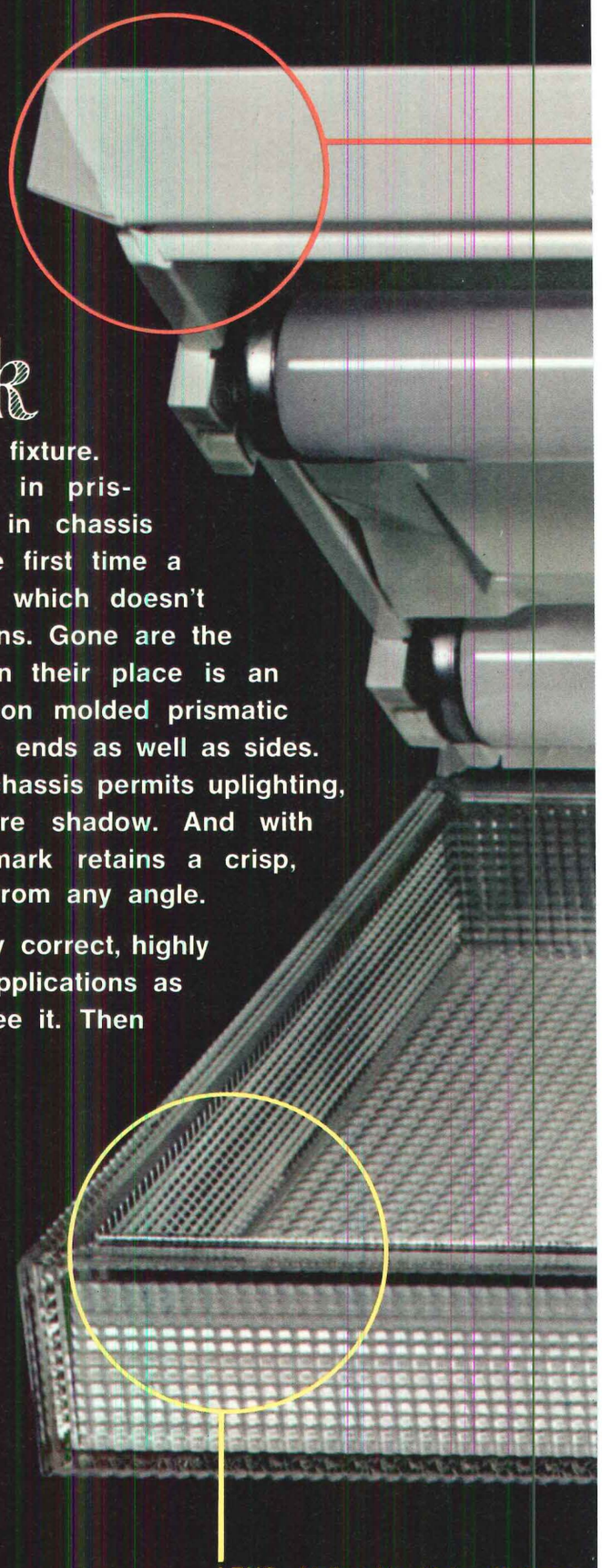

Hallmark
by DAY-BRITE
A unique luminaire that establishes
a dramatically new standard
of excellence in surface lighting.
TURN PAGE

Hallmark

. . . . . is more than a new fixture. It is a creative concept in prismatic lens processing . . . in chassis design. It achieves for the first time a nonfixture, "in limbo" look which doesn't detract from interior designs. Gone are the traditional opaque ends. In their place is an exclusive one-piece injection molded prismatic lens that provides luminous ends as well as sides. A splay around the entire chassis permits uplighting, completely dispelling fixture shadow. And with unique corner "fins", Hallmark retains a crisp, square look when viewed from any angle.

HALLMARK . . . architecturally correct, highly efficient . . . with as many applications as your mind can conjure. See it. Then draw your conclusions.

DAY-BRITE®

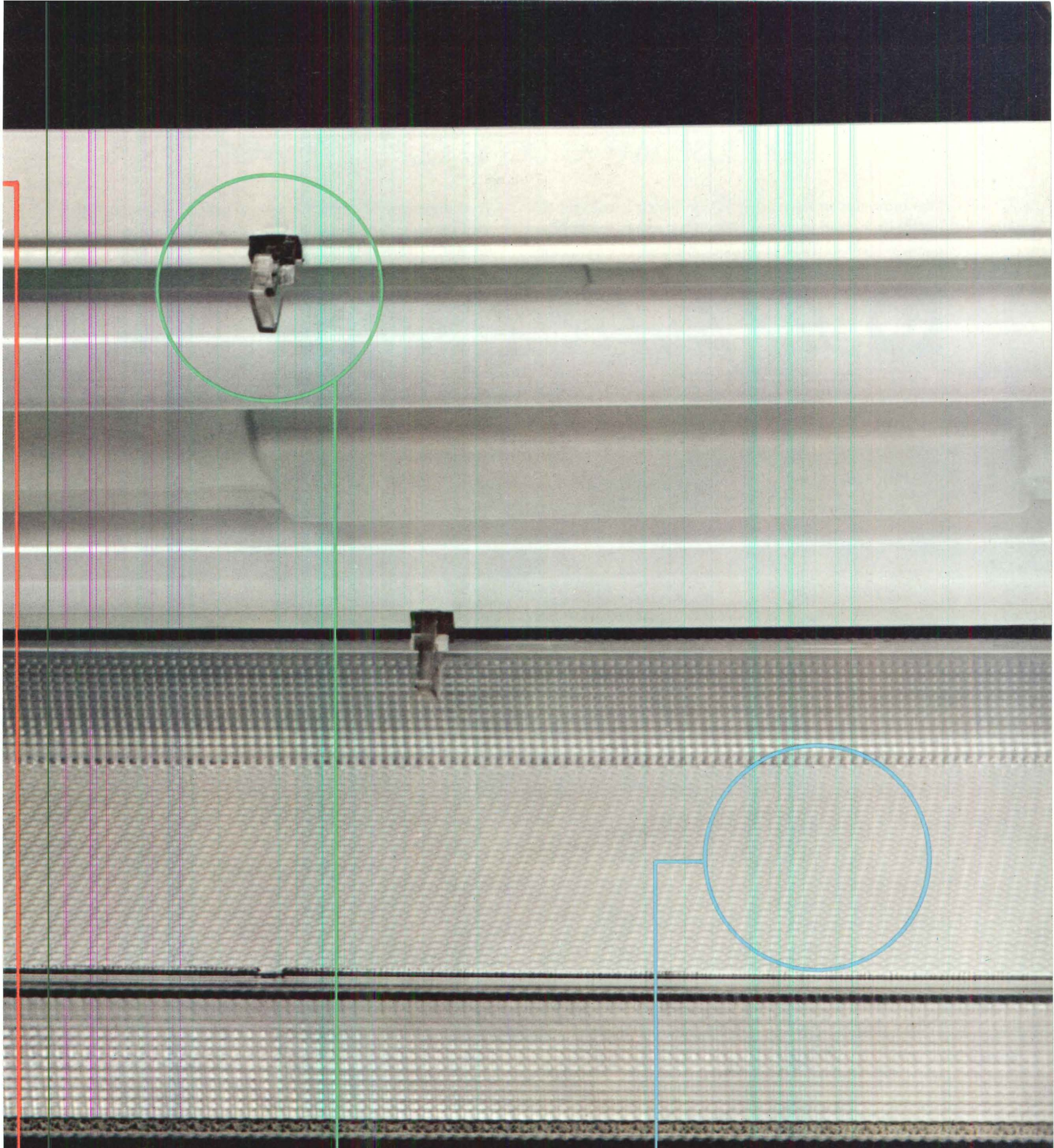


LENS—Hallmark's high efficiency low brightness prismatic lens is the first to have a return edge around its entire periphery. Of virgin Acrylic, it is injection molded in one piece by a totally new process . . . transmits light from all four sides.

DAY-BRITE LIGHTING DIVISION
EMERSON ELECTRIC CO.
5411 BULWER
ST. LOUIS, MISSOURI 63147

EMERSON

For more data, circle 52 on inquiry card



CHASSIS—Hallmark eliminates the traditional "pocket" to achieve uplighting. Instead, entire chassis fits flush-to-ceiling, angles inward to permit uplighting around entire fixture. Unique corner "fins" offset splay to retain a clean, vertical corner line when viewed from any angle.

LATCHES—Enclosure is hinged on both sides for easy access in cleaning and servicing, and remains captive when in fully open position. Positive-lock, invisible mechanical latches will not let lens get out of alignment.

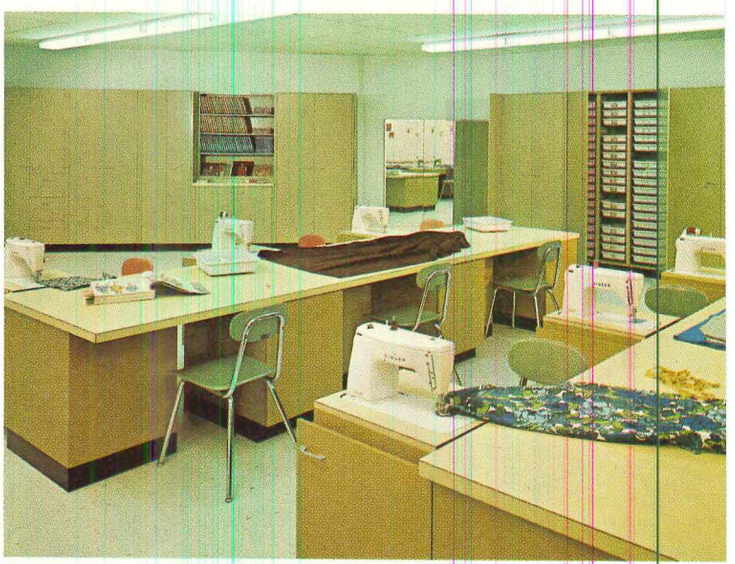
SPECS—Hallmark is a slim 3" deep, 12" wide in the 2-lamp model... 16½" wide in the 4-lamp. It comes in 4' and 8' lengths, for use singly or in tandem, surface or suspended. Metal splay is available in baked white enamel finish, or matte black.

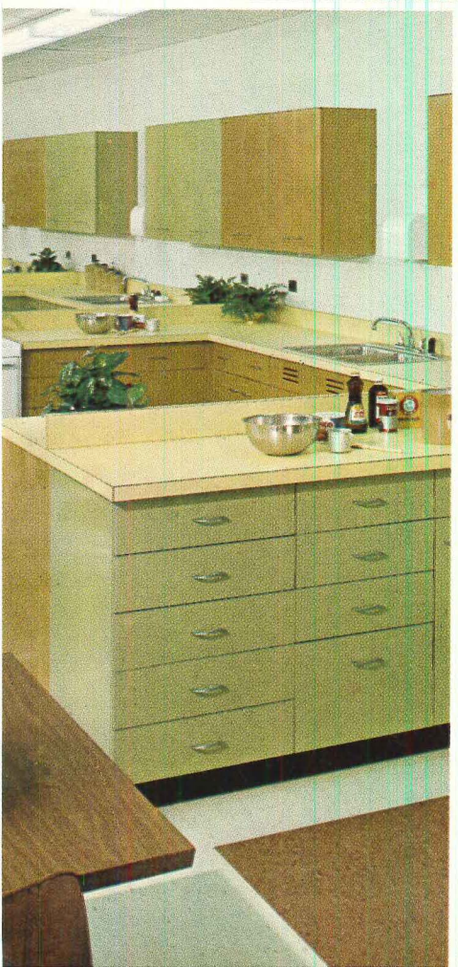
We build better classroom casework because we've done our homework.

We know, for instance, the way in which a colorful and neatly-organized room can stimulate students and teachers alike. We know, too, how important a part minimum maintenance plays in your plans. And how you appreciate on-time dependability and the complete flexibility of design that only made-to-order casework allows. And we know enough to offer two distinct lines—one heavy, one light. After all, we've been doing our homework for over 35 years.

St. Charles® Custom School Storage Furniture

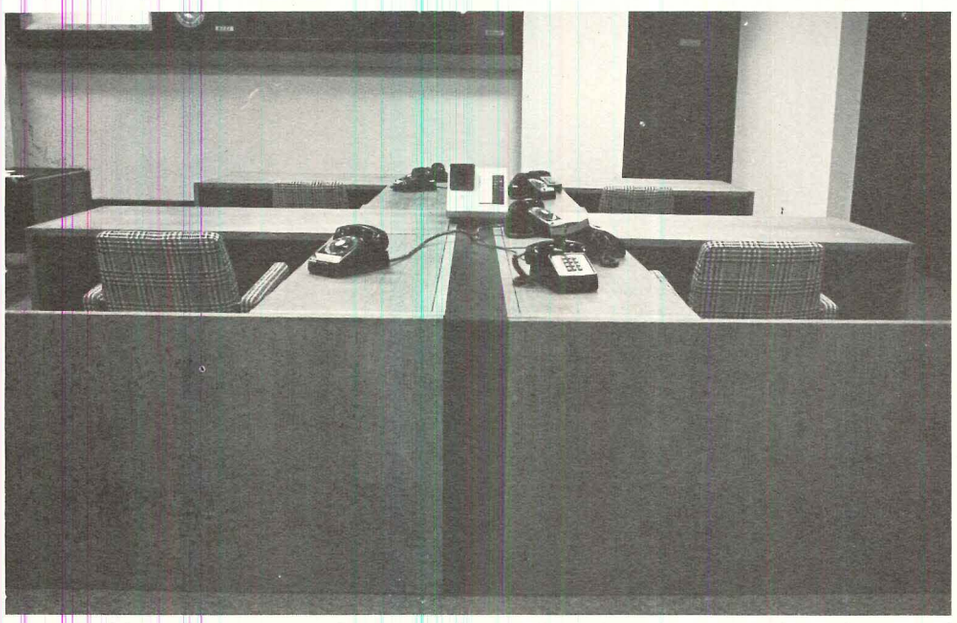
Write for our School Catalog • St. Charles Manufacturing Company, St. Charles, Illinois 60174





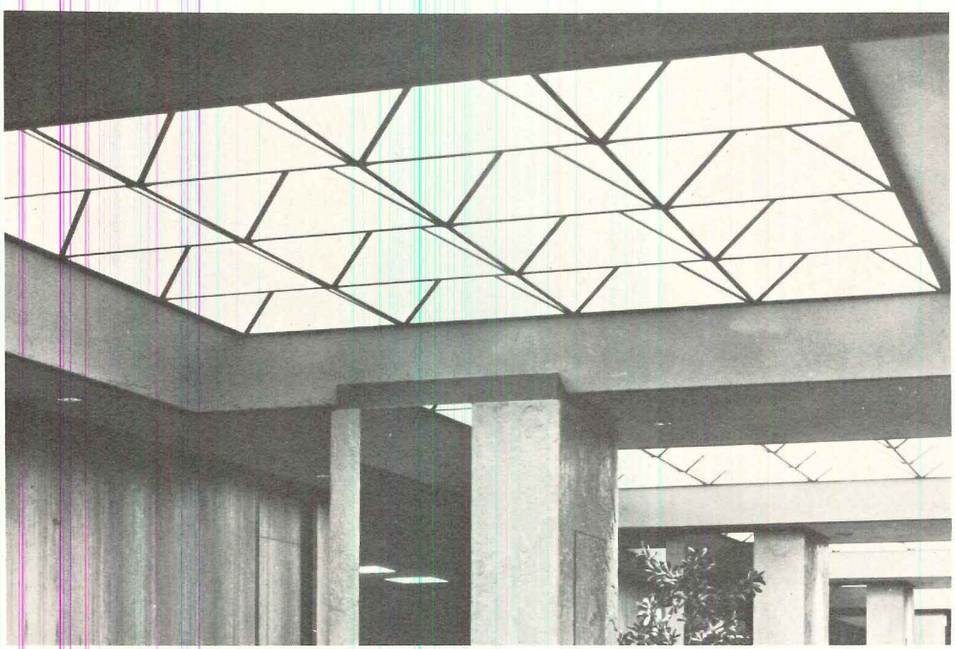
For more information circle item numbers on Readers Service Inquiry Card, pages 201-202

Desk series features raceway system concealing all wiring



Raceways deliver electric power, electronic and telephone hook-ups to each desk in a series, with only one in-put point for each service. Rapid relocation of desks and constant access to all wires and services with a minimum of structural interference are design features. The raceway system is installed on site. Mounting screws are fastened and the components of the raceway are snapped onto the screws. The manufacturer supplies all hardware. ■ JG Furniture Co., Inc., Quakertown, Pa.

Circle 300 on inquiry card



LIGHTING SYSTEM / This lighted ceiling, designed around an 8-way fitting in its structural grid, creates an irregular pattern of lighting pyramids. The pyramid light diffusers may point upward or downward in uniform or alternate patterns. Flexible in design, this three-dimensional system can accommodate decorative incandescent lamps at any exposed grid junction, lending a glittering chandelier effect. Color diffusers may be interchanged with standard opal white diffusers. The lay-in diffusers can be easily removed and replaced for cleaning and access to relamp. Standard modular sizes are 2½ ft by 2½ ft, 3 ft by 3 ft, and 4 ft by 4 ft. Applications include libraries, board rooms, theater lobbies and department stores. ■ Integrated Ceilings, Inc., Los Angeles.

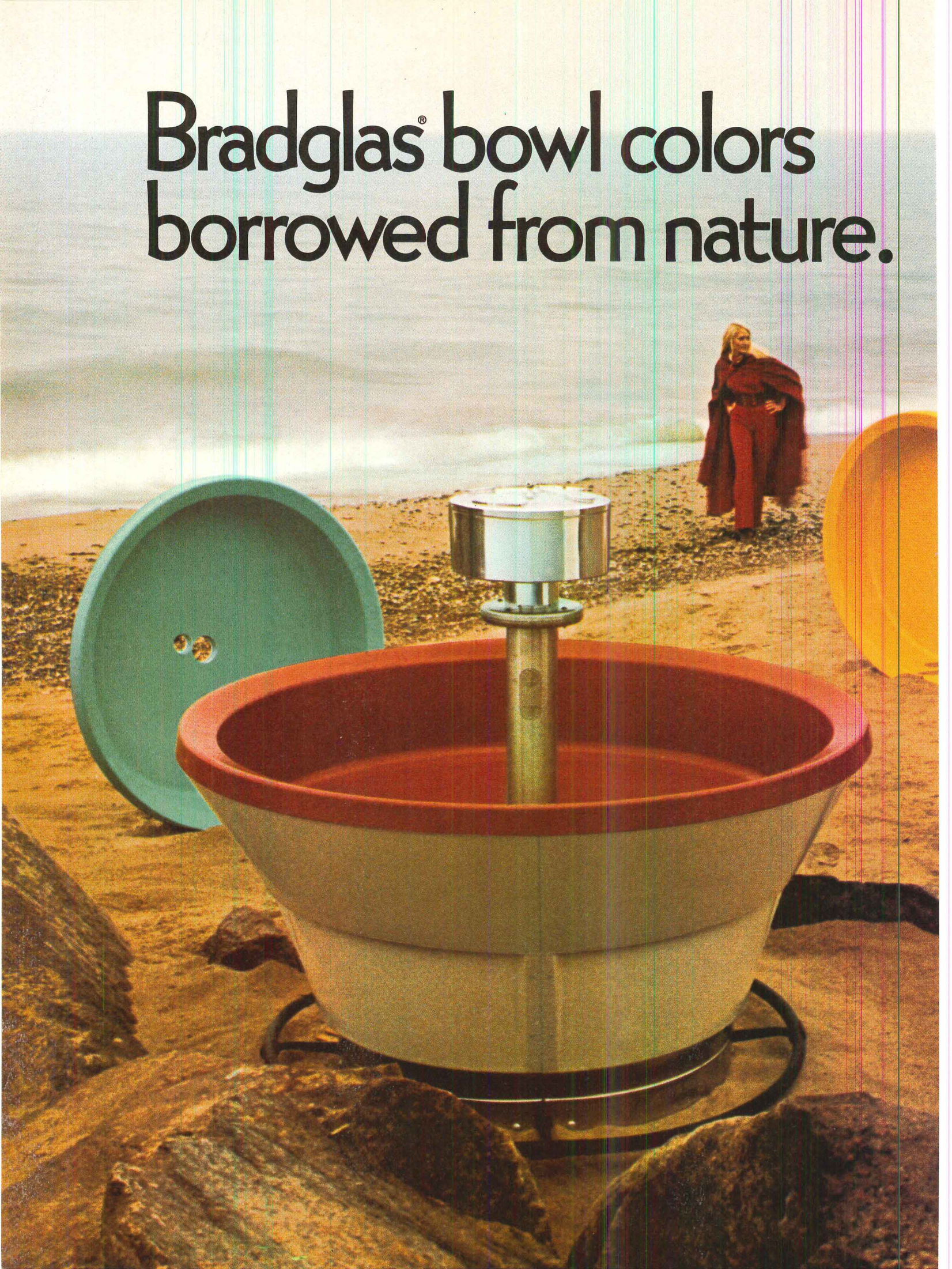
Circle 301 on inquiry card

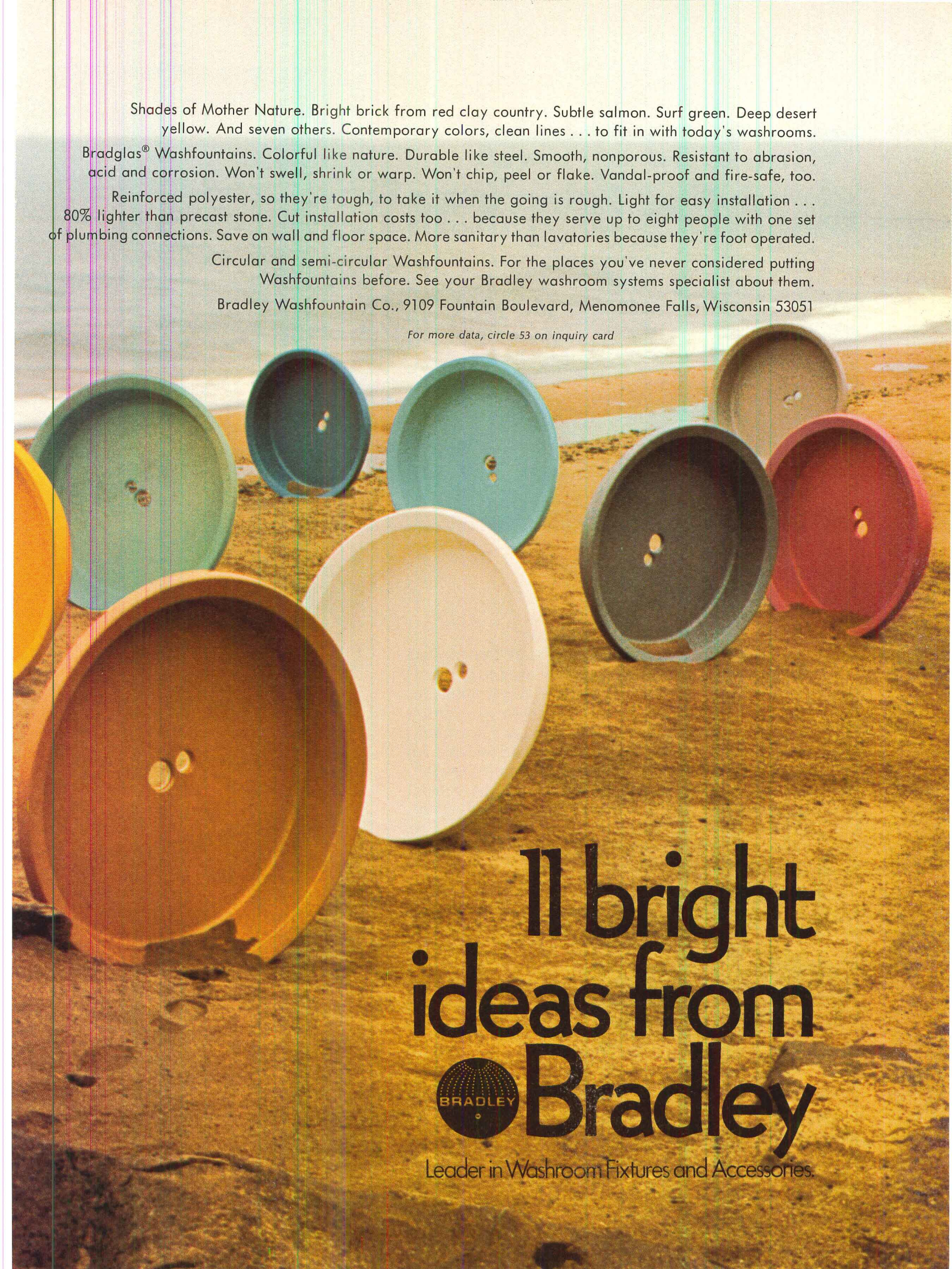
WALLBOARD / This vinyl-faced gypsum wallboard system is produced with loose vinyl flaps extending from both long edges, creating a continuous wall covering appearance when the flaps are set with an adhesive. Fasteners and panel joints, finished with the manufacturer's joint compound, are concealed by the vinyl flaps and allow installation of the entire system in the course of a single day. Panels are ½ in.-thick, 4 ft-wide and range in length from 8 ft to 14 ft in one-foot increments. Vinyl surfaces are available in five patterns (woodgrain shown above) and 25 colors. Matching vinyl roll goods are available. ■ National Gypsum Co., Buffalo.

Circle 302 on inquiry card

More products on page 144

Bradglas® bowl colors borrowed from nature.




Shades of Mother Nature. Bright brick from red clay country. Subtle salmon. Surf green. Deep desert yellow. And seven others. Contemporary colors, clean lines . . . to fit in with today's washrooms.
Bradglas® Washfountains. Colorful like nature. Durable like steel. Smooth, nonporous. Resistant to abrasion, acid and corrosion. Won't swell, shrink or warp. Won't chip, peel or flake. Vandal-proof and fire-safe, too.
Reinforced polyester, so they're tough, to take it when the going is rough. Light for easy installation . . . 80% lighter than precast stone. Cut installation costs too . . . because they serve up to eight people with one set of plumbing connections. Save on wall and floor space. More sanitary than lavatories because they're foot operated.
Circular and semi-circular Washfountains. For the places you've never considered putting Washfountains before. See your Bradley washroom systems specialist about them.
Bradley Washfountain Co., 9109 Fountain Boulevard, Menomonee Falls, Wisconsin 53051
For more data, circle 53 on inquiry card
11 bright ideas from
BRADLEY
Bradley
Leader in Washroom Fixtures and Accessories.

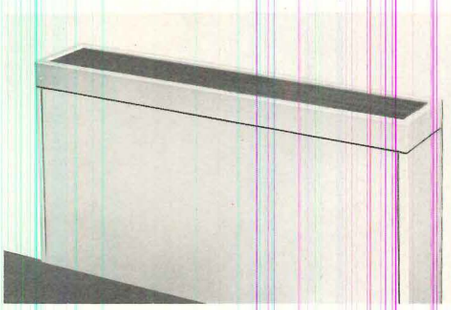
continued from page 141

FREEZERS / This line of storage cooler and freezer units features rigid fiberglass exterior wall panels and urethane insulation. These prefabricated panel sections are precision designed to customer specifications. The frothed-in-place urethane panels provide a stronger, rigid, more uniform composition than standard foamed-in-place urethane panels, according to the manufacturer. ■ Elliott-Williams, Indianapolis.

Circle 303 on inquiry card

OFFICE FURNITURE / Flexibility is built into this office work center. The roll-out workshelf provides additional working surface, adjusting easily to desk- or machine-height level. The communications center provides more desk space by shelving the phone, dictating unit and letter trays, all units conveniently located at head level. ■ Steelcase, Grand Rapids, Mich.

Circle 304 on inquiry card



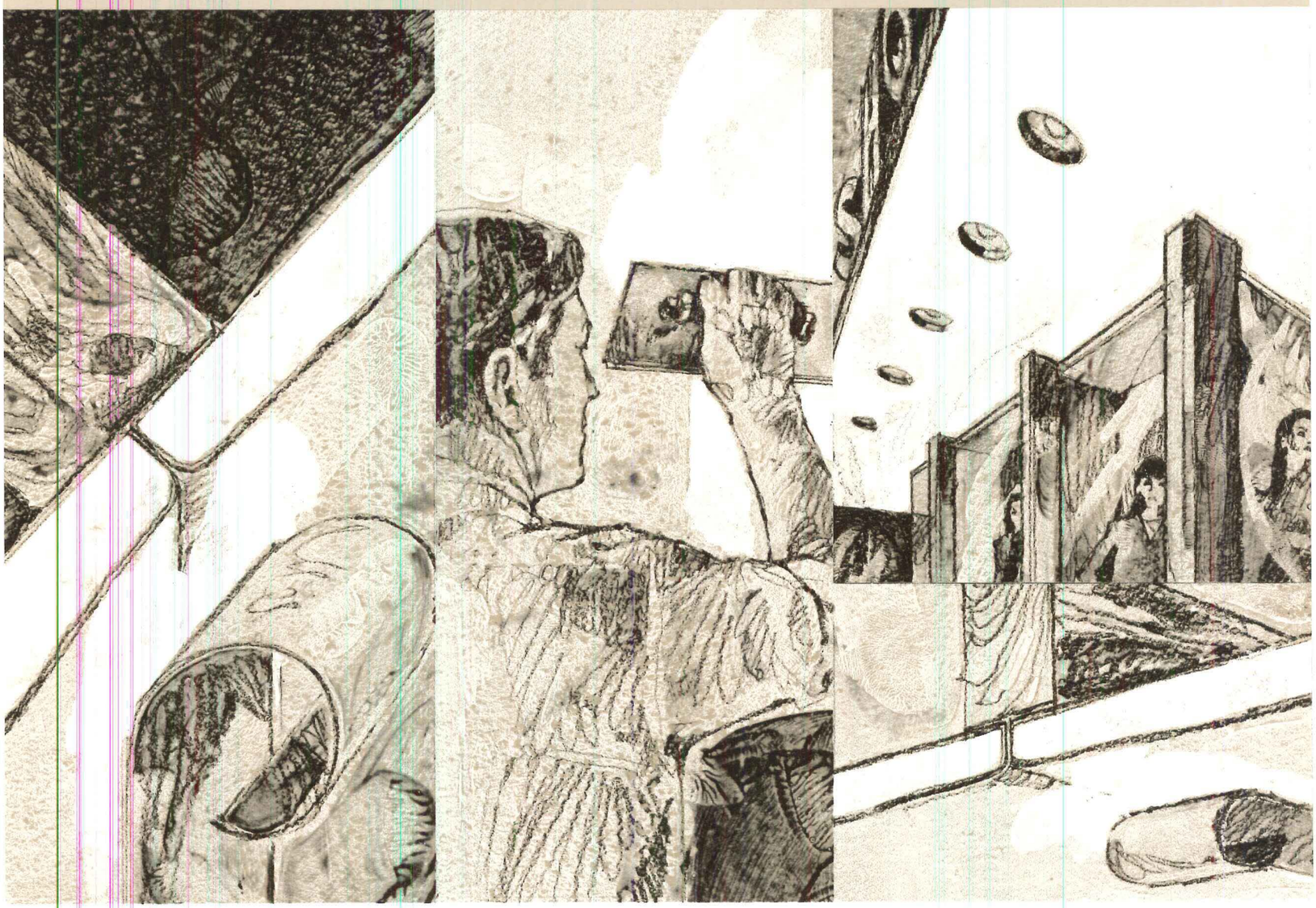
AIR CONDITIONER / This thru-wall, year-round air conditioner offers a choice of hot water, steam or electric-control heating. All moving parts are isolated with sound-deadening rubber mounts. Heavy gasketing between chassis and sleeve excludes condenser side-sound and outside air leakage. This model is available as a combination heating/cooling unit, as a cooling unit with provisions for add-on heat, and as a heating unit with provisions for add-on cooling. ■ Slant/Fin, Greenvale, N.Y.

Circle 305 on inquiry card

more products on page 150

For more data, circle 55 on inquiry card ▸

in gypsum?



A round edge board that minimizes ridging and beading.

Start specifying Georgia-Pacific's new round edge board. And you can solve ridging and beading problems.

But that's not all.

This new board uses ⅓ less joint cement than other special edged boards. And since there is more gypsum on the board itself, it holds to fire ratings better.

G-P's round edge board. Cuts down on costs.

A joint cement with a one hour working time.

Georgia-Pacific's new Speed Set is a vinyl gypsum adhesive that sets in only one and one-half hours.

This high strength cement provides a smooth monolithic surface. In addition, it has low shrinkage and is easily sanded. Its surface takes almost any finish. Texture. Paint. Wallpaper.

A gypsumboard that can be used for exterior soffits.

Georgia-Pacific's new Soffit Board is specially designed for use on exterior soffits.

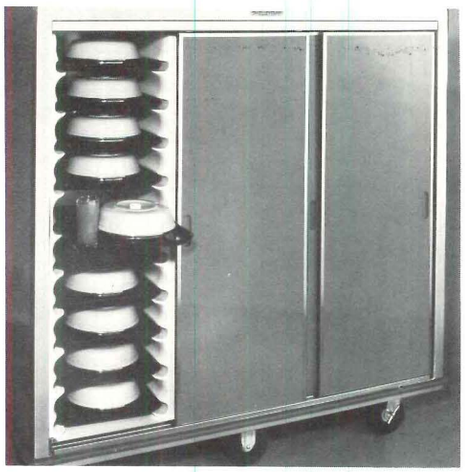
A special round edge minimizes ridging and beading problems. What's more, this new board goes up and finishes as easily as regular wallboard. There are no exposed nails or joints. And it takes almost any finish.

Better see your G-P representative today.
Ask him about these new gypsum products from Georgia-Pacific.

GP GEORGIA-PACIFIC

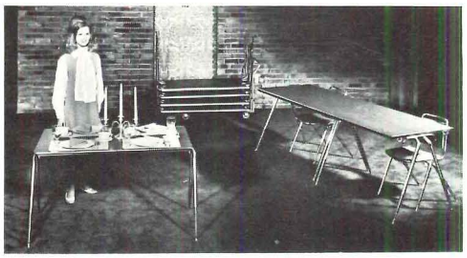
GYPSUM DIVISION Portland, Oregon 97204

continued from page 144



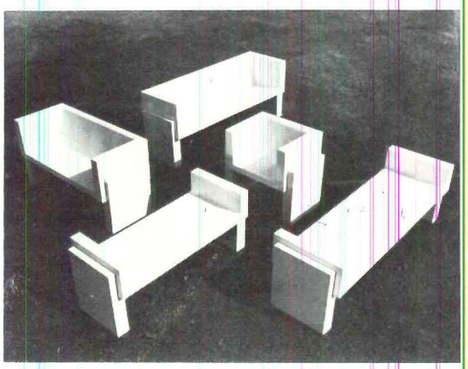
FOOD SERVICE EQUIPMENT / Designed for hospital use, this food delivery cart is available in 16-, 20-, 24- and 30-tray capacities, with 5 inches of clearance between trays. Both interior and exterior are of one-piece molded fiberglass. ■ Shelley Manufacturing Co., Miami.

Circle 306 on inquiry card



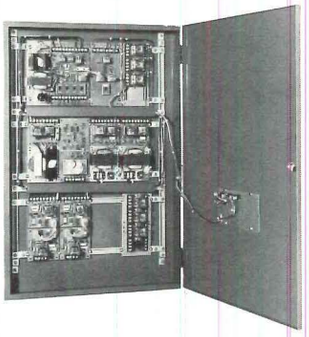
TABLES / This Astro Stack/Gang Table is especially designed for use in multi-purpose rooms. A positive level "ganging" device levels tables together with no space between tops to provide seating for large groups. No latches or bolts are used. Companion Add A leaf permits a 30 in. by 48 in. top, with no legs attached, to gang between two regular Astro Stack/Gang Tables to seat twelve. ■ Fixtures Manufacturing Co., Kansas City, Mo.

Circle 307 on inquiry card



CONCRETE PLANTERS / These planters, available in five sizes, may be used to complement the manufacturer's line of concrete furniture, or used alone. A variety of colors and three finishes may be selected. ■ Random Industries, Farmington, Conn.

Circle 308 on inquiry card



FIRE ALARM / *Flexalarm II* consists of a control panel which connects to manual stations; fire, heat and/or smoke sensing devices; sprinklers and other types of fire extinguishing systems. The system can be expanded easily with the addition of modules. Options include positive, non-interfering and successive coding circuits and standby power. ■ Gamewell, a Gulf & Western Systems Co., Newton, Mass.

Circle 309 on inquiry card

PANELING / An aluminum-hardboard composite panel for commercial and residential use offers built-in cost-saving features. Pre-painted, they can be installed as easily as plywood panels. The company guarantees that the panels will not rust, peel, blister, flake, chip or split under normal weathering conditions for a period of 10 years.

Designed for interior and exterior use, *Miralume* panels come in four-ft widths and in lengths of 8, 10, or 12 ft. ■ Kaiser Aluminum, Port Carbon, Pa.

Circle 310 on inquiry card

more products on page 155

For more data, circle 57 on inquiry card

For more data, circle 59 on inquiry card

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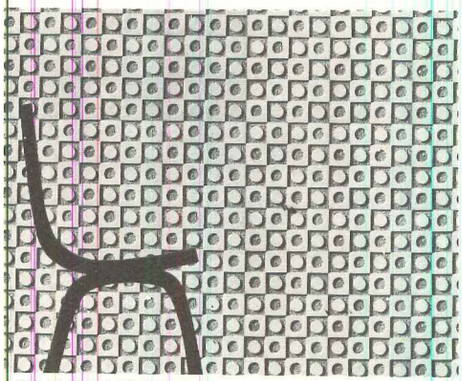
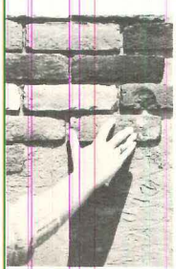


CERAMIC WALLS / Composed of textured and sculptured ceramic units installed like tiles, this 12 in. by 12 in. "nuts and bolts" design creates a wall of small-scale geometrics. The density of pattern obscures the joints between the large square units. This is one of 125 basic designs in the collection. Applications include facings for lobbies, accent walls in office interiors, and other areas both indor and out. ■ Design-Technics Ceramics Inc., New York City.

Circle 311 on inquiry card

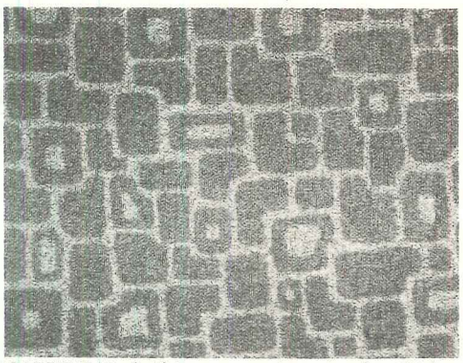
SOLID WASTE COMPACTOR / Designed for commercial and industrial use, this portable unit can accommodate five to six times the amount of trash normally contained in a regular 20-gallon trash can. Any solid waste can be placed in the compactor's two 25-gallon removable polyethylene bags (one in the single model). A stainless steel ram exerts over 3,000 pounds of pressure, reducing the waste into a solid and compact 3½ cubic ft package. The compactor operates on compressed air. ■ Automatic Refuse Systems, Inc., St. Clair Shores, Mich.

Circle 312 on inquiry card



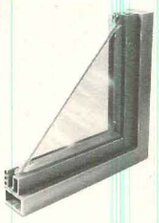
SYNTHETIC BRICK / Made from high quality polyester with the look and feel of real brick, each weighs approximately two ounces and is one-quarter-in. thick. Designed for interior and exterior use, it can be applied to almost any surface that is firm, dry and free from dirt. ■ Plastronics, Inc., West Yarmouth, Mass.

Circle 313 on inquiry card



CARPETING / This geometric print by Walter Carpet Mills, designed for contract use, is available in 17 tri-dye ground colors in 12 ft widths. It carries the five-year *Anso* nylon surface wear guarantee for commercial carpets. ■ Allied Chemical Corp., Fibers Div., New York City.

Circle 314 on inquiry card



WINDOW / Heat welded to give water-tight joints, this steel-reinforced, semi-rigid polyvinyl chloride window features easy replacement of sections (damaged even to the metal sub-structure) and the resistance of polyvinyl chloride to atmospheric elements. ■ Aluminline Corp., Pawtucket, R.I.

Circle 315 on inquiry card

For more data, circle 59 on inquiry card

DOOR DRAMA IN SEATTLE

Automatic doors *can* be beautiful. Where the Olympic Mountains cascade into Puget Sound, swing off Seattle's monorail into the soaring tower of Washington Plaza Hotel. Custom-tall 9-foot glazed teak doors slide away or swing open automatically for your grand entrance.

One Dor-O-Matic Invisible Dor-Man® hydraulic power unit actuates 20 main entry doors: four smooth-gliding Slide'n'Swing® doors with double-acting emergency breakaway action for guests' safety . . . plus 16 center pivoted automatic swinging doors. Activating mats are hidden under lobby carpeting; bottom guides of Slide'n'Swing doors are off-floor, in-wall, so no track shows!

Dor-O-Matic gives you complete architectural freedom to design or buy doors with flair. We design only the controls and activating devices. Dramatically. Call our representative, or write for AIA Bulletin *8.31/Dor* today.

5666

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Architect, John Graham & Co., Seattle, Washington
Door Controls by

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England: Dor-O-Matic G.B. Ltd., Ramsey Rd., Sydenham Industrial Estate, Leamington Spa. **Canada:** Dor-O-Matic of Canada, Toronto.

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All-Steel®

Who said all contemporary office furniture looks alike? All-Steel design versatility and depth of line individualizes small, private work stations and dignifies an executive wing. All-Steel Equipment Inc., Aurora, Illinois 60507. Showrooms: New York, Chicago, Los Angeles, Aurora. In Canada: B. K. Johl, Inc., Montreal, Toronto, Vancouver. One of the C.I.T. Companies.

For more data, circle 62 on inquiry card

Ty-Seal gaskets cut big jobs down to size.

Take a job like the Jordan Marsh warehouse in Quincy, Massachusetts.

Nearly five miles (more than 500 tons) of cast iron soil pipe and fittings went into the drainage system for the huge, 30-acre facility.

All of it was joined with TY-SEAL® gaskets.

Why TY-SEAL?

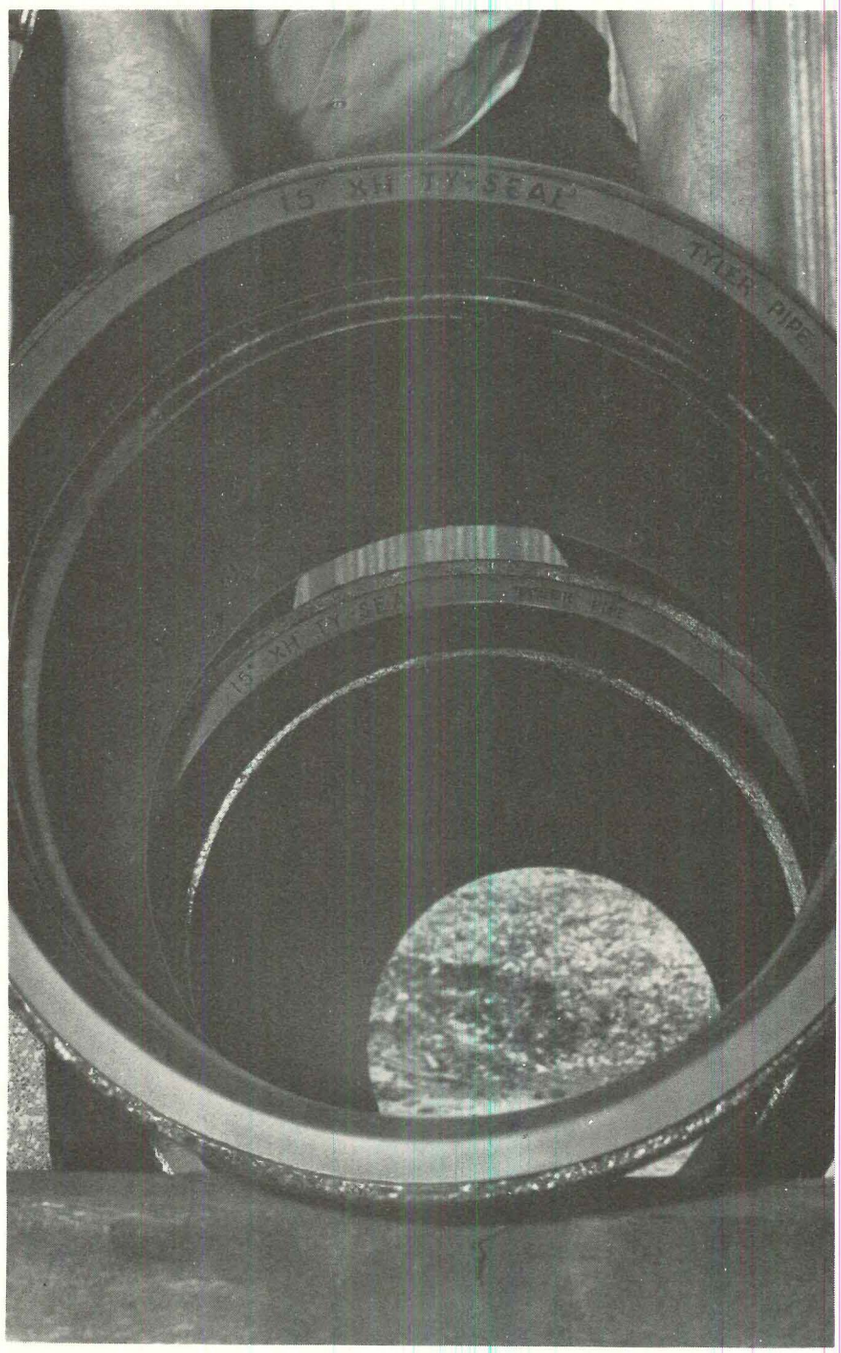
A joint was needed that could accommodate settling without leaking. The answer was TY-SEAL.

A joint was needed that could be made in any weather, in any temperature, even in water-filled trenches. Again, TY-SEAL.

A joint was needed that could help meet progress schedules. On the Jordan Marsh job, the installing mechanical contractor was always on or ahead of schedule.

We've collected the facts about TY-SEAL in the Jordan Marsh job and put it together with actual case histories of other TY-SEAL jobs, both large and small. For your free copy, write us at P. O. Box 2027, Tyler, Texas 75701.

If it goes into a DWV system, Tyler makes it.



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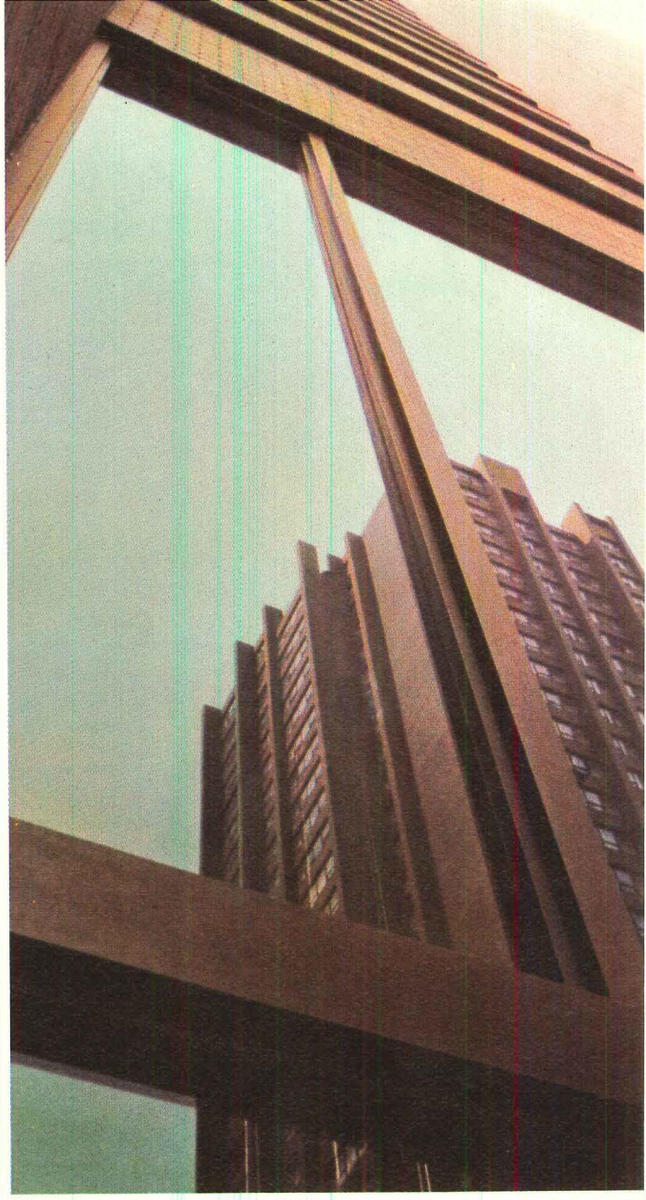


NUMBER TWO CHARLES CENTER, Baltimore. Architect, Whittlesey, Conklin & Rossant, New York, N.Y.; Window Fabricator, W. T. Industries, Baltimore, Md.; Coated Extrusions, Aluminum Shapes, Inc., Delair, N.J.

PPG Extrusion Coatings create a dramatic, enduring finish... at surprisingly low cost

Extruded aluminum shapes now can be finished in rich new PPG color coatings, allowing you complete color freedom . . . but at far less cost than other finishing systems. Color uniformity and stability of these PPG coatings are outstanding. These finishes are now available in DURACRON® thermosetting acrylic enamels and DURANAR™ fluoropolymer finishes to achieve the desired film durability on windows, mullions and other extruded shapes.

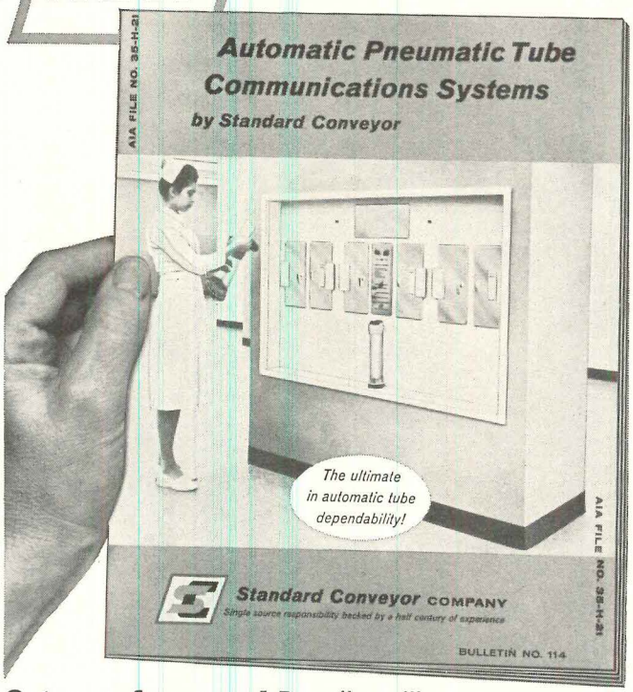
Take advantage of all of the architectural benefits of these new PPG color coatings—and pass the savings on to your clients. Check your latest Sweet's Architectural File, or write Market Manager, Extrusion Coatings, PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, Pa. 15222.

PPG is Chemicals, Minerals, Fiber Glass, Paint, and Glass. So far.

Extrusion Coatings PPG INDUSTRIES

For more data, circle 64 on inquiry card

NEW ***All you need to know about***



Get your free copy! Describes, illustrates new type automatic tube systems featuring greater dependability, quieter operation. 12 pages. ***Standard Conveyor Co., 312B Second St., North St. Paul, Minn. 55109.***

For more data, circle 66 on inquiry card

Our new, 32-page SPRINKLER SYSTEM GUIDE lays it all out. Building codes . . . insurance considerations . . . fire protection costs . . . and much more we can't tell here. Dozens of explicit illustrations. It's free. Send for it . . . before you get burned!

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THE VIKING CORPORATION
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HASTINGS, MICH. U.S.A. 49058

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Company_____
Address_____
City_____
State_____ Zip_____

For more data, circle 67 on inquiry card

FH

Arne Jacobsen had an idea for Fritz Hansen. Design a basic chair for comfort and function. With or without arms. On steel chrome-plated legs, with or without swivel. And make them stackable! And then offer a combination of any and all–in oak, teak or rosewood, or upholstered in fabric, leather or vinyl.
For more information please write to Fritz Hansen, Inc., 979 Third Ave., New York 10022.

For more data, circle 65 on inquiry card

An LP® polysulfide membrane would have kept him dry

There'd be no leaking seams or joints. No lateral movement of water under the membrane. Not if an LP Polysulfide membrane had been used.

This elastomeric membrane is seamless, even around pipes. It bonds to the substrate so that even if the membrane were punctured, water could not run laterally beneath it.

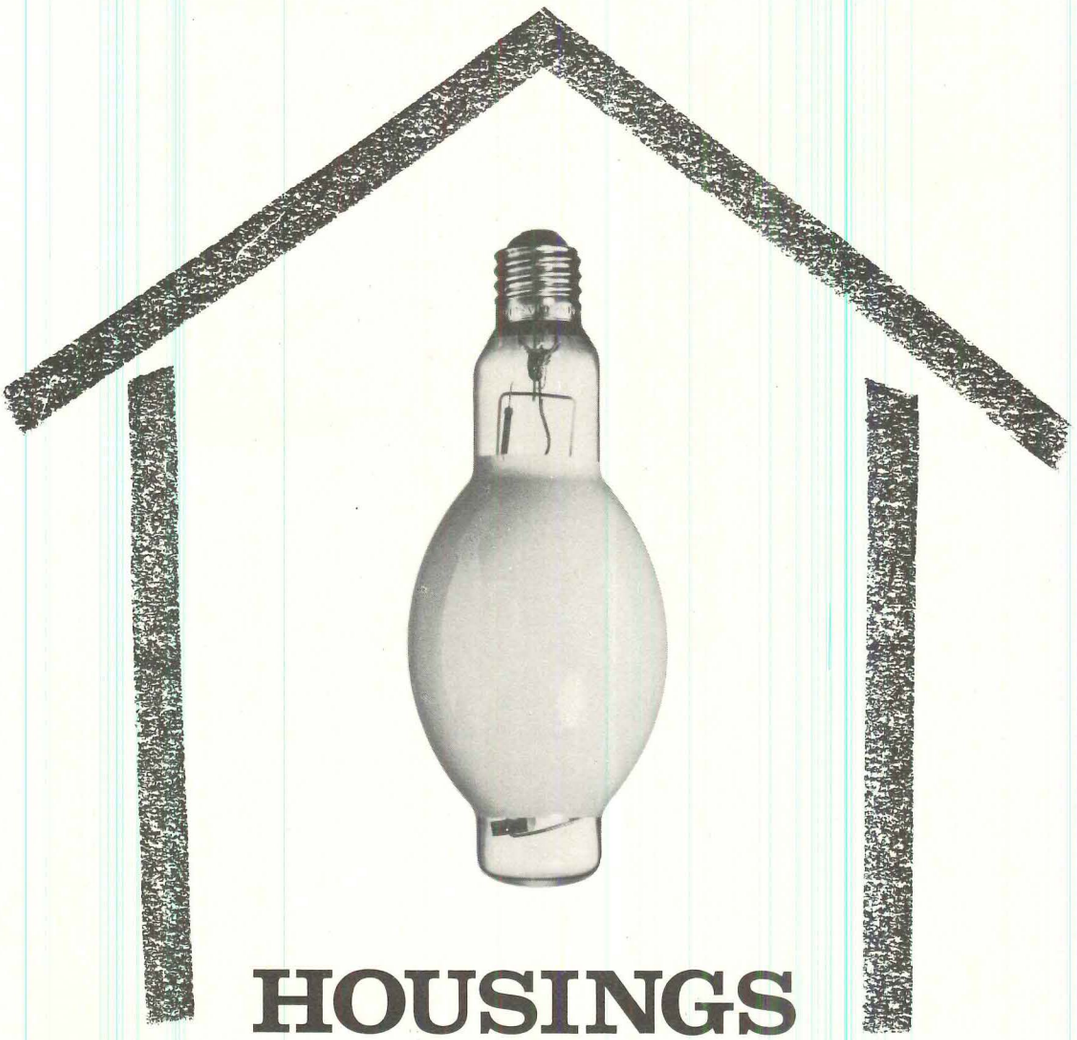
Thiokol polysulfide-based membranes are applied by spray or hand. No build-up of layers, joint sealing, splicing or adhesives. They're inert, continuous and rubbery... above or below grade... and effective to –40°F. The usual thickness is 60 mils.

For quality and economy in membrane systems, look for this trademark. And for more information plus a list of licensees, write to Dan Petrino, Thiokol Chemical Corporation, P.O. Box 1296, Trenton, New Jersey 08607.

ELASTOMERIC MEMBRANE WATERPROOFING SYSTEMS BASED ON Thiokol LP POLYSULFIDE POLYMERS

Thiokol

For more data, circle 68 on inquiry card



HOUSINGS

for Mercury lamps

PRESCOLITE has no HOUSING shortage. We have MERCALITE[T.M.] fixtures available for . . . indoor or outdoor use, hi-bay or lo-bay. Round or square recessed, ceiling cylinders, wall brackets, outdoor spots and floods, post lights, aisle lights or flush mount ground units. Over 100 different Mercury units to choose from.

Let us help with your Mercury **HOUSING** requirements. Write for our MERCALITE[T.M.] brochure No. M-1.

PRESCOLITE
A DIVISION OF U S INDUSTRIES, INC

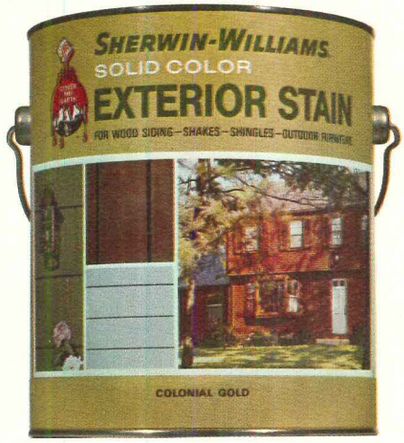
USI

General Offices and Factory: 1251 Doolittle Dr., San Leandro, Ca. 94577
Pennsylvania Factory: 539 Jacksonville Road, Warminster, Penn. 18974
Arkansas Factory: Prescolite Dr. and Industrial Rd., El Dorado, Ark. 71730

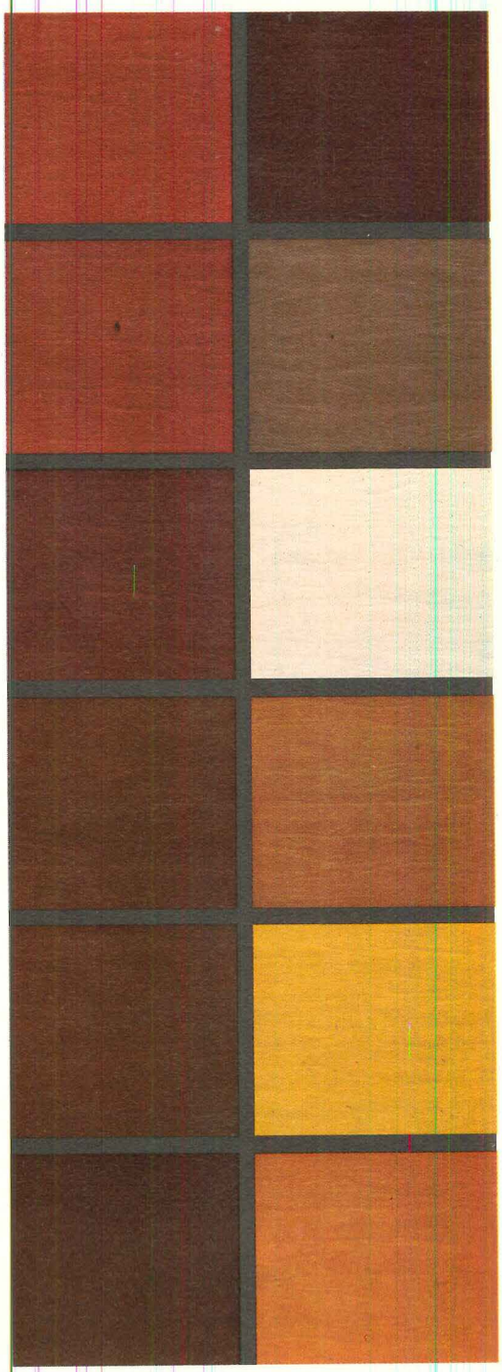
For more data, circle 69 on inquiry card

NEW FROM SHERWIN-WILLIAMS®
FULL HIDING, SOLID COLOR STAIN

For wood siding, shingles, shakes, decks, porches, steps, railings, fences, benches.



For terrace walls, interior beams, ceilings, paneling, or any area where wood is used.

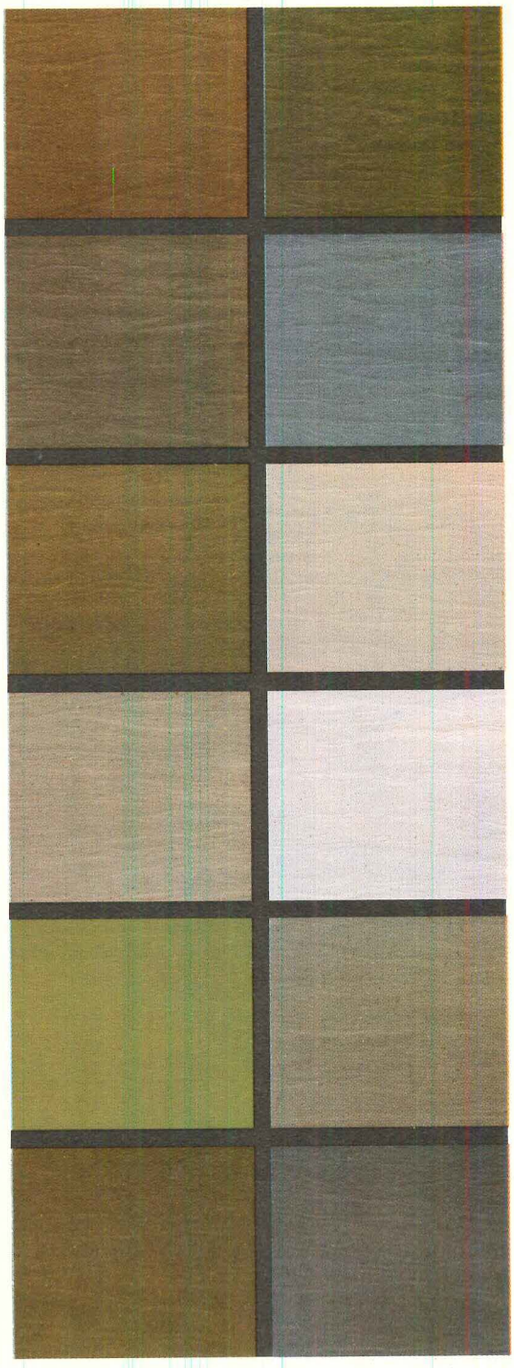


- For exterior — interior use.
- Use on new wood or previously stained or painted wood.
- No topcoat necessary.
- Superior *alkyd* formulation for toughness and longer life — not a conventional oil stain.
- Excellent weather resistance.
- Repels moisture; mildew and mold resistant.
- Won't crack, peel, or blister.
- Lap marks won't show.
- Needs no priming or thinning.
- Easy to apply by brush, roller, spray, or dipping.
- 24 beautiful non-fading colors, plus white.

Now you have a choice of using Solid Color or Semi-Transparent Sherwin-Williams Stains, or Weathering Oil® for a rich weathered effect.

See specification Nos. 71.07, 71.14, in our catalog 9.9/SH, Sweet's Architectural and Industrial Construction Catalog Files. Or circle inquiry card or write the Sherwin-Williams Co., Architectural Service Division, Cleveland, Ohio 44101.

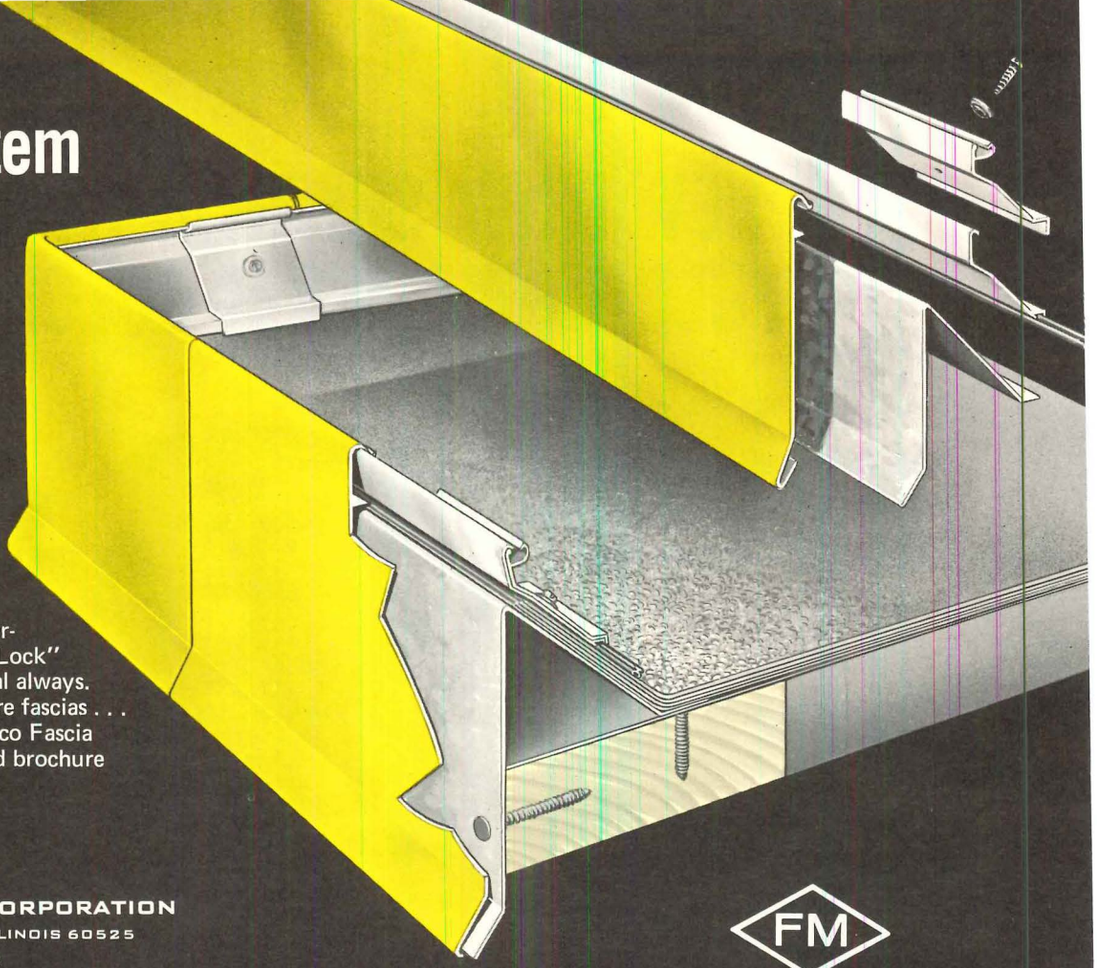
SHERWIN-WILLIAMS



For more data, circle 70 on inquiry card

New Fascia System by SILBRICO

A fascia, water dam, gravel stop, curb and cant . . . all in one simple, durable system. The Silbrico extruded aluminum fascia system is designed and installed to meet Factory Mutual roof perimeter flashing requirements of Date Sheet 1-49. to resist wind uplift of 60 lb./Lin. Ft. of wall. It controls water, prevents leakage at the roof perimeter, withstands high winds, hides building irregularities and provides a most attractive non-corrosive, durable fascia for any building. An exclusive vinyl seal throughout an extruded aluminum liner-flashing is held tight by the Silbrico "Cam-Lock" locking device to assure a positive water seal always. Wide variety of finishes and colors. Compare fascias . . . then specify "the tough one" . . . the Silbrico Fascia System. Write for details, specifications and brochure showing complete range of sizes.



SILBRICO CORPORATION
6300 RIVER ROAD • HODGKINS, ILLINOIS 60525
CHICAGO PHONE (312) 735-3322

FM

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WHAT'S NEW IN ARCHITECTURAL SIGNING?

Contemporary Letter styles are What's new in Architectural Signing.

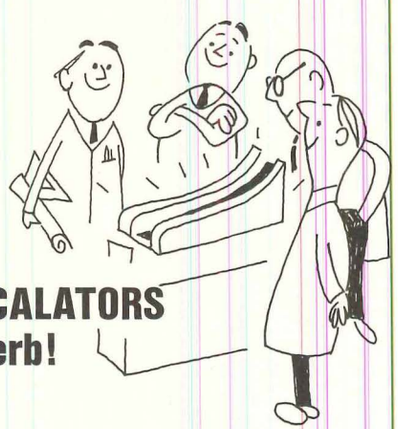
The Graphics Lab has them.

Write for your copy of our catalog.
Letter Styles for the 70's.

KNIGHT MANUFACTURING COMPANY
5975 Armour Drive P.O. Box 15282 Houston, Texas 77020

For more data, circle 72 on inquiry card

A completely biased panel* has judged the NEW 1971 STYLING of HAUGHTON ESCALATORS absolutely superb!



*All of us at Haughton hail this handsome fresh look, of course. And so do the architects, contractors and owners who have already specified this smart new styling for more than 100 Haughton escalator installations.

But judge for yourself. Find out that distinctive escalator appearance is still compatible with very smooth, very quiet and very reliable operation. Don't overlook a chance to look it over. Call your Haughton representative or write us.

RELIANCE ELECTRIC COMPANY
HAUGHTON ESCALATORS
P.O. BOX 780, TOLEDO, OHIO 43601

For more data, circle 73 on inquiry card

the indestructibles

endurables in the era of discontinuity

If it is superb quality casework you want, that is the only kind we make. If it is stainless, enameled, or high pressure laminated casework you want, we make all three. If you require custom work, we are specialists. One source. Reliable. Experienced. Anxious to be of service. Why not ask to see our catalogs?

Jamestown Products Division
178 BLACKSTONE AVE. JAMESTOWN, N.Y. 14701

AVM CORPORATION

For more data, circle 74 on inquiry card

Another step towards a perfectly dry Manhattan.

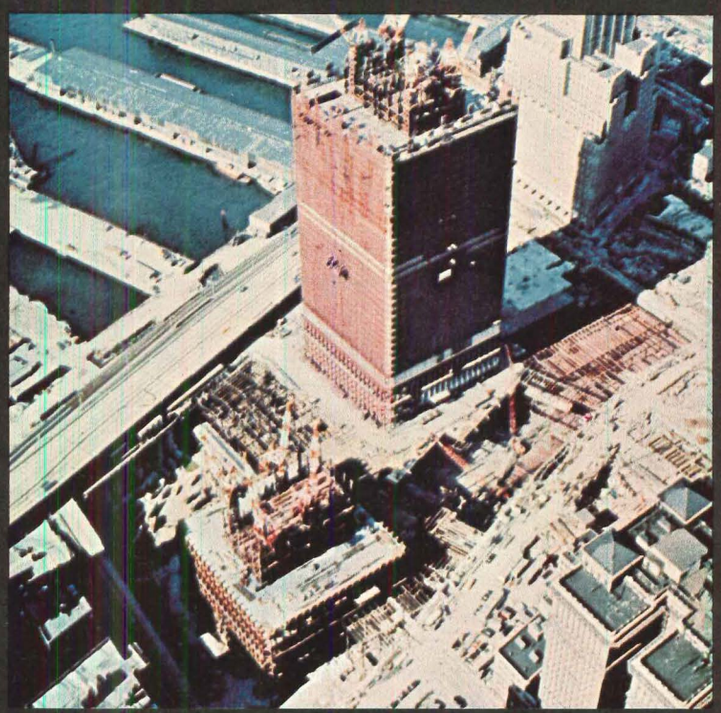


Photo Courtesy of the Port of New York Authority

New York City's World Trade Center, which will cover thirteen city blocks, will be one of the largest building complexes in the world.

And it'll also be one of the driest because Tremco sealants and glazing systems will be used in the right places.

Take the two 110-story twin tower buildings. They will use Tremco's Polysulfide Lasto-Meric, the non-oxidizing, non-shrinking sealant. It's ideally suited to situations that anticipate dynamic movement of the joint. And provides excellent adhesion to metal without priming.

They will also use Tremco Acoustical Sealant to reduce sound transmission. And Tremco Curtain Wall Sealant on unexposed joints.

The Tremco glazing system — Mono, Pre-shimmed 440 Tape and Vision Strip — is also recommended for the plaza buildings surrounding the skyscrapers. And there are good reasons why: Weather tightness. Windows that are evenly balanced for high wind loads. No pressure points. And neat sight lines. So whether you're planning to build a 110-story skyscraper or a one-story warehouse, Tremco can solve the sealant problems. No, we don't have an all-purpose sealant. We're just an all-purpose sealant company. Call your Tremco Representative today and see for yourself.

The Tremco Manufacturing Company, Cleveland, Ohio 44104
Toronto 17, Ontario.

TREMCO
The water stoppers

For more data, circle 77 on inquiry card

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 201-202

CEILINGS / A complete line of acoustical tile and lay-in panels is illustrated in a catalog giving sound absorption coefficients and sound attenuation factors as well as technical data for finishes and flame spread, and fire resistive ratings. ■ Simpson Timber Co., Seattle.*

Circle 400 on inquiry card

LIGHTING / A complete line of outdoor luminaires is described in a 40-page catalog featuring a wide selection of individually shaped globes, together with a choice of poles, bases, brackets and adaptors. ■ Pemco Corp., Philadelphia.

Circle 401 on inquiry card

REFUSE COMPACTORS / A 4-page specification bulletin gives applications of the company's refuse compactors in commercial, industrial, institutional and high-rise buildings. ■ The Heil Co., Milwaukee.

Circle 402 on inquiry card

DOOR CONTROL / Designed especially for corridor smoke doors, this system, described in a 4-page bulletin, assures positive hold-open, closing and latching of center pivoted, offset pivoted or hinged doors. Actuation can be accomplished by smoke detectors, presence sensors and other kinds of adjacent or remote switches. The system is concealed in the floor with no wall, ceiling or floor latches. ■ Republic Industries, Inc., Dor-O-Matic Div., Chicago.*

Circle 403 on inquiry card

FLOOR HARDENER / A ready-to-use non-metallic shake for coloring and hardening concrete floors is described in a 2-page bulletin. Advantages included are high-strength surface, long-lasting color and dense surface. ■ Master Builders, Cleveland.*

Circle 404 on inquiry card

ENVIRONMENTAL CONTROL / A 4-page guide to the manufacturer's equipment and systems which control environmental factors lists 18 basic products. Featured are hospital systems which include appropriately controlled acoustics, humidity, and temperature for audiological, psychological and cardiographic examination and research; and acoustic structures for industry showing applications for engineering noise-control and hearing-conservation programs. ■ Industrial Acoustics Co., Inc., Bronx, N.Y.*

Circle 405 on inquiry card

COATINGS / A guide to the evaluation of coatings for nuclear power plants features the manufacturer's line of coatings for light water reactor vessels. ■ Wyandotte Chemicals Corp., Subox Division, Fairmont Park, Hackensack, N.J.

Circle 406 on inquiry card

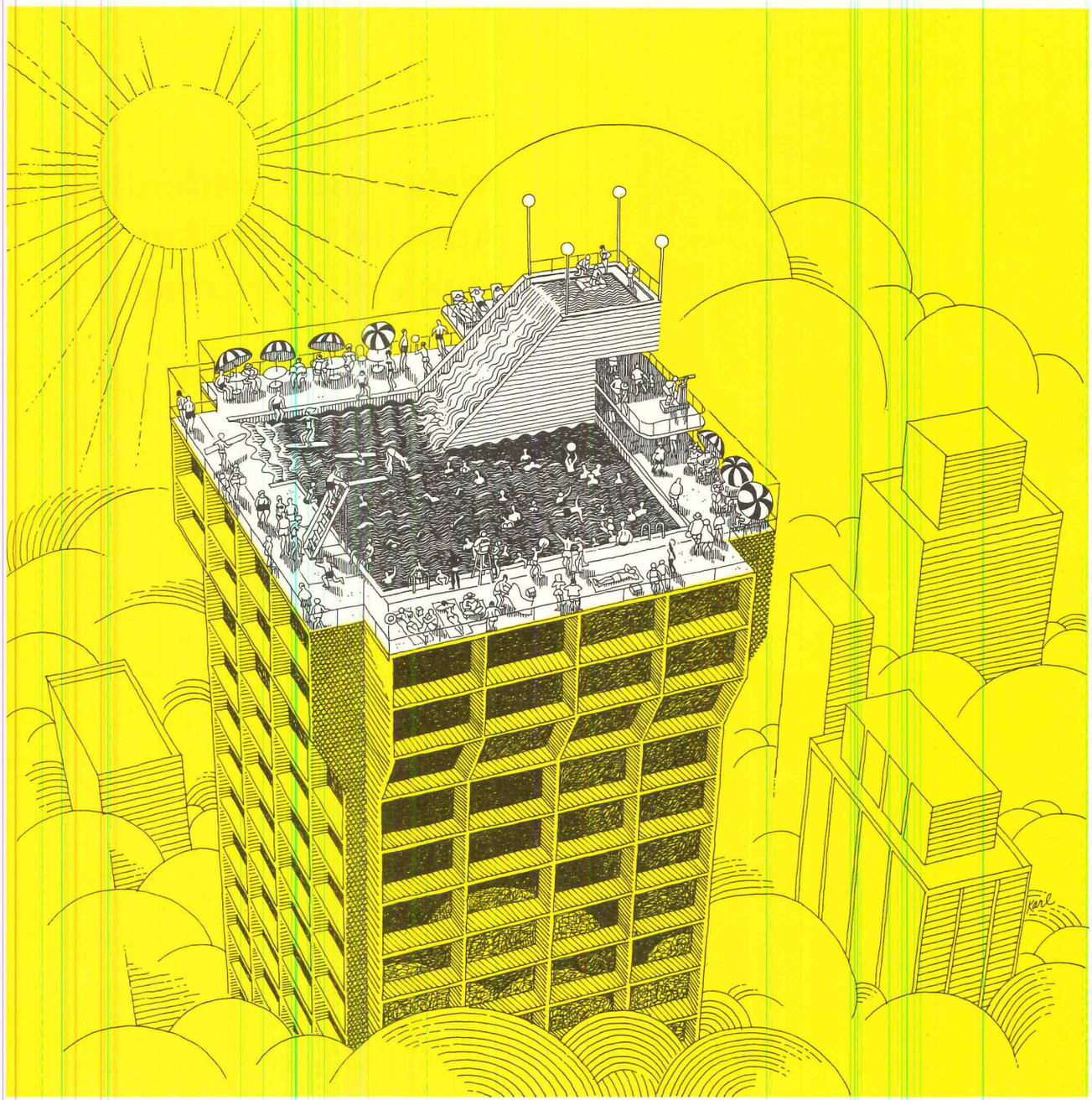
COMMUNICATIONS / Six basic health care communications systems are described in a 4-page brochure. Included are bedside cabinets with electronic controls, nurse call systems, information display systems, radio paging, doctors' register and administrative intercom. ■ DuKane Corp., St. Charles, Ill.

Circle 407 on inquiry card

** Additional product information in Sweet's Architectural File.*

more literature on page 190

We're known as difficult people.



We do the difficult pool jobs.

O.K., maybe you're not planning a Coney Island in the clouds. Even so, you might be interested in a customized, prefabricated, aluminum pool. Completely pre-tested, it's the perfect watering spot for hotels, apartments, schools and the like.

This design includes a full perimeter, recirculation system; a nonskid coping ledge and overflow gutter; fade-resistant coating; and—best of all—a watertight warranty against leaking.

This pool is faster and easier to assemble, and will resist corrosion better than any other. It'll never require grouting or sealants or caulking because it's welded. And it'll never be affected by the weather.

The design is completely adaptable to all known, and probably a few unknown, specifications. We like to think we can do almost anything when it comes to metal fabrication.

To get in the swim, contact Overly Manufacturing Company, Architectural Metals Division, Department 10B, Greensburg, Pa. 15601.

Overly
MANUFACTURING COMPANY

For more data, circle 79 on inquiry card

Second East Hills Park, Pittsburgh, Pa.
Architect: Tasso G. Katselas. Photographer: Michel Proulx.

Make Your Residential Advertising Dollars Work Harder Longer

A strong recovery in the housing market is under way and large gains are in the cards for the coming months. According to F. W. Dodge, 1971 should show a 17.5 per cent increase in housing units over 1970—with the apartment segment of the total due to increase by 22 per cent.

In mid-May Architectural Record's "Record Houses and Apartments of 1971" offers a timely opportunity for manufacturers of quality residential building products to exert year-long influence on those architects and builders who are at the forefront of this booming market. It will reach all major groups of specifiers and buyers in the housing market:

- over 40,000 architects and engineers who are verifiably responsible for over 87 per cent of the dollar volume of all architect-planned residential building.
- the nation's 20,000 foremost builders qualified by Sweet's on the basis of annual building activity to receive the Light Construction File.
- (at your option) 5,000 leading interior designers qualified by Sweet's to receive the Interior Design File.
- in addition, bonus bookstore distribution to an important segment of the house building and buying public.

"Record Houses and Apartments" offers you two unique advantages:

- *Makes your dollars work longer.* "Record Houses and Apartments" has the longest working life of any issue of any architectural magazine. Of those architects who received the first "Record Houses" annual 15 years ago, nearly half still refer to it!
- *Makes your dollar work harder.* Advertisers in "Record Houses and Apartments" earn a lower rate for all their advertising in regular issues of Architectural Record. And in many cases the new McGraw-Hill Market-Directed® Rate Incentive Plan allows an advertiser to add "Record Houses and Apartments" to his regular schedule at surprisingly little extra cost.

Ask your Architectural Record representative to show you how to get greater mileage out of your residential advertising dollars in America's most influential housing annual.

ARCHITECTURAL RECORD
A McGRAW-HILL MARKET-DIRECTED® PUBLICATION
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NEW YORK, N.Y. 10036

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QUARRYETTES

GO EVERYWHERE . . . FOR ECONOMY FARE

Quarryettes are miniature *extruded* Quarry Tile . . . offering almost unlimited design versatility, beauty and durability in all kinds of buildings . . . schools, hospitals, homes, commercial and institutional structures.

Quarryettes are available in a wide range of compatible natural earth colors, modular 1" x 1" x ¼" and 2" x 2" x ¼" sizes . . . straight shades and blends . . . four contoured shapes.

Best of all . . . Quarryettes "go" on floors and walls everywhere at costs competitive even to products that wear out. Ask your Summitville representative, Tile contractor or check Sweet's catalog.

SUMMITVILLE TILES, INC., SUMMITVILLE, OHIO

MEMBER: TILE COUNCIL OF AMERICA, INC. PRODUCERS COUNCIL

TCS

Why coat stainless steel?

. . . because proper soldering of stainless steel requires an extra step of pretinning or use of corrosive fluxes. These fluxes must be removed after soldering to prevent attack on the stainless.

TCS solders perfectly using a non-corrosive rosin flux. Pretinning is unnecessary.

. . . because architectural metals are subject to corrosive attack in severe chemical, industrial or marine environments.

TCS enhances the proven ability of stainless steel to resist corrosive attack under these conditions.

. . . because the reflective surface of stainless steel may sometimes be undesirable in architectural applications.

TCS weathers naturally to a predictable, uniform and attractive dark gray. If color is desired, it can also be painted.

TCS, Terne-Coated Stainless Steel, is 304 nickel-chrome stainless steel covered on both sides with terne alloy (80% lead, 20% tin). It is a product of Follansbee Steel Corporation, Follansbee, West Virginia.

FOLLANSBEE

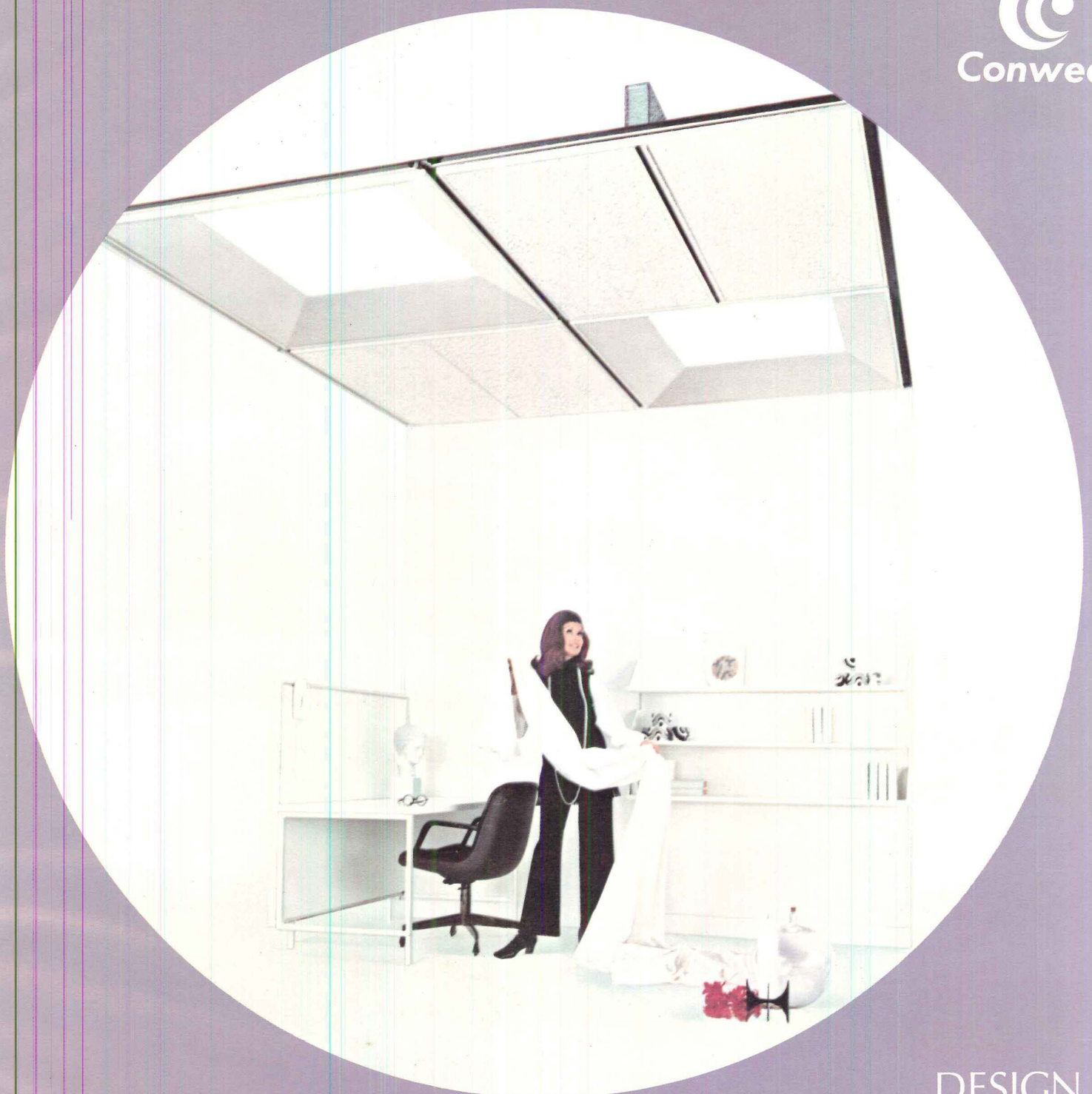
FOLLANSBEE STEEL CORPORATION • FOLLANSBEE, WEST VIRGINIA

For more data, circle 78 on inquiry card

For more data, circle 80 on inquiry card

For more data, circle 81 on inquiry card

Conwed



DESIGN
VERSATILITY

Conwed®

FIVE PLUS FIVE
CEILING
SYSTEMS

more.....

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FIVE PLUS FIVE CEILING SYSTEMS

FIVE PLUS FIVE MEETS YOUR REQUIREMENTS FOR DESIGN FLEXIBILITY, AESTHETICS AND BUDGET . . .

- **Lighting** — Five-foot modular light sources.
- **Air Supply** — Relocatable air supply devices.
- **Partitioning** — Modular partition-accepting grids.
- **Air Return** — Inconspicuous, compatible returns.
- **Acoustical** — Effective acoustical options.

No single ceiling system can meet every project's requirements. That's why Conwed created Five Plus Five . . . a truly total systems concept encompassing many ceiling system options. Five Plus Five gives you:

- **Lighting** — not one but FIVE options.
- **Suspension** — not one but SIX choices.
- **Air Supply** — not one but FIVE methods.
- **Air Return** — not one but EIGHT options.
- **Acoustical** — not one but SEVEN choices.

Let the knowledgeable Conwed professional field service team help you with ceiling plans and problems. For further information on Five Plus Five Ceiling Systems, see the Conwed section in Sweets Architectural File (No. $\frac{(9.1)}{Co}$) or write: **Conwed Corporation, Dept. C 5+5, 332 Minnesota Street, St. Paul, Minnesota 55101.**

For information on flexible Conwed 7000 Series Partition system (shown on front) write Conwed Department C/P Partitions.

High quality (top right) . . . illustrated by this striking application of one Five Plus Five System. Unique ceiling design provides integrated air supply and high, non-glare light levels.

Higher quality (bottom right) . . . represented in this office remodeling project with well illuminated employee work area. Five Plus Five compatibility with partitioning is apparent.

Highest quality (left) . . . dramatically demonstrated by this customer service area in a newly-remodeled bank.

Ceilings created by your imagination can very likely be supplied by Conwed.

Conwed CORPORATION

Front Page Photo

PRODUCT: 7000 Series partitions combined with Five Plus Five Ceiling System.

Left

PROJECT: East Lansing State Bank, East Lansing, Mich.

PRODUCT: Conwed 5+5, bays of 60"x60" regressed splays (perforated) 3'x3' fixtures.

ACOUSTICAL CONTRACTOR: Larry Brooks & Associates

Top Right

PROJECT: Western State Bank, St. Paul, Minnesota

PRODUCTS: Conwed 5+5, 30"x60" vaulted fixtures, ventilating grid and semi-concealed lay-in panels.

ACOUSTICAL CONTRACTOR: Hauenstein Burmeister

Bottom Right

PROJECT: Barber-Colman Corp., Rockford, Illinois

PRODUCT: Conwed 5+5, 30"x60" air delivery fixtures, low profile air fittings, 30"x60" fissura panels.

ACOUSTICAL CONTRACTOR: Continental of Rockford

For more data, circle 99 on inquiry card

It's a new ceramic carving. It's the natural thing to use.

Plate 613

It's Terra Vitra.

You know Terra Vitra.® The famous architectural tiles from the kilns of American Olean. They're the natural thing for floors and walls, for all the reasons you like natural things; beauty, permanence, honesty.

Well, Terra Vitra comes in ten great new indoor-outdoor sculptures.

There are low and high reliefs, overall, directional and accent patterns, even some with which you can develop continuous designs.

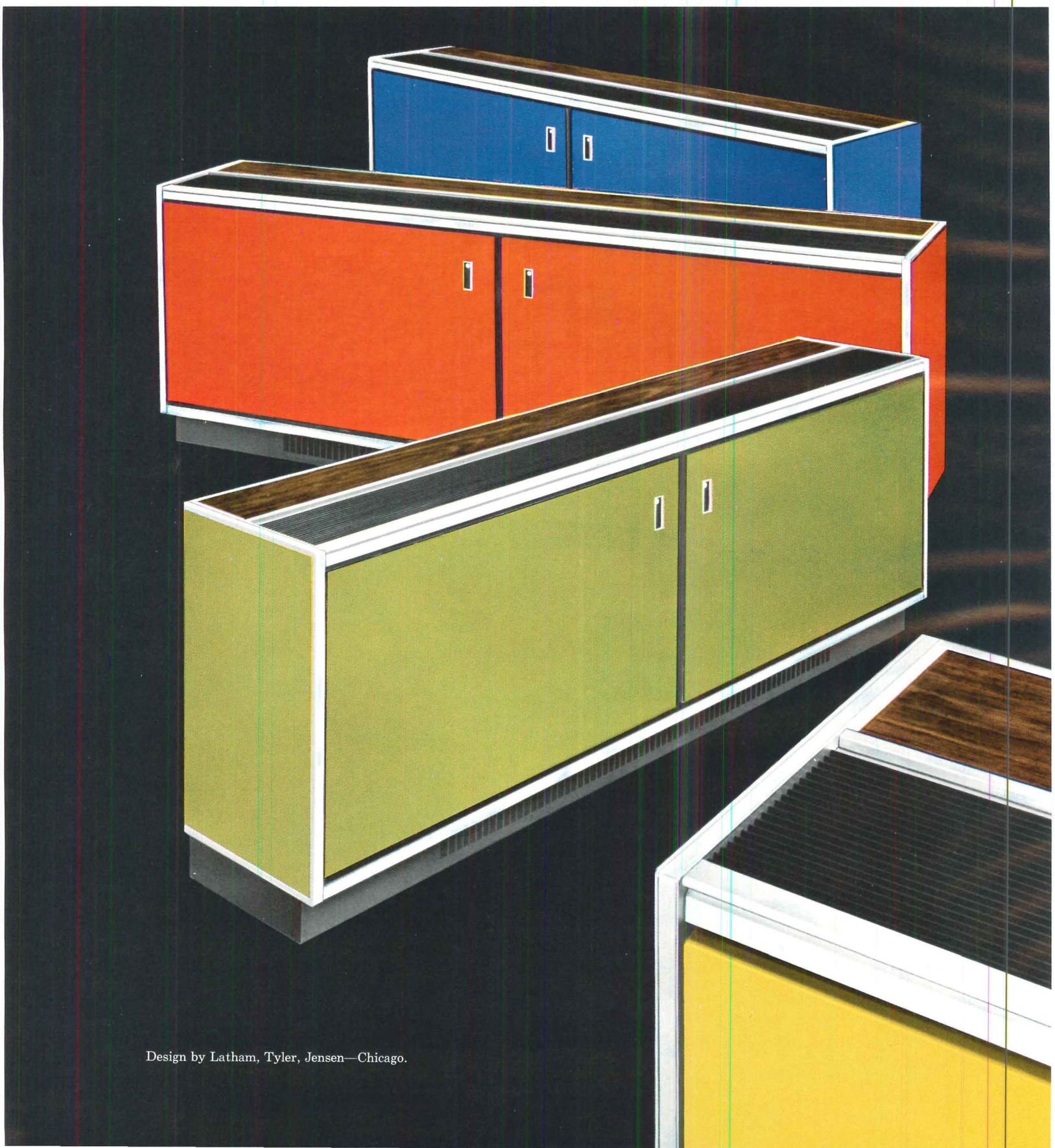
And the glaze! More textured, yet more transparent, in handsome new colors.

Write for a Terra Vitra brochure showing all the news. American Olean Tile Company, 1517 Cannon Ave., Lansdale, Pa. 19446.

CERAMIC TILE
American Olean
A Division of National Gypsum Company

For more data, circle 82 on inquiry card

New Schemenauer unit ventilators handle classroom comfort



Design by Latham, Tyler, Jensen—Chicago.

and other things.

People aren't supposed to cram things into the grille of a unit ventilator. People aren't supposed to sit on unit ventilators, or kick them, or draw on them, or try to scratch them. But people do. So we built a unit ventilator that's up to what people are up to.

The discharge grille is designed to direct any foreign objects into a drain pan for removal during normal service. Formica tops won't scratch, peel or rust. Strong, welded frames and double-panel doors and end panels handle a lot of weight and a whole school of hard knocks without giving in.

There are tough, extruded aluminum wear strips at all leading edges. And there are special locks and fasteners to prevent unauthorized opening.

Underneath this people-proof exterior you'll find other things like improved performance on mechanical and natural cooling and heating, infinite variable speed motor control, and quick-change one-piece filters that slide in and out like a drawer for easy inspection and cleaning.

And colors! We've got 13 colors, plus five Formica selections including woodgrain and slate. Plus a complete line of accessory furniture.

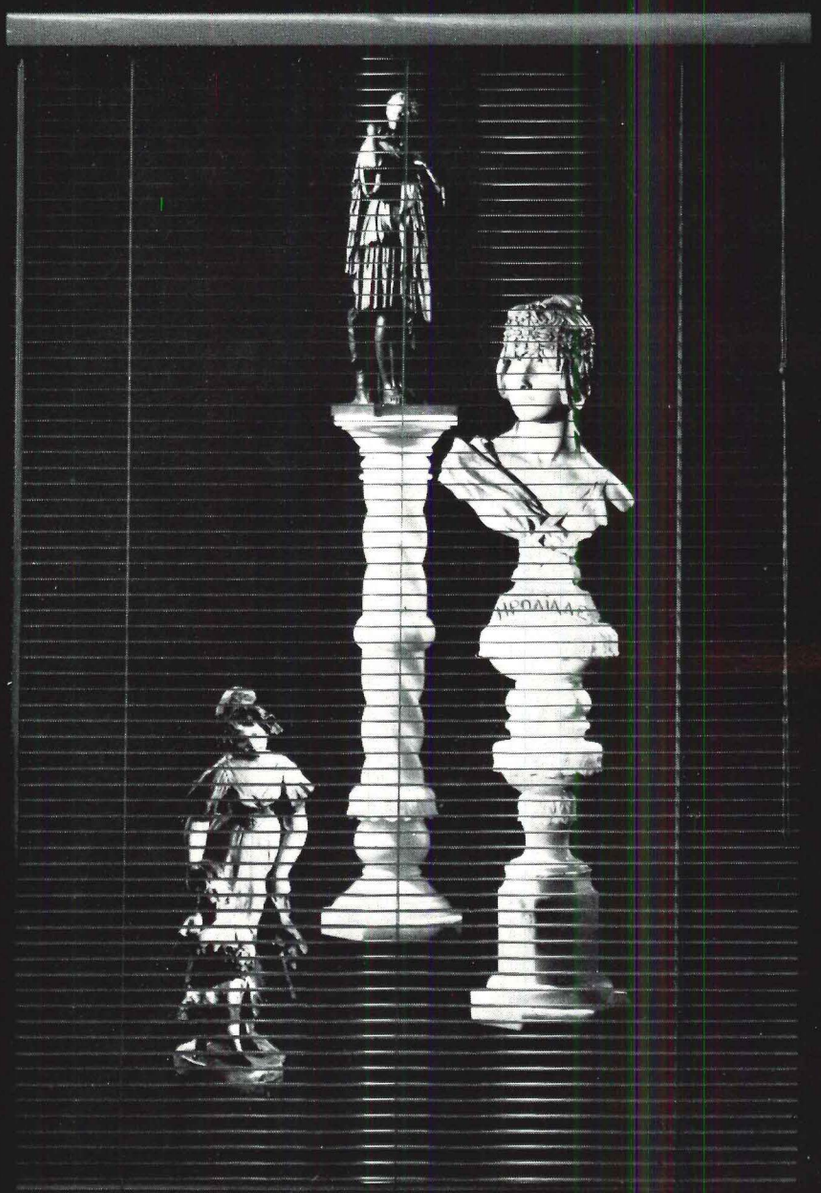
Our new unit ventilators are quiet, easy to service, and economical to operate. And, they offer the same high quality that, over the years, buyers and specifiers have learned to expect from Schemenauer equipment. But that's another story.

Floor and ceiling types available for hydronic or electric heating plus chilled water cooling. For details, see your local representative or write Modine, 1500 DeKoven Avenue, Racine, Wisconsin 53401.

MODINE

Nothing quite equals Modine/Schemenauer heating and air conditioning quality.

IT ADDS NOTHING.
And that can mean everything.



One of the requirements of good building design is that it be left alone. Inside and out. Flexalum Venette® 1-inch louvers do just that. They're functional without being obvious. Open, they virtually disappear. Closed, they give you complete privacy. In between, they control light with unprecedented subtlety and comfortable diffusion.

And the Venette is strong. Its spring tempered louvers are made of a special aluminum alloy for extra strength and resiliency. A rigid torque-tube head, aluminum wand tilter and polyester cable ladders help make this blind last longer—look newer longer.

The Venette—truly a classic in its own time—everything you'll ever want in a blind. Now. For more information write, Alcan Aluminum Corporation, Building Products Division, 100 Erieview Plaza, Cleveland, Ohio 44114

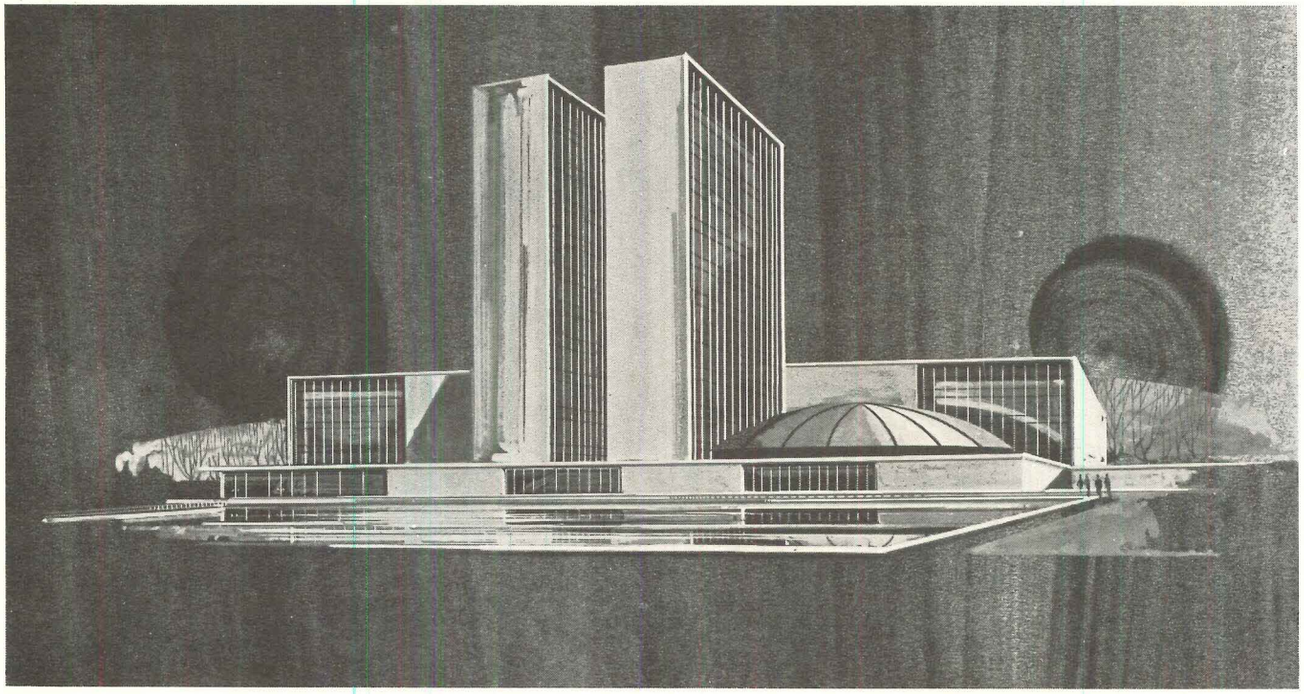
ALCAN

Cataloged in Sweets, Spec-Data and IDAC.

For more data, circle 85 on inquiry card

For more data, circle 84 on inquiry card

Weath-R-Proof Design Series



Weath·R·Proof

Insulating Glass

Weath-R-Proof units are made in a wide range of configurations, providing complete "design flexibility" to meet your most creative ideas.

Weath-R-Proof units can be promptly supplied for the largest projects; and we care enough to give you personal attention from design through glazing.

. . . backed by a 20 year warranty.

Weath·R·Proof
INSULATING GLASS

THERMOPROOF GLASS COMPANY
4815 Cabot Avenue—Detroit, Mich. 48210
Subsidiary of Shatterproof Glass Corporation

Full color insert in Sweet's

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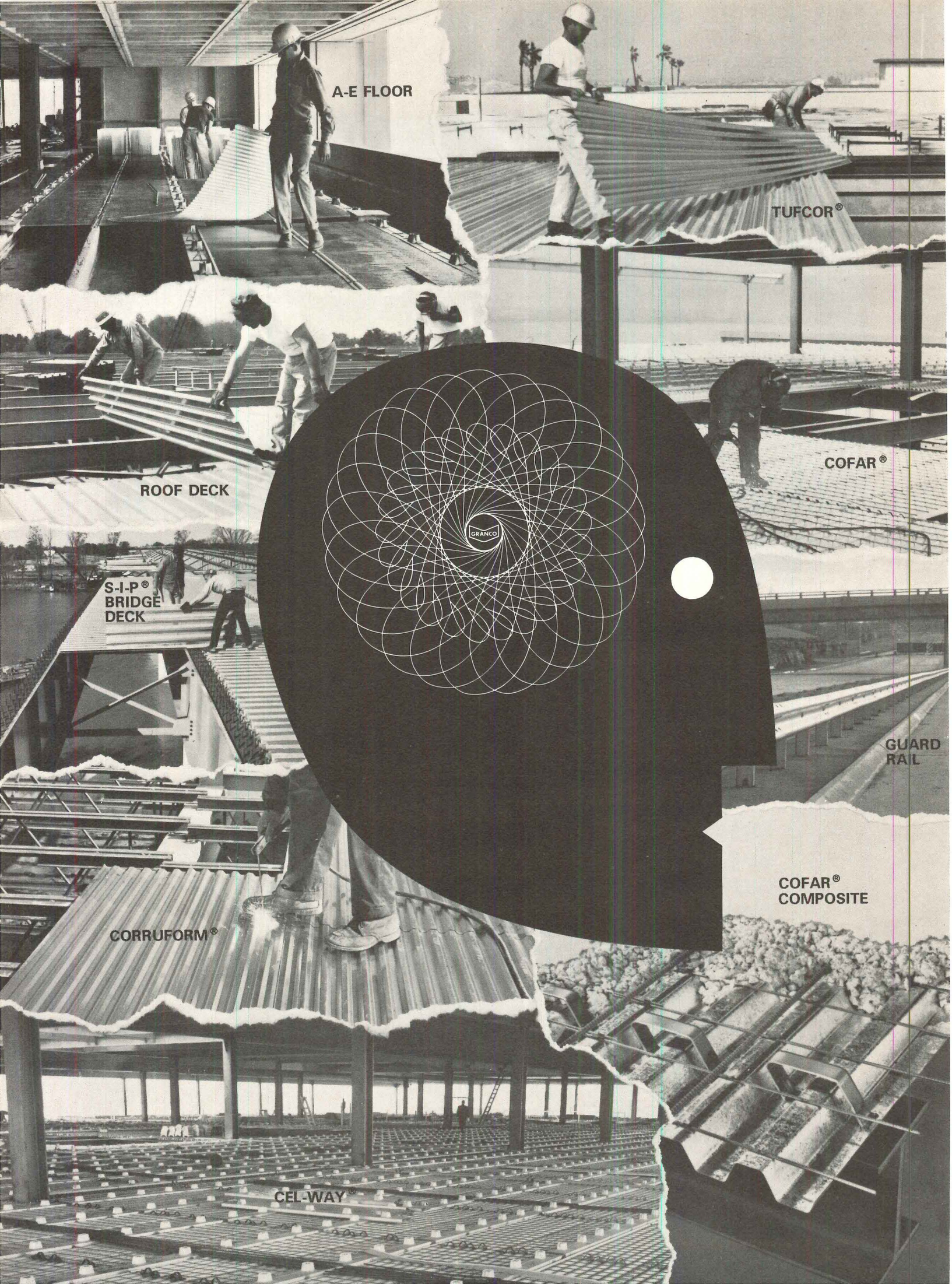
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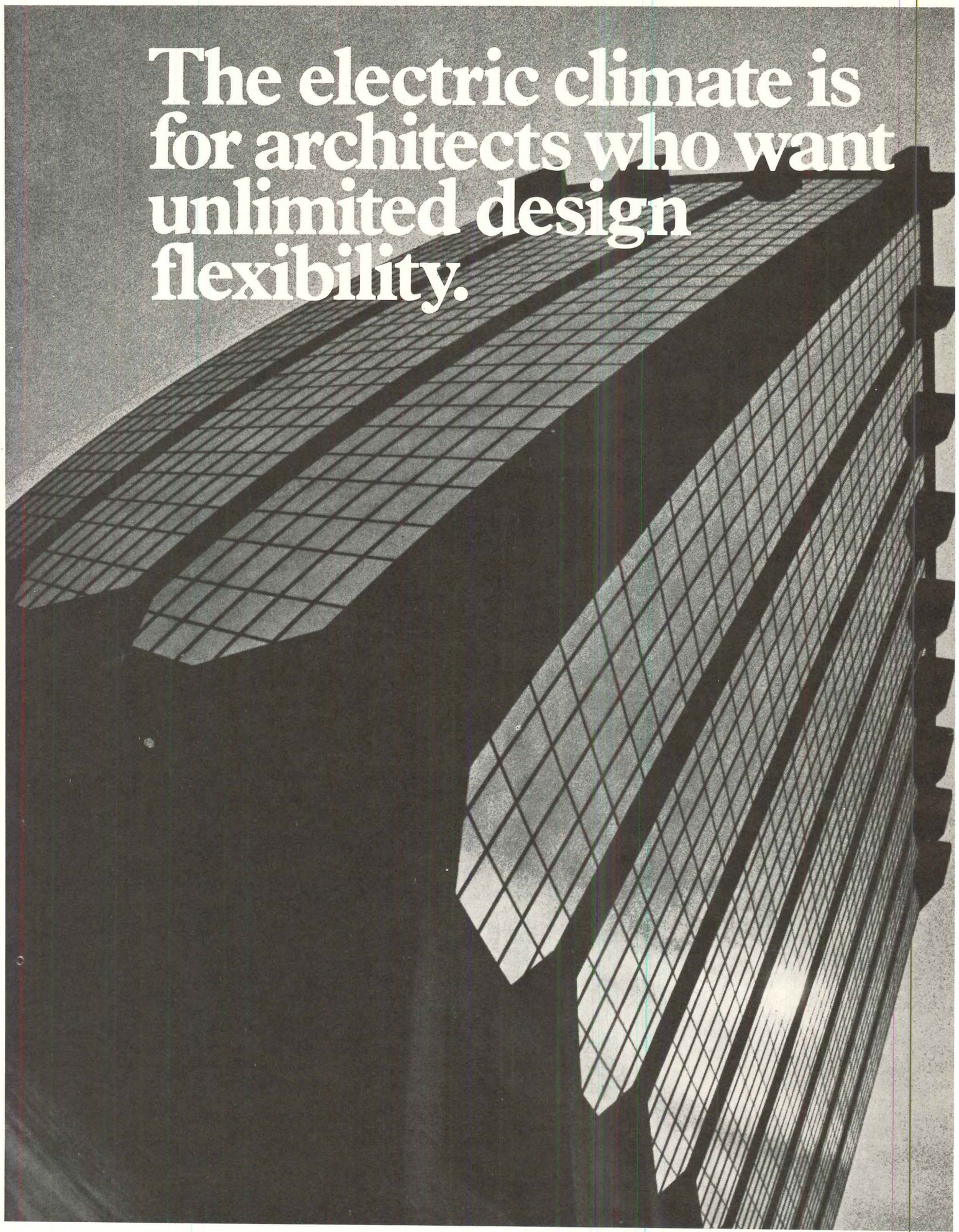
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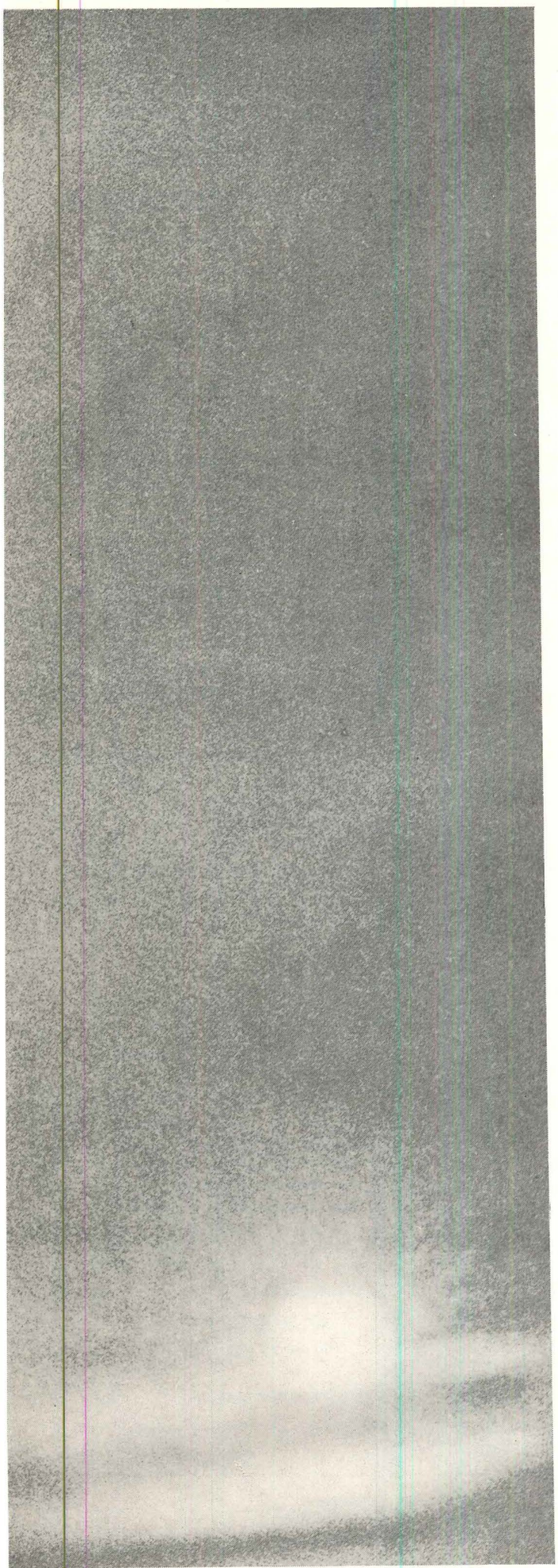

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continued from page 168

ENAMEL / "Guide to Designing with Architectural Porcelain Enamel on Steel," a 32-page manual, gives types of insulated panels and an evaluation of core materials, design data on veneer and fascia panels, color ranges and weather resistance tests for porcelain enamel, and details on fabrication considerations. Specifications are included. ■ Porcelain Enamel Institute, Architectural Div., Washington, D.C.

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ELEVATORS / Descriptive literature introduces a line of elevators using two small hydraulic cylinders enclosed in self-supporting structural steel columns, eliminating the need for a precision cylinder shaft, penthouse, or pit. Present installations are limited to a maximum cab travel of 18½ ft. ■ Keefab Corp., Omaha, Neb.

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PARTITION SYSTEM / A single-panel room-divider system set on ceiling-mounted track is described in a 4-page bulletin. A variety of work surfaces, coated fabrics and woodgrain reproductions are available. ■ New Castle Products, Modernfold Div., New Castle, Ind.*

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FLOORING / A line of parquet floor patterns available in a variety of hardwoods is presented in a 12-page catalog. The flooring units are available in unfinished, paper-fronted panels, or pre-finished, felt-back panels. Specifications are included. ■ Bangkok Industries, Inc., Philadelphia.*

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WASTE COMPACTOR / A stationary packer designed for commercial and institutional operations is described in a bulletin. The unit has a packing capacity of .63 cu. yds., has push-button control, and a cycle time of 42 seconds. An optional limit switch system prevents jamming problems. ■ Kysor Industrial Corp., Anchorpac Div., Jackson, Mich.

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AIR CLEANER / Construction and operation features of this electronic unit are detailed in an 8-page bulletin. The unit utilizes individual power cell modules to remove foreign matter from the air. A table of capacities and dimensions is included. ■ Westinghouse Electric Corp., Sturtevant Div., Pittsburgh.*

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POOL ENCLOSURES / A line of swimming pool enclosures is described in literature showing installation photos for both private and commercial pools. These enclosures make year-round pool use possible. Specifications and detailed drawings are included. ■ Structures Unlimited, Inc., Manchester, N.H.*

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WATER COOLERS / Product descriptions and specifications on nearly 50 models are given in a 16-page catalog. Water-cooler construction is detailed, with explanations outlining each component function. ■ Ebco Mfg. Co., Columbus, Ohio.*

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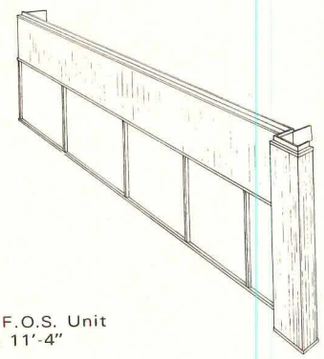

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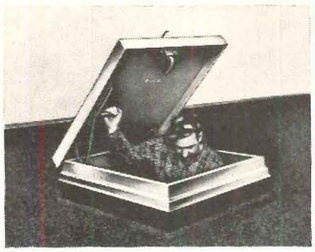
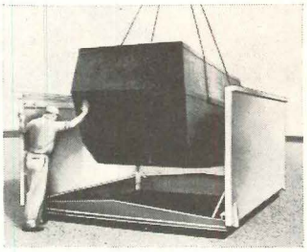


Up down



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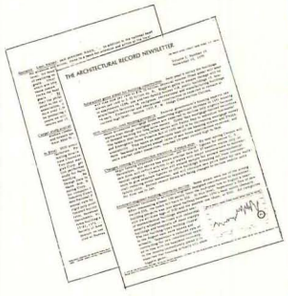

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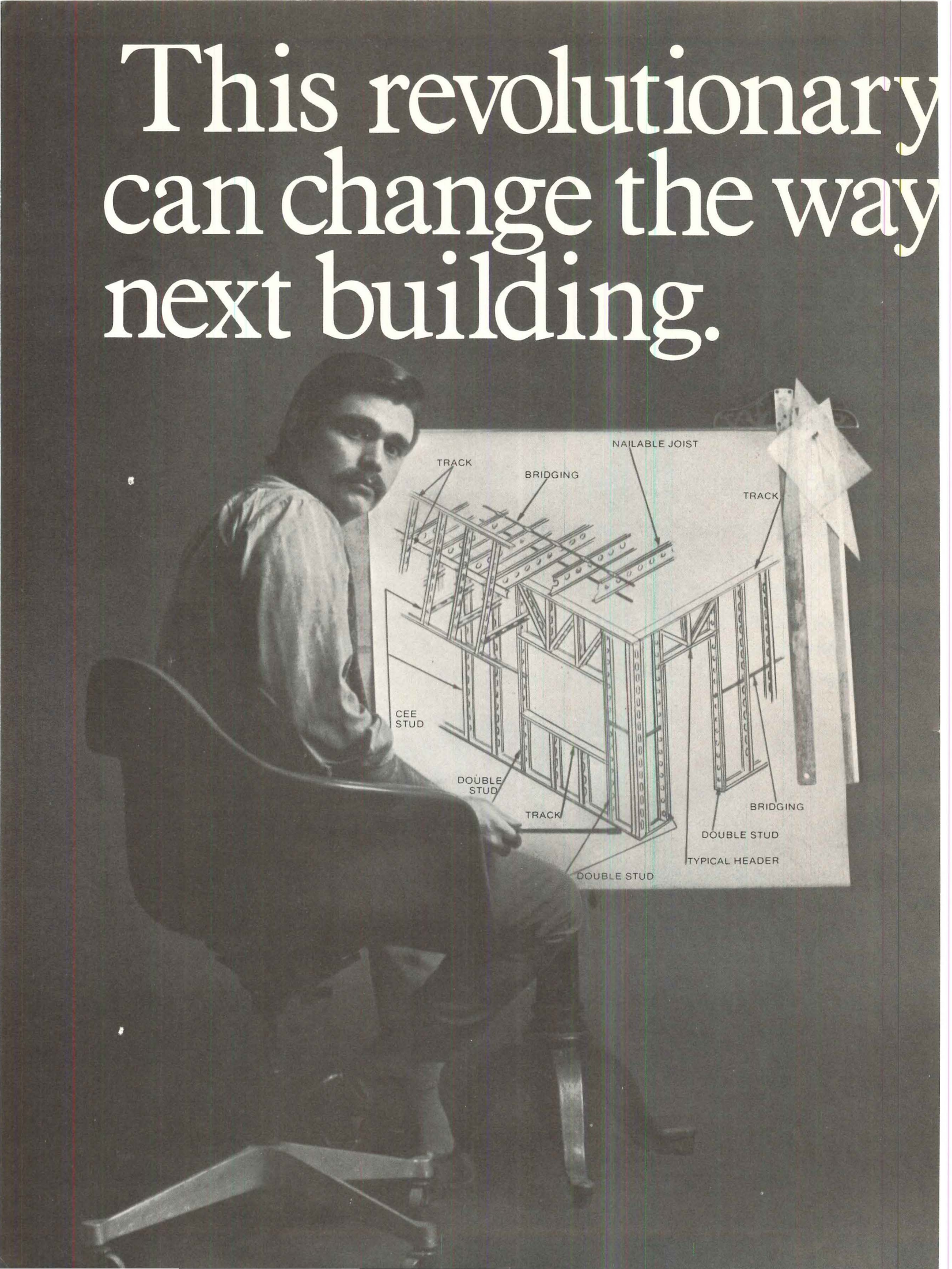

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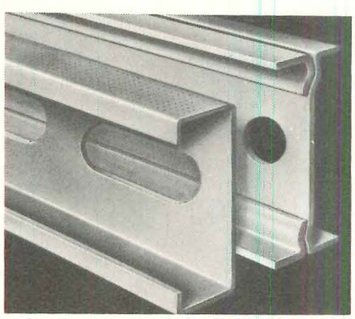

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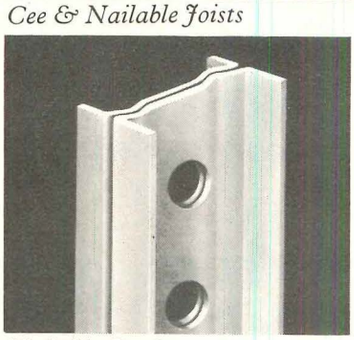

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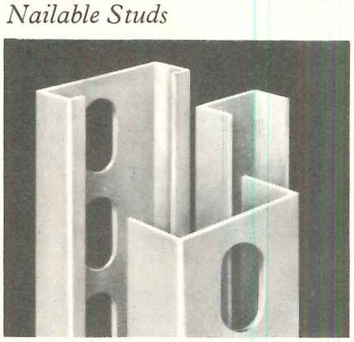

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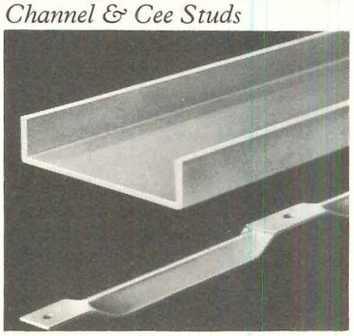

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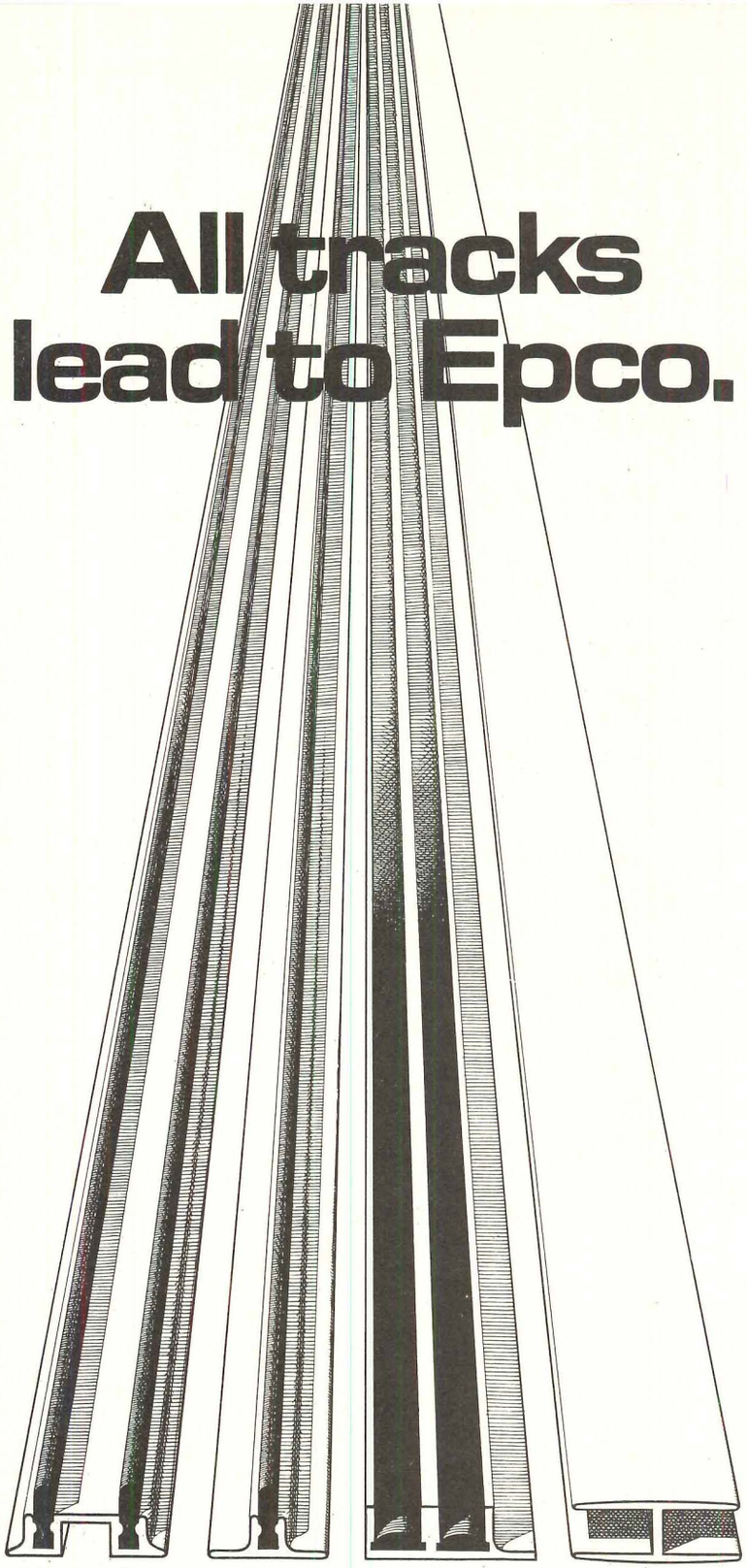

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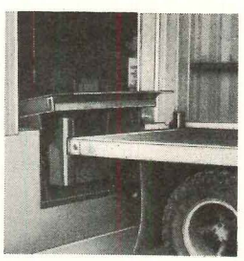

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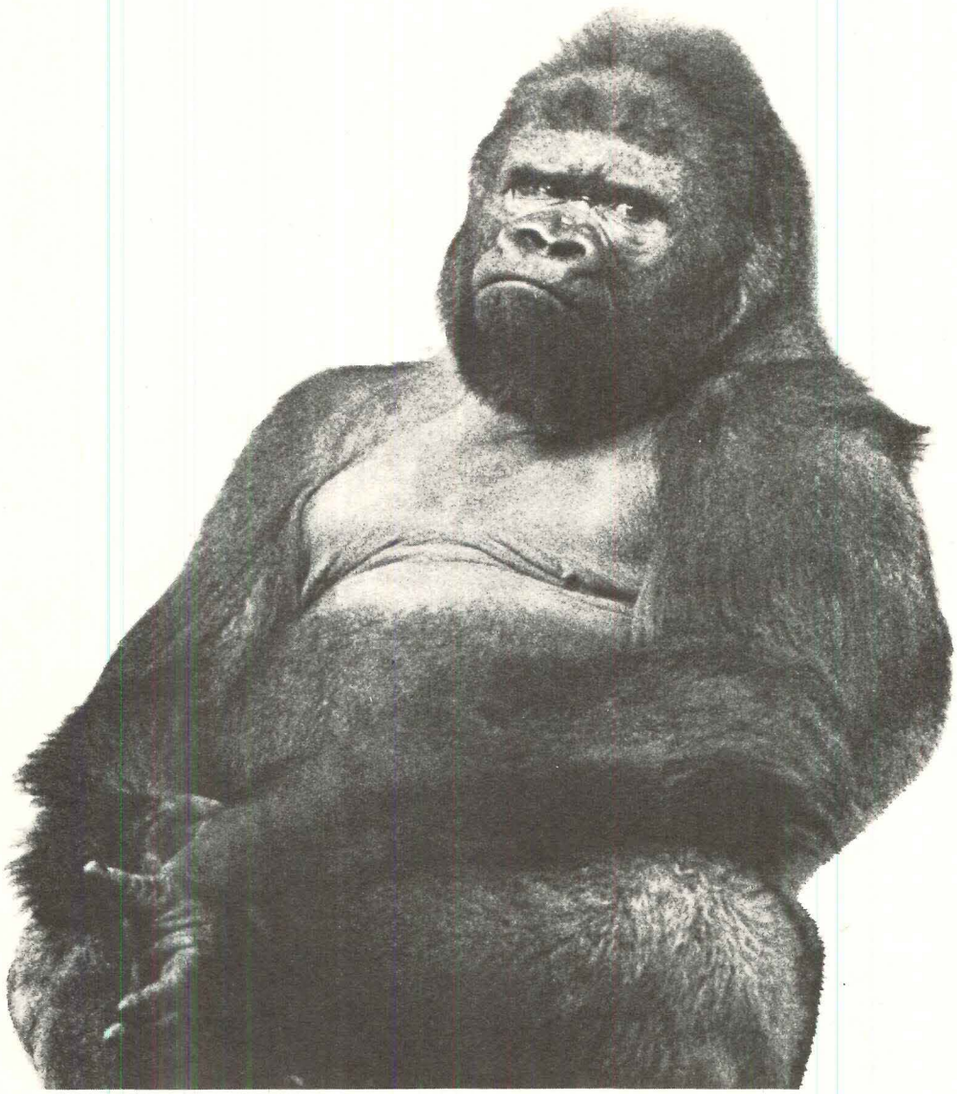

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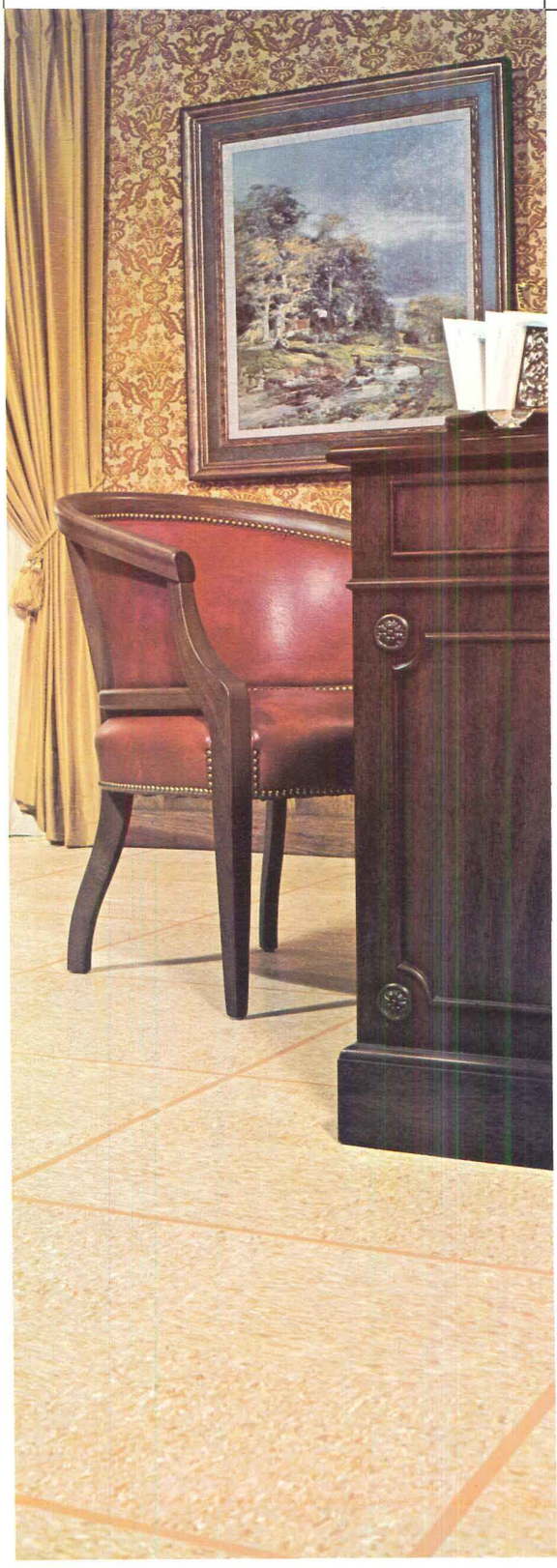
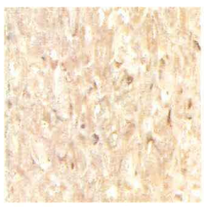


VL-13 Olive Mist

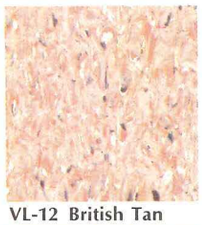


VL-11 Frosted Beige

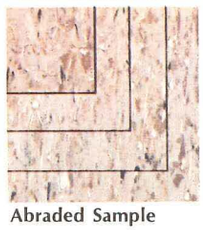
VL-10 Mocha White

VL-15 Jade Haze

VL-14 Lemon Ice



VL-12 British Tan



Abraded Sample

Thru-Onyx

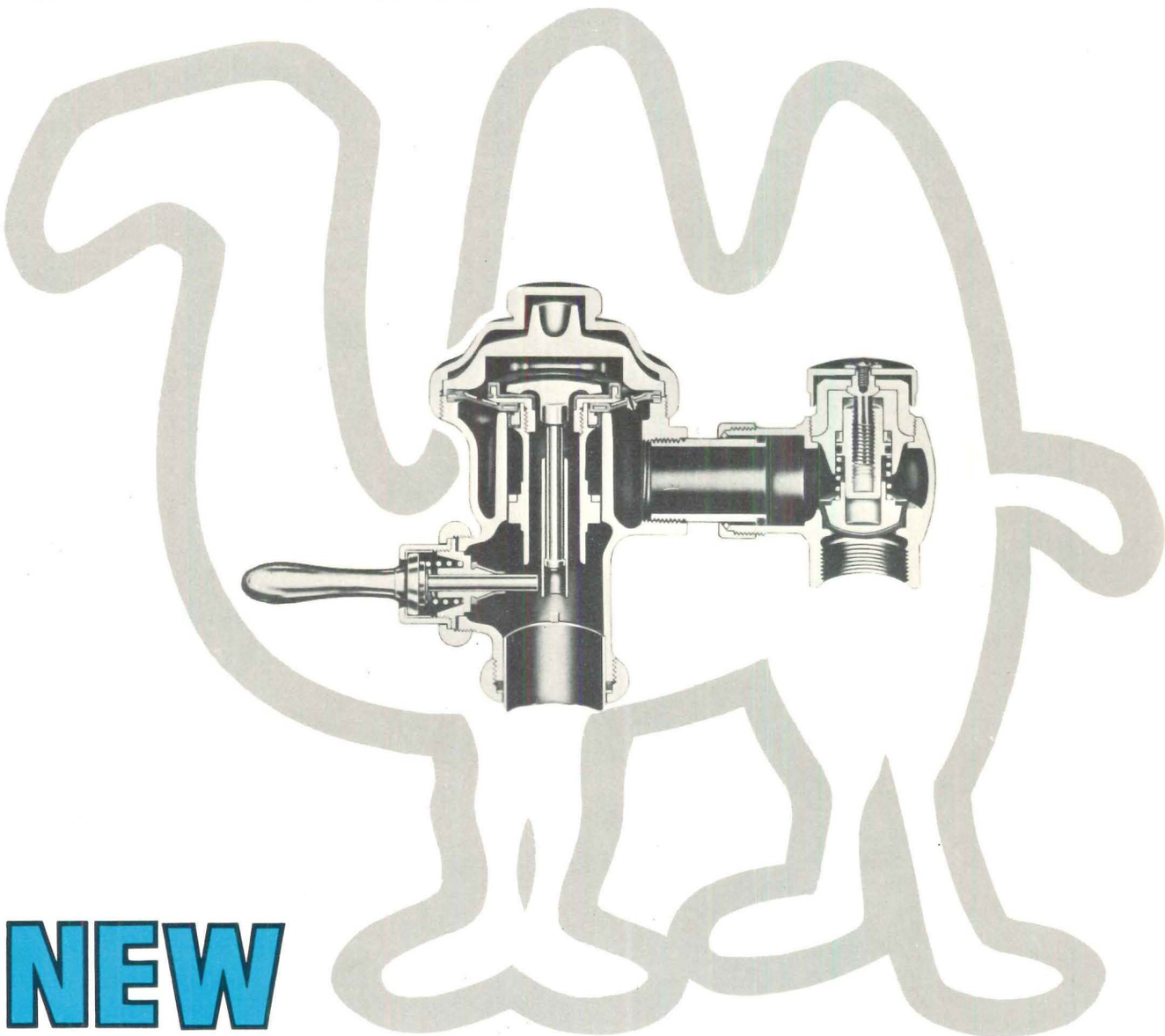
Add a new dimension of elegance to the floors you design with this exclusive new styling achievement in Azrock vinyl asbestos tile. Thru-Onyx is created with fine particles of actual marble and translucent vinyl chips, some containing asbestos. Patterning is distributed through the tile thickness, as illustrated in the abraded sample above. Beautifully designed for heavy-traffic commercial, institutional, and residential use. 1/8″ gauge, 12″ x 12″ size.

Specify **AZROCK®** *with confidence*

Consult Sweet's File or write for samples.
Azrock Floor Products, 553A Frost Building, San Antonio, Texas 78205

For more data, circle 98 on inquiry card

ANOTHER PLUS FEATURE OF SLOAN FLUSH VALVES . . .



NEW BAK-CHEK

retains water at normal line pressure to protect against supply line pressure failures

Our "camel" has a new way of storing water. By spring-loading the seat plug of the Sloan Control Stop, we now retain water at normal line pressure in the *control stop* and in the *flush valve* when not in use.

This new feature, which we call Bak-Chek, means simply that the retained water is *held* at *normal* line pressure regardless of a significant drop or loss of pressure in the supply line—even if a negative pressure develops. This prevents spontaneous flushing or continuous running flush valves when normal supply line pressure is again restored.

Bak-Chek is incorporated in all new Sloan Flush Valves as standard equipment—no extra charge. It is but one of seven flush valve features introduced by Sloan within the past eighteen months—seven more reasons for Sloan's continuing flush valve leadership. For the best in flush valves specify and insist on Sloan—most people do.

SLOAN VALVE COMPANY
4300 West Lake Street • Chicago, Illinois 60624

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