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COVER

Wall of Auditorium-Theater for the University of California ingeniously serves a variety of acoustic and theatrical functions. This model photo is of an early study. (p. 194) Photo: Ulrich Roth.

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SPRINGFIELD, MASS.

Springfield Institution for Savings Architects: Alderman and MacNeish Architectural and Interior Design: Raymond Lowey / William Snaith General Contractor: E. J. Pinney Co. Dover Oildraulic Elevator installed by Bay State Elevator Co.

3525 W. Peterson Office Building Architect: Schurecht, Inc. Dover Oildraulic Elevator installed by Gallaher & Speck

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Wants More Problems, Fewer Personalities

Dear Editor: This is a plea for more articles based on architectural problems or ideas (such as "Educational Reform and its Architectural Implications", in the AUGUST 1965 P/A), and fewer based on personalities, i.e., M-G-M Presents (same issue). Need I remind P/A that one journal that often gave the impression of preferring architects over architecture is now extinct?

> JOHN H. BEYNON Paris, France

CBS: Following the Module

Dear Editor: May I bring to your attention a technical error in your article on the CBS building in the JULY 1965 P/A.

On page 192, the writer, Bethami Probst, states that "everything except for interior partitioning is on a 5-ft module." As interior architects for the building, we would like to point out that this statement is incorrect and may leave the reader with the impression that the interior partitions do not follow the modular concept. On the contrary, our planning was specifically designed to incorporate the 5-ft module theme throughout the entire interior. Consequently, all private offices, larger work areas, and corridors were laid out to meet this demand. All components of interior metal partitions were carefully designed. as was the acoustic ceiling tile grid with its square lighting fixtures, including the integral air-conditioning elements.

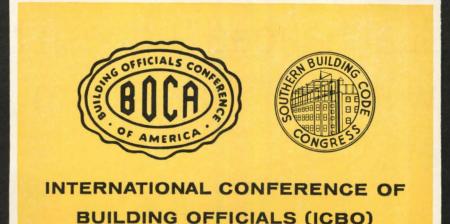
Electric and communication outlets followed the same pattern. The only departure from this basic rule took place in the interior of the structural core of the building where the exact requirements of the elevator shafts, fire tower, and stairs prevented the module from being followed.

> ARVIN SHAW III Carson, Lundin & Shaw New York, N. Y.

Author Thanks Critic

Dear Editor: I am writing these few lines in gratitude to Professor George Collins for his critique of my book (p. 196, AUCUST 1965 P/A). I want you to know what I thought of it. Professor Collins is the foremost authority in the world on Gaudí. He has devoted many years to the study and investigation of our artist-architect, and is the author of a basic book on Gaudí that opened broad and—for me, rich—perspectives *Continued on page 10*

6 Views



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Continued from page 6

on the man and his times. He has made a commentary on my book which is to compress it into a couple of words profound and just.

> ERIC CASANELLES Barcelona, Spain

Qualifying the Reviewer

Dear Editor: I do not think that George Keller, reviewer of Homes, Towns, and Traffic in the August 1965 P/A (p. 230) is qualified to make several of the observations that he does. Both Messrs. Tetlow and Goss have spent more than a few years in Birmingham, the center of a huge metropolitan agglomeration, and a city in which the noise level at rush hour (buses, etc.) and air pollution problems are staggering. Keller suggests "that the authors have had little experience with major urban areas." His assumption that Britain is wholly a "private enterprise, democratic society" is also somewhat naive, and his review of this book might well have been referred to someone who had spent some time in Britain.

> DAVID L. COLLINS Jacksonville, Fla.

Inappropriate for P/A

Dear Editor: Referring to lines 17-22, on page 146 of the AUGUST 1965 P/A: "It has been aptly said of this school that it weds artistic form with a utility that at once comprehends the present, and *brilliantly anticipates* evolution toward the *unkown* in educational instruction [my italics]."

This is the sort of nonsense one expects to find in *Art News* and the like, but seems highly inappropriate for P/A. EASON CROSS Washington, D. C.

Enlightening Discussion

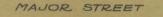
Dear Editor: I have just finished reading your Editorial in the JULY 1965 P/A and just wanted to tell you that I thought it was excellent and definitely relevant to today's problems. The points you have brought up regarding image and often the falseness of such images are good for all of us to ponder. Thank you for a very enlightening discussion of the subject.

> BEN HARVEY Public Relations Manager The Celotex Corp. Tampa, Fla.

> > OCTOBER 1965 P/A

Ecology, Anyone?

Dear Editor: I do appreciate your Editorials, and I feel very much in line with your thinking, but I feel distressed about having to leave the embryo of a *Continued on page 18* Schweitzer-Slater Associates, ALA. pre-plan an office building to grow vertically for Open World views



PARKING

STREET

How do you plan a high-rise office building to be easily expandable, yet retain "Open World" views? This was the problem Libbey Owens Ford gave to Architect Robert F. Slater of Schweitzer-Slater Associates, Milwaukee. Here, and on following pages, he outlines the major considerations and suggests a unique solution.

STREET

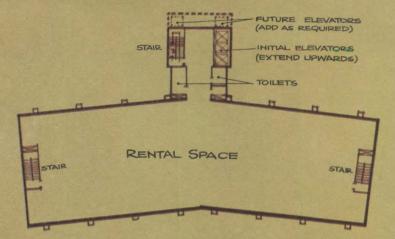
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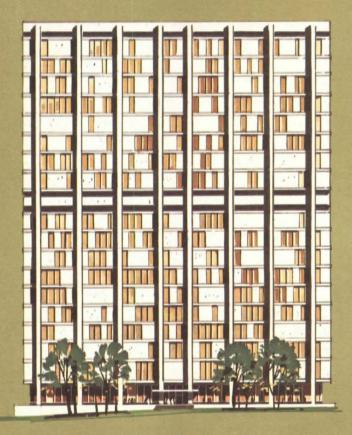


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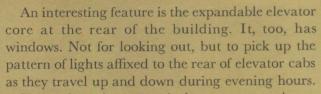
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OCTOBER 1965 P/A





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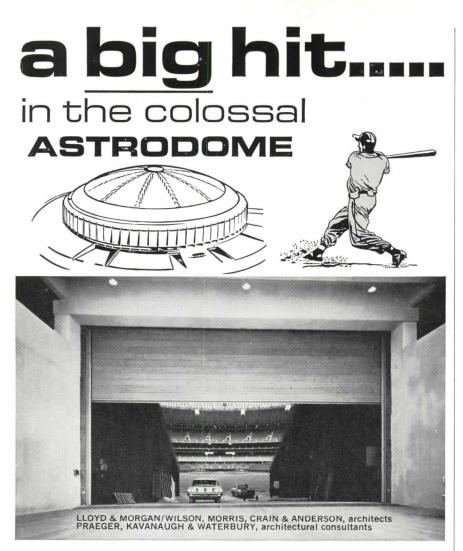
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Continued from page 10

good idea hanging in midair. Or to put it another way, can you tell me how much more confidence is needed to put things a little more clearly, to push the ideas out into the sunshine? Reconstructing our society and creating new traditions (your August issue) is a very big order, but unless you say something more about it, it's no order at all, but simply rather empty phrases.

It's not necessary to bring politics under discussion, in order to say a great deal more about what ails our society, or point out some remedies. And this program you mention—where do we begin?

Ecology, that branch of science which integrates biology, geography, ethnology, and about as many other sciences as you care to involve, seems to me to be a very substantial starting point, because it makes us look at man in his environment—past, present, and future—relating him intimately to other living organisms, and even asks the questions about our origins, which in themselves demand a kind of organic thinking—which is just what is needed.

The soil wasteage that brought about the dustbowl made us think about conservation, but too late. Is laying out square miles of asphalt for highways a sane policy? Or ought we not think about the whole transportation question from a human and ecological point of view? This kind of question, and a multitude of others, provide the only real basis for political thinking, and as many heads as possible are necessary to give weight to this way of thinking.

Dr. Gutkind at the University of Pennsylvania has a great deal to say on the matter. Would it be possible to convene a congress of ecologists and have a few architects thrown in?

ROBERT ESDAILE Bekkestua, Norway

Tapping Talent Through Application Forms

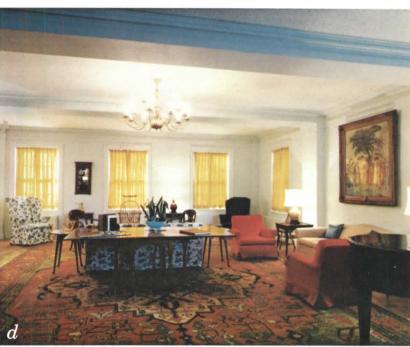
Dear Editor: By qualification and by the nature of your position with P/A, your views of our profession and its work is understandably enlarged beyond the ordinary—and, I might add, a benefit to those of us who are comparably limited.

From critics, editorials, books, articles, etc., I read much concerning the need for imaginative "new blood," "untapped talent," the insatiable quest for ability to meet the "ever-growing challenge of our day (?)," and, by contrast, or for laughs, the "who is responsible for ugliness" bit. One hears the same *Continued on page 21*









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CLEDUCATION CENTER, Mount Vernon, N. Y. Louis Levine, A.I.A., Architect. P&L products used: Vapex Wall Primer, Lyt-all Flowing Flat, Vitralite Enamel Eggshell.

b RALPH WALDO EMERSON SCHOOL, Yonkers, N. Y. Col. Howard C. Snyder, Architect.P&L products used: Primafil, Lyt-all Flowing Flat, ''38'' Pale Trim Varnish, Vitralite Enamel Eggshell.

C ST. JOSEPH'S REGIONAL BOYS HIGH SCHOOL, Montvale, N. J. M. George Vuinovich, A.I.A., Architect. P&L products used: Primafil, Vapex Flat Wall Finish, Vitralite Enamel, Lyt-all Flowing Flat, Stains and Varnishes.

d CHAPIN HOME FOR THE AGING, Jamaica, Long Island, N. Y., Coffin & Coffin - Phelps Barnum & Son, Associated Architects. P&L products used: Vapex Wall Primer, Lyt-all Double Duty Primer, Lyt-all Flowing Flat, Vitralite Enamel Eggshell.



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Continued from page 18

heart-tugging desires from school boards, industry, church and civic groups, city officials; alas, even the Federal Government wants, needs, and begs for these wonderful people.

To read and hear such lofty aspirations finds us all floating—carried on the wings of a Sibyl Moholy-Nagy through the expanding hot air of those same groups that plead for "talent." The crash-landing gear to such flights of fancy is an instrument called the typical application form for architectural commission used by school boards, industry, and civic or federal agencies. These forms not only bring you to the ground, but, if you are a relatively new firm ("new blood," remember?), they put you about 6 ft under.

To those in the architectural stratosphere, these forms read something like this: "In the following 14 pages, list the projects your firm has completed within the last 15 years, along with the corresponding construction costs." Also: "In the following 47 spaces, list in detail the names and qualifications of your *key* personnel, and, in the remaining three pages, merely add the total number of 'other' personnel among your regular staff."

Then comes your tombstone—as you are told that, *if* you are selected, you will be granted work comparable to the *size* of your office staff, and the average project cost as listed in your previous 15-year history. (Oh, who in the hell is responsible for ugliness?)

My apologies to those who are seeking "new worlds" and facing problems "as yet unencountered by mankind"; surely this is too mundane for their consideration. Although it isn't exactly news to me, I am encouraged to know that we must obviously leave this world to find a better one.

EDWARD RAST San Antonio, Texas

NOTICES

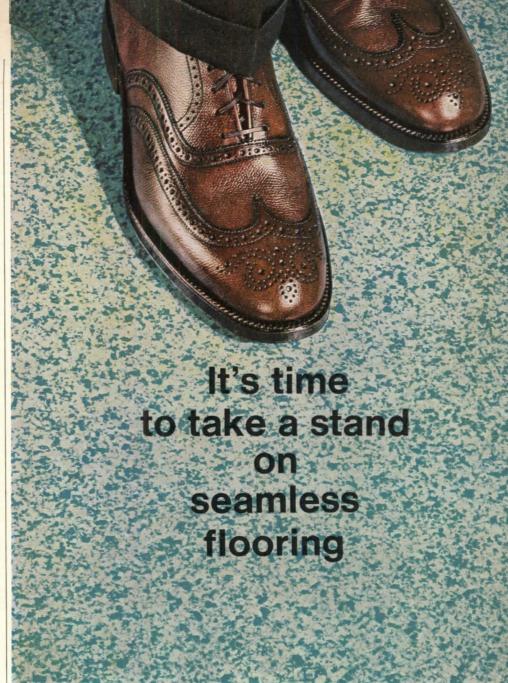
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MOORE, LYNDON, TURNBULL & WHIT-Continued on page 294

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OCTOBER 1965 P/A



BB93



BB600



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ridiculous

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They can't understand why we pay so much attention to design, structure, and detailing. These desks, they say, are for secretaries, young executives and general offices. So why bother making them in teak as well as walnut? And why experiment with oak when everybody knows it won't be fashionable for at least another year? And why protect key wear spots with Densedge fibre stripping? And why, for crying out loud, do we put all that work into the finish? Other mass-use furniture gets away with a lot less than Pennwood. So why have drawers that adapt to either letter or legal size files? And isn't the steel track, nylon roller suspension drawer onl for expensive furniture? And why have secret compartments in desk for handbags and galoshes? And why put touch latches on credenz doors when pulls are cheaper? And why bother engineering a chai for support and just the right amount of comfort? Why design i to win design awards? Why? Why?

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The built-in resilience of the fiber means at a plushy pile <u>stays</u> plushy. The anhyous quality of the fiber means that <u>stains</u> are easier to get out. In other words, the elegance of the carpet <u>lasts</u>. And isn't that what you're after? Only the finest carpet mills offer carpets made with Acrilan.

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HERE'S A BRIGHT IDEA ABOUT SCHOOL EQUIPMENT

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Republic Bracket Type Library Shelving will help you keep things neat, clean, and colorful. Shelves adjust easily in one inch increments to accommodate books of any height. There's an easy-tooperate leveling screw at the bottom of each post, too another Republic idea.

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Finishes are highest quality baked enamel, applied over five successive rust inhibiting coatings. Tough, to *last*—and styling and construction that's going to stay up-to-the-minute in appearance for years.

Want to know more about this colorful subject? Write and be sure to ask for the new Republic Locker color sample bulletin—shows true color samples of all the 45 colors you can get in Republic Spectrum 45 Lockers.





This does sound like a bright idea! Send literature on:

 Republic Spectrum 45 Lockers
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You can have **Buensod Dual-Panels** in steel, stainless steel or aluminum. You can have them unfinished...or finished, in most any color or material. And just because Dual-Panels have exclusive foamed-in-place polyurethane cores for incomparable rigidity, don't think you're limited in sizes. You can order them in lengths and heights to fit any specifications. And you can use them flush, overlapped, or butted in a variety of sill and base arrangements. Write Buensod-Stacey Corp., 470 Park Ave. S., N.Y., 10016. You'll see.



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New Ionian Terraflex... the beautiful floor tile built to take abominable abuse

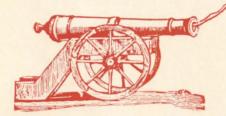
Beefing up a floor tile to give it extra strength is easy. However, making one that has delicate beauty at the same time is a beast of a different color. But that's what makes new Johns-Manville Ionian Terraflex stand out from the horde. It offers both.

Ionian's massive swirl design, high gloss and subtle blending of colors give it a glowing elegance that blends with any decor. Yet there's no sacrifice in durability. That's because the pattern goes all the way through and is uniformly distributed throughout the thickness of the tile. Even years and years of the heaviest commercial traffic won't mar its looks.

So there you have it. Beauty and the beast. All in one $9" \times 9" \times 1/8"$ (or 3/32") tile. And it's available in eight different shades. Incidentally, no two tiles have the same pattern thus assuring the over-all random shading characteristic of real marble. For details see your J-M Representative.



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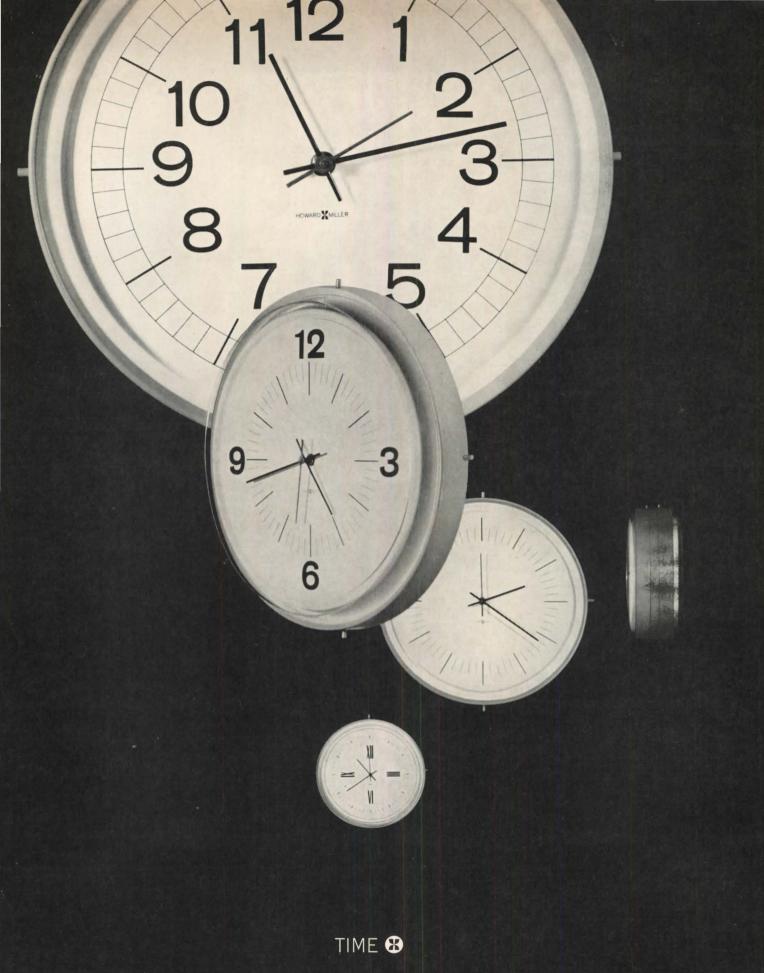
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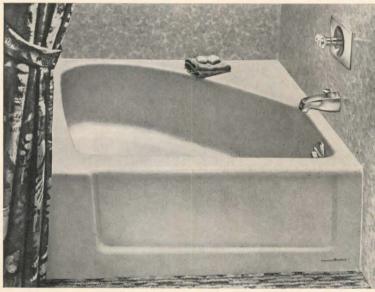


Clocks for todays modern interiors . . . Institutional clocks designed by architect-designer George Nelson. Four dial styles available in 14 and 18 inch diameters. Choice of satin finished black, white or olive in single or double face. For mounting directly to wall or suspended with bracket from ceiling or wall. Write us for our illustrated catalog. Howard Miller Clock Company, Zeeland, Michigan 49464

And now American-Standard brings you

A tub that fits in shower stall space

The new Restal* makes full baths in homes, apartments, hotels and motels



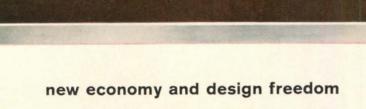
Here's a great little American-Standard bathtub with big-bathtub ideas. It takes only 38 by 39 inches of floor space—or about the same as a conventional shower receptacle. But it permits relaxed, deep-suds bathing that only a tub can provide. The sculpted ledge may be used as a seat when bathing or as a footrest when showering. The compact size makes cleaning easy. Construction is of lifetime cast iron, *Irademark AR&SS Corp.

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OCTOBER 1965 P/A



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Reynolds Aluminum Multi-Framing System

This system combines the beauty and durability of aluminum, with new economy and design flexibility. Multi-purpose extrusions reduce the number needed. All are solid shapes, permitting easy inspection.

Components are stocked by distributor-fabricators who also install, at minimum field cost, according to the architect's design.

Mullion depth, in this system, can vary from four to eight inches.

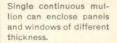
One continuous mullion can enclose a variety of glass, panels and window thickness.

Details are available in a portfolio which also shows the system's application to Store Fronts, Re-Facing and Partitions. 57 sheets of drawings.

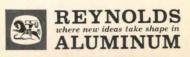
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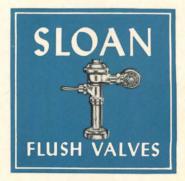
FOR SWEAT-SOLDER INSTALLATIONS, which appear to be gaining in popularity, Sloan's new Sweat Solder Kit is guaranteed to be a boon to the installing Plumber, as well as appealing to Owner, Architect and Engineer.

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Monarch nylon pile*

unchanged after 2,000 cycles.

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Just to prove that when up against it, Monarch carpet gives superior wear.

In a recent laboratory test conducted for Monarch by an outside source, *** two comparable commercial carpet samples were subjected to strenuous testing on the Taber Abraser machine (an established means for measuring abrasion-resistance). After 2,000 revolutions under pressure, the natural fiber carpet pile was worn through to the backing. Yet Monarch nylon carpet pile withstood identical abrasion with no sign of wear . . . proof that the Monarch carpet offers the greatest resistance to scuffing and traffic.

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*Monarch Veltron carpet made by an exclusive electronic process. **Heavy weight commercial wool carpet. ***Test data available on request.

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OCTOBER 1965 P/A

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6th Century Mosaic, Lady in Waiting, Court of Empress Teodora—Church of San Vitale, Ravenna, Italy.

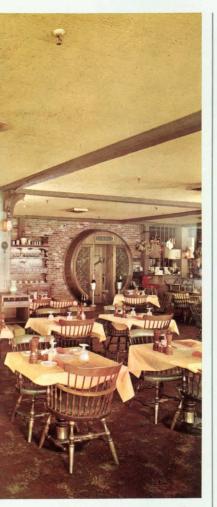


beauty that endures



Early American charm, nautical view, and all the modern advantage of a ceiling that's beautifully quiet—Lo-Tone Fissura acoustical tile.

PROJECT: Anthony's Pier 4 LOCATION: Boston, Mass. ARCHITECT: Sumner-Schein ACOUSTICAL CONTRACTOR: Acoustical Contractors, Inc., Watertown, Mass.



BEAUTY That Endures ...with quiet charm that blends the old and the new

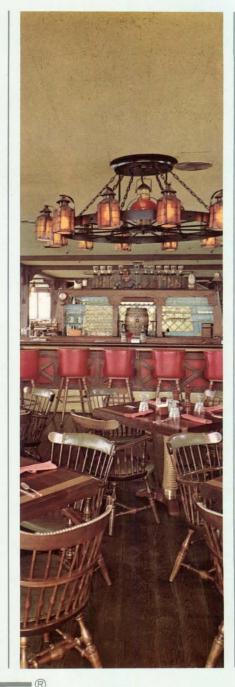
Just how do you capture the rich heritage of Early Americana, the deep nautical tradition of the Boston Harbor, yet achieve the modern convenience and luxury of a truly fine restaurant? You'll find a delightful answer in the new Pier 4 Restaurant. Rich in antiques, 100-year-old New England brick and rustic hand-hewn beams—yet constructed with every modern convenience for the pleasure and comfort of the diner.

And just as relaxing as the view and surroundings is the quiet atmosphere in this new restaurant. A quality provided by Lo-Tone acoustical ceilings.

And qualities of many kinds abound in the full range of Lo-Tone ceilings—both board and tile. Lighting, for example, is easily integrated with recessed Lo-Tone translucent panels and fixtures. You can also combine the distribution of heated or cooled air with an acoustical ceiling. Lo-Tone ventilating tile and board incorporate easily adjustable jet slots that allow high plenum pressures, assure uniform air distribution to the area below.

Many Lo-Tone ceiling designs let you add extra fire protection. What's more, fire-rated Lo-Tone board and tile can usually even help you eliminate costly intermediate fire protection above the acoustical ceiling.

Ceiling ideas come easy with the complete information on Lo-Tone products at your fingertips. See AIA File No. 39-B in Sweet's. Call your nearby Lo-Tone acoustical contractor (he's listed in the Yellow Pages). Or write Wood Conversion Co., St. Paul, Minn. 55101.



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You can specify, for example, 4000 sq. yds. of 3 ply all wool yarns.

But can you specify, how the wool should be scoured?

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You can specify a ³/₄ inch pile height. But can you specify even weight from yard to yard?

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But can you specify 63 inspections to make sure of no skips or misweaves?

See our point?

40

A carpet mill can foul you up.

At Lees, we don't.

We don't give you wool from mangy

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Or nylons or acrylics from mangy manufacturers.

Or streaked, mismatched, off-colored, ravelled, pulled, fluffed, puckered, wrinkled or tacky-backed carpets.

Put it this way. We don't give you trouble.

Except sometimes.

Sometimes we get specs we can't afford to follow as they are.

If we did, we'd have to make substandard carpet.

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For a lot of good, down-to-earth reasons, "those heavenly carpets by Lees."

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OCTOBER 1965 P/A



ight-diffusing Huewhite ames the sun by day, omes aglow by night **>**



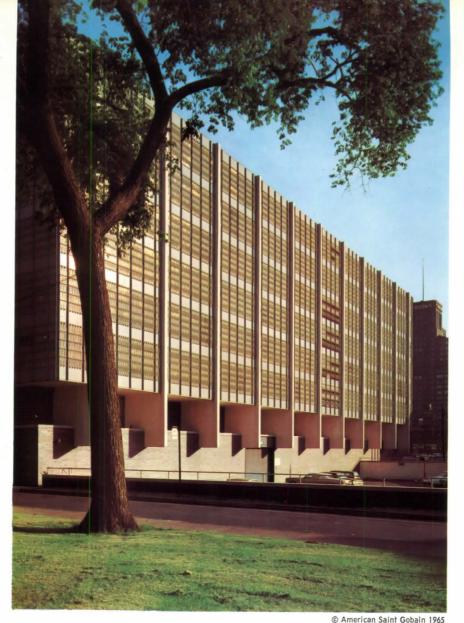
Sunscreen of Huewhite glass makes this new bank a day and night attraction Assignment: Design a two-story, glass-walled bank with its longest exposure facing west. Make the building open, light-filled, inviting to new business. Yet insure that interiors are protected from the strong sun of the Southwest. The glowing, block-long sunscreen of ASG's Huewhite® glass shown below and on the preceding page provided the solution to this problem for the architects of this Texas bank. Set in a framework eight feet from the building's clear glass walls, the Huewhite screen reflects much of the sun's heat as it fills the 130-foot banking lobby with softly diffused, glare-free natural light (left). As darkness settles, interior floodlighting projects a graceful tracery of shadows against the luminous screen of uniformly white glass.

Huewhite is available plain, wired and corrugated, and in sizes up to 60" by 132". It's another of the broad and versatile line of architectural glasses produced by ASG. See them at your ASG distributor's or for more information write: Dept. E-10, American Saint Gobain Corporation, P.O. Box 929, Kingsport, Tenn. 37662.

AMERICAN SAINT GOBAIN



First State Bank & Trust Company, Edinburg, Texas Architect: Neuhaus & Taylor



Jail with a new look

Gleaming white and crisply detailed, this new addition to Detroit's Wayne County Jail looks quite unlike the traditional detention building. To form the attractive facades, ASG's wired Huewhite glass was glazed into all windows and combined with matching white spandrel panels. Tempered steel rods have been welded to the metal window frames in a staggered pattern that is decidedly more attractive than regular jail bars, but equally effective.

Huewhite windows admit plenty of natural light to cell blocks on all floors. Yet the translucent glass—which appears opaque when viewed from the side of greater brightness, as from the street during daytime—effectively blocks all views inward or outward. Wired Huewhite also offers the safety features characteristic of wired glass. Architect: Eberle M. Smith Associates, Inc.



AMERICAN SAINT GOBAIN

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For further information on communications planning, see Sweet's Architectural File 33a/Be.



Bell System American Telephone and Telegraph and Associated Companies



How a ceiling concept was saved by Custom Lighting in Memorial Library— University of Notre Dame

"Ceiling areas were the size of a city block, unbroken except for columns," states L. Kenneth Mahal, of Ellerbe Architects. "We, as the architects, wanted an effect of intimate study areas, with really pleasing ceilings and, of course, good lighting. To help achieve this, we decided on 4' x 4' surface-mounted fixtures, placed equi-distantly. For appearances, our choice was Day-Brite's 'Daylume'. Except that it isn't a combination light and air handling fixture. And we wanted to avoid ceiling clutter and the soil problem common to many diffusers. We were quite concerned! But thanks to the magnificent job of customizing by Day-Brite, the library has ceilings that are 100% aesthetically satisfying, good lighting and the finest air distribution system our firm has had tested."

Day-Brite Custom Designing is just one of several services which can make a valuable contribution to your creative lighting needs. To learn more about them, contact your Day-Brite representative. He's eager to help and there's no obligation. For the best solution to any lighting or air distribution problem, look to Day-Brite and Barber-Colman... where the creative answers are coming from.



DAY-BRITE LIGHTING 5411 BULWER A DIVISION OF EMERSON ELECTRIC ST. LOUIS, MO. 63147

MODEL LD-22M-TC



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at your work. The thick, generous seat that adjusts easily and quickly to any height drafting table, is available in a wide choice of cover materials and colors. Only Cramer has an adjustable foot ring that slips up and down in a twinkling. Casters or glides have a sure-footed 22-inch spread. There's also a fingertip adjustment on the back rest so you can set the inchthick cushion exactly where you want it. For a free descriptive brochure, write: Cramer Posture Chair Company, 625 Adams St., Kansas City, Kansas 66005



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The interior, the exterior: one source provides the total environment.

The compatibility of wood and stone.

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Wood paneling for floor plans that change.

Regular maintenance crews can dismantle, move and install these Weldwood Movable Walls in a new location—all in a matter of hours. Weldwood Movable Walls are offered in six different standard systems. Variations in post, head, and base sections offer the architect a choice of decor treatments, yet use identical 1¾-inch thin panels. A full selection of domestic and imported hardwood faces are available on an incombustible Weldrok[®] core and on Novoply[®] core panels. Shown: Design 777. Designer: Beeston & Patterson, New York, N.Y.

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rsatile Glasweld[®]—a material for all seasons.

eation: St. Vincent's Infant Home, Towson, Md. The walls: black Glasweld used for both interior and exterior faces of these sandwich panels. Bult: permanent color, chip-free durability, low installed cost, no maintenance. Glasweld is a completely weatherproof asbestosinforced panel with a colorfast mineral surface. For window inserts, curtain walls, fascias and balcony facings, it appears optically will not "pillow" or "oil can," and is 100% incombustible. Architect: The Office of Gaudreau, Baltimore, Md.

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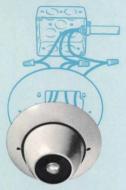
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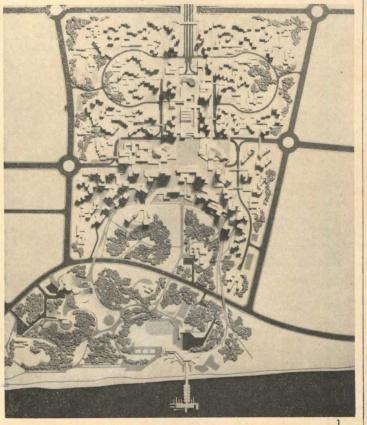
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French Design New City for Israel



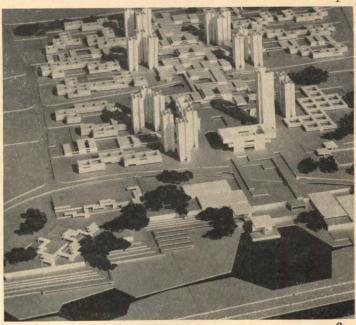
ing area has been, thus far, a vast stretch of sand going down to the sea. Now, as a result of an international architectural competition, it will become a living metropolitan center.

Winners of the competition were Jean Ginsberg and Pierre Vago of Paris, who, with Martin Van Treeck, have proposed a variegated, compact city center (1). The architects said that their city-planning investigations revealed that what is lacking in many contemporary city plans-Brasilia being a prime example-is a gutsy, human intensity that inspires, stimulates, and creates the sentiment urbain. In such places, they believe, the arrogance of the buildings and the spaces between them, plus the servitude to the machine necessary to funnel automobiles into the center, subdivide and sterilize the earth.

In Ashdod, the architects intend a very dense center, with the ground level reserved

for pedestrians, and machines of all sorts relegated to two underground levels. Aside from density, variety will be the chief characteristic of downtown Ashdod, Ginsberg and Vago have made sure that life will be there after business hours, with promenades, plazas, cultural facilities, and places for shops, recreation, or just relaxing. They have sought "in essence a pr vision for a comfortable, animated, 'crowded' life." They state that the city will face the sea in a long arc and that its silhouette will consist of a "dynamic concentration of vertical volumes at the center of the composition, contrasted with the horizontal character of the residential districts surrounding it.'

A third-prize winner, and the only U.S. competitor to place, was the plan by Fridstein & Fitch of Chicago, which proposed tower clusters interspersed with lower buildings in the accepted Corbusian manner (2).



ASHDOD, ISRAEL This is a new town that has been suffering uncontrolled growth along the Mediterranean shore south of Tel Aviv. It is expected eventually to reach a population of 300,000 to 400,000, making it Israel's third or fourth largest city (depending on how big Jerusalem is by that time) and second most important port. The center of this burgeon-

Robie House Restoration Underway



CHICAGO, ILL. Although only \$57,000 of a wished-for \$205,-000 has been raised to restore Frank Lloyd Wright's Robie House, initial work will begin soon. Now owned by the University of Chicago, the house will be used for some still-tobe-established purpose.

In 1957, the Chicago Commission on Architectural Landmarks designated the house a landmark, citing it, "In recognition of the creation of the Prairie House—a home organized around a great hearth where interior space, under wide sweeping roofs, opens to the outdoors. The bold interplay of horizontal planes about the chimney mass, and the structurally expressive piers and windows, established a new form of domestic design." Last year, the National Park Service of the Department of the Interior made it a Registered National Historic Landmark.

The current work, which will represent about one-third of total restoration, will include: replacement of the tile roof; removal and replacement of gutter lining; installation of 200-amp electrical service and rewiring of the building; in-

October 1965

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stallation of a new heating unit; and removal of all old plumbing fixtures and the restoration of the ground-floor and first-floor bathrooms. Taxdeductible contributions for the remaining restoration are still sought. Checks should be made payable to Robie House Restoration Fund, University of Chicago, and sent to the committee in care of Commissioner Ira J. Bach, Room 1006 City Hall, Chicago, Ill. 60602.

Theaters on the March

The cultural explosion is producing an architectural fallout of sorts. On Broadway, traditional home of the American theater, no new theaters have been built since 1928, the year the talkies appeared. In fact, the number of existing playhouses is only 36, down from a high point of 54 during the 30's. Throughout the country, the number of commercial theaters has dwindled from 590 in 1927 to 200 today. Part of this shrinkage is, of course, the result of a sort of cultural evolution in which the electronic-mechanical entertainment media are becoming today's stage.

While the number of plays produced on Broadway each year has dropped from an average of 142 during the 30's, to 63 in the 1963-64 season, symphony orchestras throughout the country have increased to 1400, more than double the 1939 number. And the number of groups now performing operas-754-has doubled in the last decade. Most of this expanded artistic activity is amateur. Of the 1400 symphony orchestras, only 54 are composed predominantly of professional musicians. Only 35 to 40 of 754 opera groups are fully professional, and not more than 10 of these perform more than 15 days a year.

This expanded interest in the performing arts is mirrored by a proliferation of theater groups, both amateur and semiprofessional. And all this theatrical activity is matched by concomitant architectural activity. More than 100 so-called cultural centers are being built or planned in U.S. communities. Theaters that have blossomed in churches and in cellars are moving into shopping centers and other open spaces. Last October, there were 64 permanent theaters in shopping centers, all of them designed subsequent to the one Welton Beckett did for Bergen Mall in Paramus, N. J., in 1960. "A natural wedding of the theater and the market place," someone said of the Paramus theater; and Fort Wayne, Louisville, Dayton, Toledo, Memphis, St. Louis, Baltimore, Washington, New Orleans, Tucson, Fort Lauderdale, Miami, and Sarasota took up the idea.

Many other shopping centers have summertime tent theaters, which are finding it financially expedient to convert to permanent housing. Music Fairs, Inc., for instance, which has a string of tent theaters on the East Coast, is providing a permanent home for its theater in Westport, Long Island.

Roger Stevens, chairman of the National Council for the Arts, is planning to build 30 theaters throughout the country in shopping centers. (Land in shopping centers is relatively inexpensive and parking facilities are already available.) His theaters will be built to a standard scale, so that sets can be manufactured in each city, saving transporation costs. For traveling troopers, it would be like performing in the same theater each night, quite a change from the old days on the Klaw & Erlanger circuit. Stevens' idea is to provide steady employment for repertory groups, but one hopes that, architecturally, the results will be better than can be hoped for from the usual prefabricated approach.

This architectural activity is not limited to shopping centers. The New Jersey Highway Authority plans to build a cultural center on land along the New Jersey Turnpike, in hopes of bringing motorists onto the road and into the theater.

Some of the more architecurally significant new theaters are shown elsewhere in this issue.

All the Street's a Stage

NEW YORK, N.Y. For four weeks this past summer, it seemed as if the 16th-Century perambulating theater, the Commedia dell'Arte, had been revived on the streets of New York. A group of players, using an improvised stage on the back of a truck, alternately set up shop in the streets of Harlem, the Lower East Side, the Far West Side, the Bronx and Brooklyn. The theater, pro-duced by Patricia Reynolds and directed by Phoebe Brand, is probably the most mobile of the mobile theaters that have evolved in the last few years. This offshoot of Papp's theater in Central Park has grown into an elaborate caravan of Ringling Brothers proportions. "The Theater in the Street," as the Reynolds group is called, is still small enough to maneuver, to be set up and dismantled in an hour. Supported partly by the New York State Council on the Arts, it also receives support from private citizens, and subsists on a budget of \$16,000.



This summer's bill of fare included a Chinese fairy tale, Molière's 'Doctor in Spite of Himself,' Chekhov's 'The Bear' (both done in English), plus a rousing production of the Chekhov play in Spanish. Although this is a far cry from 16th-Century players who loaded "their memories with a great mass of contemporary matter, such as stock sentiments, conceits, love speeches, complaints, ejaculations of despair and madness" to be called on as needed, the classic playwrights had enough stage business in them to entertain the audience—most of which had never seen a live play before.

The degree of audience participation in the New York productions was astonishing. Boos and unsolicited advice came from absorbed onlookers -both young and old. Local community organizations supplied chairs; local Boy Scouts or urchins set them up, and matrons supervised. The upshot seems to be that you do not necessarily need auditorium, stage, dressing rooms, etc., to have theater-almost any street will do. And there, in the street, the audience is surprisingly alive, a response and a quality difficult to build into any theater structure.

Repertory Theatre Opens at Lincoln Center



NEW YORK, N. Y. New York City's Vivian Beaumont Theater opens officially on October 21 with a performance of Georg Buchner's, *Danton's Death.* However fine the performance by the Lincoln Center Repertory Company may prove to be, it may well be overshadowed, as a work of art, by the hall itself, which is the result of an architectural collaboration between Eero Saarinen Associates and Skidmore, Owings & Merrill as As-

sociated Architects. SOM designed the over-all building; Saarinen Associates, the two theater-auditoriums.

The third building to be completed in the five-building complex that will comprise Lincoln Center for the Performing Arts, the Vivian Beaumont Theater is distinguished by its quiet dignity, a quality heightened by the classical inclinations of its neighbors.

Inside, the building will house a library for the theater collection and music library of the City of New York. Also, of course, there will be two autoriums, the result of design planning by the late Eero Saarinen, in the three years prior to his death in 1961, and collaborating designer Jo Mielziner. Beneath the main auditorium is the small 299-seat experimental Forum Theater, complete with its own entrance, box office and lobby. It has an apron stage and can be used for both rehearsals and

formal performances. Above this is the Beaumont theater, seating 1100, which has a stage changeable from proscenium to thrust by a lift, and a below-stage turntable that can substitute seating for stage area and vice versa.

The theater, considered a milestone in theater design, is named after Vivian Beaumont Allen. Described by *The New York Times* as a "vivacious philanthropist," Mrs. Allen was the daughter of J. E. Beaumont, who, after prospecting unsuccessfully for gold in Colorado, helped found the May Company department stores, now one of the largest department store chains in the country. Mrs. Allen donated an initial \$3,000,000, which made a start on the theater project possible.

Next month, P/A will examine the interiors of both theaters in detail. The library will be discussed in a future issue.

An American Architect Looks at Russia



NEW YORK, N.Y. Just returned from a 10.000-mile tour of the Soviet Union, New York architect Frederick G. Frost, Jr., has much to show for it. Not the least is a collection of some 700 slides of architectural subjects-from a log cabin near the shores of Lake Baykal, deep in Siberia, to strikingly beautiful tilework on mosques and minarets in Samarkand, ancient capital of the Mongol empire, to a 3000-room hotel being built almost entirely of precast concrete sections in Moscow. Frost was one of a group sent on a three-week trip, arranged by the State Department, to examine precast concrete work in the U.S.S.R.

(Earlier, a similar Russian group had toured the U.S.) In all, the group (of which Frost was the only architect) visited nine cities, traveling mostly by air. Frost is quick to point out that what architecture he saw was incidental, for the trip was not planned as an architectural tour. Yet he found that prefabrication with precast concrete was extensively used throughout the Soviet Union. He thinks more of it should be done here.

At Bratsk, a new city being carved out of the forest about 300 miles north of Irkutsk, on the shore of Lake Baykal, Frost saw an aluminum plant and a cellulose plant (1) under

construction, both of them prefabricated almost entirely with precast concrete; even piles and pile caps had been made elsewhere and shipped to the site. In Leningrad, he saw a parking garage under construction whose roof was built of precast concrete panels that were placed on a steel mesh grid (2). "All prestressing plants ship their work by truck," explains Frost. "Some trucks are specially designed to handle the larger pieces. which may measure as much as 13'x40'." Bratsk has been under construction for six years, and, when completed

cro-districts will be arranged in concentric circles, screened off from one another by the Siberian forest, which, whenever possible, is being left untouched. At the center of the rings will be a macro-district. or city center, with facilities for the entire town: a large department store, government and commercial offices, and a theater for the performing arts. Plants that will supply heat, hot water, and sewerage disposal for all buildings in the community will be located either in the city center or in outlying areas.

Although almost all housing



(in about another ten) will have a population of approximately 200,000, which will be brought in to work the aluminum and cellulose plants, to operate the hydroelectric plant that will provide power for them, to provide services for the population, and, of course, to create future Bratskians. Eventually, Bratsk will have 30 micro-districts, each housing 6000 to 8000 persons, set up as self-contained units with shopping facilities and schools. Housing consists of elongated. mostly five-story buildings of precast concrete panels (3) that are reminiscent of army barracks and are lined up like so!diers in formation. Stylistically. these prefabricated apartments are typical of all housing being done in the Soviet Union. Mi-



by colored murals and balcony guards formed of colored plastic. This small concession to aesthetics was explained to him as a variation authorized by the Soviet government to satisfy the national taste of the Uzbek natives. In Kiev, these housing developments are often built of brick (4), because the region is rich in brick-producing clay. Brick bearing walls support the buildings; interior walls as well as exterior support precast concrete floor slabs. According to Frost's guides, Soviet housing activity still reflects an effort to alleviate a vast housing shortage, ternational Style, are of glass and concrete. Making pleasing use of horizontal bands of glass windows, they show a greater involvement with design than all other buildings Frost saw that were completed within the last 20 years.

Another sign of increasing architectural awareness is the controversy involving the Rossiya Hotel (6), now under construction on a 27-acre site adjacent to the Kremlin. When completed, it will house 3000 rooms in a 12-story base and a 23-story tower. Critics generally oppose the hotel, which is typical of the current Soviet

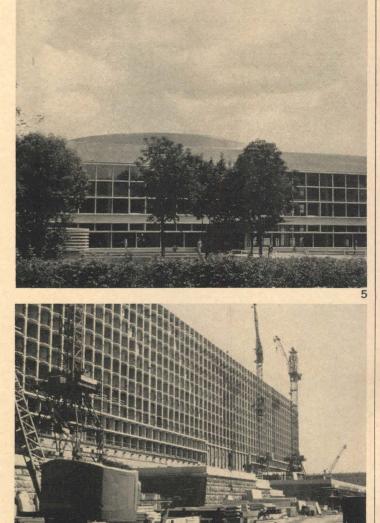
never evolved. Yet some of the architectural heritage is being carefully preserved. In Moscow, Frost visited several of the old Czarist palaces, which have been painstakingly re-stored and maintained. They remain as examples of an architectural past that the Soviet ideology considers as a display of extravagant ostentation wasted on the ruling classes. Following a 1939 visit to the Soviet Union, Frank Lloyd Wright observed: "I found that in Russia now, as in the United States long ago, the masses who had nothing and to whom the landed aristocracy appeared to have everything had their turn to be pleased. Noth-

ing pleases them so much as the gleam of marble columns under high ceilings, glittering chandeliers, unmistakable luxury as they had to look up to it when it decided their fate, when they ate out of luxury's hand when they ate at all." Today, the old palaces are much visited.

But nowhere did Frost find evidence of a great architectural emergence that Wright had hoped for. Perhaps it is yet to come. Perhaps architecture, as much suppressed as the other arts, is only the slower to emerge. In the meantime, Russia is blighting her landscape—something she may one day regret.

Engdahl, Hedrich-Blessi

Bill

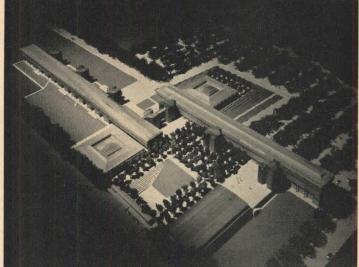


and to give families that have been living in cramped quarters for years housing of their own.

Surprisingly, Frost came across no distinctive post-World War II buildings—with two exceptions. These, in his opinion, are the Congress Hall in Moscow and the October Palace of Culture in Kiev (5). Both buildings, designed in what might be termed the Inbuilding effort, on aesthetic grounds, pointing out that its bulk and unaesthetic design will mar the Red Square skyline. Completion is currently planned for 1967, to coincide with the fiftieth anniversary of the Bolshevik Revolution.

Considering the blending of Eastern and Western architectural styles once common in Russia, it seems strange that an indigenous architectural style

Armed Community College



ST. LOUIS, MO. Shown above is a model of the Forest Park Community College, a twoyear college that will eventually have an enrollment of 7000 day students. Designed by Harry Weese & Associates, the buildings consist of two long (about 740'), narrow, fivestory classroom arms extending from two outriding, square, library / student-center / diningroom buildings. The linear arms house lecture halls on the lower floors, laboratories on the top floors, and, on the intermediate floors, faculty offices and classrooms. Each arm has exterior towers, on 180' centers, housing all vertical mechanical services, stairs, elevators, and toilets. At the east end of the complex will be a gymnasium; at the west, a theater-lecture center. Buildings will have brick cavity walls and concrete frames. Roofs, sills, copings, and soffits will be lead-coated copper. The library and the first section of the east classroom arm will be completed by the end of 1967.

P/A Awards Jury Meets

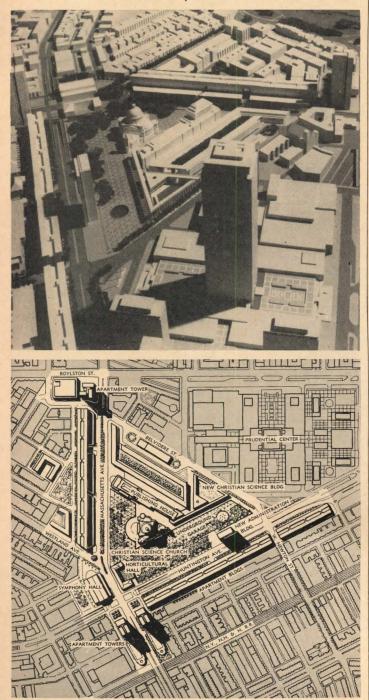
NEW YORK, N.Y. Gathering in New York, the jurors for the 13th Annual P/A Design Awards Program spent two intensive days (September 20 and 21) selecting the 1966 winners from a field of 778 entries. Edward Charles Bassett, William J. Conklin, Kevin Roche, Vincent Scully, Jr., and Dr. August E. Komendant made the selections from the largest number of entries ever submitted. Winners will appear in the JANUARY 1966 P/A.

The traditional jurors' luncheon was in the *kitsch* surroundings of Manhattan's Café Nicholson. After spending two hours amidst Victorian gargoyles and

murals, the jurors returned with a fresh eye for their work.

\$71 Million Christian Science Renewal

BOSTON, MASS. Crowded as a prayer meeting on Judgment Day, the headquarters of the Church of Christ, Scientist, badly need room for expansion. The church's board of directors decided that plans for a new church center "could no longer



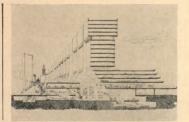
be postponed." Accordingly, I.M. Pei & Associates worked out a master plan for 31 acres of land surrounding the Original Edifice (built in 1894) and its stately, white-domed extension (completed in 1906), which will continue to be the focal point of the complex and a highlight of the Boston Back Bay skyline. To be completed in two stages, Pei's plan calls for initial construction of the 15-acre church center on a roughly triangular plot, followed by private construction of apartment and commercial buildings on 16 acres along two sides of the triangle. Seven acres of the church center land will become an open landscaped area, and, rising from one end of the park, will be a 22-story church administration building. Beneath the park will be a 600-car garage. Although the church has not yet acquired all the land needed for the private sector of the development, it hopes eventually to lease this land to entrepreneurs, who will put up a long row of nine-story apartments lining the two major sides of the church center, anchoring them with three, 34story, combination apartment/ office towers.

The entire program, which includes relocation of persons in church-owned buildings to be taken down and the maintenance of current tax payments throughout the 6 to 10 years needed to complete the project, will be handled by the church in consultation with the Boston Redevelopment Authority.

Located not far from the new Prudential Center, the Back Bay area includes Boston's Museum of Fine Arts, Symphony Hall, Horticulture Hall, Public Library, Civic Auditorium, New Engand Conservatory of Music, Jordan Hall, and Northeastern University. In recent years, it has slided quietly into shabby gentility. Pei believes that, as a result of his plan, "this part of Back Bay can look forward to a restoration of its former dignity as a residential cultural, and spiritual hub."

The Philadelphia Story

PHILADELPHIA, PA. "In Boston," Mark Twain once noticed, "they ask, How much does he know? In New York, How much is he worth? In Philadelphia, Who were his parents?" In Philadelphia today they no longer ask questions—they are much too busy now producing





the answers in their massive, \$2 billion Center City redevelopment and rehabilitation

program. (Oddly enough Ed Bacon, executive director of the City Planning Commission, under whose aegis the program has been since 1949 thoughtfully planned and coordinated, had as his 1932 Cornell senior thesis "Plans for a Philadelphia Center City.") The program is massive and stretches from one end of the city to the nextfrom the Science Center in the west to Penn's Landing in the east. Penn Center, Market East (1), Society Hill, Independence Mall are all the giant steps that Philadelphia is taking along the way. And this giant has no feet of clay.

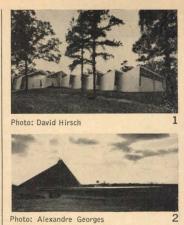
Last month, plans for Independence Center (2)-a \$50 million "office park" near the Mall to be located between 6th and 7th and Race and Arch Streets were announced by its developer Norman D. Denny. Bower & Fradley, architects of the General Waterworks Building at 15th and Walnut Streets, have designed a ten-building complex which will offer restaurants, underground parking for some 1200 automobiles, a "drive-up" movie theatre, health club, data processing centers, plus some attractive economics. Office space will be sold (at prices lower than many of the current rental fees) to tenants who can purchase space for the future. Left over space will be rented (by the developer) for the tenant until he needs it. Denny's attractive offer will, he hopes, fill all the spaces by the 1970 completion date.

Most likely he will suceed. As a former vice-president of Levitt & Sons, he once filled the residential development, Rambler Park, in record time. His ploy-a free Rambler with each home bought at the opening of the site. But Denny doesn't really need tricks for this one. The office complex, as a part of Independence Mall (3) a three block long park which will lead from Philadelphia's Independence Hall to Franklin Square, should be just as successful as the whole rejuvenation of Center City is turning out to be.

JERSEY AIA MEETS

SPRING LAKE, N.J. Spring Lake was the site of the 65th annual convention of the New Jersey Society of Architects. From September 9 to 11, the architects registered their ladies, charmed their guests, awarded student scholarships, and fought the battle of "Environetics."

A more fitting convention



theme could hardly have been chosen for the most environmentally raped state of the Union. Those traveling to the convention from the north were introduced to the "Garden State" through the Jersey flats-those inspired industrial parks that have turned a once aquatic bird sanctuary into an odiferous polluted sewer. The traveler might then have enjoyed a thrilling ride on U.S. 22, whose bordering commercial chaos accounts for its reputation as the most deadly strip of black-top in the country. If he survived this hurdle, he would then have seen the real environment of New Jersey: its pine barrens, rolling farmland, and lovely coast.

The keynote of the convention was sounded on Thursday by chapter president Robert R. Cueman, who called for the architect to arm against "ill-begotten mess the we Americans are creating for ourselves." His words were echoed at Friday's dinner by Robert Durham, AIA vicepresident, who challenged the architects to take the opportunity of molding our environment. Both men spoke within the general context of the AIA's war on ugliness-a program that is idealistic, uncontroversial, and as necessary as man's war on the shark.

A commitment to political and economic action by the architects would seem a mandatory corollary to the successful realization of their idealistic program. And, indeed, the convention was addressed, at its opening, by Governor Hughes, and, during the ensuing two days, by other prominent political figures. But representatives of the financial world were noticeably absent. The political pronouncements, in an election year, coincided with the AIA's war on ugliness. Frank Thompson, New Jersey Congressman, was given an award for participation in the battle.

Seminars on "Environetics" —described as the study of "Total Site Environment" were held on each of the three convention days. On Thursday, Arthur Edwin Bye, Jr., and Herman L. Porter discussed landscaping. On Friday, a panel on lighting included Dr. H. Richard Blackwell, Seymour Evans, and Stanley L. Peterson; and Saturday's panelists were Professor Henry Wright and Jerome M. Larson, who discussed interior environment.

The display of award buildings demonstrated the increasing abilities of the New Jersey architects to build competently designed structures. Illustrated here are the Assembly and Education Building for the Unitarian Society of New Brunswick, designed by Jules Gregory (1), and a church in Lambertville, also by Gregory (2). However, in a convention stressing total environment, it might have been better, particularly in justice to the designers of industrial buildings, to have shown the basis of rationality they had introduced into chaotic industrial settings. Given the theme of environmental responsibility, more attention should have been given to illustrating the surrounding building environment.

Perhaps the one-man project and the enlightened private client are the prime surviving elements of pure architectural expression. At least, as presented at this convention and in most of our architectural magazines, that would seem to be the case. Perhaps it is a necessity that architectural expression be divorced from the "common sense" of commercial and industrial buildings today-the commercial and industrial common sense that often is so common and so devoid of sense that it does not even commission architects to design its projects. If this is true, and if the only course open to architects is to design isloated buildings, then the AIA crusade is needed to educate the nation. As Robert Cueman remarked in his keynote address, no one is "better qualified . . . to lead the fight" than the architects; and we feel there could be no better battleground than the Garden State.

Interment Decorators

COLUMBUS, OHIO. Latest new design type should attract the attention of Jessica Mitford and all architects interested in grave matters. Mr. P. J. Sigal, evidently in a paroxysm of revelation after decorating a funeral home in Youngstown, Ohio, announced that What America Needs is a firm dedicated to being "the only complete design and consultation service for funeral directors.' Funeral Home Interiors has been formed by Mr. Sigal to fill this deplorable vacuum. The organization will work "with the architect, builder, or the Funeral Director, to furnish functional interiors that compliment [sic] the design and structure of the funeral home." FHI's flugleman announces that the firm's experience will lend itself to the discovery of "dual purposes" for rooms (obsequies in the morning and a Bar Mitzvah in the afternoon?). Design aim is for a "lasting, dignified effect" with-out "the sombre look." Product is an undertaking establishment "to which the director can point with pride, and in which visitors and the bereaved are put at ease"-a million laughs, we take it; nothing like an unhappy burial.

If you want this latest refinement on The American Way of Death, you can find it in Columbus, Ohio. More information than that you are not going to get out of us with a massive formaldehyde injection.

Friedberg Sweeps Landscape Awards



HARTFORD, CONN. The American Society of Landscape Architects held its annual convention in Hartford in late June, and as part of the proceedings awarded prizes for distinction in landscape design. It is interesting to note that at least six citations were for imagina-

tive landscaping of public housing areas or similar projects. Only three went to the more traditional type of landscape architectural commissions: one to a private house, one to a country club, and one to a school. The firm of M. Paul Friedberg & Associates swept the field with three Honor Awards (Pavilion of Spain at the New York World's Fair 1, Hillel School 2, and Nathan Straus Memorial Plaza 3) and two Merit Awards (Carver Plaza and Amphitheater and Riis Plaza and Amphitheater).



Another Honor Award was won by George Patton (Uni-

versity of Pennsylvania Campus 4). John Rahenkemp-Richard E. Vogel won three Merit Awards for their Haveford Garden Apartments, 22nd and Meredith Block Rehabilitation, and a private residence. Allen



W. Hixon, Jr. won a Merit Award for the Tumble Brook Country Club, and a Merit Award was earned by George Patton for "Sculptural Spaces for Imaginative Play."

Jury consisted of Lyle Blundell, Stuart Dawson, James Skerrit, and N. A. Rotunno.

New Stadium For San Diego



SAN DIEGO, CALIF. Sports stadia are proliferating almost as fast as cultural centers. This stadium, designed for both football and baseball events in San Diego, is scheduled for completion by the fall of 1967. With it, San Diegoans hope to lure a major-league baseball team to town to match the recently formed San Diego Chargers of the American Football League.

Designed by Frank L. Hope & Associates, the stadium will seat 50,564 for football games and 47,144 for baseball. De-scribed as "a combination of a square and a circle," it is said to provide more choice seats for both types of sporting events than the more usual circular stadiums being built today. Vertical walking distances within the stadium are minimized by having spectators enter the semidepressed stadium at midlevel. Two movable seat sections, located in front of the lower stands and accom-

modating 8700 spectators, are centered on the 50-yd line for football and moved to form a 90° angle behind home plate for baseball. These sections, supported by a steel frame that rests on concrete pads, can be lifted and towed on rubber tires to a new location. On the exterior, the stadium is distinguished by 38 frames of dual reinforced concrete pillars, 8' apart, and spaced at 28' intervals with cantilevered arms that support the upper-level seating. Ramps spiraling to these upper seats are placed at intervals outside the stadium and provide walkways. As planned, the seats, which are to be of contour-molded plastic with arm-rests and selfrising seats, will fit horseshoeshaped around the playing field. Eventually, seating capacity can be increased to 70,000 by filling in the open end of the horseshoe. Construction cost is estimated at \$27,600,000.

Underground Moves

WASHINGTON, D.C. Housing subdivisions built with Federally insured mortgages are now required to have underground utility lines. Although the regulation will affect only an estimated 13.1 per cent of the vearly housing starts in this country, including multifamily buildings, the regulations may have a more far-reaching effect. Despite an additional cost, developers may find that a lack of unsightly power lines and poles may give them a competitive selling edge. The regulation covers both electricity and telephone wires. Although the details are still being worked out, it is expected that builders

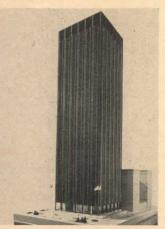
will have to comply with the regulation unless they can show compelling reasons to the contrary. According to the FHA announcement, "The developer of new subdivision housing who has not specified underground wiring systems in his plans, must prove to the FHA's satisfaction that such systems are not economically feasible for his project."

But the lessening of suburban blight may not be accomplished so easily. The New Times interviewed utility officials, asking them about the Government ruling. The consensus, according to the Times, was that the public remains largely unconcerned about the buried power lines. In fact, they see poles and wires as a norm and underground wiring as an omission. The future of this aesthetic advance will probably rest like the future of many artistic advances - on salesmanship.

NAAMM Handbook Being Revised

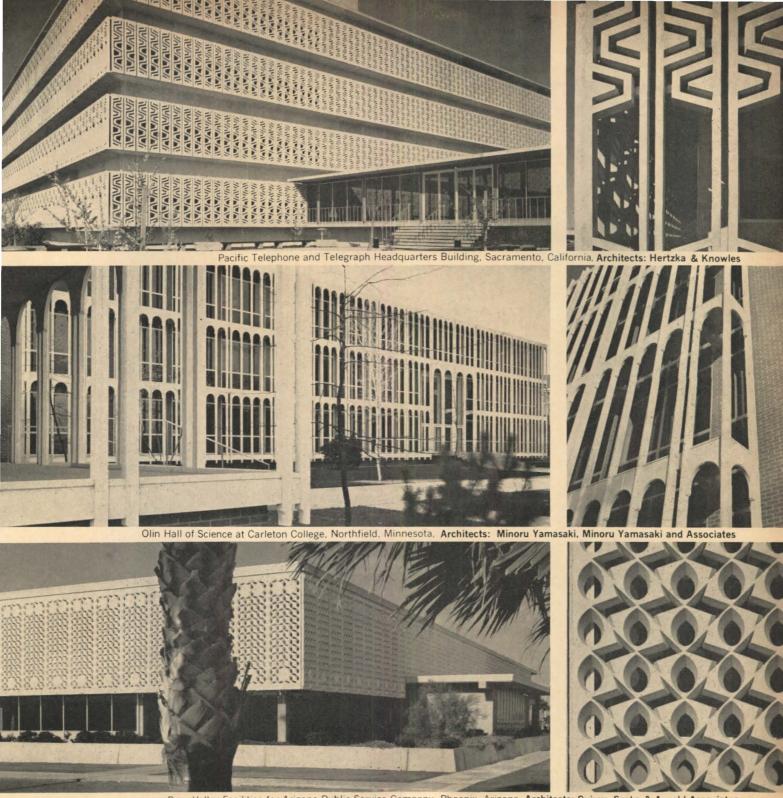
The National Association of Architectural Metal Manufacturers is completely revising its Metal Curtain Wall Manual, which it originally published in 1960. They hope to print and distribute the new version next year. Architects and engineers are invited to submit suggestions to NAAMM, 228 North La Salle St., Chicago, Ill., 60601.

Park Avenue Parade



NEW YORK, N.Y. Recent talk of adjusting New York City's outdated building codes brings nods of approval from many who think the changes will pave the way for more flexible designs. One of the first buildings planned for construction under the wished-for amendments is a 42-story office structure that will replace the Park Lane Hotel now being demolished. Designed by Emery Roth & Sons, it will rise from a podium of unpolished gray granite. A rectangular tower, it will provide almost 1,000,000 sq ft of rentable space (26,000 sq ft per floor), and will be clad in black spandrel glass, highly polished metal mullions, and gray-toned window glass. It will be the twenty-fourth office building to rise on Park Avenue since 1946, 14 of them by Emery Roth & Sons, also.

Continued on page 66



Deer Valley Facilities for Arizona Public Service Company, Phoenix, Arizona, Architects: Guirey, Srnka & Arnold Associates

Mo-Sai, pleasantly patterns the sun.

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Another First from Barber-Colman

Place Victoria

for more than a million square feet, which is best: electronic or pneumatic controls?

UNTIL recently, almost all "big job" comfort control systems have been one-type installations—all electronic or all pneumatic. But when the first tenants began moving into Montreal's new Place Victoria in May, 1965, a new era opened in the design of environmental control systems.

The environmental control system for this new Canadian Stock Exchange Tower is the first ever installed which selectively combines the most desirable features of four different types of controls along with new concepts in air distribution equipment and building automation—all designed, manufactured, and installed by a single manufacturer.

Because compatibly designed Electronic, Pneumatic, Electric, and Hydraulic controls are standard Barber-Colman lines, our application engineers were able to select the exact controls best suited to Place Victoria's various requirements. And with nineteen different fan systems, the requirements are bound to be varied. For instance, five systems furnish air for perimeter system induction units. Nine supply Barber-Colman Jetronic Single Inlet Mixing Units for interior zone comfort. Three condition the five below-ground garage and utility levels. Two serve the lobby.

Pneumatic Controls are installed on the 4700 induction units and Barber-Colman Jetronic Single Inlet Mixing Units. These controls are most economical where there is no local source of electricity, and they are ideally suited to simple multiunit sequencing control.

Electronic and Electric Controllers and Actuators control all central fan systems. They are best for this application because of the ease and simplicity with which they provide desirable features such as these: Resetting of hot and chilled water temperatures to match outdoor weather conditions; remote selection of space temperatures; recording and retrieval of building automation data at the Selectronic Control Center.

Hydraulic Controls are used selectively in shopping and store areas to control radiators and wall-type convectors. These compact controls combine the advantages of Electronic, Pneumatic, and Electric Control in a unit-mounted system that offers excellent accuracy for smaller air conditioning and heating units.

All systems are tied together at a Barber-Colman Selectronic Control Center located on the fifth floor. From here, all fan systems can be monitored and controlled by a single building operator. Because electronic and electric controls are used on the various fan systems, temperature can be read out and analyzed "Selectronically" without intermediate conversion of signals.

From the time that this project began, a Barber-Colman engineering and installation "Task Force" worked closely with Place Victoria's owners, architects, engineers, and contractors. Result: A *complete* environmental control system that fulfills exactly the descriptions of operation required in the final specifications.

Today, Barber-Colman is the only company with the experience and staff to design, manufacture, install, guarantee and service *all types* of comfort control systems and air distribution products. This unique capability enables Barber-Colman to offer important installation and service benefits on your next building.

For more details on the ultimate in fully integrated automatic controls and engineered air distribution systems, contact the Barber-Colman field office nearest you. Or write for our five new booklets outlining the features and advantages of Barber-Colman Electronic, Electric, Hydraulic, and Pneumatic Controls, and Selectronic Control Centers.



This Barber-Colman Selectronic panel controls the climate on all 52 floors of Place Victoria. It provides 42 points of remote indication control and reset on fan and secondary water systems. With it, the operator can read temperatures at each of these points and change the thermostat set point without even leaving the 14' x 20' Selectronic room. A television-like screen at left enables the operator to see equipment layouts for the various systems he is monitoring, simply by pressing a button: (In addition to the Selectronic panel, there are also 14 Barber-Colman graphic control subpanels located throughout the building. These show local system temperature readings and indicate when air filters in the system need changing.)



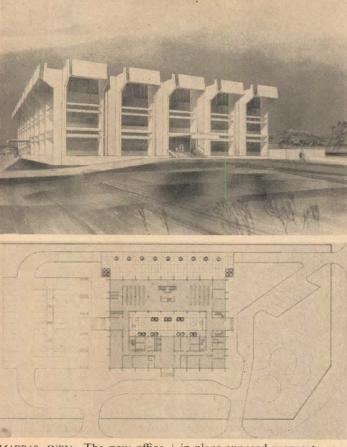
BARBER-COLMAN COMPANY

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... where originality works for you

Place Victoria — Architect: L. Moretti, Rome. Associate Architects: Greenspoon, Freedlander & Dunne, Montreal. Consulting Structural Engineers: P. L. Nervi, Rome; D'Allemagne & Barbacki, Montreal. Associate Consulting Engineers: Letendre & Monti. General Contractor: E. G. M. Cape & Co. (1956) Ltd. Reinforced Concrete Frame Contractor: Janin Construction Ltée.

Continued from page 62 Sun-Protected Office for Madras Consulate



MADRAS, INDIA The new office building of the U.S. Consulate General here will be characterized by emphatic sun-protection devices in the form of louvers and projecting sunshades. A large interior court will also feature louvers (Madras is located at latitude 13° North, and solar loads are something to dry out your Aunt Tillie's gin-and-tonic in a trice). Exterior materials will be castin-place exposed-aggregate concrete and native granite spandrel panels. First floor will hold the visa area and the USIS Library, which will open onto a landscaped terrace. USIS offices will be on the second floor, and the consulate office on the third. A 200-seat auditorium will be located in the basement, under the courtyard. Architect: Burk, LeBreton & Lamantia, New Orleans.

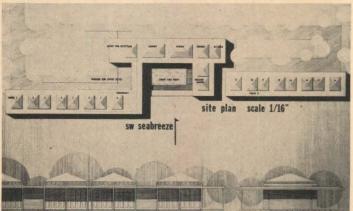
Awards

Charles A. Blessing, director of Detroit's City Planning Commission, received the Arnold W. Brunner Scholarship award presented annually by the New York Chapter, AIA. Also lauded with Brunner grants-in-aid were Joseph Russell Passonneau, professor and dean of architecture at Washington University, St. Louis, and Paul D. Spreiregen, Head of the AIA Urban Design Program of Washington, D.C. . . . The Boston Society of Architects has awarded the Harleston Parker Gold Medal to Harvard's Carpenter Center for the Visual Arts designed by Le Corbusier with Sert, Jackson & Gourley, associ-

ated . . . Eight students have been awarded summer scholarships to the Fountainebleau School of Fine Arts in the Portland Cement Association's architectural scholarship awards program. Winners are: James B. Herold of Harvard, J. Stephen Matthias of the University of Virginia, Fred F. Leonard of Kent State University, Louis Orlando Acosta of Louisiana State University, Masao Yamada of Washington University (Mo.), Edward F. Smith of the University of Utah, Larry R. Winds of Arizona State University and Herbert J. Schumann of the University of Manitoba . . . Ludwig Mies van der Rohe has been awarded the national brotherhood award of the National Conference of Christians and Jews. . . . Winners of *Lighting Magazine's* lighting modernization contest have been brought to light. They are Donald Lane, Jr., Poughkeepsie, New York, architect for his relighting of Schwartz and Co.; John R. Gale of Dayton Power and Light Co., Dayton, Ohio for his relighting of Woody's Supermarket in West Carrollton, Ohio; and finally Joseph N. Kellas, Assistant Street and Highway Lighting Supervisor of Niagara Mohawk Power Corp. of Buffalo, New York for the relighting of St. Gerard's Church, Buffalo. All were delighted. . . . Twenty lucky college students have just been awarded Ruberoid's \$500 scholarship. Each year The Ruberoid Co. has made available \$10,000 to be distributed by the AIA to 20 deserving students in their final years of study. Applications may be obtained from the AIA, national headquarters.

Peace Corps in China Seas





KUANTAN, MALAYSIA. The site alone-a narrow strip of land between the jungle and the South China Sea on the eastern coast of the Malayan Peninsula -would make the design of a motel there an exciting project for any architect. For Thomas E. Regan, Jr., 25, this was especially the case. From the fall of 1962 to June 1964, Regan, a Peace Corps volunteer and a recent architectural graduate of Notre Dame, worked in the Architects' Department of the Malaysian Public Works Ministry. In all, he designed nine buildings. The largest of these was a 16-unit motel, of which he is justly proud. "The value of my experience," he wrote P/A recently, "was in the opportunity for me, as a young architect, to carry through a project such

as this, from its conception, through working drawings, to the actual supervision of construction."

One of four Peace Corps architects in Malaysia at the time, Regan was the only one in the East Coast state of Pahang, where he worked with a Malaysian architect and a staff of 12 draftsmen and technicians. The motel was his own project. After 100 years of British influence, the newly formed Federation of Malaysia is seeking a way to express itself culturally, and Regan was encouraged to find and use an architectural style suitable to the area. His long, rambling plan exposes a maximum amount of the building to cooling breezes from the sea. Regan placed the raised verandahs, which protect the interior

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of the structure from sun and rain and provide all pedestrian circulation, on concrete piles. The raised structure is traditionally used in Malay homes. Each pyramidal roof unit defines a definite space beneath, and each of these units is raised slightly above the flat roof to provide ventilation. Grouped around a central court, which in turn is encircled by a water-filled moat, all rooms, the lounge and dining areas have sliding louvered doors opening on the sea.

"My biggest problem," writes Regan, "was choice of materials. Timber, the state's main industry, had long been discarded as a first-class building material." Timber rots, and, besides, it was associated with the traditional native hut. Chemical treatment overcame the problem of decay, and Regan's choice of decorative and tough hardwoods lessened the stigma of building with a material that lacked status. He used chengai, one of the hardest Malayan woods, on all exposed exterior surfaces. Because their handsome color complemented the chengai, balau and merawan were used as wood decking and doors.

Work was completed in 10 months by Chinese workmen. A second construction phase will add eight more guest rooms to the eight completed.

Although built with funds provided by the Malaysian government (to help promote tourism and give traveling government officials a place to stay), the motel is being leased to a private manager.

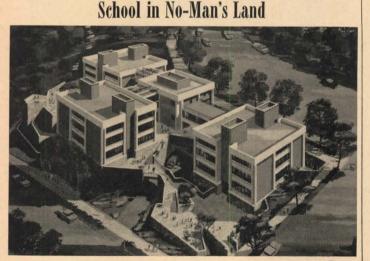
Regan, now back in the U.S., plans to enter Pratt Institute this fall to study for a Master's of Architecture degree. elementary school that will accept children only from kindergarten through second grade. Designed by Frederick G. Frost, Jr. & Associates, the building comprises three classroomadministrative units arranged around a central kitchenlunchroom - playroom-administrative unit, with the former connected to the latter by bridges. Because the relatively small site (1.35 acres) is hilly and rocky, it was impossible to leave room for a central playground. Instead, land is being built up and terraced around the edges of the site, creating several small, irregularly shaped play areas. A short service road leads beneath a bridge to a basement loading platform. Completion of the \$2,150,000 structure, which will have a concrete and brick façade, is scheduled for the fall of 1966.

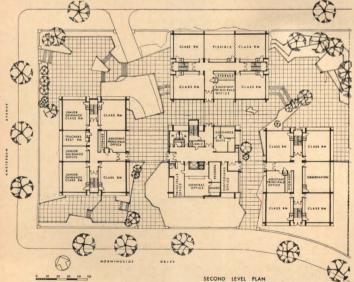
Once More, With Feeling

NEW YORK, N.Y. Backed by the Astor Foundation, the team of architects Pomerance & Breines and landscape architects M. Paul Friedberg & Associates has done it again-or rather, will do it again. Its success at the Carver Houses (pp. 177-79, JANUARY 1965 P/A) was well earned. Now a similar plan -but on a larger scale-is underway for the Jacob Riis Houses. The problem, however -of converting a barren concrete pit into a park for people-is the same.

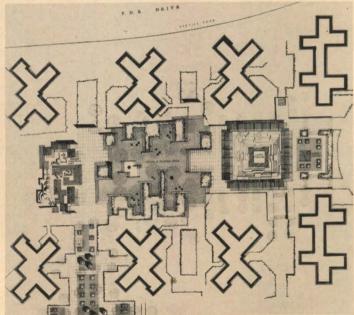
The designers have replaced lawns and plants with textured







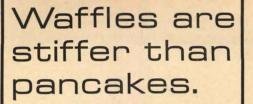
NEW YORK, N.Y. Morningside Park is one of Manhattan's least used parks. It is sort of a vertical no-man's land separating the cloisters of Columbia University, on the Heights, from the streets of Harlem, at its base. In one stony northeast corner of the park, construction is now beginning on an



paving. Sculpture, raised planters, and terracing on the site is used to break up this single space. There will be a play space for children off the main walkway (a subtle method of keeping the peace, since children are never out of view). The largest area will be utilized for a series of small brick-paved sitting areas centering on a large sculptural element that will serve as an axis leading to the ampitheater the strongest element in the

design. The ampitheater's terraced steps will lead down to planting, pools, and fountains (which will be open to children in the summer). The terminating element of the design will be an encolsed fountain court for the elderly. Cost for the entire project is around \$750,000. Completion is expected in late December of this year.

Whatever humanity the Riis Houses will have depends on the outcome of the new park.



When you hold up a waffle, it stays flat. A pancake droops.

You can get a pancake to stay flat by using more batter. But the extra materials and the overcooking add to the cost of the breakfast.

Reinforced concrete floors are similar. Use a waffle system and you stiffen the floor. The deeper the square voids in the waffle system, the stiffer the floor



Section 1

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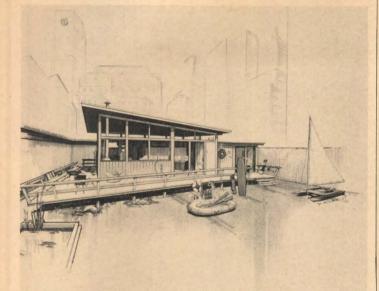
and the more materials saved...And the farther apart you can place the columns without overloading the system.

Appropriately, we do our waffle forming on a flat fee. This usually proves to be much less than the general contractor would spend to form the floors himself. With a Ceco quotation, you and your contractor have a firm cost before building starts. There are no variables such as insurance, overhead, labor, lumber, and form conditioning. The Ceco quotation includes all these. Your contractor is not subject to a sudden piling up of hidden costs. Tell him so.

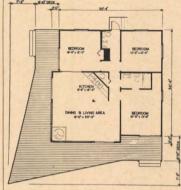
Get full particulars about Ceco's Steeldome Service, for you and your contractor. Write for literature. Also see Ceco's Steelform catalog in Sweet's. The Ceco Corporation, general offices at 5601 West 26th Street, Chicago, Illinois 60650. Sales offices and plants in principal cities.



Vacation House in The Sky



NEW YORK, N.Y. One of the things guidebooks often point out about New York City is that Abercrombie & Fitch, the New York City sporting-goods store, has a hunting lodge on its roof. It does-not for hunting, though, but for use by store officials in entertaining guests. That same roof now also has a vacation house, a model of a prefabricated home that the store will sell and that it will put up for a customer on a lot anywhere in the U.S. A modification of a model offered by Stanmar Leisure Homes, Sudbury, Mass., the Abercrombie version was adapted by interior designer Bud Holman and Sports Illustrated magazine; Stanmar will handle construction. The house, which Abercrombie president Earle K. Angstadt, Jr., thinks is "the first . . . vacation house on Madison Avenue," has post and beam construction, the main roof support being a centrally located cedar post, allowing flexibility in the interior floor plan, and making possible large sliding glass walls. The living-room/kitchen area has a high ceiling capped



by an encircling row of windows just beneath the roof line, which will flood the room with light, no matter how the house is situated. Three of the home's four rooms open onto a spacious cedar deck (about 1000 sq ft in all). Even with a price tag of \$14,375, or \$16,340 winterized (with insulation and a heater), it is an appealing house-open, inviting, and conveniently functional. Holman decoration includes boldly colored spinakker cloth curtains, and objects from Abercrombie's-boomerangs, bows and arrows, shell collections. One could do worse than spend the summer on Abercrombie's roof.

Personalities

Harvey B. Gantt, first Negro to attend a white, state-supported school in South Carolina, graduated with honors from Clemson University with a degree in architecture. He will join the firm of A. G. Odell, Jr. in Charlotte, North Carolina. . . Louis I. Kahn has been given an honorary degree from Yale University and praised with the words, "Your design for our new art gallery began Yale's glorious architectural development of the last decade". . . H. N. Muller, vice president, engineering division of Westinghouse Co. Ltd., was installed as president of The American Society of Mechanical Engineers. . . John Wilson Cuningham graduate of the University of Minnesota

(Bachelor of Architecture), and Harvard (Master of Architecture) has received the Rotch Travelling Scholarship for 1965. . . . Leonardo Ricci, Italian architect and professor of architecture at the University of Florence will visit Pennsylania State University this fall . . . Hunter & Benedict, Architects, and Attridge, Fish & Associates of Los Angeles have been selected as consultants to the Los Angeles Department of Water and Power . . . Directors of ACTION Council for Better Cities have re-elected Albert M. Cole chairman of the Board and John H. Muller president . . . Dr. James G. Coke, urban planner and pro-

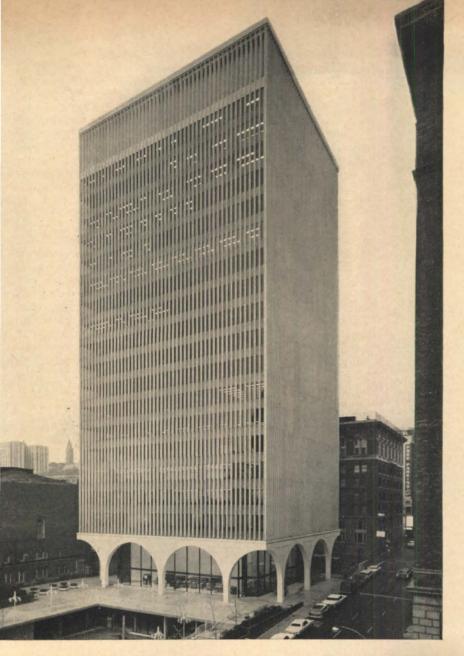
fessor of planning and landscape architecture will direct Kent State University's new Center for Urban Regionalism. . . . Lawson B. Knott, Jr. has been named Administrator of GSA.... New ASTM (American Society for Testing and Materials) officers were named: Robert F. Legget, president; Frank J. Mardulier, vice president; and James B. Rather, Jr. as vice president . . . Construction Specifications Institute's Los Angeles Chapter has installed for a second term as president Raymond Whalley of Prescott, Whalley & Weitt . . . Newly elected: George D. Lobingier as president of the American Society for Engineering Education.

Lone Star Students Look South of the Border



COLLEGE STATION, TEXAS Half the fifth-year design students in the School of Architecture at Texas A&M University worked on the student project shown here. The problem was to program and design facilities for the 1968 Olympics, to be held in Mexico City. Working in three teams, which included landscape architectural students, the group had the advisory help of Director Gonzales Reyna of the School of Architecture, University of Mexico, the U.S. Ambassador to Mexico Fulton Freeman, and the Mexican Olympic Committee. Although the project was hypothetical-the Mexican government has not decided exactly what buildings it will put up for the Olympics: probably some buildings at the University of Mexico will be used—the site used in the designs was an actual one, two miles east of the university. Its 500 acres of lava rock base slopes slightly toward a small dormant volcano crater at the easternmost corner of the site. If the site is actually used, a monorail system will probably connect it with the university.

In addition to site development, the students designed the main buildings: a stadium to seat 150,000; a sports palace or gymnasium with 20,000 seats; a swimming pavilion with 10,000 seats; an administration building; and housing for 12,500 (to be used after the Olympics for student and faculty housing). Each group



IBM Building, Seattle Wash.; Site Development: UNIVERSITY PROPER-TIES, INC., Seattle; Architects: NARAMORE, BAIN, BRADY & JOHANSON, Seattle, and MINORU YAMASAKI and ASSOCIATES, Detroit; Structural Engineers: WORTHINGTON, SKILLING, HELLE & JACKSON, Seattle; General Contractor: HOWARD S. WRIGHT CONSTRUCTION CO., Seattle; Precast Concrete: OLYMPIAN STONE COMPANY, Seattle; Ready-Mixed Concrete: SEATTLE READY-MIX CONCRETE, and PIONEER SAND & GRAVEL COMPANY, Seattle

TYPICAL FLOOR plan illustrates central service core with reinforced concrete walls. Floors extend to outside walls, with no interior columns needed. Waffle-slab floors are supported on integral concrete beams, precast at the site.

A STRIKING NEW LANDMARK by day (above) or night (below), the new IBM Office Building in Seattle makes effective use of fire-safe, locally-manufactured, modern concrete.



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Equally unique was architect Minoru Yamasaki's structural design. The 113-ft-square building relies on a central reinforced concrete service core as a supporting element. Waffle-type concrete slab floors extend from the core to the outer walls, eliminating columns in the office areas. Pipe columns in the outer walls are concealed by concrete fins.

Lightweight-aggregate concrete, made with "Incor" high early strength portland cement was used for floor topping. This decreased the weight and shortened the critical path time. Regular Lone Star portland cement was used for all other cast-in-place concrete.

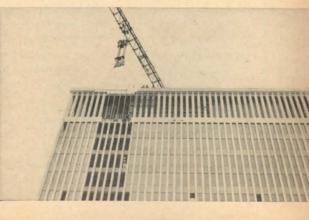
The nearly 2000 precast, prestressed decorative fins were also made with "Incor" cement for rapid turnover of forms. These exterior fins were surfaced with white cement and marble chip aggregate.

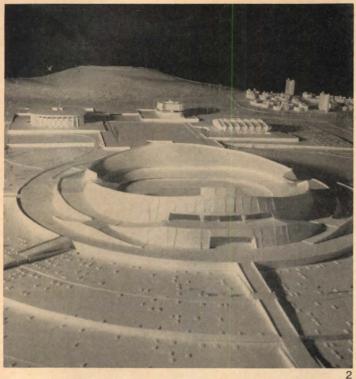
"Incor," America's *first* high early strength portland cement, helps make the most of today's CPM and precasting techniques.

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EXTERIOR WALL has nearly 2000 prestressed concrete fins, each two stories tall.







worked with a different site plan. Group I (1) clustered the primary buildings around a central pedestrian plaza. Group II (2) also has a central plaza, but the spaces defined are rectangular and the spectrum of activity diminishes as it moves toward the volcano where the housing is situated. In Group III (3), the stadium is the focal point around which all activities are grouped. Again, housing is furthest from the center.

Faculty advisor for the project was Paul Pate, Associate Chairman of the School of Architecture.

Eavesdroppings

"One excellent reason for becoming an architect is that he always deals with people who are in a happy, optimistic mood. A man, for instance, has a family and wants to build a beautiful home for them. Someone has been successful in industry, and he wants to build a new factory or a symbolic building. Architects are always working with people who are happy, instead of people bedeviled with stomachaches or legal problems."— Edward D. Stone advises the youth of America in March 1965 Boys' Life.

"The sheer physical aspects of the automobile are not confined to what happens when it is in motion. Alive or dead, it is a jealous consumer of space. The stabling of a single car requires some 13 per cent of the floor space of an average family home. Commercial parking establishments, nearly eleven thousand of them, aggregate into big business with an annual intake of over a third of a billion dollars and the consumption of an important amount of urban space. Metered on-street parking is a significant element in municipal income. But both free and paid parking are often at a premium in commercial areas, their benefits being offset by the obstruction to the flow of traffic. The loss of sales in the older civic centers due to parking difficulties is amply proved by the growth of peripheral shopping facilities, due only in part to suburban expansion. . . .

"The American public, so often accused of materialism, suffers from exactly the opposite malady-a lack of respect for materials. The modern automobile, aside from weird vagaries of appearance which seem to be quieting down, is a superb engineering achievement deserving more respect and better care than it usually gets. One cannot help thinking nostalgically of an earlier day when possessions were harder to come by and home equipment such as edged tools and rifles were given the loving care now bestowed on household pets." Paul B. Sears, "Man or Motor," The Atlantic, July 1965.

"My own conviction is that we are at a point where the foreces we think most characteristic of modernity are still in a comparatively benign state of development. But those forces could quite rapidly change their aspect, becoming violent and destructive as they overflow the banks which have contained and disciplined them. It is quite fascinating, for example, to see advertisements in the New York buses which invite the crowds to come out to the World's Fair, where they may enjoy the spectacle of seeing illuminated figures chart. moment by moment, the U.S. population explosition. We can still find pleasure in the fact that we are a growing population. But how long will that be? How long will the public mood permit us to exploit for commercial entertainment a phenomenon which could suddenly here-as it has already elsewhere—become one of the grimmest and most forbidding realities of the time?

"In the same way we take delight in huge building programs-not only finding them good for business, but really being convinced that they will prove good for man. Yet the growth of cities can guite literally become cancerous. In the less developed countries, cities are already being filled with refugees from rural slums unable to shape a viable urban existence for themselves. And certainly we shall begin to take a new and more somber view of the building explosion when, like the population explosion, it begins to outrun the bounds of human values and rational choice." August Heckscher at the AIA Convention.

JO'BURG HIGH-RISE



JOHANNESBURG, SOUTH AFRICA. Johannesburg calls to mind images of diamonds and gold. Jan Christian Smuts and Cecil Rhodes, of Winston Churchill escaping from a Boer prison, and of Herbert Oppenheimer trying to corner the world's diamond market. But though the city's history may be romantic and distinguished, its architecture is about as exciting as Newark's. With a population approaching 1,000,000, Jo'burg sprawls over the yellow soil of the Transvaal, growing outward instead of upward. Its tallest building is 23 stories high. Now, however, plans are underway for a complex of buildings-two theaters and an office building to house the offices of the Transvaal Provincial Administration - that may well start a trend toward architectural distinction here. It may also start a trend toward taller buildings. At 45 stories, the administration building will be 5 ft taller than the city's Continued on page 76

October 1965



L-M STYLED MERCURY units in Kohls' Shopping Center, Racine, Wisc.

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STYLED MERCURY Available in 4 dramatic, sweeping designs for application variations. Available in 9 decorative colors. Plus over-all economy with 1) internal ballast eliminating external ballast ing, 2) standard pole top mounting eliminating support arms, and 3) shorter poles.

(Scale: 1"=2')

SPECIFICATION

All units available for use with 400-, 700-, and 1000watt mercury and metallic additive lamps except the STYLAIRE DYAD which is only for 1000-watt lamps; constant-wattage or reactor ballasts; IES Types III and IV distributions for 1000-watt; IES Types II, II-4 way, III and IV for 400-watt luminaires; photocontrol accommodation.

(Scale: 1"=3')

(Scale: 1"=3')

STYLAIRE

DYAD

(Scale: 1"=3')



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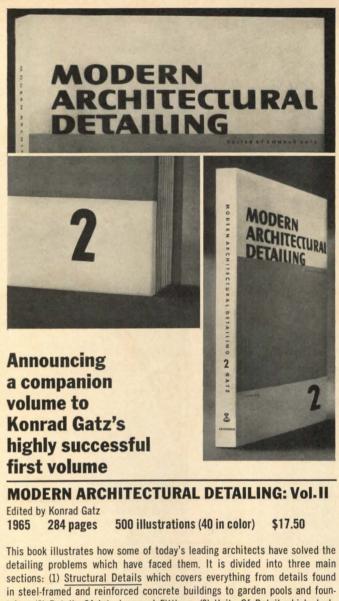
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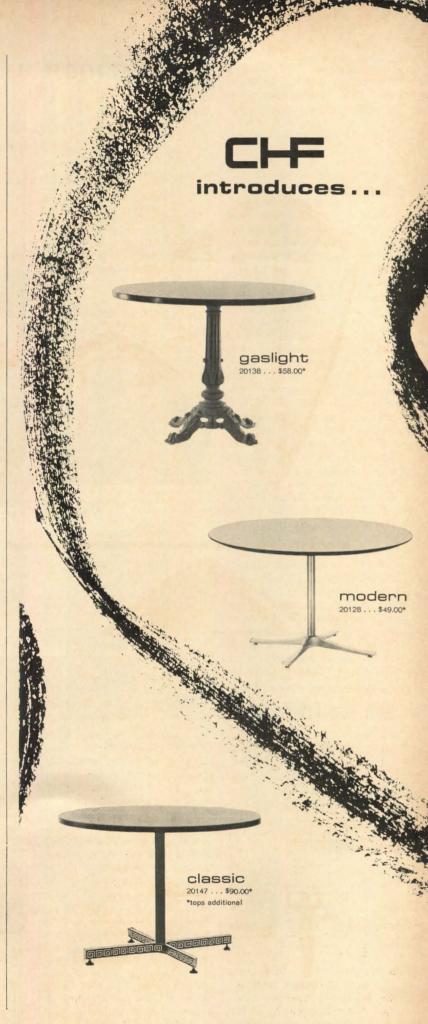


tains; (2) Details Of Interiors and Fittings; (3) Unity Of Detail which deals exhaustively with five complete building projects notable for their excellent design. The detail work of more than 250 American and European architects is examined with a view toward aesthetic quality, technical soundness and originality. The value and uses of both new and traditional materials are discussed in relation to structure, exteriors, interiors and landscaping, providing a wealth of ideas and information for the architect, draftsman, designer, building contractor, and interior decorator.

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Special Decor... or Custom Design CHICAGO HARDWARE FOUNDRY CO. North Chicago, Illinois Continued from page 72 highest point: the Herzog Tower, a television transmission tower that stands on the Witwatersrand, the long ridge of yellow earth and stone that forms a backdrop for the city.

Architects Pauw, Moolman and van der Walt, who have been traveling throughout Europe and the United States studying skyscraper construction, plan to start construction on the complex's first building, a small 750-seat theater, by the summer of 1966. When completed, the theater will be part of an L-shaped structure, sharing a common lobby and backstage facilities with a 2000seat opera house in the other wing. As currently planned, the high-rise office building will have three 40-ft-wide concrete end walls connected by posttensioned floor-height Vierendeel trusses. Each of its two narrow wings will project from opposite ends of a common central lobby area, giving the building a central, right-angled cut that breaks the façade line. Stair wells and elevator shafts will be located at the end of each wing. Total floor area will be 475,000 sq ft: 8000 sq ft per floor. Occupying about onethird of the 6-acre site, the structures will rest on a landscaped podium, giving downtown Johannesburg its first planned open space in some time. Beneath will be three parking levels for 1200 cars. The project is scheduled to

be completed by 1973, at a total cost of \$20,000,000.

High-Rise Proliferation

Photo: Robert Brandeis



Hartford Building, San Francisco; Skidmore, Owings & Merrill. (Completed.)

Skyscrapers, like teen-agers, seem to be inevitable, and, also like them, their tribe is increasing. "Michelangelo," Frank Lloyd Wright once mused "built the first skyscraper, I





International Trade Center, Los Angeles; Edwin J. Ropperdan. (To be completed by fall 1965.)



Hawthorne House, Chicago; Solomon-Cordwell & Associates. (To be completed by fall 1966).

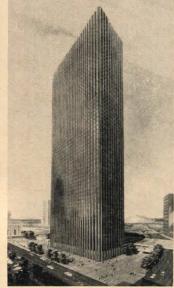
suppose, when he hurled the Pantheon on top of the Parthenon. The Pope named it St. Peter's and the world called it a day, celebrating the great act ever since in the sincerest form of human flattery possible. As is well known, that form is imitation." Wright was willing to admit the emergence of the skyscraper as an art form when Sullivan's Wainwright Building appeared, but he lost whatever enthusiasm or hope he may have had for it (except for his Bartlesville tower and mile-high proposal, of course). "The light that shone in the Wainwright Building as a promise flickered feebly and is fading away," he said later. But if Wright was interested



Fidelity Bankers Life Building, Richmond, Va.; Marcellus Wright & Pariners. (To be completed by December 1965.)



Laurence G. Payson House, New York City; Frederick G. Frost Jr. & Associates. (To be completed by December 1966.)



Office Building, Pittsburgh; Harrison & Abramovitz. (Construction not yet scheduled.)

in the skyscraper purely as architecture, others have worried about it as a social problem and even as psychological one. After the completion of the Flatiron Building in Man-



Mutual Benefit Life Insurance Co., Newark, N. J.; William L. Pereira & Associates. (Construction not yet scheduled.)



Pierce National Life Insurance Co., Los Angeles; Welton Becket & Associates. (Construction not yet scheduled.)

hattan in 1902, some people complained that the weight of skyscrapers would cause the island to sink into its watery surroundings. Others blamed them for the rise in the tuberculosis rate and believed them a menace to life and property. Writing in the 20's, Lewis Mumford saw skyscrapers as intimidating, depriving persons forced to live in their shadows of stature or grandeur. He may have been right; certainly tall buildings cut off light, but such is the adaptability of 20th-Century man that writer Ralph Caplan realized one day last summer, when someone asked him about the Pan Am Building, that he had passed through it twice that morning without being aware of it.

Height and mass are no longer the major architectural considerations in cities such as New York and Chicago, where one more story or a few more square feet are becoming inconsequential. What matters more are things like placement on the site and placement of the site.

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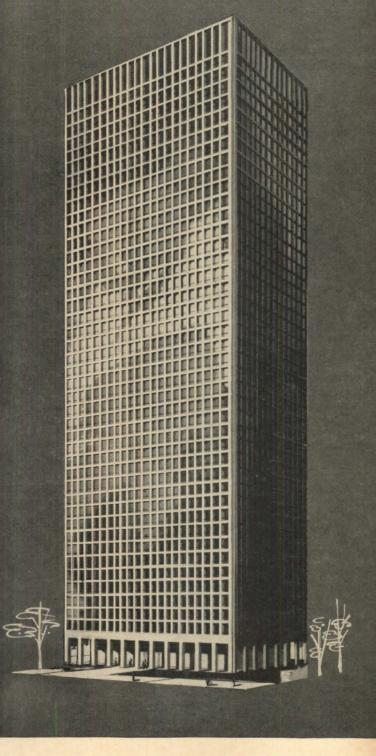
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Office Building, New York City; Emery Roth & Sons. (To be completed by fall 1966.)



Wachovia Building, Greensboro, N. C.; A. G. Odell, Jr. & Associates. (To be completed by spring 1966.)

These factors are equally important in smaller, less congested cities, such as Milwaukee, Minneapolis, Cincinnati, St. Louis, and even San Francisco, where the skyscraper is undergoing a minor boom. It is as though some cities had heeded Rodgers and Hammerstein's musical admonition of the 40's about Kansas City, which "went and built a skyscraper seven stories highabout as high as a building oughta go," only to forget it in the press for useable economical space.

The skyscraper was, of course, made feasible by the elevator, ("an unprecedented monster born of the elevator," Montgomery Schuyler once called it). It first appeared in New York in 1870, when Henry Baldwin Hyde's office building for the Equitable Life Assurance Society went up at 120 Broadway. The structure had seven stories and was the first building in the world to have a passenger elevator; two, as a matter of fact. (The Empire State Building has 74 in 7 miles of elevator shaft.) Just how far has the skyscraper come? A comparison of the Wainwright Building and the Seagram Building would seem to indicate that it has not come too far. New materials have come along, spans have increased, plans have opened up, heights have increased, but both buildings are close to perfect expressions of the form in the idiom of their time.

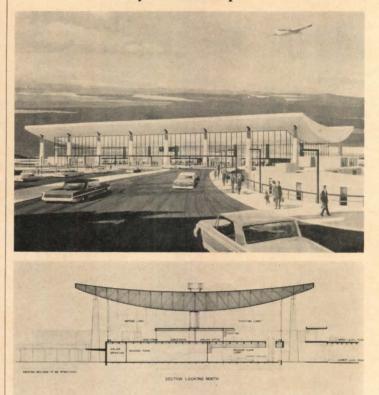
The watcher of trends can see a distinct move away from the all-glass, -metal, and -porcelainized cladding of the 1950's. The decade of the Park - Avenue - , Emery - Roth type high-rise building has almost ended, and in its place there is a greater concern with texture and "permanence" for office towers (see CBS Build-ing, pp. 187-192, JULY 1965 P/A). The bright blues and greens of a few years ago have given away to muted tones and dark anodized panels. Frequently, today, even the most prosaic building can assume a little dignity through the use of these techniques. That the 20year-life structure has not left us completely, however, can be seen by looking at any collection of recent high-rise building projects.

The skyscraper is not a building subject to the playing of many changes, which perhaps led Mr. Wright to his comment about imitation. How well, or how poorly, this "imitation' is being achieved today is partially evident in this indication of skyscraper construction as sampled from our mail of the last two months.

Schools

Cornell University recently received a \$200,000 grant for fellowships in city planning and urban renewal. The fellowships will be known as the Mellon Fellowships in City Planning and Urban Renewal . . . Pennsylvania State University will this fall begin a graduate program in acoustics. A sound idea. . . . The American Academy in Rome is offering a number of fellowships in the fields of architecture and landscape architecture, among others. The fellowship competition should attract anyone interested in a program offering roundtrip transportation, studio supplies, travel in Europe money, free residence, studio or study, and access to facilities at the Academy. Applications and information may be obtained from the Executive Secretary, American Academy in Rome, 101 Park Avenue, New York 17, N.Y. December 31 is deadline for submission of work.

Mysterious Airport



BOSTON, MASS. You can't chop your father up in Massachusetts, the song says, but this stricture evidently does not pertain to works of architecture. Take, for example, the design for the new North Terminal Building at Boston's Logan International Airport by the respected local firm of Perry, Shaw, Hepburn & Dean. Where Saarinen relied on the basic catenary curve and its ally gravity—to achieve the dra-

matic thin-shell swoop of the roof at Dulles International Airport, the designers have provided here a curved steel truss (16' deep at its thickest point) atop 52'-high pylons, forming a beefy hat for the building, that heavy-handedly recalls Saarinen's tour de force. Why did a good firm do such a thing? Why did the client accept a second-hand Dulles? Such are the mysteries of architecture.

Student Users Advise on Dormitory Planning

MOUNT CARROLL, ILL. When architect Charles Stade of Stade, Dolan & Anderson, Park Ridge, Ill., received the commission for the new men's dormitories at Shimer College in Mount Carroll, he performed the commendable act of going directly to the ultimate users of the facilities — the students themselves — to find out what kind of accommodations they wanted.

The result is what should be an exceptionally amenable plan. Basis is a four-man suite, with two bedrooms for two men each on either side of a common study room. This area

provides space for informal discussions on which the college relies to supplement textbook teaching. The separation of work and sleeping areas also has the obvious advantages of privacy when one student wants to sleep and another to work, and separate temperature controls: the windows can be open in the bedrooms and closed in the study room. Within the bedrooms, bunk beds are used, but, since the students voiced antipathy to regular "Pullman" type bunks, they are at right angles to one another so that only a small part of the upper bed is over

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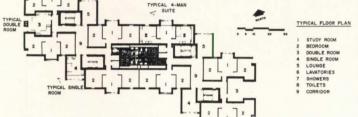
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the lower one. The students also did not want entrances to the suites directly opposite one another, giving an institutional atmosphere. Consequently, a central area plan has been adopted that clusters the suites around common facilities and avoids long corridors. Additional privacy is insured by having doors always locked and entrance to nontenants permissible only after ringing a buzzer to the suite. The form of the dormitory will be dictated by the shape of its interior spaces, creating projections, rooms "in the eaves," and similar characteristics of acadème. The students have become so involved in their new dormitory that they have voluntarily helped bring brick to the construction site.

WASHINGTON/FINANCIAL NEWS

BY E. E. HALMOS, JR.

Money was pouring out of the Congressional hoppers in early September, as lawmakers continued their drive for adjournment.

Most of the new supply of funds will go for construction work: some \$500,000,000 in the Housing and Urban Development bill (half for water and sewer projects, the rest for rehabilitation and planning); \$580,000,000 in the "Higher Education Act" (HR 9567) for continuing grants for construction of teaching facilities; \$3,300,000,000 for public works in economically depressed areas; and \$3,000,-000,000 in highway apportionments (for fiscal year 1967).

There was one sharp—though temporary—setback in the flow of money bills: The President's veto of the \$1,700,-000,000 military construction measure. The veto was based on a Constitutional argument: President Johnson claimed that Congressional insistence on approving closing of military bases was an invasion of the powers of the Executive branch. It had nothing to do with the amount, which approximated what had been asked in the budget message last January.

In most cases, Congress was outdoing the President in the amounts it would make available for these purposes, and there was only mild protest from the west end of Pennsylvania Avenue about this.

One question remained, of course—but that needn't be worried about until next year: where would the money come from? Most of the funds authorized this year will appear in the form of budget requests next session.

Along Life's Highway

Congressional okay on the highway apportionment was

admittedly a stop-gap measure, intended to insure against any break in the pace of awarding contracts.

But, as of late August, Congress hadn't tackled the vital question of providing new money to meet an estimated \$3,000,000,000 deficit that will appear in the Highway Trust Fund at the end of the program (1972), if current cost estimates are correct. There have been numerous suggestions in the form of bills (transfers of funds from the added taxes on Treasury, trucks, diversion of excise taxes on new-automobile sales and the like), and the President's drive for highway beautification might put an added drain on the fund.

Congress has seemed inclined to sweep the whole business under the rug—for this session, anyway.

You can get an idea of the problem from these Commerce Department figures:

The Highway Trust Fund started Fiscal Year 1965 with a balance of \$641,000,000. Income during the year was \$3,700,000,000, disbursements \$4,027,000,000. So some \$357,-000,000 more was spent than was received, and the new balance is \$284,000,000.

Ugly \$ Win Again

Utility won out over aesthetics, at least so far as Congress is concerned, in a dispute between the Atomic Energy Commission and the community of Woodside, California, as to whether power lines should be above or below the ground.

AEC wants to put a 200,000-v line on high steel towers near the community, despite recent local ordinances forbidding such construction. California and lower Federal courts backed the town's adamant insistence that the line go underground. AEC, arguing that such a line would add substantially to costs, also insisted that it has been granted the power to override local laws-and Congress agreed. The case will go to the U.S. Supreme Court.

NASA High-Rise

Architects have been ordered to proceed with detailed design for an unusual "high-rise/lowrise" group of buildings for the National Aeronautics and Space Agency research center at Cambridge, Massachusetts. The first three buildings part of an eventual \$60,000,-000 project—will include a 26-story (378') tower; a threestory Microwave Laboratory, and a 350-seat auditorium. Architects are Edward Durrell Stone, Giffels & Rossetti, and Charles A. Maguire Associates.

Financial

Most disturbing economic factor for those concerned with building was the increasing evidence of rising construction costs.

The rise, as yet, didn't seem to have any effect on future planning: businessmen still reported plans for substantial expansion, over the next year or so

But the Bureau of Public Roads' quarterly cost index hit an all-time high for the second quarter of the current year: a jump of 3.5 per cent over the previous quarter—to 106.9 (1957-59 taken as 100). Previous high was 104.8, in the same quarter of 1957.

The BPR index has been rising by small amounts, but fairly steadily, for the past year. Statisticians cautioned, however, that the sudden jump doesn't necessarily forecast a strong uptrend. Biggest factors in the rise were whopping increases (of more than 10 per cent) in costs of excavation and structural steel.

Apparently confirming the uptrend was the Public Health Service's index of costs, which has gone up by fractions of a percentage point every month since its inception more than a year ago. For July, this index was recorded at 112.31—up from 111.83 in the previous month.

Other indicators, however, showed no slackening of support for construction. In July, according to the Investment Bankers Association, voters approved 70.3 per cent (for a total of \$53,300,000) of all public construction bonds presented; average prices of secondary mortgages held steady at \$98.3 per \$100 of outstanding mortgage money for the seventh consecutive month, indicating a continued stability in money markets.

Housing continued its slow drift downward: In July, said the Census Bureau, the rate of privately owned housing starts stood at 1,459,000 units—3 per cent below that a year ago.

JUST PUBLISHED! LA-SERIES

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1966 EDITIONI

Specifications and Load Tables for High Strength Open Web Steel Joists

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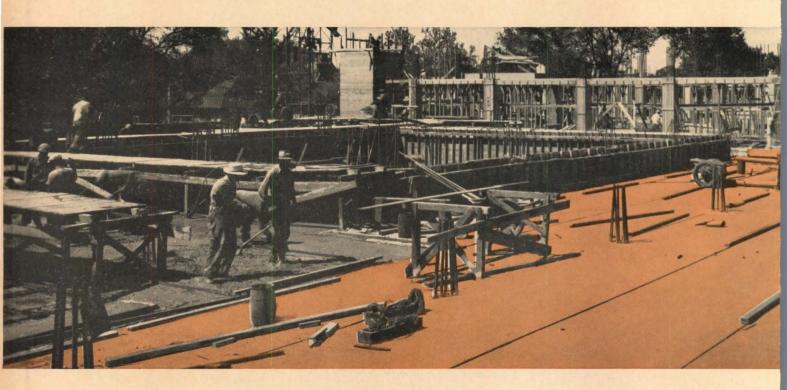


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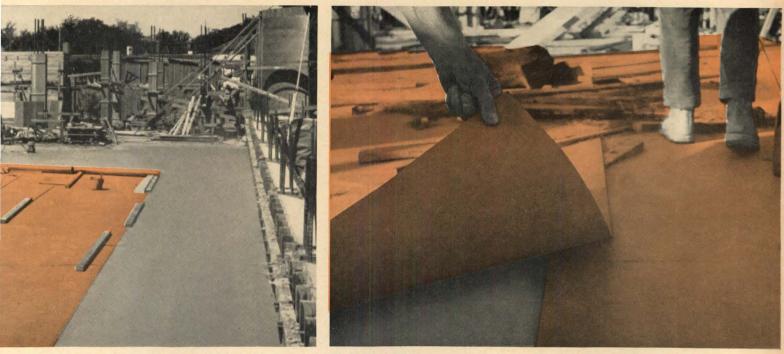


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EW PRODUCTS





Tone Sandex" acoustical ral board for exposed grid gs simulates sand plaster. ular surface conceals miperforations that absorb d. It is made in panels are 24" x 28" in size and thick. Wood Conversion First National Bank Bldg., aul, Minn. eaders' Service Card, Circle 100

Air/Temperature

diant Ceiling Heat



I-Strip" secures radiantng cables to ceiling withusing nails or screws. s are cemented to ceiling posite ends of a room, and ntinuous heating cable is between the strips. ufacturer claims Ceil-Strip es cost of installing radiceiling cables. Extrud-Oc, Inc., 316 Meyer Rd., enville, Illinois. eaders' Service Card, Circle 101

Construction **3-D Plastic Panel**

ir," a patterned acrylic ic sheet available in 17 sparent colors or colorless, ires a hammered texture

on both surfaces. Flair is available in 48" x 72" and 48" x 96" sheets and $\frac{1}{8}$ ", $\frac{3}{16}$ ", and 1/4" thicknesses. This pattern can be used to produce threedimensional stained-glass effects in panels, lighting, and domes. Rohm & Haas Co., Independence Mall West, Philadelphia, Pa.

On Readers' Service Card, Circle 102

Nonshrink Concrete

"ChemComp" expansive cement compensates for the normal drying shrinkage of portland cement. Concrete mixed with ChemComp expands by the same volume that normal concrete shrinks, then, after four to six days, shrinks to its original volume. The expansion puts a compressive force into the concrete so that subsequent shrinkage does not cause tension that normally produces drying shrinkage cracks. Manufacturer recommends using ChemComp concrete in exposed areas such as pavements, water tanks, and parking decks. Chemically Prestressed Concrete Corp., 14656 Oxnard St., Van Nuys, Calif.

On Readers' Service Card, Circle 103

Plastic-Surfaced Wood

"Plyglaze" is a plastic-surfaced solid core panel material. Wood grains and designs are achieved through precise rotogravure printing of pigmented alpha cellulose papers. These papers are completely saturated with resin and permanently fused under extreme heat and pressure to one of four core materials: hardboard-faced plywood; flakeboard; hardboardfaced flakeboard; or hardboard. Plyglaze is resistant to abrasion, scratches, dents, burns, stains, acids, alcohol, chemicals and detergents. Plyglaze can be used for furniture, panels, or partitions. St. Regis Paper Co., Forest Products Div., 1019 Pacific Ave., Tacoma, Wash.

On Readers' Service Card, Circle 104

Doors/Windows Invisible Door Closer

"In-A-Rale" door closer is completely concealed within Amarlite's aluminum doors.

Readers' Service Card Now Located on Page 329



Features include adjustable hydraulic back-check; adjustable sweep speed and latching speed; fully concealed slidetype arm with hold-open (arm for 180° opening is optional). Concealed extruded slide serves as a shock-absorbing cushion as well as a hold-open device. Anaconda Aluminum Co., Amarlite Div., P.O. Box 1719, Atlanta, Ga. On Readers' Service Card, Circle 105

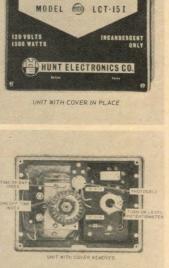
Snap-In Window Frame



Aluminum louver system, employed in almost all ventilation and sun - control applications, uses snap-in method for assembly and for bracing blades. Stationary louver system includes blades in a wide range of sizes and types spanning up to 72" without intervening mullions. System is said to cost from 25 to 40 per cent less than preassembled systems of comparable quality that use conventional screw, rivet, or welding for assembly. Blades slide within jamb sections before installation of head and are engaged by notches in the jambs by tapping the blade with a rubber mallet. After all blades are inserted, the head member is

fitted in position and secured by corner blocks. Frames use interlocking mullions for joining louvers in series. Variety of finishes for aluminum are available. Construction Components. Inc., 2408 Forney St., Los Angeles, Calif. On Readers' Service Card, Circle 106

Electrical Equipment Outdoor Light Control



Outdoor lights can be automatically intensified as darkness increases, or dimmed as sunlight increases, by means of a photocell-activated, light-control process. Unit contains an internal adjustable 11-hr timer (6:00 P.M. to 5:00 A.M.). "LCT-15-I" unit, which has no moving parts, measures only 6"x41/2"x 2116". Light control features "Silicon Symmetrical Switch." a solid state device that is unaffected by line transients or peak inverse voltages. It eliminates need for relays or relay contacts. Unit can be installed in temperature range between -45 F to +131 F. Hunt Electronics Co., 2617 Andjon Drive, Dallas, Tex. On Readers' Service Card, Circle 107

High Output Color

"Super-Hi Output" mercury lamp provides white light of favorable color rendition without the use of a phosphor coating, which must be used

in standard color-corrected mercury lamps to eliminate green tones. Lamp provides 75 to 80 lpw, which is an improvement, says the maker, of 43 to 50 per cent over ordinary color-corrected mercury lamps. Westinghouse Electric Corp., Lamp Div., Bloomfield, N.J. On Readers' Service Card, Circle 108

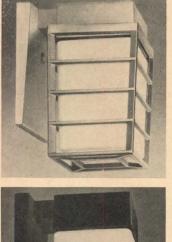
Sol's Bright Light

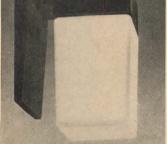


"Solinor," a 200-w sodium vapor luminaire, is rated at 135 lpw. Fixtures can be installed on street standards or on walls of buildings. The 3'long lamps are mounted in aluminum fittings coated with epoxy resin. Heat resistant 3/16"-thick acrylic plastic enclosure seals the luminaire against insects, moisture, and dust. Acme Floodlite Co., 12 Ave. at South 19 St., Newark, N.J.

On Readers' Service Card, Circle 109

Wet Lighting





Complete line of lighting fixtures are used in outdoor, indoor, and wet locations. Outdoor and wet-location lights are made of corrosion-resistant cast aluminum, enclosed and gasketed for vapor-tight performance. Available in triple-ground satin aluminum or satin black anodized finish. Some 32 models are available in ceiling units and wall brackets (single and double units, 100-w and 200-w). McPhilben Mfg. Co., 1329 Willoughby Ave., Brooklyn, N.Y. On Readers' Service Card, Circle 110

Walnut Grid



Hand-rubbed solid walnut grid system and opal white acrylic diffusers compose lighted ceiling system called "Heritage." Sculptor William Adair Lyon, who created the design, has concealed the T-bars from view. Module sizes are 1' x 2', 2' x 2', 2' x 3'. Flat, rigid, and 100 per cent Plexiglas sheets can be wiped clean without removing the frame from the ceiling. "Torsion-Ease Hinge" permits easy access for cleaning and lamp replacement. Integrated Ceilings, Inc., 11766 West Pico Blvd., Los Angeles, Calif.

On Readers' Service Card, Circle 111

Sound-Deadening Panel

"Noise-Guard" is a sounddeadening, 3/8" thick by 16" wide panel used under gypsum wall board. It produces a resiliency that absorbs and dissipates sound vibration. Panel consists of interconnecting cells of expanded polystyrene with black kraft paper laminated to both sides. It can also



be applied under gypsum board ceilings or as a floor underlay. It is available in 8' sheets or 100' rolls. W. R. Grace & Co., Zonolite Div., 135 S. LaSalle St., Chicago, Ill.

On Readers' Service Card, Circle 112

Natural Daylight Fluorescent Tubes

Fluorescent lamp matches the color spectrum distribution of natural outdoor light, permitting accurate color perception. "Duro-Test Optima" flourescent tube eliminates need for shopper to take objects to store window or door to evaluate color and texture of merchandise. It can be used in art galleries, showrooms, stores, etc. Tubes are available in 18"/ 15 w, 24"/20 w, 48"/40 w, and 96"/74 w. Duro-Test Corp., North Bergen, N.J. On Readers' Service Card, Circle 113

Outdoor Lighting



Four post-top fixtures for exterior area lighting, called "Landmarker Luminaires," are available in 100 through 500 incandescent sizes and 100 through 400 w mercury vapor. Open space is provided between lamp housing and ballast, which is concealed inside pole mounting cap. Open space directs light downward as well as outward, permits relamping without taking Insture apart, and leaves no place for insects to get trapped. Standard 12" diameter open-bottom glassware is self-cleaning. Fixtures, 32" high, may be mounted on 10' poles. Housings are of cast and extruded aluminum and all hardware is noncorrosive. Luminaires are available in eight colors. American Electric Manufacturing Co., Southaven, Miss. On Readers' Service Card, Circle 114

Finishes/Protectors Primer Plywood Panel



Panel, called "Primed Plyaloy, features a coat of light gray, acrylic latex paint "baked-on" to the overlay and applied to the surface of the panel at the factory. According to the manufacturer, this primer coat prevents plywood panel seal from breaking. Thus panels do not have to be retouched or painted. Primed Plyaloy is available on either one or both sides of the panel in thicknesses ranging from 5/16" to 3/4". Sizes range from 4' x 8', 4' x 9', and 4' x 10'. Other thicknesses and panel Other thicknesses and panel sizes are available on request. St. Regis Paper Co., Forest Products Div., Tacoma, Wash. On Readers' Service Card, Circle 115

Stone-Colored Sealant

Stone-colored, one-part polysulfide joint sealer cures chemically to form a solid, rubbery seal when exposed to atmos-"Weatherban phere. Brand One-Part Sealer 101 Stone" can be employed for sealing stone joints, exterior and interior joints between curtain wall panels, metal framework, masonry, glass, porcelain, and wood. Sealer resists effects of ozone, oxygen, fresh and salt water, and alcohol. It can withstand continuous exposure on a building at temperatures between -40 F and +160 F without deterioration or loss of



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fulfill your architectural desires; get to the job on time; install smoothly, with factory supervision if desired; and work and work and work indefinitely. With us, service is generous, personal



by experts in applying, manufacturing and erecting fine metal windows. The William Bayley Company, Springfield, Ohio.



adhesion. 3M Co., Adhesives, Coatings, and Sealers Div., 2501 Hudson Rd., St. Paul, Minn. On Readers' Service Card, Circle 116

Approved Anticaking Concrete Agent

Spreading and anticaking agent, called "X-59," has been ap-proved for use in portland cement plaster by the International Conference of Building Officials in Pasadena, California. Approval is for one year's duration, at which time studies are conducted relating its performance to recent developments in areas of application. X-59 is a fine white powder that reduces drying cracks in portland cement plaster and improves the flow characteristics of a mix so it can be pumped or spread easily. Quantity used is 3/4 lbs per sack of cement. Cabot Corp., 125 High St., Boston, Mass. On Readers' Service Card, Circle 117

Black/White Flashing



Reversible, synthetic-rubber flashing, black on one side and white on the other, has been announced. "Sure-Seal Reversible Flashing" is a durable, chemical-resistant synthetic rubber that is unaffected by sunlight or temperature conditions and is resistant to all chemicals except those of petroleum origin. It is said to perform better than built-up asphalt membranes, fabrics, and fibers. Material conforms to irregular shapes and surfaces and is readily bonded without special equipment or heat. Flashing is available in a standard thickness of 1/16" and in widths of 12", 18", 24", and 36". It is recommended for expansion joints, valleys, chimneys, window head and sill, and all areas where flashing is visible. Carlisle Tire & Rubber Div., Carlisle Corp., Carlisle, Pa.

On Readers' Service Card, Circle 118

One-Part Sealant

One part terpolymer construction sealant, called "Mono-Lastic-Meric," meets Federal specs. According to the manufacturer, it eliminates hazards and high costs of job-site mixing; does not require primer or surface conditioner to attain adhesion; is nonstaining; has a high resistance to ultraviolet rays, oxygen, and moisture; will not sag in joints 1/2" x 1/2" or $\frac{3}{4}''$ wide x $\frac{1}{4}''$ deep; is available in wide range of colors, including white, black, aluminum, charcoal, and neutral stone; and offers 20 year minimum life expectancy. Tremco Mfg. Co., 10701 Shaker Blvd., Cleveland, Ohio. On Readers' Service Card, Circle 119

Furnishings Dignified Desks



The "Exec IV" desk series by Directional has 14 pieces, including 6 desk sizes, 3 cabinet sizes, and several combinations of desks with side units. The walnut frames are finished either with satiny oil, rubbed lacquer, cordovan tones, or bleach; desk tops are flush or overhang on four sides. Hardware can be silvery (to match a polished steel base) or bronze-colored brass (to go with a walnut base). The desk shown has a deep cordovan leather top on walnut, with bronze-finished drawer pulls. Directional Contract Furniture Corp., 979 Third Ave., New York, N. Y. 10022. On Readers' Service Card, Circle 120

Commodious Kitchen Cabinets



A wide range of modular sizes, including single units as narrow as 9", and combination units as wide as 96", insure that these cabinets can be fitted to the widest range of kitchens. Four different finishes (birch and walnut tones, white and gold, and natural) and several styles are available; a myriad of time-, work-, and space-saving conveniences can be installed. Long Bell Div., International Paper Co., 928 Grand Ave., Kansas City, Mo. On Readers' Service Card, Circle 121



Simple Square Chair

Framed in walnut, featuring covered sides, the "471 Chair" has hand-tied coil springs topped with foam rubber. The chair is available as a standard model covered in elastic vinyl, fabrics, or leathers. Stow & Davis Furniture Co., 25 Summer Ave., N.W., Grand Rapids, Mich.

On Readers' Service Card, Circle 122

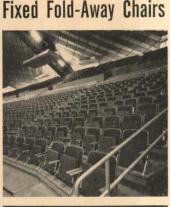
Capacious Carrels

Walnut veneers, with top surfaces in plastic (either matching woods grains or simulated white Persian leather) compose



the "Declaration" library furniture made by Drexel. Among the more than 50 pieces in the group, including card catalogue cases and check-out desks, is the carrel shown. It is the 4-place model, which provides study space for four persons within a 75"-square area. The units can also be used as single- or double-study spaces. Drexel Enterprises, Inc., Drexel, N.C.

On Readers' Service Card, Circle 123





Fold-Away" "T-299 seats. mounted on telescoping platforms, have spring seats with polyurethane pads and independent folding action. Backs fold forward and seats retract so that neither extends beyond the face of the riser when in stored position. Backs are upholstered over a formed poly-urethane pad and have nickel chrome rigidized steel back panels with rolled edges for protection of upholstery at tops and sides. Shown is Fold-Away installation at Seattle Center Coliseum. Heywood-



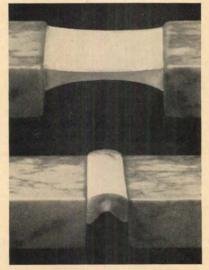
Alcoa Plaza Associates, Owner; Harrison & Abramovitz, Architects; Turner Construction Co. & HRH Construction Corp., General Contractors; General Bronze Corp., Curtain Wall Fabricator; Abbott Glass Company, Glazing Contractor.

9 tons of G-E Silicone Construction Sealant seal new UN Plaza

-E Silicone Construction Sealant is an mazing synthetic rubber that cures in air. i's waterproof. It won't crumble, harden r peel. So it's the first really *permanent* ealing compound.

At the new United Nations Plaza apartnent and office building, just across from ne famous United Nations Building in lew York City, nine tons of Silicone Construction Sealant were used for varius sealing applications. Seven tons of ilicone Construction Sealant were used o glaze the windows. Another two tons eal the aluminum curtain walls. G-E bilicone Sealant is also used to caulk ir ducts as well as miscellaneous caulkng throughout the thirty-eight story win-tower skyscraper.

G-E Silicone Construction Sealant upplies quickly and smoothly from a



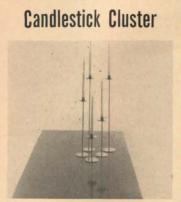
Joints expand and contract 10,950 times in 30 years . . . and so will G-E Silicone Construction Sealant.

standard caulking gun, forming a tight bond to glass, metal, masonry and other common building materials. No mixing either. And it can be applied easily in any weather . . . never stiffens in cold or runs because of heat. Cleanup is a cinch. So you save time while you get a good looking, permanent seal that minimizes callbacks.

Available in a wide range of colors, as well as a translucent form, G-E Silicone Construction Sealant blends in well with almost any material. It's stocked by local distributors and in many building supply stores. For complete information, including a new bulletin on guide specifications for Silicone Construction Sealant, check the distributor nearest you, or write to Section Q10160R Silicone Products Dept., General Electric Company, Waterford, New York.



Wakefield Co., 206 Central, Garner, Mass. On Readers' Service Card, Circle 124



Handsome and inexpensive candlesticks come in heights of 8", 12", and 14". Designed by Darrell Landrum in chrome finish for Avard Inc., 353 E. 62 St., New York, N.Y. On Readers' Service Card, Circle 125

"Lytegem"



Latest diminutive, high-intensity lamp: sphere that revolves 360° (3" diameter; 2" aperture) is attached to cube base $(2\frac{1}{2}" \text{ sq.})$ via telescoping arm of polished chrome, which allows height flexibility of 6" to $14\frac{3}{4}$ ". May be ordered in one of seven finishes. Designed by Michael Lax for Lightolier, 346 Claremont Ave., Jersey City, N.J.

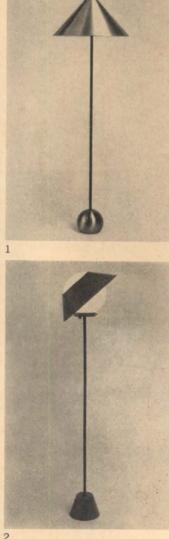
On Readers' Service Card, Circle 126

Multi-Cube



Storage cube is designed to be used in clusters to make up "room dividers," bars, consoles, and cabinets—both standing and wall hung. Dimensions: 24" high x 15" wide x 24" deep. Designed by Jerry Joseph for Toujay Designs Inc., 363 E. 76 St., New York, N.Y.





Looking somewhat like coolies standing frozen at attention are two standard lamps in a collection designed by Neal Small. Shades adjustable for reading are available in 10 colors. Stems and finials for both lamps also are colored. The shade and base (1) are polished or satin brass, chrome, or in color. The 8"-diameter glass ball in (2) is of Swedish glass. Koch & Lowy, Inc., 201 E. 34 St., New York, N.Y. On Readers' Service Card, Circle 128

Woven Wall-Covering

A wall-covering called "Fabricraft" has been developed that resembles grass cloth. Heavy paper fibers, colored and/or neutral, are combined in a simple weave and laminated to a standard No. 2 backing; the surface is coated with transparent, nongloss vinyl. Of the four basic patterns, "Chalkstripe", a weave of almost three-dimensional design, is the most interesting. Brochure with 26 sample cuts, installation instructions, and specifications is available from Deltox, Inc., Oshkosh, Wisc. On Readers' Service Card, Circle 129



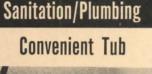
"Lexfoam" is a recently developed urethane roof insulation. Rigid urethane foam is chemically bonded to supersaturated asphalt felt skins to provide an integral, dimensionally stable insulation board. Lexfoam is water and rot resistant and does not shred, delaminate, or crumble. Nonporous surface resists absorption of bitumen and assures a good bond between built-up roof and insulation. Standard-board size is 3' x 4', with thicknesses ranging from 3/4" to 2". Lexsuco Inc., P.O. Box 9530, Solon, Ohio. On Readers' Service Card, Circle 130

Breathing Insulation

Aluminum-clad exterior insulative board, called "Ribclad," is faced on both sides with aluminum breather-type foil that reflects up to 95 per cent of radiant heat. It can be supplemented with other insulation in cold climates or airconditioned buildings. Breathertype foil surface prevents trapping water vapor. Available in 8'- or 9'-long by 4'-wide panels. Window and door openings can be cut out after the panel has been applied to walls. Aluminum Company of Amer-



ica, 684 Alcoa Building, Pittsburgh, Pa. On Readers' Service Card, Circle 131





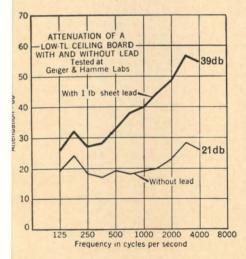
"Restal" tub is made of enameled cast iron and is 38" x 39" x 12" in size. It features maximum bathing area, easy manipulation of the fittings from the seat which is out of the shower spray area, longer well that permits user to stand back from the shower while soaping, widened front rim (11/2") to accommodate rigid shower enclosure tracks, and low 12" sides that reduce normal stepping height. American Radiator & Standard Sanitary Corp., 40 West 40 St., New York, N.Y.

On Readers' Service Card, Circle 132

Special Equipment Floating Floor

Free-floating resilient floor system for gymnasiums, ballrooms, and multipurpose rooms can be installed on a concrete slab or over any firm level surface. Cushioning, called "Perma Cushion," is provided by air-channeled resilient pads attached to the underside of the sleepers. Sleepers do not contact the slab, permitting cross-ventilation under the entire floor system and assuring a dry, warm subfloor. According to manu-

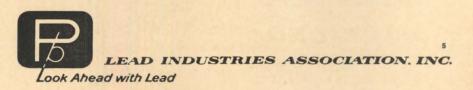
«Aw, shut up!»



The roar of the machine shop across the hall . . . the irritating clatter of the typewriter next door . . . the growl of the nearby air conditioning machinery . . . all foreign sounds invading your privacy.

Today, these conditions need not be tolerated. Thin-sheet lead used as a plenum or over-ceiling barrier effectively cuts outside noise to a murmur. Tests have confirmed that sound attentuation has been improved 18 db (see chart) through the use of thin-sheet lead barriers between hung ceiling and slab.

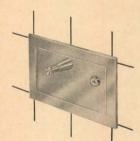
And thin-sheet lead is economical too. It cuts easily, simplifying installation around lighting fixtures, sprinkler heads, piping and conduits. For more information write for our "Practical Lead Sound Barriers" brochure. Lead Industries Association, Inc., Dept. N-10, 292 Madison Avenue, New York, New York 10017.



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On Readers' Service Card, circle No. 327



facturer, pads are guaranteed not to absorb moisture from the air or transmit moisture from the slab to the sleepers and flooring through capillary action, Robbins Flooring Co., White Lake, Wis. On Readers' Service Card, Circle 133

Hot Stuff



"Litton 500" microwave oven operates on 110 v, but delivers the power and speed formerly available only with equipment operated on 220-v circuits, according to manufacturer. Smaller and more powerful air-cooled magnetron tube permits a considerable reduction in the cavity size (12" deep, 12" wide, and 6" high). "500" is available in stainless steel or a variety of baked enamel colors. Over-all size: 215/8" x 211/2" x 147/8". Litton Industries, 850 Third Ave., New York, N. Y. On Readers' Service Card, Circle 134

Moving Treads

"TransiTread" conveyor system moves people or materials





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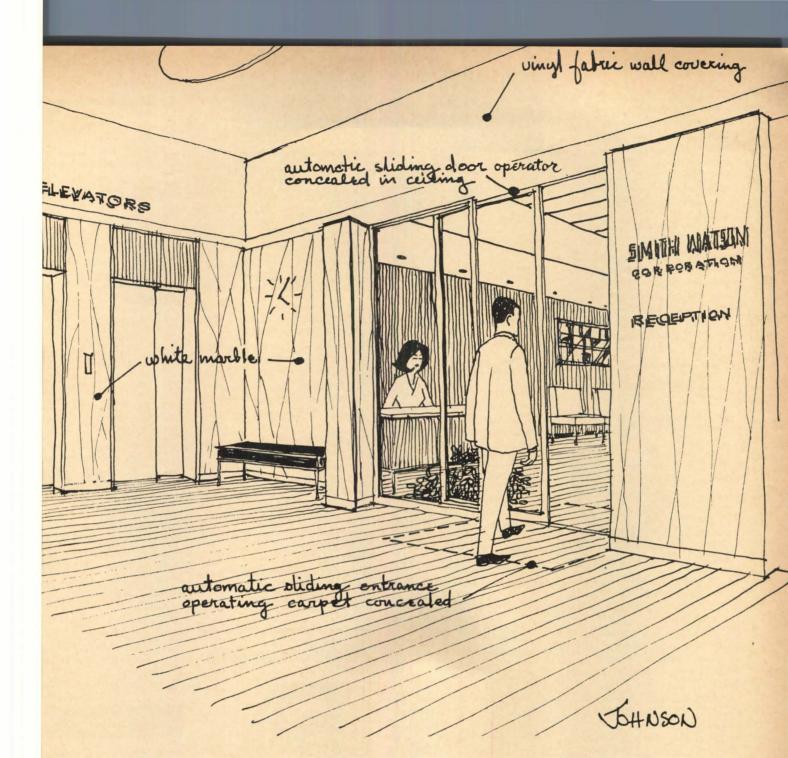
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376 E. Church Kobo 215, CH 31806 ENTENNESSEE Memory and Company 357 Cumberland Ave. 901, GL 2-7301 Nashville John W. McDougall Co. 41st & Indiano Avenues 615, 297-395 TEXAS Dallas Automatic Door Control Co. 1175 1091h St. Grand Prolifie 214, AN 2-1474 Houston Shelton Greer Co., Inc. 3025 Maxroy Street 713, 864-4487 Lubbock Door Automation Soles & ath St. Som Mathematic Co., Inc. 306, 514 4-7584 San Antonio Samuels (Gios Company 221 Newell Ave. 512, 227-2481 UTAH Building Speciaties Co., Inc. 1340 South First West 801, 844-7882 VIRGINIA Richmond Trance Sales Corp.

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on precision treads coupled together into a moving platform that moves horizontally, up or down, or in a spiral. The treads can turn through a right angle or make abrupt reversals. A modular design and simple drum type drive reduces initial costs of installation and maintenance, says the manufacturer. TransiTread can be installed 4" above the surface of existing paths. On new installations, it can be fitted flush with any surface. If equipped with heating elements, the system can be used outdoors in snow and ice. Stearns Mfg. Co., Inc., Flat Rock, Mich. On Readers' Service Card, Circle 135

Digital Compass



"Eason D-500" digital compass gives quick, accurate drawing of circle from 1" to 5" and in increments of 1/32'', 1/16'', 1/8'', and 1/4''. According to manufacturer, compass saves time in drawing tangent arcs and locating adjacent coordinates. It is easier to use than conventional bow compass. Precision-tapered holes in the ballbearing-supported calibrated disc accepts the conventional drafting pencils, colored pencils, or pens. Compass is priced at \$11.95. Scentinel Products Co., P.O. Box 580, Bellaire, Tex.

On Readers' Service Card, Circle 136

Hospital Fountain

Drinking fountain has been specially designed for use in both hospitals and convales-cent homes. "Model 7WC" stainless-steel fountain mounts on the wall at a height that permits wheelchair patients plenty of knee room beneath the receptor. Longer stainless steel extension from the wall to the bubbler allows the patient to approach the fountain from any side. Moving parts can be removed for adjustments and repairs without detaching the fixture from



the wall. Haws Drinking Faucet Co., 4th and Page Sts., Berkeley, Calif. On Readers' Service Card, Circle 137

Colored Writing

Fine-line nylon tip pens write on any surface including glass and plastic. "Glory Pens" are capable, according to the manufacturer, of writing more than 50,000". Ink is nontoxic, washable, and does not penetrate through paper. Colors include red, blue, green, yellow, brown, and black. Set of six is available for \$2.95. Reed Products Co., 4438 N. 20 St., St. Louis, Mo.

On Readers' Service Card, Circle 138



"TV Sentry" closed-circuit television security system consists of a console for each apartment featuring an 11" screen, a telephone handset, a front/rear selector switch, and a door-opener button. Occupants can view caller for two minutes after he presses buzzer to that apartment. Tenants can ignore caller or conduct conversation with handset. Even when there are no callers, tenants can activate the monitor at any time and observe the front or rear entrances by pressing button on the console. Orth-O-Vision, Inc., 18-10 26 Road, Long Island City, N.Y. On Readers' Service Card, Circle 139

Plastic Toilet Partitions



Flush laminated plastic toilet partitions include four types: floor-mounted, overheadbraced: floor-mounted: ceilinghung; and a special high-performance, floor-mounted, overhead-braced unit developed for installations where rougher than normal wear is common. It features use of "vandalproof" through-bolting in the application of all hardware. Components for all partitions include laminate-clad partition panels, door panels, overhead braces and pilasters, and tamperproof, chrome-plated steel hardware. Cores for panels and doors consist of "Supercore" flakeboard or an approved fiveply plywood. Formica Corp., 4614 Spring Grove Ave., Cincinnati, Ohio.

On Readers' Service Card, Circle 140

Modular Range Hoods

Range hoods consist of modular panels in three types of basic stock panel sizes, which can be assembled to any length, width, or design configuration. Module panels meet custom requirements for standard, island, corner, peninsula, or built-in models. Flanged frames are secured to both top and bottom of the modules. Hoods are availble in antique copper, patterned copper, hammered copper, patterned pewter, antique brass, and stainless steel. Monk Mfg. Co., Industrial Rd., Addison, Ill.

On Readers' Service Card, Circle 141

School Intercom System

Recently developed school communications system, called "SST5000," enables school administrators to speak with each other or with any classroom directly, without making use of an operator. Compact desktop intercom station is located in the administrator's office. Main console, which can be located anywhere in the school, houses system's sound and intercom amplifiers, radio tuner, record player, tape recorder, and related equipment. Administrator can originate twoway intercom calls to classrooms and offices; receive calls from classroom and offices and transfer classroom calls to other offices or classrooms; make emergency announcement to entire school by pressing "Emergency" button; make announcements or give talks to entire school or to selected groups of classrooms; conduct conferences with administrative personnel or classrooms and receive and monitor sound programs and signals going out from the central console. Executone, Inc., Long Island City, N. Y.

On Readers' Service Card, Circle 142

Surfacing Stickum Up, Tile!

"Quick Stick" metal wall tiles eliminate need for mastics. Quick Stick is a double-faced tape with a release paper on both sides. Tape adheres on all clean dry surfaces and has good tack properties. Vikon Tile Corp., 130 N. Taylor St., Washington, N. J. On Readers' Service Card, Circle 143

NUFACTURERS' DATA

Acoustics

Sound Control

d Advice" describes adl structural systems de-to meet increasing control problems in resi-, commercial, and instibuildings. Booklet wood, steel, and gypstud construction plus and triple solid parti-Booklet includes cutdrawings, detailed malists, sound and fire test s, and data on isolating ontrolling sound. It also pes of wall construction et various decibel levels ound-control goals. Inglossary of terms. 20

Georgia-Pacific Corp., Box 311, Portland, Ore.

ders' Service Card, Circle 200

Air/Temperature Air Moving **Product Ratings**

loving and Conditioning iation's directory lists cts licensed to bear the A certified rating seal. cts include centrifugal propeller fans, axial fans, roof ventilators, and neaters. All products are according to category nanufacturer. Air Moving Conditioning Assn., Inc., West Touhy Ave., Park , Ill. 60068. aders' Service Card, Circle 201

entilator Planning



ning guide describes wash fire extinguishing systems, ers, and custom-designed lators. Specifications, airne tables, and isometric ings of wide range of oment are given. 16 pages. le Ventilator Co., 1200 S. Ave., Wheeling, Ill. 0

eaders' Service Card, Circle 202

Collecting Dust

Guide shows methods of selecting the correct dust-collecting equipment for 14 types of industry. It recommends equipment for the concentration and particle size of the dust to be collected. Products are divided into dry centrifugals, wet collections, fabric collectors, and oil mist collectors. Photos illustrate these types of dustcollectors. 16 pages. American Air Filter Co. Inc., Louisville, Ky.

On Readers' Service Card, Circle 203

Construction **Plate Glass Designs**

Loose-leaf packet contains five 4-page inserts each dealing with the use of various types of "Heavy-Duty" plate glass in several well-known structures: Chicago Civic Center, National Geographic Society in Washington, D.C., Michigan Consolidated Gas Company in Detroit, Philharmonic Hall in New York, and the IBM Building in Seattle. Each insert illustrates building in color, and gives details of window frames. Packet also includes design chart for selecting thickness of polished plate or sheet glass. Libbey-Owens-Ford Glass Co., 811 Madson Ave., Toledo, Ohio.

On Readers' Service Card, Circle 204

Post-Tensioned **Concrete Structures**

Book describes post-tensioning techniques and materials for concrete structures. Cut-away pictures illustrate the components of stressing system and details show their application to building construction. Elementary design calculations and simplified specifications. 30 pages. Stressteel Corp., 221 Conyhagham Ave., Wilkes-Barre, Pa.

On Readers' Service Card, Circle 205

Copper, Brass, Bronze

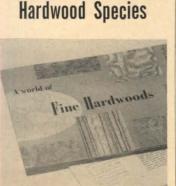
"Copper, Brass and Bronze in Architecture" points up in color photos and details the economic and aesthetic advantages of these three metals. Twelve color samples of common architectural alloys and finishes are shown. The book discusses mechanical, chemical, and applied finishes; care and cleaning of both exterior and interior finishes including "Incralac" protective coating recently introduced by the copper industry; joining of architectural alloys of copper, sheet and extrusion design criteria. Copies of this 24-page publication (No. 406/5) are available free. Apply on business letterhead to Copper Development Assn. Inc., 405 Lexington Ave., New York, N.Y.

I Think It Just Moved



Modular wall system, called "School-Wall," primarily used in schools. Leaflet gives details and specifications for hollow partitions with cork or chalkboard surfaces laminated to gypsum boards. Over-all thickness of School-Wall is $2\frac{1}{4}$ with a 1" cavity. Available in 4' modules in heights up to 10'. 4 pages. Gotham Educations Equipment Co. Inc., 91 Weyman Ave., New Rochelle, N.Y.

On Readers' Service Card, Circle 206



Brochure shows 30 hardwood species in color and describes 22 species in detail. Color diagramatic photos of matching techniques, construction of hardwood plywood, and slicing methods used to produce typical figure patterns are included. Booklet is available at 25¢ per copy. From Fine Hardwood Assn., 666 Lake Shore Drive, Chicago, Ill.



"Design and Use Manual" details properties and applica-tions for mat-formed wood particleboard. This material is made by combining wood flakes with resin binders hotpressed into panels from 1/8" to 2" thick. Available from 3' to 8' wide, and up to 24' long. Booklet lists physical properties of various types of particleboard and illustrates edge treatment, finishing, and painting. 14 pages. National Particleboard Assn., 711 Fourteenth St. N.W., Washington, D.C. On Readers' Service Card, Circle 207

Foundation Failures

"Failures In Foundations" illustrates a number of structural collapses, ancient and modern. Written by Jacob Feld, an authority on diagnosing and repairing collapsed structures, the book recommends that close supervision and adequate quality control are necessary to reduce the number of failures. 32 pages. Soiltest Inc., 2205 Lee St., Evanston, Ill. 60202. On Readers' Service Card, Circle 208

Perforated Metal Design

More than 200 patterns of perforated screens for metals and nonmetals are illustrated. Materials include mild and alloy steels; copper and copper alloys; lead, magnesium, and other nonferrous metals and alloys; bonded, clad, and plated metals; precious metals; proprispecialty alloys; and etary wood, paper products, plywood, and plastics. Catalog #10 gives specifications and suggested applications such as screens and acoustic enclosures. 60 pages. Charles Mundt & Sons, 51-61 Fairmount Ave., Jersey City 4, N.J. On Readers' Service Card, Circle 209

Control Joint for Plaster Partitions

Booklet illustrates many applications of a control joint developed to reduce cracking in plaster partitions when a highrise building frame deflects. A 3/8"-wide joint isolates partitions from vertical and horizontal members of structural frame. Drawings show applications for solid and various types of stud wall systems. 16 pages. National Gypsum Co., Buffalo, N.Y.

On Readers' Service Card, Circle 210

Prefab Steel Structures

Folders present basic information on six types of pre-engineered steel buildings: manufacturing plants, shopping centers and retail stores, recreational and sports facilities, automobile showrooms and service areas, warehouses and freight terminals, and classrooms and gymnasiums. Diagrams show major types of rigid steel framing systems. Color photos illustrate various types of projects. American Iron and Steel Institute, Sheet Committees, 150 East 42 St., New York, N.Y. 10017. On Readers' Service Card, Circle 211

Open Web Steel Joists

Booklet presents standard specifications and load tables of four series of open web steel joists, which have been approved jointly by the American Institute of Steel Con-struction and the Steel Joist Institute. Specs and load tables cover the long-span LA-Series, high-strength long-span LH-Series, and the two recently adopted short-span J and H Series. 52 pages. American Institute of Steel Construction, 101 Park Ave., New York, N.Y. 10017. On Readers' Service Card, Circle 212

Timber Connectors

Folder explains how to use smaller size timber joists when

using cantilever design principles with "Line-A-Joist" connectors. The connectors transmit vertical shear forces from one "in-line" joist member to an adjacent joist member. Connector is made from 16gage galvanized steel and is supplied with 9-gage, 11/2"hardened-steel spiral long, shank nails. Comprehensive tables recommend sizes for joists spaced 16" apart with spans ranging from 20' to 36'. Tables include data for joists in 15 species of lumber. Timber Engineering Co., 1619 Massachusetts Ave., N.W., Washington, D.C. 20036.

On Readers' Service Card, Circle 213

Wood Service Program

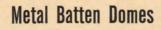


Comprehensive service program assists architects in specifying wood products for nonresidential construction. Program includes a six-volume technical reference library of wood information. First volume is a wood products manual written by architectural specialists, and organized and edited to conform with recommendations of the CSI. It contains product information, illustrations, and specs. The other five volumes provide samples of laminated beams, prefinished panel, doors, and other materials. Among other services are trained architectural market representatives to serve specifiers; regional technical staffs to answer engineering questions and assist architects in estimating costs; and an architectural services department in Tacoma, headed by Robert A. Eckert. Weyerhaeuser Co., Wood Products Div., Tacoma, Wash. On Readers' Service Card, Circle 214

Cold-Weather Concreting

Spec writer's chart "RM-51," $8\frac{1}{2}$ " x 11", describes, in succint terms, cold-weather concreting. Information is provided on accelerators, preparation of forms and subgrade for placing concrete, protection, and cur-

ing. On the back of chart is a nomograph that indicates at what temperature mix water should be to obtain the desired concrete temperature with aggregate and cement. The Master Builders Co., Div. of Martin Marietta, 2490 Lee Blvd., Cleveland, Ohio. On Readers' Service Card, Circle 215





Battens in variety of metals can be used on domelike parabolic and other curvilinear roof systems. Construction details and roofing specs are given, as well as photos of various types of structures utilizing metal batten roofing. Shown is SOM's Industrial Reactor Laboratories in Plainsboro, N.J., which won an AIA Honorable Mention in 1964. Brochure, 8 pages. Overly Mfg. Co., Greensburg, Pa. On Readers' Service Card, Circle 216

Obauting Deate

Shaving Costs with Wood

"How To Trim In-Place Building Costs 11 Ways" can be achieved, according to Potlatch Forests Inc., by employing several wood building products in both Western and Southern species. Among those covered are laminated roof decking, solid paneling, rough-sawn factory-stained siding, Electro-Mechanical Stress-Rated lumber, moldings, milled and preprimed cornice systems, oak flooring, and Larch underlayment. Brochure, 12 pages, illustrated. Potlatch Forests, Inc., 320 Market St., San Francisco, Calif.

On Readers' Service Card, Circle 217

Concrete Specs

"Suggested Specifications for Plain and Reinforced Concrete" is used when comprehensive ACI spec sheet 301 is not warranted. Suggested specs show how to specify materials, concrete quality, mixing and placing concrete, and forms and details of construction. Portland Cement Assn., 33 West Grand Ave., Chicago, Ill. On Readers' Service Card, Circle 218

Treated Plywood Roof System

Treated plywood roof system offers low fire-insurance rates. Basic components are fire-retardant-treated plywood deck and aluminum vapor barrier. Plywood is 3" or thicker with tongue-and-groove or blocked joints. Framing is made of fireretardant and treated joists, untreated wood beams or steel. System is UL-approved. Photos, details, and specs are given. American Plywood Assn., 1119 A St., Tacoma, Wash. On Readers' Service Card, Circle 219



"Unadome" is a system for forming concrete joists in standard widths and modular lengths. Flanged on all four sides, the formwork units can be moved by compressed air. Pamphlet gives sizes, weights, and basic layouts for concrete joist floor construction. 6 pages. Grid Flat Slab Corp., 145 Freeport St., Boston, Mass. On Readers' Service Card, Circle 220



Specifications of grades, sizes, and shipping weights of rebutted-and-rejointed shingles,



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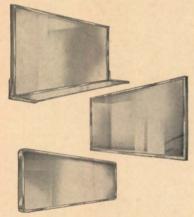


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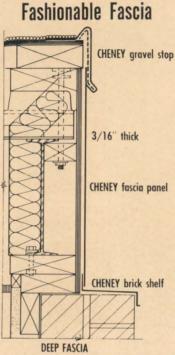
For selecting and specifying mirrors, this easy-to-use file folder can serve as a quick, convenient reference. Each FM mirror model is illustrated, carries complete size range, and includes specification information. Write today requesting the number of file folders needed for your office.



Faries-McMeekan, Inc. P.O. Box 35 Elkhart 2, Indiana

On Readers' Service Card, circle No. 361

grooved sidewall shakes, and handsplit shakes. Includes illustrations for roof and wall applications, including hips, ridges, valleys, nailing, and finishing. 4 pages. Red Cedar Shingle & Handsplit Shake Bureau, 941 White Henry Stuart Bldg., Seattle, Wash. On Readers' Service Card, Circle 221



Gravel stops, fascia panels, cap and through-wall flashings in copper, "chinc" (titanium added to copper zinc alloy), stainless steel, or colored aluminum. Catalog illustrates details of applications and gives brief specifications. 8 pages. Cheney Flashing Co., 623 Prospect St., Trenton, N.J. On Readers' Service Card, Circle 222





Extruded aluminum entrances and store fronts are presented in an 8-page booklet. Five door types and four basic framing systems are available. Fastening devices are concealed. Exposed surfaces are

7 MATOT DUMBWAITERS SPEED MEDICAL AID AT ST. FRANCIS



At St. Francis Hospital, Evanston, Illinois, 7 dumbwaiters in combination with an inter com system are being used to increase hospital efficiency. With a new addition increasing their capacity from 385 to 516 beds, the new system was introduced to relieve the added burden on their staff.

The lifts are used in different areas:

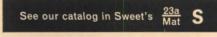
- · Surgery to pathological specimen
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BENEFITS: The new dumbwaiter with the intercom system provides St. Francis with 4 important benefits: 1.) Service is speeded up in critical areas; 2.) Closer infection control can be maintained during surgery; 3.) More patients can be serviced with less help; 4.) Efficient operation ... no frenzied corridor dashes, less breakage and thefts.

Matot specializes in developing units to solve any problem, and provides free engineering services, too.

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polished, satin-smooth, and 'alumilited" under license arrangement with Aluminum Company of America. Full vision, solid panel, inswingoutswing, single or double acting, transoms, side lights, and interchangeable door hardware are standard components. Single or multiglass module wall areas can be achieved with or without reinforcing steel, through the availability of both tube and split frame sections. Details of various extruded aluminum shapes are given. Dry-set glazing is by snap-in glass stops with extruded vinyl seals which permits clean and leakproof installation. 8 pages. Natcor Co., P.O. Box 9321, Nashville, Tenn. On Readers' Service Card, Circle 223

Electrical Equipment

Interior Lighting

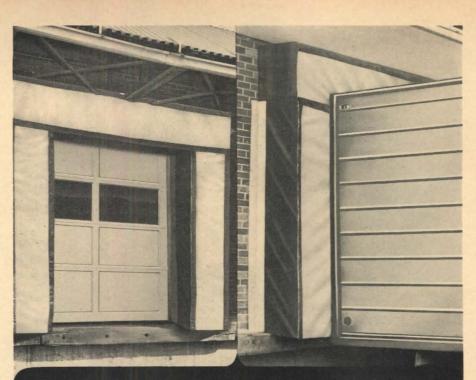
The importance of colors and reflectances of sidewalls, ceilings, and floors in planning a lighting system are emphasized in "Light and Interior Finishes." A reflectance-value chart in full color presents figures for the percentage of light reflectance values in various areas of the office, school, factory, and home. General Electric, Inquiry Bureau Dept., TP-129, Nela Park, Cleveland, Ohio.

On Readers' Service Card, Circle 224

"Dodecahedron"



Catalog number C-2 illustrates chandeliers, wall brackets, pendants, directional spots, and opal modules. Book includes "Dodecahedron", a brass and white glass table lamp 12" in diameter by 33" high. 32 pages.



Processed air areas need CRAWFORD DOR-SEAL Save as much as \$700 per door, per year

- 1 WHAT DOR-SEAL IS. Crawford Dor-Seal is a system of compressive polyether foam bolsters, encased in weatherproof, practically wearproof, material installed around door openings where trailers and trucks are loaded or unloaded.
- **2 WHAT IT DOES.** Dor-Seal provides a "pillow" which receives the rear end of the trailer or truck and, through compression by the vehicle body, forms a seal which locks in heated, cooled, washed, filtered or other expensive processed air and locks out wind, rain, exhaust fumes, dust and other air-borne contamination.
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- A FOR MORE INFORMATION call your Crawford dealer (Yellow pages under DOORS) and ask for Dor-Seal brochure CD-3196B or write direct. Crawford Door Company, 4270-3 High St., Ecorse, Mich. 48229.

DOR-SEAL

See our catalog in Sweet's

Stops the leaks that drain profits away

Grawford



Prescolite Mfg. Corp., 1251 Doolittle Drive, San Leandro, Calii. On Readers' Service Card, Circle 225



Comprehensive lighting catalog comprises four sections: architectural section that describes, diagrams, and gives specifications for downlighting, accent lighting, wall lighting, and general and outdoor lighting fixtures and accessories; control section that deals with custom boards, package dimmers, motor-operated dimmers, and wall dimmers; television section; theater section that details spotlights, floodlights, striplights, and borderlights. Wiring and positioning data are also included. Separate 44-page

product index briefly describes each of the products in the four-page sections. Another 24-page booklet details theater accessories including scene projectors, mirrors, showers, and bubble machines. Copies of the comprehensive catalog may be obtained by writing on business letterhead. L/E Product Catalog, Lighting & Electronics Inc., 81 Prospect Ave., Brooklyn, N.Y.

School Lighting

"Lighting For Education" covers all phases of school lighting including classrooms, gyms, offices, corridors, entrances, yards, and parking lots. Topics include illumination levels, glare and visual comfort, cost analysis, and lighting efficiency. Photometric and scissors curves, two reflection diagrams, a cost analysis form, and a vertical surface lighting diagram are given. Also discussed are multiple examples of typical school lighting applications, such as kindergartens, largeand medium-size classrooms, and special-purpose classrooms. Methods of using the various types of lighting, such as fluorescent, incandescent, and mercury equipment, are shown. Manual also illustrates 19 different "Holophane" luminaires used in school lighting with page references to applications covered in the text. 60 pages. Holophane Co. Inc., 1120 Avenue of the Americas, New York, N.Y.

On Readers' Service Card, Circle 227

Industrial Lighting Standards

Latest standards and recommendations for industrial lighting are presented in 52 page report entitled "American Standard Practice for Industrial Lighting." Report contains recommended levels of illumination for many tasks developed by the Illuminating Engineering Research Institute; information on factors affecting seeing tasks, including those concerned with subnormal vision and that of the aged; sections on color; maintenance of lighting; illumination tables; and emergency lighting. Copies are available at 80¢ each. Illuminating Engineering Society, 345 East 47 St, New York, N.Y.

Insulation

Take Me To Your Lead Barrier

"Practical Application of Sheet Lead For Sound Barriers" is a recent publication of the Lead Industries Association. Among topics covered are "Three Ways Barriers Are Rated," "Practical Tips For Better Sound Barriers," "Tabulation of Practical Sound Barrier Walls Using Sheet Lead" in chart form, and "Design and Construction of Practical Leaded Walls." Lead Industries Assn., 292 Madison Ave., New York, N.Y. On Readers' Service Card, Circle 228

Sanitation/Plumbing Built-In Cleaning

"How to Plan and Install Built-In Cleaning Systems" is subject of 8-page bulletin. Discussion covers best location for components of "Vacu-Flo" system, including plug-in inlet valves, power units, and tube systems. Various types of residential

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LIFT AND SHIFT



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THE MOST SIGNIFICANT ADVANCE IN FLUORESCENT FIXTURE DESIGN IN YEARS

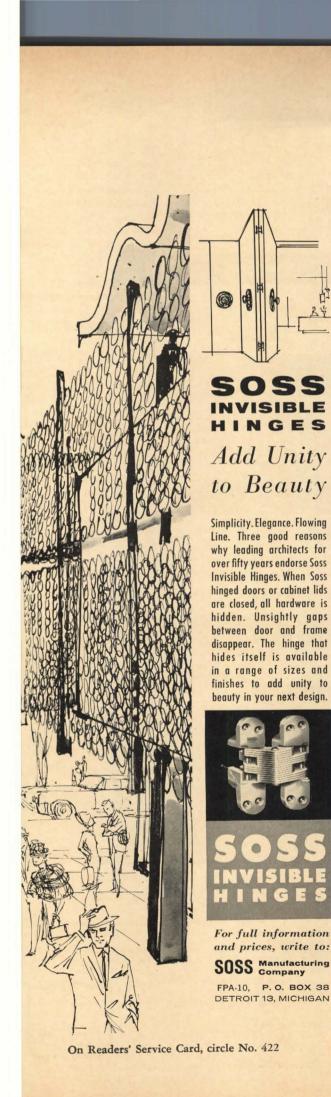
Finally available, a plastic light diffuser that needs no metal door frame. Increases daylight opening of fixture thus increasing its light output and efficiency.

One piece injection molded out of either acrylic or polystyrene CUSTOMLENS reduces the cost of the fixture by eliminating the expense of the steel door frame with its assemblage of latches, screws, hinges and locks, requiring less maintenance.

Installation costs are reduced as the lenses, with their integrally molded hinge pins, are laid in the fixture and completely operable.

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Lighting News AT THE **

RODEHEAVER AUDITORIUM Bob Jones University, Greenville, S. C.







Twelve hours a day, Rodeheaver Auditorium is in use for worship services, variety presentations, Shakespearean productions, opera, concert and other of the University's cultural offerings. This intensive schedule of wide-ranging uses (and largely with student staffs) demanded a high degree of versatility in the design and development of lighting systems and controls.

From the simplest to the most complex, your lighting problem gets expert attention from Kliegl. Whether the project is architectural, educational, theatrethe rich experience of over 60 years of lighting design craftsmanship is ready to go to work for you. Hundreds of designers, architects and engineers have



Student production staff operates the Kliegl SCR® 5-scene, advance-design, pre-set system which is considered one of the most sophisticated yet developed for professional theatre use.

profited from Kliegl assistance in the thousands of different applications. Lighten the lighting problem on your next projects—call in your Kliegl representative—no obligation, of course.

Our lighting advisors will be pleased to assist in the planning of any installation, using standard or special units to meet your requirements. Full details on request.



construction details are given. H-P Products Inc., Louisville, Ohio. On Readers' Service Card, Circle 229

Special Equipment Knock It Off

"Pedigrid" recessed entrance foot grid helps eliminate unsightly, hazardous tracking of dirt, snow, and water into occupied building areas. Grid of serrated vinyl strips scrub dirt, snow, and water that falls through the grid into a recessed trench below to be drained away. Vinyl strips are available in six standard colors (white, black, blue, green, gray, and beige), and may be specified in either single, combination, or custom inlaid designs. Pedigrid is constructed of extruded aluminum and designed for a 200 psf load with a safety factor of 1.75. It is available in any length, and in any number of 1" increments in width. 4 pages. E-L Corp., Foot of Center St., Williamsport, Pa.

On Readers' Service Card, Circle 230

Keeping It Clean

"A Primer of Home Laundry Planning" discusses minimum and optional laundry room space allocations. Illustrations depict variety of solutions to laundry planning problems. 16 pages. Home Laundry Center, Maytag Co., Newton, Iowa. On Readers' Service Card, Circle 231

Sending It Up and Getting It Back Down

"Elevator Planning Guide" includes all data required to prepare preliminary plans for elevators in almost any building. Best type of elevators to use and the necessary allowable space for using them are discussed. Types of elevators detailed are passenger elevators, hospital elevators, and freight elevators. Recommended sizes and capacities and minimum pit and overhead dimensions are given with each type. 16 pages. Dover Corp., Elevator Div., 1055-A Kentucky, Memphis, Tenn.

On Readers' Service Card, Circle 232

Surfacing

Floor/Wall Tile Line



Complete line of "Romany-Spartan" glazed and unglazed floor/wall tiles for commercial, institutional, and residential uses 1s presented in 28-page brochure. Products include glazed wall tile, porcelain ceramic mosaics, glazed and unglazed ceramic mosaics, swimming pool tile, and conductive tile. Some 184 different ceramic tiles and 94 patterns are shown in color. Other photos in color show installations of each particular tile. Trim details and specs are given. United States Ceremic Tile Co., 217 Fourth St., N.E., Canton, Ohio. On Readers' Service Card, Circle 233

Plywood Paneling

Hardwood plywood paneling booklet is divided into four types. Architectural and custom panels are offered in all commercially-available domestic and imported woods with rotary-cut and/or sliced face veneers. Panels use three types of core materials including veneer, lumber or engineered wood core. Sizes are up to 50" x 192" and 1³/₄" thick. "Craftwall," $7/_{16}$ " thick and "Forestglo," ¹/₄" thick are available in 62 color tones, patterns, and woods in stock panels as large as 4' x 10'. Color photos show



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From Roof Top to Sub-Grade, Addex Solves Your Roofing, Waterproofing, Weatherproofing Problems.

Get up-to-the-minute facts on Addex Color-Shield[®] and Roof Shield[®]. Write Dept. 134, ADDEX MANUFACTURING COMPANY, WICKLIFFE, OHIO Aquarium of Niagara Falls, New York Architects: Dickerson and Cain Cleveland, Ohio

Contractor: Scrufari Construction Co., Niagara Falls, N. Y.

Roofing: The Asbestos Asphalt Corp. Niagara Falls, N. Y.



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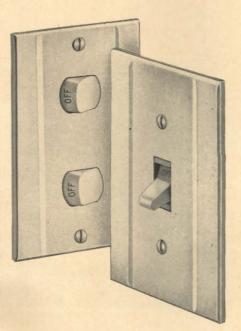
The NIK-O-LOK Company 422 East New York Street Indianapolis 2, Indiana

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Simple...Unadorned...Attractive

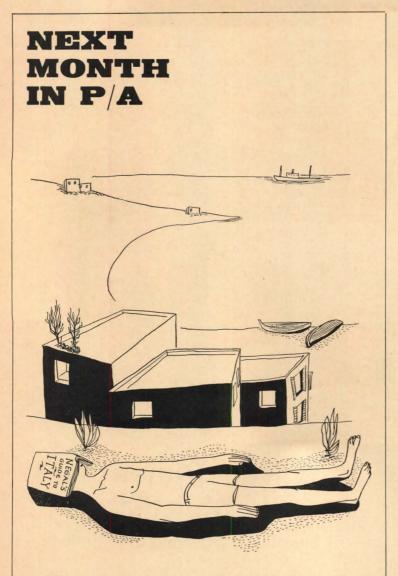
The classic beauty of these new P&S wall plates—with intentionally understated design —complements any decor.

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For more information write Dept. PA 1065





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Harvard's Medical School Library ... a nonlibrary architect brings new thinking to a classic problem.

Cracks in high-rise partitions . . . an exhaustive report on an architectural nightmare by a firm of consulting engineers.

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■ Send your \$5 check immediately and you will receive the exciting November issue of P/A plus eleven more, including the big Design Awards Issue in January. Address Circulation Department, PROGRESSIVE ARCHITEC-TURE, Reinhold Publishing Corp., 430 Park Avenue, New York, N. Y. 10022. us types of wood. Weyerer Co., Box B-273, Ta-, Wash.

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Patterned Tiles



o" wall and floor ceramic patterns are shown. Among s of Vico tiles shown are avetex," appearing like 1-loomed fibers; "KCM," a tidimensional striated wall and "Nuvo-Tex," a crysne-glazed tile. Backings for are, according to manufacturer, impervious to moisture, heat, frost, and other climatic conditions. Stains wipe off with a damp mop. 16 pages. Amersterdam Corp., 41 East 42 St., New York, N.Y. On Readers' Service Card, Circle 236

Comparing Tile Colors

1965 edition of color comparison charts cover both vinyl asbestos tile and asphalt tile. Revised edition makes it easier to select equivalent color and style combinations. Vinyl asbestos patterns compared are chip, wood, marble, special marble, embossed travetine, and plain. Under asphalt are marble and cork. Products compared are from Amtico, Armstrong, Azrock, Congoleum-Nairn, Flintkote, Johns-Manville, Kentile, and Ruberoid. Asphalt and Vinyl Asbestos Tile Institute, 101 Park Avenue, New York, N.Y. On Readers' Service Card, Circle 237

Bathtub Specs

Technical Bulletin "No. CTI-O-108-64" gives details on Roman bathtubs. Complete information and drawings outline recommended standards for inspection, materials, waterproofing, reinforcing, testing, membranes, and sloping. Both on-grade and on-joist construction recommendations are covered. Ceramic Tile Institute, 3415 West 8 St., Los Angeles, Calif. On Readers' Service Card, Circle 238

PROGRESSIVE ARCHITECTURE MEWS REPORT

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The Tongue and Groove paneling shown is FactriSawn[®] a trademarked Certified Kiln Dried product of these mills...UNION LUMBER CO. • THE PACIFIC LUMBER CO. • WILLITS REDWOOD PRODUCTS CO. • SIMPSON TIMBER COMPANY MILLER REDWOOD COMPANY • GEORGIA-PACIFIC CORPORATION • ARCATA REDWOOD COMPANY ... which form the CALIFORNIA REDWOOD ASSOCIATION.

a story worth remembering by bradley washfountain

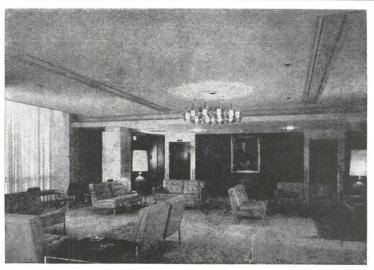
Witness the modern lounge or powder room . . . bright, beautiful, marvelously sanitary. A vast improvement over the washrooms of yesterday! One reason for this phenomenon: progressive architects and discriminating owners select Bradley Duos — the washfixtures that win

Compliments For The House

Duos are far more sanitary, because they are foot-operated. Hands touch only clean, tempered water, never germ-laden faucets or taps. And the water spray rinses the bowl *clean*. Space-saving Duos serve two people, yet require no more space than single lavatories. Of course, they are available in a full spectrum of colors to complement the most elegant decor. Bradley Duos are the last word in beauty and sanitation. And the last word of a guest leaving a Duo can well be "How thoughtfu!"

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COUNTER-TYPE WASHFOUNTAIN



A lounge of Huntington Memorial Hospital, Pasadena, Calif. Architects: Thormin, Haynes, Oakley & Associates; David Oakley in charge of design. System Design and Mechanical Contractors: Kilpatrick & Co.

You're looking at a new perspective in automatic climate control!

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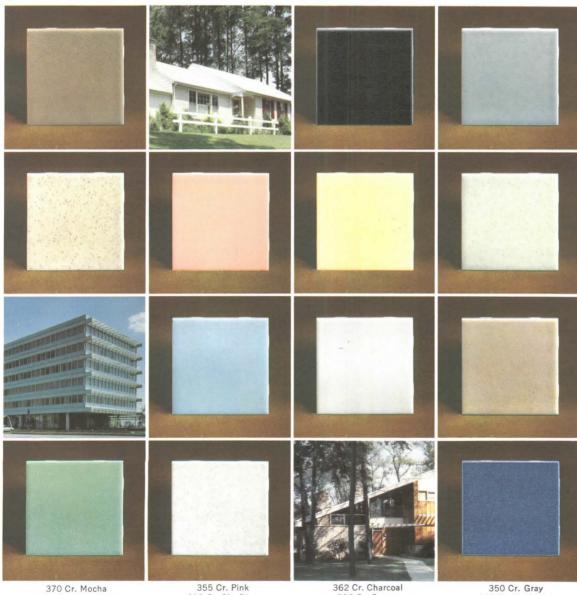
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Six of the new Crystalline Colors are shown on the opposite page: 342 Cr. Lagoon, 374 Cr. Antique White, 376 Cr. Sage, 309 Cr. Yellow, 321 Cr. Cornflower, 331 Cr. Suntan.

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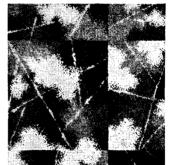


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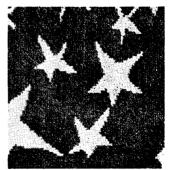
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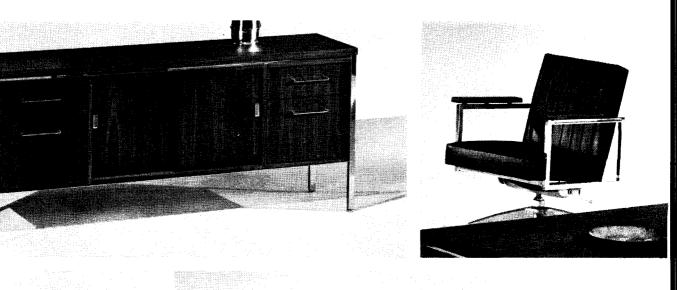
Or desks that turn into work stations at the drop of a stationery rack, hanging file, sliding tray or typewriter lift.

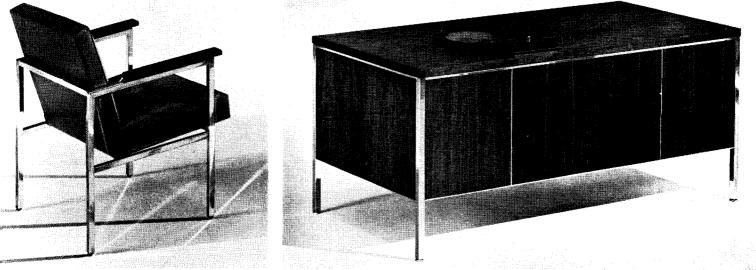
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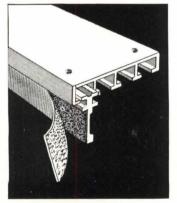
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Home Furnishings Daily calls it "a pacesetter for a window revolution."

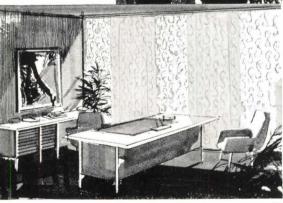
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Paneltrac is window decorating panels on tracks. Extruded aluminum tracks with sliding strips in them with Velcro® nylon tape fastened to the strips. And almost any fabric fastened to the tape to form flat-hanging panels. Now customers can display prints without pleats. Or make shoji screens, tapestries, sun shades, wood and expanded metal screens. (A 6-channel installation with 45" panels can cover 21'6" as a oneway draw; twice that as a centeropen draw. Yet width is less than a French-pleated drapery.) Paneltrac sets come assembled and with Velcro tape and hem weights. Custom-order sizes available and priced by the foot. Call or write Kirsch Company, 809 Prospect, Sturgis, Michigan 49091.



Paneltrac comes in single, double and triple channels. Combine them and you can decorate any window.



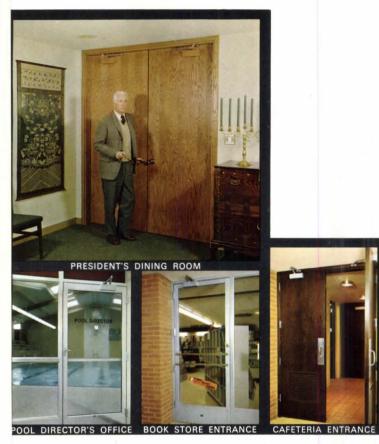


Paneltrac is ideal for unique, multicolored paneled window treatments. And when you draw one panel (with an unobtrusive nylon baton), all the others follow.



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Series 7000 narrow-projection door closers with covers; aluminum covers to match door hardware, wood covers to match door paneling. PRESIDENT'S DINING ROOM a perfect match of closer and door paneling. BOOK STORE a blend with the aluminum door and frame. POOL DIRECTOR'S OFFICE beauty in aluminum closer and cover for an extremely high humidity area. CAFETERIA ENTRANCE a match between door closer cover and the other door hardware for a dramatic contrast with the dark finish of the door.

IN BEAUTY IN DEPENDABILITY IN VERSATILITY

Norton Door Closers passed all the tests at Rockford College

Rockford College adheres to the philosophy that well designed buildings contribute to education. Rockford authorities have developed their new 304 acre campus to leave the original land contour and trees intact with all the buildings harmonizing with the natural beauty of the site. Every item, even interior hardware was selected for beauty. Naturally, each also had to meet a high standard of dependability and application versatility.

BEAUTY—the ability to harmonize with elegant surroundings is one of the hardest tests of door closer styling. All Norton door closers have been designed to compliment their surroundings and make each installation as attractive as possible.

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VERSATILITY—the ability to be applied on any door and meet the requirement of the various locations in a school building, places a real test on the completeness of a hardware line. Norton Closers offer versatility in depth, giving you the opportunity to choose the control best suited for the type of use and the overall architectural decor.

In specifying from the complete Norton line of door controls you are able to standardize on one manufacturer throughout your entire plant. You simplify all installation and maintenance. And you realize the ultimate in versatility of application, dependability of quality, and beauty of appearance.

TURN PAGE



Series 1600 Tri-Style Closers with narrow, clean lines to compliment modern doors. Available in invisible mounting, back mounting and exposed mounting. PATIO ENTRANCE invisible top-jamb mounting with screws concealed. Closer body does not project past narrow top frame. STAIRWELL ENTRANCE exposed mounting with parallel arm for an attractive installation for even out-of-the-way places.



Series 6100 Uni-Trol door control, a combination door holder and door closer. Simplified installation yet complete control for doors. IN-FIRMARY DOOR an attractive installation and an open door during busy hours.





GYMNASIUM ENTRANCE doors with Norton Series 1600 Closers top-jamb mounted. These closers could have been installed just as easily regular arm or parallel arm.

SERIES 1600 TRI-STYLE DOOR CLOSERS

Norton Series 1600 Closers offer a phenomenal degree of versatility. These closers are available in three distinct mounting methods: invisible mounting, no screws visible; back mounting, only four bolts visible on the back side of the door; exposed mounting, shown above. In addition, Series 1600 Closers come as standard for regular, parallel arm, or top-jamb mounting. You get clean distinct styling that can be applied in any location.





PRESIDENT'S DINING ROOM with Norton Series 7000 Closers. A veneer of oak bonded to the cover. Cover was finished at the same time as the door for a beautiful matching finish.

SERIES 7000 NARROW - PROJECTION DOOR CLOSERS

Norton Series 7000 Closers have been specifically styled to allow closer to match or contrast room decor. Available with metal covers; bronze, brass, aluminum, and chrome finish to match door hardware. Also with a selection of 67 native and exotic woods bonded to the cover for finishing on the job to match room and door paneling.



INFIRMARY DOORS where periodically traffic is heavy, are equipped with Norton Series 6100 Uni-Trol, a combination door holder and door closer.

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Norton Series 6100 controls combine the function of a door holder and a door closer in a single unit. Both closer and holder are coordinated to function as a single product for complete and optimum door control. You have only one product to specify, template, and install. And installations at the doors are more attractive since they are uncluttered.

NORTON® DOOR CONTROLS

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Please send me more details on the door controls described above.

Please just send information on the controls I've checked

SERIES 7000 SERIES 1600

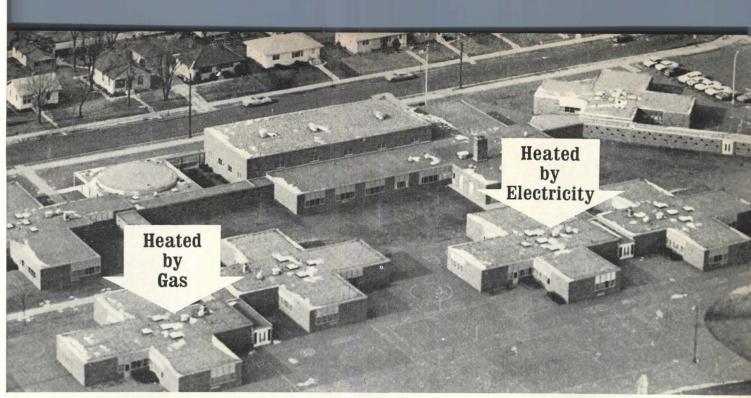
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New Facts on Gas vs. Electric Heat



In one unique 3-year study, a major school system found heating with electricity cost 7 times more than Gas.

2. And 16 other comparative bid studies prove no basic difference in first costs between the two systems.

Advertisement

1. OPERATING COSTS

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They determined to find out for themselves. They would gather objective data, over an extended period, on the relative cost of heating a modern school plant with Gas vs. electricity. What they learned has significance for architects, engineers, and school administrators throughout America.

Previous Studies Inconclusive

Many comparisons of electric vs. nonelectric heating have been built on theoretical assumptions of what might have happened if one fuel had been used instead of another.

THESE TESTS WERE INEQUITABLE, SCHOOL OFFICIALS FELT, BECAUSE THEY DID NOT PROVIDE IDENTICAL THERMAL AND USE CONDITIONS.

The opportunity for this kind of study presented itself in the form of a new campus-type elementary school. The plant consisted of several three classroom clusters, attached to a central administration building. Design was similar to many other masonry and curtain wall schools.

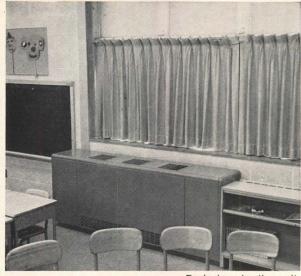
Identical Units Selected

School officials chose two physically identical classroom cluster units for the study. Clusters 1 and 3 had identical orientation, identical use hours, and equivalent occupancy. Thus, they could be used, heated and ventilated under *simultaneous* equivalent study conditions —insuring the complete objectivity and impartiality of the experiment.

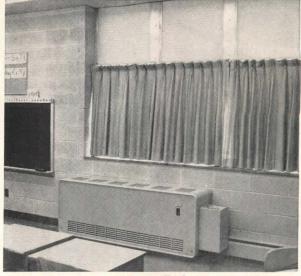
(It should be emphasized that the local electric power and Gas companies cooperated in the study from the early design stages of the school.)

Heating Systems Chosen

Into Unit No. 1 went a hot water system supplied by a firebox boiler, with a Gas-fired



Typical gas heating unit.



Typical electric heating unit.

burner of 550,000 BTU input. Individual rooms in this test cluster had unit ventilators with supplementary fin radiation. Firing efficiency, according to a flue gas analysis, was 84.6%. Unit No. 3 received an electric resistance heating system with a total of 89.9 KW installed equivalent to 306,828 BTU. The system included a unit ventilator and strip heating in each classroom. Efficiency was assumed to be 100%.

> AN IMPORTANT POINT: BOTH OF THESE SYSTEMS WERE INSTALLED BY PRIVATE HEATING CONTRACTORS, THE SUCCESS-FUL LOW BIDDERS FOR THE WORK. THUS, ALL RELATIVE CONSTRUCTION COST DATA AND SPECIFIC COST AMORTIZATION RE-QUIREMENTS ARE BASED ON FIGURES SUBMITTED UNDER ACTUAL COMPETITIVE CONDITIONS. THEY ARE NOT THEORETICAL OR "ESTIMATED" COMPARATIVE COSTS.

Advertisement

Test Equipment Used

An extensive array of test and recording equipment was used to keep close check on each unit. One meter measured the amount of Gas consumed in heating Unit 1. Unit 3 employed four meters—one in each classroom and one for the non-classroom storage and activity area. A master switch in the main building boiler room operated ventilation controls.

The temperature and operational "watchdog" for both test units consisted of a 12-point recorder, located in the boiler room of Unit 1. Every six minutes the instrument recorded: temperature, on-off operation of ventilating equipment, and day-night operation of the thermostat pneumatic system.

The location of thermostats in each classroom and hallway corresponded exactly in Units 1 and 3. Also determined by the recorder were the degree days in each unit. Once a week the recorder was unlocked to change the paper and tape copies were provided to all the parties concerned. In addition, school engineers read the meters each weekday and submitted reports to school officials and both utility companies.

Fuel Rates

Electricity used in the study was charged at the same rate as for all city agencies—2% cents per KWH. Gas charges were 50.1 cents per 1000 cu./ft., the interruptible rate for users in this class. However, during the test period Gas was not interrupted in Unit 1, as it was in other parts of the building. An adjustment was made in the final cost tabulations to reflect this non-interruption factor.

Operating Cost Results

The initial test period of the more than threeyear study ran from January 5 to April 30, 1959. Actual cost of Gas: \$149.73. Actual cost of electricity: \$1,330.19.

The costs listed above were then adjusted to determine what the figures would have been under normal interruptible conditions, heating with Gas and standby oil. The curtailment figure used for Unit 1 was 350 hours—the same time which applied to other Gas heated sections of the school. Total adjusted fuel cost for Unit 1: \$171.74.

For the period of the test, the cost of operating electric motor auxiliaries in the control units— \$28.44 for the Gas unit, \$11.68 for the electric.

> On the basis of these final adjustments, the ratio of electric heating cost to Gas cost was 6.70 to 1.

In the test city, electric rates are higher and Gas rates are lower than the average. But applying the facts of this study to other sections of the country, electricity would still cost two to three times more than Gas.

> OPERATING COST COMPARISONS THROUGH THE BALANCE OF THE THREE-YEAR STUDY CONTINUED TO BE HIGHLY FAVORABLE TO GAS. IT IS SIGNIFICANT THAT NO CHANGES WERE NECESSARY IN THE GAS TEST UNIT AT ANY TIME DURING THE STUDY. BUT SEVERAL PHYSICAL, EQUIPMENT AND CON-TROL MODIFICATIONS WERE MADE IN THE CLASSROOM CLUSTER HEATED BY ELEC-TRICITY.

These adjustments, suggested by the early phases of the study, included more insulation, larger unit ventilator motors, and new thermostats. Energy rates remained the same throughout the experiment for both Gas and electricity.

The final adjusted cost for the total test period is illustrated in the following table:

Ratio of Adjusted Costs Adjusted Adjusted Electric Cost Electric to Gas Cost Electric Cost Gas Ratio

	Gas Cost	Electric Cost	uas natio
First season	\$305.11	\$2,668.30	8.7 to 1
Second season	\$290.50	\$1,958.01	6.7 to 1
Third season	\$331.03	\$2,082.94	6.3 to 1
		Average:	7.2 to 1

Because Unit 1 was equipped with a Gas-oil dual fuel burner—to take advantage of interruptible Gas rates in future operation—first costs were somewhat higher than with the electric unit. (Approximately a 3-year write-off period for first cost difference.)

2. FIRST COSTS

However, in more typical studies of installation costs, actual dual bid figures for 16 new schools showed *no basic difference in first costs between electric and Gas-heated schools*.

Advertisement

E	ight Illinois	Schoolse	ach bid two	ways	
		Total Const	ruction Bids		
Location, Name of School	Square Feet	Gas	Electric (Resistance)	Date of Bid	System Installed
Crestwood (Kolmar)	34,000	\$418,153	\$444,054	Mar. '64	Gas Heat
Matteson (Matteson)	11,720	154,886	151,900	Mar. '64	Gas Heat
Morton Grove (Golf)	28,653	474,730	466,982	Dec. '60	Gas Heat
Villa Park (Iowa)	24,130	309,847	304,880	Feb. '62	Gas Heat
Glen Ellyn (Glen Crest)	34,270	436,838	456,467	Apr. '62	Gas Heat
Malta (Malta High)	35,470	430,353	424,122	Feb. '64	Gas Heat
Joliet (Oak Valley)	20,400	336,561	337,684	Mar. '64	Gas Heat
Plainfield (Eastern Ave.)	20,800	290,348	284,755	Aug. '63	Gas Heat

Eight Pennsylvania Schools...each bid two ways

Total Construction Bids					
Location, Name of School	Square Feet	Gas	Electric (Resistance)	Date of Bid	System Installed
Monroeville (South Jr.)	104,000	\$1,580,700	\$1,636,300	July '60	Gas Heat
Claysville (Findley)	14,000	205,633	204,173	July '59	Gas Heat
Claysville (Blaine-Buffalo)	14,000	216,459	217,725	July '59	Gas Heat
Claysville (South Franklin)	4,600*	96,952	95,938	July '59	Electric Heat
Mount Morris (Perry)	18,000	267,285	270,132	Jan. '61	Gas Heat
Westmoreland Co. (West Point)	39,071	729,620	715,666	Apr. '63	Gas Heat
North Braddock (Fairless)	17,000	345,279	348,679	Apr. '61	Gas Heat
Plum Boro (Holiday Park)	35,000	530,790	522,970	Dec. '61	Gas Heat
*Addition					

The schools were built over a 5-year period in Illinois and Pennsylvania. Shown above are the construction bid figures as reported in a recent issue of a leading plumbing-heating-cooling magazine.

> RECOMMENDATION TO SCHOOL BUILDERS: CONSIDER THESE COST FIGURES OB-TAINED IN ACTUAL ALTERNATE BIDS. THEY REFUTE THE CLAIM THAT ELECTRIC RESIST-ANCE HEATING OFFERS DRAMATIC FIRST COST SAVINGS OVER GAS.

Conclusions on Operating and First Costs – Gas vs. Electric

- THE COMPARATIVE FUEL COST FIGURES SPEAK FOR THEMSELVES. USING THE HEATING EQUIPMENT SPECI-FIED IN THE TEST INSTALLATION, ELECTRIC HEATING IS OBVIOUSLY SUBSTANTIALLY MORE EXPENSIVE TO OPERATE THAN GAS. IN THE GREAT MAJORITY OF CASES THERE IS NO BASIC DIFFERENCE IN THE FIRST COSTS OF ELECTRIC AND GAS-FIRED SYSTEMS.

-IN THE TEST INSTALLATION NO SIGNIFICANT DIFFER-ENCES APPEARED TO FAVOR EITHER HEATING SYSTEM IN THE FOLLOWING AREAS: ROOM CLEANLINESS, PAINT DETERIORATION, JANITORIAL AND CUSTODIAL EX-PENSE, INSTRUCTIONAL EFFICIENCIES. - WHILE THE ELECTRIC UNITS HEATED UP MORE QUICKLY IN THE TEST INSTALLATION, OVER THE COURSE OF THE SEASON THE ON-OFF NATURE OF THE ELECTRIC SYSTEM PROVIDED LESS THERMAL RESERVE. AND OVERALL ROOM COMFORT APPEARED TO VARY MORE THAN IN THE GAS HEATED UNIT.

*

*

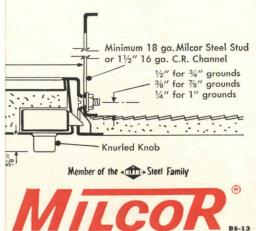
These are the facts and figures of highly significant relative cost studies, Gas vs. Electric. Under these careful control conditions, heating with Gas is proved to cost only one-seventh as much as electricity. And under the requirements of competitive bids, there is no basic difference in first costs.

If you are a school administrator, architect or engineer concerned with the economy and efficiency of school heating systems, you'll want a complete report of these studies. The Heating Sales Engineer of your local Gas Company can provide you with these valuable guides which identify the school systems and report the data in full detail. Call or write him today.

AMERICAN GAS ASSOCIATION, INC.



NEW MILCOR FIRE-RATED ACCESS DOOR



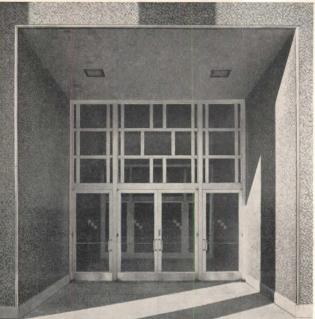
First access door to earn the Underwriters Laboratories 1½-hr.
"B" Label — the Milcor Fire-Rated Access Door. You can specify it for service openings in plaster, masonry, tile, or wallboard construction. Sizes, 12" x 12", 16" x 16", 24" x 24", 32" x 32". Now available with key-operated flush cylinder lock. Also can be furnished with screw-driver-operated lock with knurled knob. See Sweet's, section 16k/In. Or write for catalog 210-5.

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CTOBER 1965 P/A





Student Union Building, University of Buffalo, Buffalo, N. Y. Architects: Duane Lyman & Associates, Buffalo.

ALUMINUM SCHOOL DOORS

Plenty of rugged strength combined with a graceful modern appearance makes these Michaels Heavy Duty Aluminum Doors right for the Student Union Building at the University of Buffalo. Standardized design makes them economical. The stiles and rails are heavy-gauge extruded tubing for extra rigidity. For special resistance to twisting, a strong reinforcing bar runs inside the top rail, fastening to both stiles. The custom aluminum column covers and glass framing work seen here also are by Michaels, who supplied aluminum doors, windows, and curtain wall for the entire building. Few archi-

tectural metal companies can compare with Michaels for versatility and skill in aluminum, stainless steel, and bronze. Write for details.



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Graber Contrack helps solve read-through problem for National Guardian Life building

The new home office of National Guardian Life Insurance Company in Madison, Wisconsin is a striking example of achieving cube expression by use of reflective glass. The architect used dual-glazed bronzed glass, disguising the spandrel panel, yet allowing light entrance at vision panels. The structure is flat plate reinforced concrete with electrified floors.

The Interior Designer wanted to maintain the uniformity in exterior appearance inherent to the architect's design. He had effective sunlight control as a secondary end.

Several drapery track brands were tested. Graber Contrack extruded aluminum architectural track was selected for its superior ease in traversing and its capability to meet exacting needs. One of these was minimizing read-through.

Since standard white batons for traversing the draperies could be seen from the outside, Graber brass finish fiber glass batons were selected to eliminate the problem. Graber engineering assistance was credited with providing an installation which solved the readthrough problem.

On the inside, the installation blends in as part of the building. The decorator cited the track as providing the longevity which the installation demanded. Replacement in later years need never be considered and maintenance is minimal.

ARCHITECT

John J. Flad & Associates, A.I.A. Madison, Wisconsin

INTERIOR DESIGNER

Don Reppen & Associates, A.I.D Madison, Wisconsin

GENERAL CONTRACTOR J. H. Findorff & Sons

Madison, Wisconsin

INSTALLER

Connie Gruebling Madison, Wisconsin

MATERIAL AND INSTALLATION DATA



No. 5807 Contrack Hand Traverse on smaller windows in cafeteria and at ground level, within aluminum window frames.



No. 5805 Contrack Hand Traverse with batons on all floors. Installed flush to white painted drapery track nailer along perimeter of fenestration. Continuous track installation wall-to-wall incorporating end-stops every 9' average, allowing for two-way draw between 9' segments.



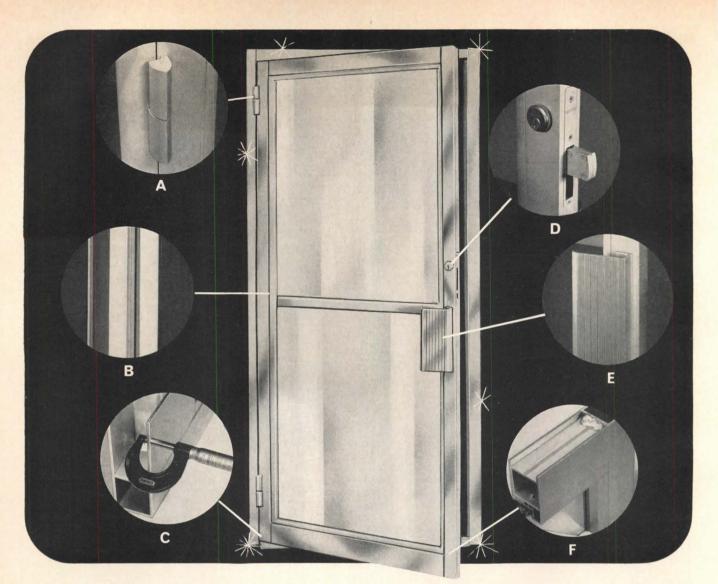


Write for samples of six Contrack cross sections, Architect's File with Catalog, Specifications, and Price Information Dept. DC.

Frabe	er drapery fixtures CONTRACT DIVISION MIDDLETON. WISCONSIN
description NATIO	NAL GUARDIAN LIFE
location MAI	DISON, WISCONSIN
TRACK STYLES	Nos. 5805-5807
FILE NUMBER	C-1003

OCTOBER 1965 P/A

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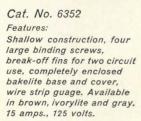
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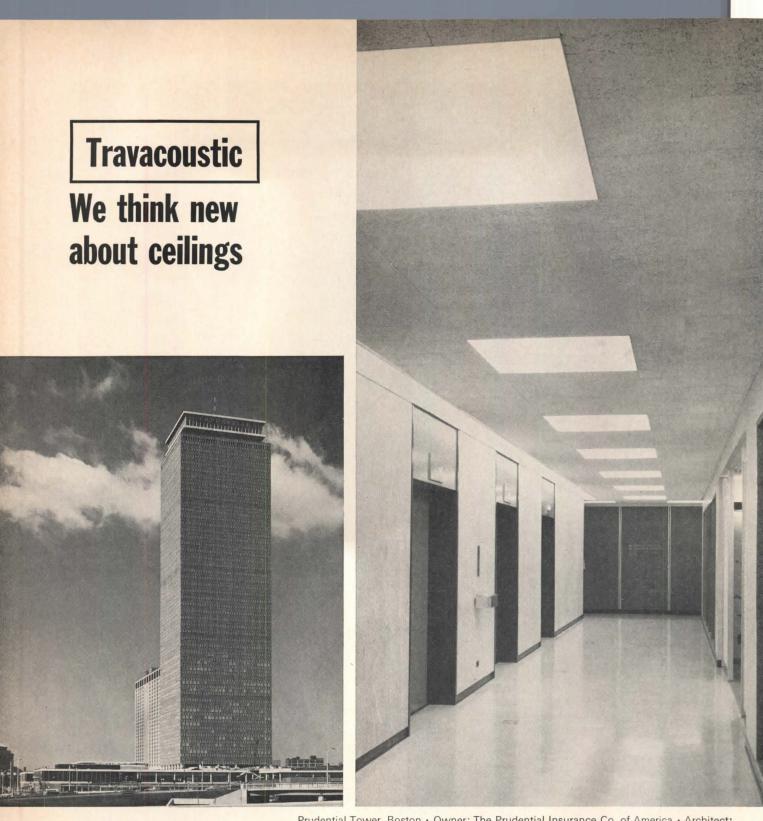


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in Prudential Tower in Boston

alike. Due to an exclusive manufacturing process, the lightweight 12" x 12" tiles have exceptional resistance to high humidity — can be installed before plaster is dry, cutting days off building completion and occupancy time. Travacoustic tiles have a base made of long mineral wool fibers that are uniformly interlocked to give greater resistance to sag than ordinary acoustical tiles. Rated Class A- noncombustible, Travacoustic has noise-reduction coefficients up to 80%. Thinking about ceiling tile for your next building? Think new with Travacoustic, in fissured or sculptured patterns. Ask your Gold Bond® Representative

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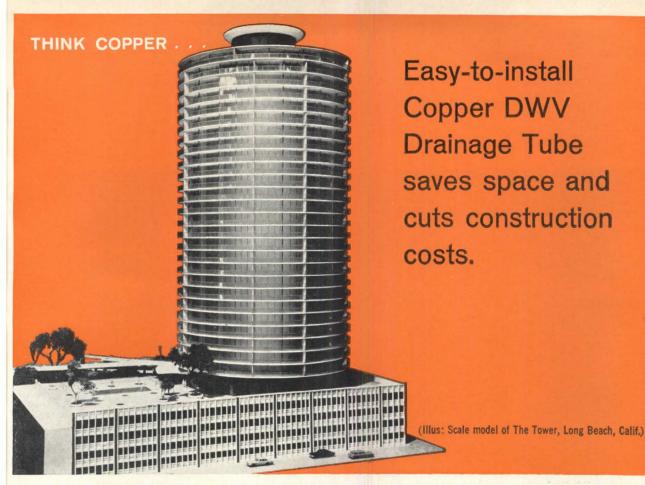
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OCTOBER 1965 P/A



THE TOWER, Long Beach, California: WORLD'S TALLEST PRE-STRESSED CONCRETE APARTMENT BUILDING; Henry Sassoon, owner; Carl B. Troedsson, architect; James R. Wilde, consulting architect; Charles M. Boldon, coördinating architect; John Kerr Associates, mechanical engineers; Hickson Plumbing Company, mechanical contractor.

The time to start thinking copper is in the design stage... as THE TOWER architect and mechanical engineer did when planning this 34-floor apartment house.

Mr. Carl B. Troedsson, architect of THE TOWER, states: "By taking advantage of an amendment in the Long Beach plumbing code permitting 3" DWV lateral drainage lines in high-rise structures, THE TOWER'S team of planners was able to maintain the designed 8'9" fl.-fl. height despite the very limited furred space available over kitchens and baths.

This decision saved many thousands of dollars."

Installation economies made possible by copper added considerably to total savings.

Building efficiency such as this explains why more and more architects and engineers are *thinking copper...insisting on copper* for plumbing in the early stages of plans and specifications.

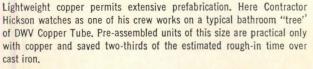


A pre-assembled unit of copper soil, waste and vent branches is easily positioned. Supported by preplaced hangers, it is ready for joining to rest of system. Note the space that is saved by this compact assembly of copper tube and solder-joint fittings.

R. E. Hickson, mechanical contractor for THE TOWER, adapted pre-assembly techniques which enabled his men to rough-in drainage in one-third the time allowed for ferrous piping. Over 200 "trees" were pre-assembled on the job site during wait periods, permitting efficient utilization of a trained crew. As a result the DWV rough-in could be accomplished by two men at the rate of one floor each four days—eight apartments per floor, each with two baths.

For speed, space- and labor-saving economies, specify copper...Anaconda copper. For further data write: Anaconda American Brass Company, Waterbury, Connecticut 06720. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. 64.0845





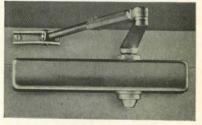
The New Russwin 2800 Series Door Closer

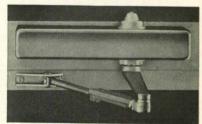
Ask Russwin how this one <u>new</u> door closer design its <u>every</u> door n your building!

usswin's new 2800 series door closer is designed for every door in our building — in function and in price.

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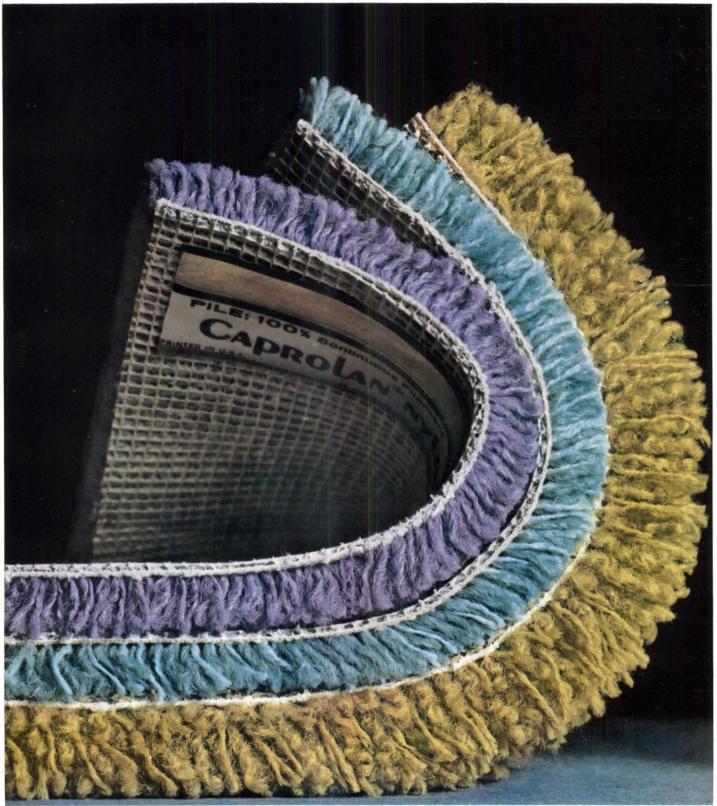
The Trinity Lutheran Church in Chelmsford, Massachusetts offers a good example. Architect Joseph J. Schiffer has used custom ACRYLITE* Skydomes in an integrated design with the cross-shaped form of the church. Glazed with clear ACRYLITE – the weather-proof, shatter-resistant plastic – Skydomes create a strong vertical focus to increase the feeling of height through the pattern of light admitted by the skylights. This has an uplifting effect upon the worshipper and at the same time contributes to the overall design. Cyanamid has the facilities and engineering staff to design ACRYLITE Skydomes in custom shapes for your specific applications. For further information consult Sweet's Architectural File 20a/Am, Industrial Construction File 15c/Am or write American Cyanamid Company.

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ARCHITECT: BENIAMIN GINGOLD



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DAP '1012'® GLAZING COMPOUND

PLICATIONS: Interior and exterior face azing of metal sash.

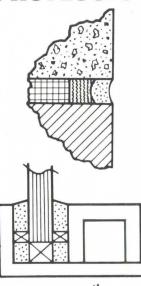
DAP '1231' FLEXIGLAZE® GLAZING

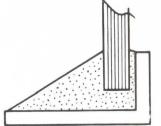
PLICATIONS: Channel, bead or stop glazg. Bedding glass in primed wood or metal sh. Setting insulated glass window units panels.

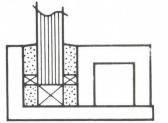
DAP ARCHITECTURAL

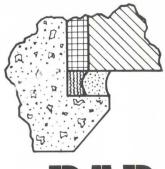
PLICATION: General caulking.

AP makes a complete range of specialed caulking, glazing and sealing products r the construction industry. For knowlgeable assistance in selecting the right alant for your next project, write us about e DAP Technical Service Program.









CHARACTERISTICS: Outlasts, outperforms conventional caulks 5-to-1. Butyl rubber base assures permanent flexibility. Butyl-Flex gives airtight, watertight seals between similar and dissimilar materials. Sticks tight to aluminum, concrete, glass, steel, marble and other construction materials. Won't sag or slump over wide temperature range. Non-bleeding, non-toxic, non-corrosive. Available in cartridges and bulk containers.

CHARACTERISTICS: A 2-part liquid polysulphide polymer compound for trouble-free service in the toughest caulking, glazing and sealing jobs. Balanced Modulus means adhesion always exceeds cohesion . . . assures airtight, watertight seals under severest conditions of expansion, contraction, temperature and exposure. Smooth, buttery consistency makes mixing and application easy throughout a wide temperature range. Compounded in one, premium-grade quality only. Meets and exceeds Federal Specification TT-S-227b.

CHARACTERISTICS: Aluminum gray color matches color of aluminum sash. Easily applied. Excellent handling and knifing. Sets quickly without cracking, sagging. Stays flexible. Adheres to all metals. Takes paint. Meets and exceeds Interim Federal Specification TT-G-00410c for a non-hardening glazing compound resistant to damaging effects of heat, cold, vibration and moisture. Available in cans and bulk containers.

CHARACTERISTICS: Specially formulated from 100% solids—the finest synthetics and inerts to eliminate shrinkage, cracking, discoloration. An outstanding mastic compound with excellent adhesion, cohesion, and flexibility. Adheres to primed wood, metal, glass, porcelain—most any kind of construction material. Forms a tough permanent seal that won't harden, bleed or stain.

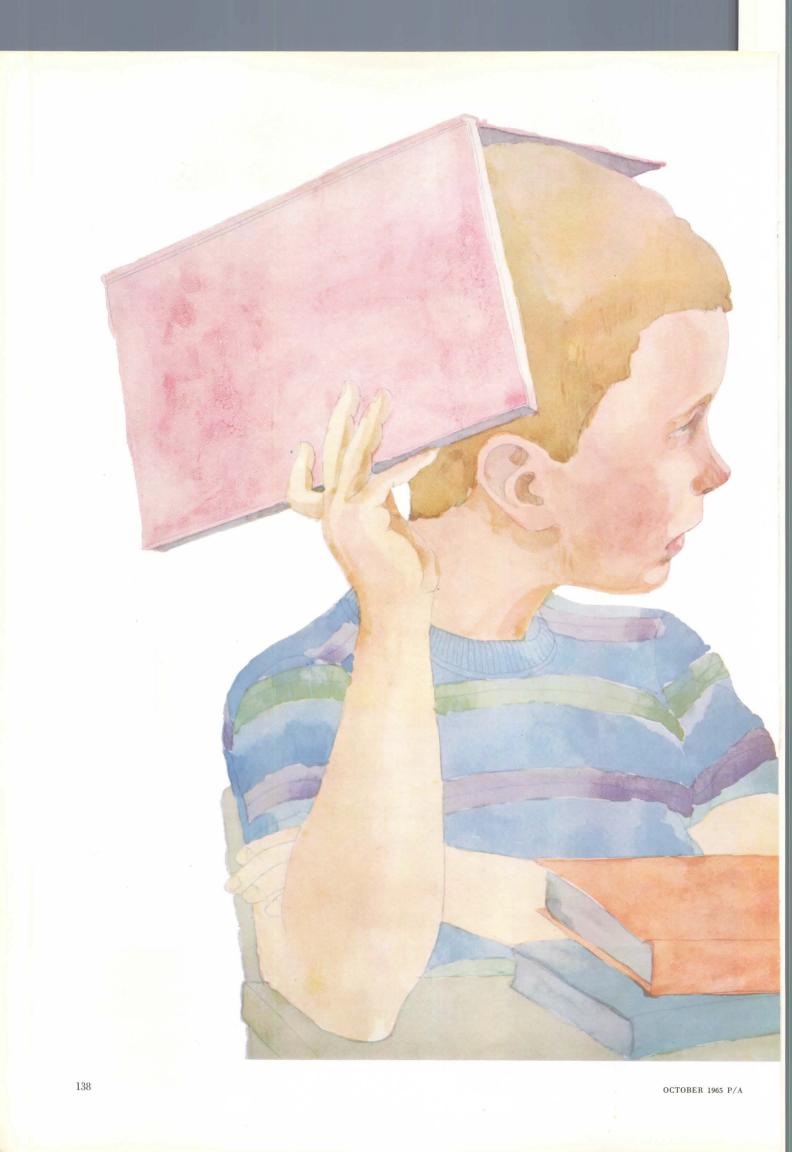
CHARACTERISTICS: Forms a tough skin for dependable airtight, watertight seals. Meets and exceeds Federal Specification TT-C-598b, Grade 1, for oil-based caulks. Stays flexible throughout extremes of weather and temperature conditions. Compounded for easy gunning. Colors: white, brilliant white, gray, aluminum gray—special colors available on special order. Packaging: cartridges and bulk containers.



DAP INC., GENERAL OFFICES: DAYTON, OHIO 45431 SUBSIDIARY OF Plough. Inc.

On Readers' Service Card, circle No. 356

TOBER 1965 P/A



e's a etter reader ecause of omething ou did

e children have reading problems have nothing to do with eyes or ty. The problems come from bad ng, sun glare or general classroom armony.

It you devote more time to room-environment problems and eating an educational atmosphere coa can help you to simplify mechanical worries. Alcoa

knows aluminum building products. And Alcoa sales offices can tell you what building components are available in aluminum, and who makes them. Each is custom looking, yet a standard production item at standard price. The advantages to you are these: You can spend less time with mechanical things because these standard aluminum components eliminate costly detail work. You get a custom look because there is an infinite variety of combinations. You save budget money because the components are standard, off-the-shelf items.

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Hollow Doors, Revolving Doors, Sliding Doors, Swinging Doors, Downspouts, Outdoor Drinking Fountains, Dumbwaiters, Elevator Cab Controls and Dials, Elevator Cab Doors and Linings, Elevator Control Boards and Dials, Entrances, Exhaust Systems, Expanded Metal, Expansion Joints, Extrusions, Facings, Fascia, Fasteners, Chain Link Fences, Fire Escapes, Flagpoles, Flashing, Flooring. Get more time to solve educational problems-call an Alcoa sales office for building components. CHANGE FOR THE BETTER WITH ALCOA® ALUMINUM

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flexible gas air conditioning adapts to any building design.

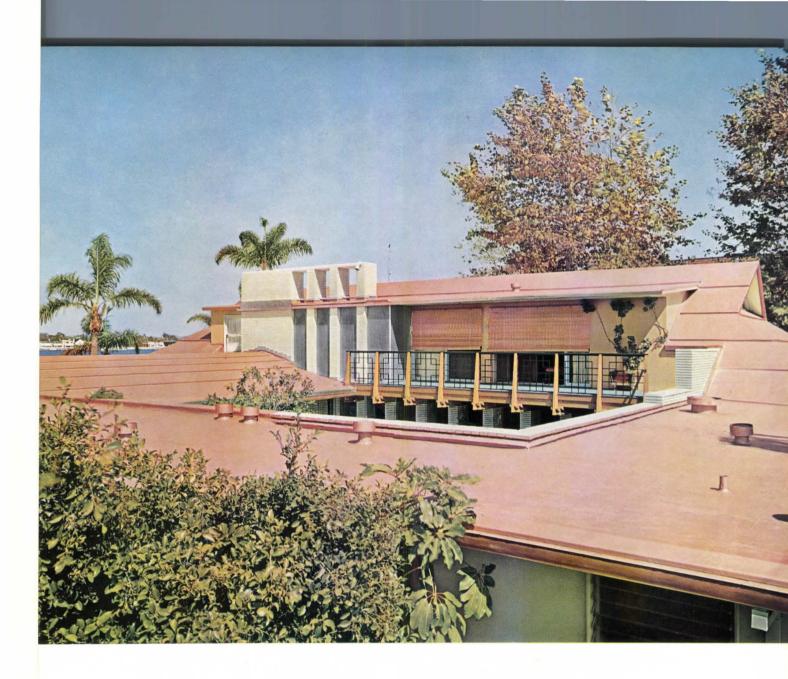
Gas absorption air conditioning doesn't cramp your imagination (or your floor plans). You put it where you want to. On the roof. In the basement. Anywhere! Wherever it best fits your design concept. It works for you...with you...as a dynamic and functional element to enhance, not encumber, your thinking. Easygoing and vibration-free, gas air conditioning doesn't need "quiet zoning." You can work to it...around it...from it. Even tie in existing boilers to make them perform year 'round for you. You'll find gas absorption air conditioning most accommodating...right at home in the climate of creativity. In East Ohioland, call your East Ohio Architectural Representative for more cool facts and figures. He'll work with you to capitalize on the design flexibility, the practicality, of gas air conditioning.

ity, of gas an conditioning.

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Dead-level decks, steep and vertical slopes, step-downs, curves and double curves . . . Last-O-Roof covers every contour. This complete system of compatible components— *Trademark membranes, cements, flashings, finishes—weighs 3 times less than most smooth roofs, 10 times less than gravel. It adjusts better to structural stresses, provides monolithic protection. It's fire-resistant, heat-reflective, weather-proof in any climate. Finished in aluminum, white or pastel shades (like the rose metallic roof shown here), Last-O-Roof can add dramatic beauty to your structures.

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Design with the one roofing system that's equal to your imagination —J-M Last-O-Roof. For details, write to Johns-Manville, Box 111, New York, N. Y. 10016.

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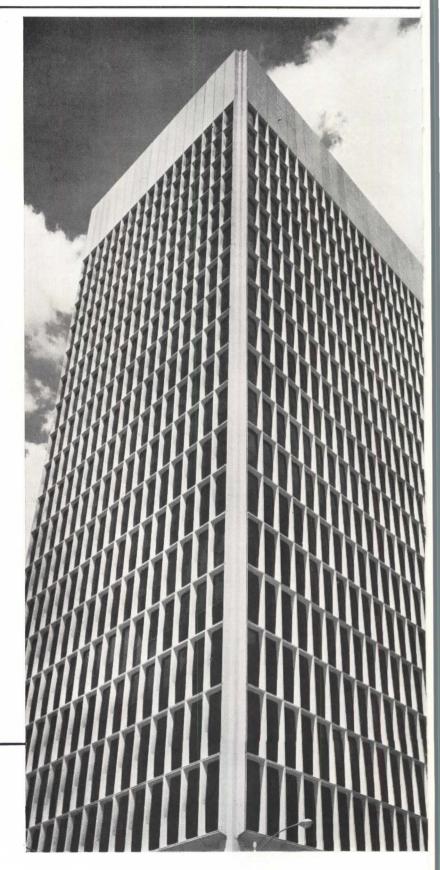
No.20/ CONCRETE CURTAIN

The joints of all exterior walls are generally subject to the same forces and considerations and have certain specific prerequisites. Two important considerations for joints in concrete curtain walls are (1) understanding the volume changes which occur before and after the erection of concrete units and (2) establishing functions for the joint.

Like most materials, concrete expands as temperature rises and contracts as temperature falls. Concrete also expands and contracts with gain or loss in moisture. However, the contraction of concrete due to moisture loss while drying is usually greater than any subsequent expansion. Since concrete exposed to the atmosphere loses some of its original water, it normally exists in a somewhat contracted state compared to its original dimensions.

This is an important consideration when designing joints for concrete components. If the joint design relies entirely on a positive bond between panels to waterproof the wall, then the joint sealer must be capable of expansion and contraction as well. For this reason, the elastic sealants such as polysulfide and silicone rubber have been satisfactory for panels of all sizes. Such flexible sealants (even if applied over mortar joints which act as setting beds) can absorb the movement in a joint due to volume changes of the panels.

500 Jefferson Building, Houston, Texas. Architect: Welton Becket & Assoc., Los Angeles, California.



WALL JOINTS / Clip for a.i.a. file 4-a / Prepared as an industry service by Portland Cement Association

'o minimize volume changes in oncrete wall panels, the following onstruction methods are effective: . Limit the water content of conrete to the minimum required for

roper placement. . Avoid conditions that increase he water demand of concrete such s high slumps and high concrete emperatures.

. Use the largest total amount of ggregate in the mix that is pracical.

. Use the largest maximum size oarse aggregate to fit the job onditions.

. Use fine and coarse aggregates hat exhibit low shrinkage characeristics when used in concrete.

. Avoid use of aggregates that ontain an excessive amount of lay.

. Provide a period of air drying efore placing units in a wall.

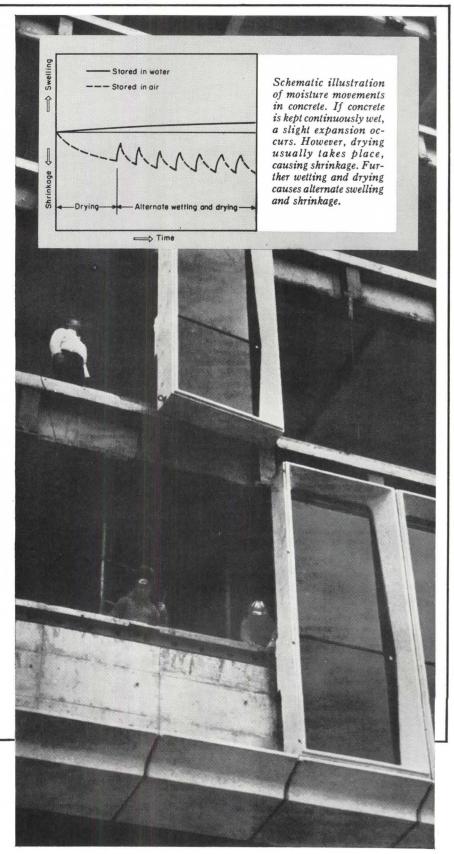
The production of concrete panls should always be scheduled well head of erection and should inlude ample time for thorough uring, air drying and inspection.

For additional technical data, vrite for free literature. (U.S. and Canada only.)

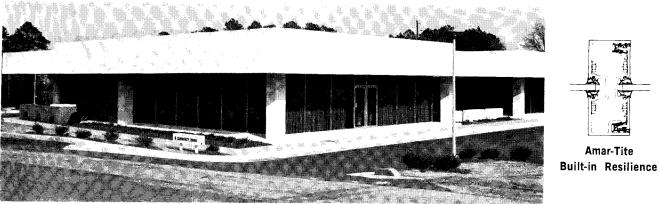
PORTLAND CEMENT ASSOCIATION

ept. A10-25, 33 West Grand Avenue, Chicago, Illinois 60610

n organization to improve and extend the uses of concrete, made possible by the financial support of most competing cement manufacturers in the United States and Canada



R 1965 P/A



Security Federal Savings and Loan - Columbia, South Carolina / Architect: Jackson and Miller / Dealer: Binswanger Glass Company / General Contractor: Laf Tarrant



First Federal Savings & Loan — Wichita Falls, Texas / Architect & General Contractor: Bank Building & Equipment Corp. / Dealer: Southwestern Glass & Paint Co., Inc.



Citizens Bank — Gainesville. Florida / Architect: Kemp, Bunch & Jackson / Dealer: Crystal Glass & Paint, Inc. / General Contractor: Tassinari Construction Company

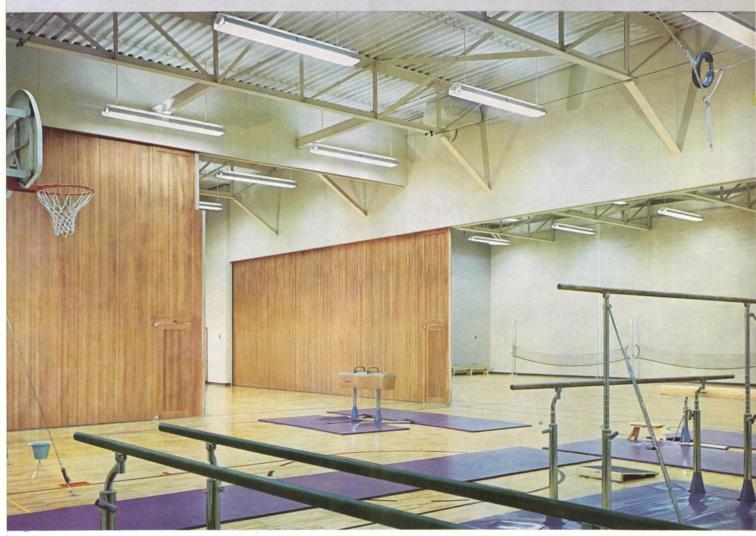
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MODERNFOLD the long division line



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> For complete specifications, see Sweet's File 22d/Ne or consult your nearby Modernfold distributor.



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Smooth-Fin Coils offer you:

Greater Heat Transfer per sq. ft. of face area

Lower Airway Resistance -less power per c.f.m.

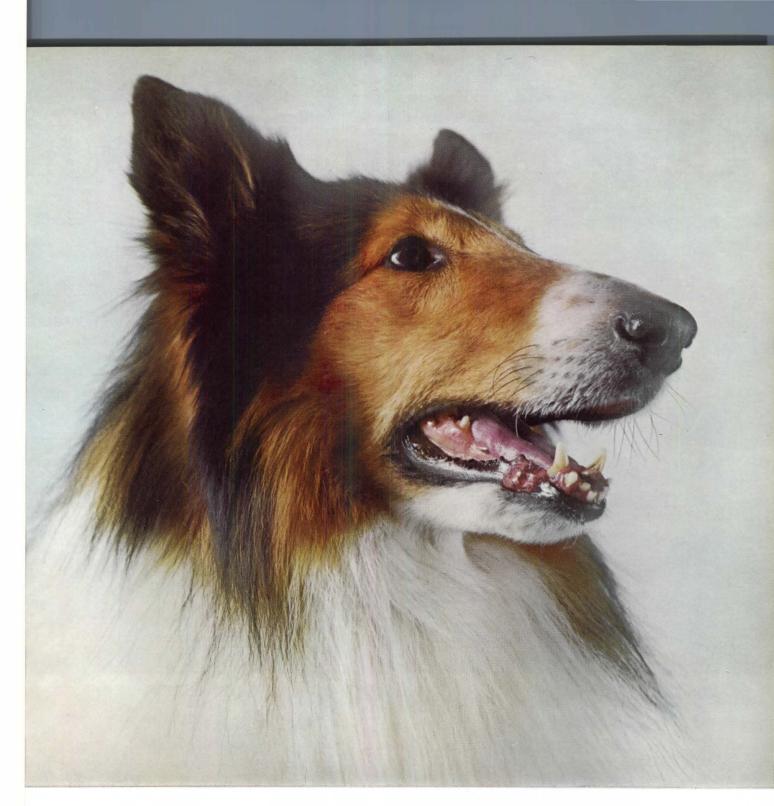
> Aerofin smooth fins can be spaced as closely as 14 per inch with low air friction. Consequently, the heat-exchange capacity per square foot of face area is extremely high and the use of high air velocities highly practical. Tapered fin construction provides ample tube-contact surface so that the entire fin becomes effective transfer surface. Standardized encased units are arranged for simple, quick, economical installation.



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And the second second



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It's as though nothing is between the collie and the camera lens. This clarity is the reason why PPG Float the new glass from Pittsburgh Plate Glass Company—is attracting the interest of automakers, mirror manufacturers and architects.

It's called PPG Float Glass because of the way it's made. Liquid glass is floated on a lake of molten metal, resulting in a new approach to perfection in glass.

PPG Float is available now. Specify it wherever the last word in clarity is called for. Contact your PPG Architectural Representative or write: Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh, Pa. 15222.

Left: This is how the photograph at top was taken through 10 pieces of PPG Float Glass.

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Pittsburgh Plate Glass Company, Pittsburgh, Pa.



PPG makes the glass that makes the difference

Molecular Electronics Division Westinghouse Electric Corporation





First phase of the project (108,000 sq ft) is composed of four ministration. Additional modules will be placed to form a number of partially and fully enclosed landscaped courtyards.

Space modules permit easy enlargement in relatively small increments



Westinghouse's Molecular Electronics Division facility is situated on a rolling, wooded, 7-acre tract in Anne Arundel County, Md. Roads, parking areas, and buildings are located so that a minimum of the site is disturbed.

Architect: Vincent G. Kling FAIA, Philadelphia Structural Engineers: Allabach & Rennis, Inc., Philadelphia General Contractor: Kirby & McGuire, Inc., Baltimore Steel Fabricator: Derby Steel Co., Baltimore

iry design motivation was to create -dust, noise-free, wide-span unit of in which a controlled environment be easily maintained . . . which serve small research and produceams efficiently... and which could panded easily and economically additional research or manufacturpace became necessary.

on is a simply organized square e module" which structurally and ecturally can stand as an independnit or in combination with other modules. Each unit is a square composed of a 90×90 ft, column-free central space 14-ft high, designed for laboratory or production use. Each is surrounded by a band of lower-ceiling space designed for office and service support areas.

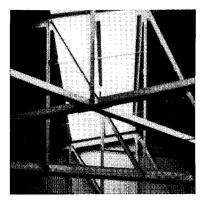
The high ceiling portion of the structure is roofed with a steel-truss space frame resting on four Bethlehem wide-flange columns at the corners. The roof for the lower-ceiling perimeter area is formed by cantilevering the lower chord of the trusses beyond the columns to the outer walls.



Courtyards provide interior spaces with an abundance of natural light and pleasant vistas, and create a stimulating human environment.







Daylight floods through these translucent plastic panels and lights up the darkest corners of Pier 94, in Brooklyn.

Artificial lights go on only at night, or on days so overcast there is not enough light even outdoors. As would be expected, savings in electricity are substantial.

The strong, lightweight Hetron-based panels were easy to install and are easy to maintain. Neither storms nor vandals can shatter them. Because they eliminate dark spots, they permit freight handling in the pier at top speed without "blind spot" hazards. *Meet rigid codes.* The Hetronbased panels are inherently fire

retardant. They have a flame-spread rating of 35 to 60 by the U/L tunnel test and meet the rigid building code and fire-retardant specifications of the Department of Marine and Aviation. We do not make the panels—just the Hetron polyester resin that helps make them strong, translucent, lightweight, fire retardant, and chemical resistant. For more detailed information on the excellent properties of Hetron and a list of fabricators, please write Durez® Plastics Division, Hooker Chemical Corporation, 7710 Walck Road, North Tonawanda, N. Y. 14121.



DUREZ PLASTICS DIVISION On Readers' Service Card, circle No. 480

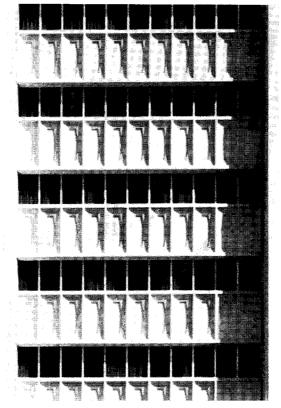
Hetron-based panels let in a flood of daylight at Cunard Pier 94, Panel fabricator: Filon Corporation. Engineers and architects: Praeger-Kavanagh-Waterbury.



Hetron⁻based panels let nature pay the light bill

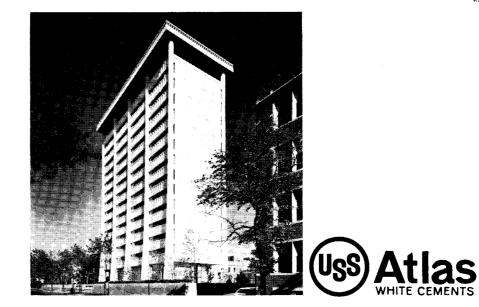


William James Hall, Behavioral Sciences Building, Harvard University. Architect: Minoru Yamasaki & Assoc., Birmingham, Mich. Contractor: George A. Fuller Co., Boston. Structural Engineers: Worthington, Skilling, Helle & Jackson, Seattle. Precast Concrete Panels: San-Vel Concrete Corporation, Littleton, Massachusetts



Glistening white concrete spandrels stretch 36 feet... support concrete floor beams Precast, prestressed concrete spandrels on this

new tower building at Harvard University support the precast floor beams and serve as the exterior wall between columns. 7½ feet deep and 14 inches thick, these units span 36 feet between columns and are connected to the floors by fabricated steel connectors. Made with ATLAS WHITE high-early-strength cement, these units have a simple recessed pattern and an exposed quartz aggregate finish. ■ The structural concrete columns and end walls are also faced with precast white concrete panels. Prestressed as a safeguard against flexural stress during handling, these facing units were used as form liners for the cast-in-place concrete. ■ For more information on the aesthetics and structural economies of precast white concrete, see your local precast concrete manufacturer. For the 32-page brochure, "White Concrete in Architecture," write Universal Atlas Cement Division, United States Steel, 100 Park Avenue, New York, N.Y. 10017. "USS" and "ATLAS" are registered trademarks.

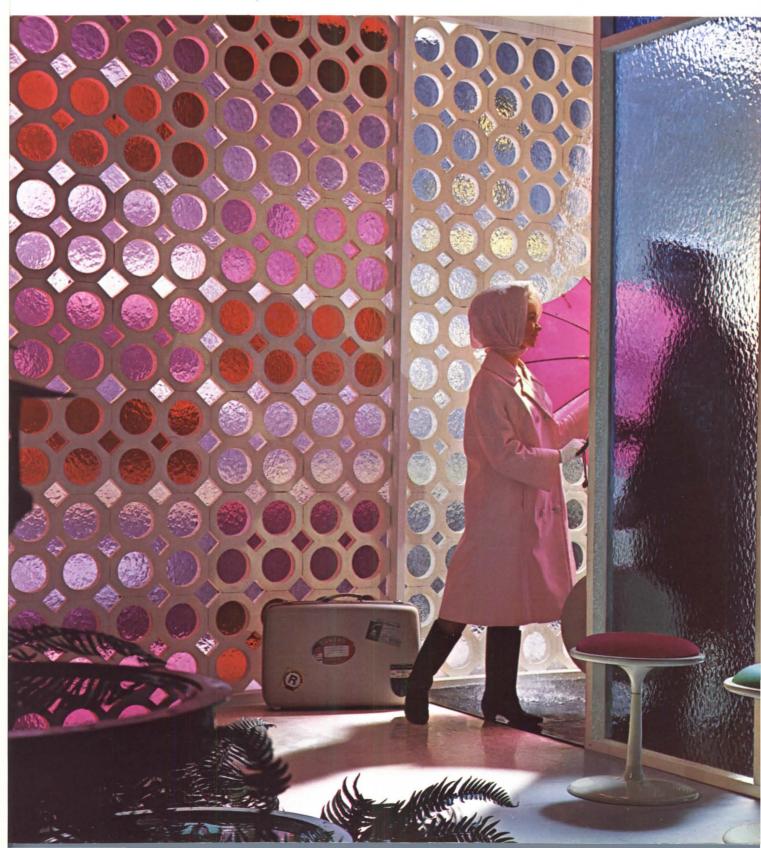


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OCTOBER 1965 P/A On Readers' Service Card, circle No. 414 ≯ PATTERNED PLEXIGLAS

pleasing interplay of light, color and surface texture in xterior walls pictured below demonstrates the design ntial for Flair patterned PLEXIGLAS® acrylic plastic sheet. ection of 17 colors and colorless is available in sheet up to 4 feet by 8 feet. Because Flair is PLEXIGLAS, it offers impact resistance, lightweight, weather resistance, formability and easy handling and installation. A slow burning plastic, its use is generally subject to the same regulations as untreated wood. Write for names of local suppliers, color samples and our illustrative brochure.

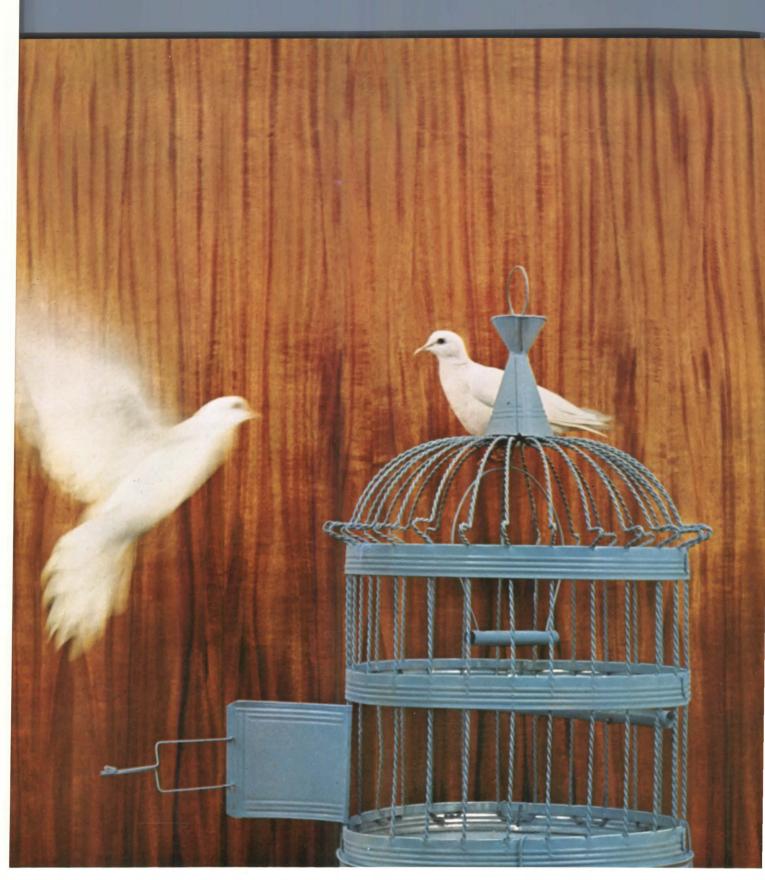




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wall paneling idea, Acacia offers a creative response to the architect whose imagination takes wing to ealms of originality. Acacia's natural luster has such depth it seems to radiate from behind itself, suspending exquisite grain patterns in a dimensional sheen of poetic beauty. Seen from any angle, Acacia stimulates ration for new design freedom.

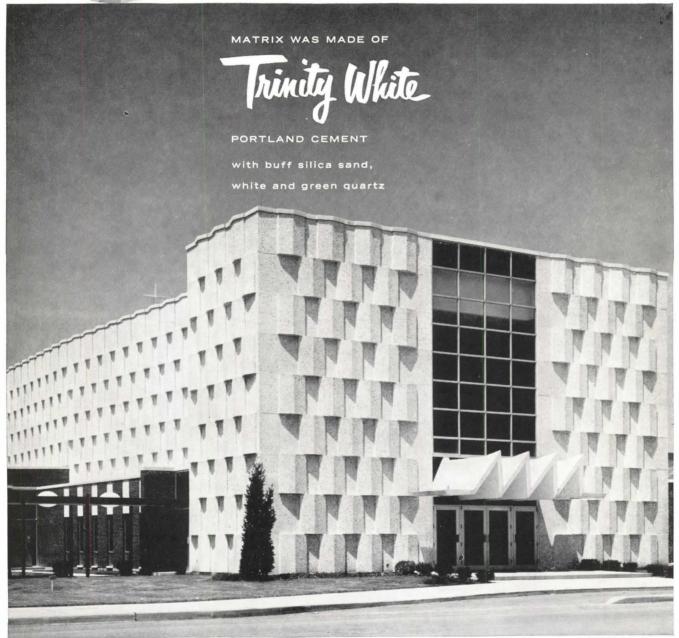
M...EMINENCE IN WOOD

Chester B. Stem, Inc. 795 Grant Line Road New Albany, Indiana



DELIGHTFUL USE OF LIGHT AND SHADOW...

PRECAST WHITE CONCRETE PANELS



CREDITS: St. John Vianny Church, Northlake, Illinois. ARCHITECT: Joseph W. Bagnuolo & Associates Architect-Engineer, Chicago. GENERAL CONTRACTOR: Valenti Builders, Inc., Chicago. PRECAST CONCRETE CONTRACTOR: Hufschmidt Engineering Company, Sussex, Wisconsin.



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"For an architect ought not to be and cannot be such a philologian as was Aristarchus, although not illiterate; nor a musician like Aristoxenus, though not absolutely ignorant of music; nor a painter like Appeles, though not unskillful in drawing; nor a sculptor such as was Myron or Polyclitus, though not unacquainted with the plastic art; nor again a physician like Hippocrates, though not ignorant of medicine; nor in the other sciences need he excel in each, though he should not be unskillful in them. For, in the midst of all this great variety of subjects, an individual cannot attain to perfection in each, because it is scarcely in his power to take in and comprehend the general theories of them."

VITRUVIUS



Le Corbusier's death ends a long and eventful chapter in the history of modern architecture. Of the several leaders of the design revolution that swept away the old traditions, he was by far the most creative. Even in the last years of his life, when most old men are either retired or merely repeat the triumphs of their earlier days, he brought forth a stream of brilliant designs that influenced architects throughout the world.

And yet, the amount of completed buildings he leaves for posterity is pitifully small when one considers that he was in practice for more than half a century. A few dozen structures, after many decades of world-fame, is not a great accomplishment for one who always had such an intense desire to build.

Geniuses, as a rule, are difficult people, and Le Corbusier was no exception. Some of those who contributed the brief appraisals appearing in this month's P/A Observer, allude to traits that made him not an easy person to talk to or work with.

It is characteristic of Le Corbusier that for his autobiography, published in 1960, he chose the title, *Creation Is a Patient Search*. Because this is how he wanted to appear to the world—as a sort of saint unaffected by emotions, a patient worker immune to the pressures of life. But creation is not only a patient search. It is also an impatient search—an intensely emotional and consuming act that often leads to frustration, irritation, and despair. These become vastly magnified by the inevitably difficult struggle with the world outside of oneself.

This Le Corbusier never quite understood, and his *impatience*, verging on a persecution complex, is apparent throughout his writings. Perhaps the most telling statement about what he thought of his fellow men appears in the autobiography. It is a sentence tacked on at the end of a caption about one of his many projects that never got built. "Some men," he wrote, "have original ideas and are kicked on the behind for their pains."

There is no point arguing the validity of this sentiment. Isn't this how we all feel most of the time? The tragedy of Le Corbusier was that he turned this feeling into a self-destructive element—a misanthropic vendetta that not only drained much of his energy but also made impossible so many commissions that were possible.

And now we are all poorer for it.

Goodby, Corbu. I hope the angels wear softer shoes.

Jan C Rowan

The Changing Practice:

THEATERS

This issue of P/A is devoted to the examination of the architect's changing practice and his dealings with his consultants and clients through the in-depth consideration of one complex design problem: the theater.

In presenting this drama to our audience, we have employed the structure of a play: a Prologue, in which the basis for subsequent development is established; Act I, in which the interplay of Programming and Client-User is unfolded, with appropriate examples given; Act II, dealing with the conflict occasioned by Functional Design and the Consultant, followed by illustrative projects; Act III, wherein Total Design and the Architect take the stage to enact the agonies of creation and completion in this field; and, finally, the Epilogue, which attempts to draw these strands together into a pattern indicative of where The Changing Practice stands at this time, and what direction it is likely to take in the future.

Prologue: Wherein the Chorus makes known the history of developments to come and sets the stage for subsequent events.

Act I

"PROGRAMMING AND THE CLIENT-USER" Place: A Fogbound Heath Time: The Beginning How, at the start, the protagonists set out to explore the area of controversy. How they gather necessary knowledge for their voyage into the unknown realm, determine their route in advance, and their method of procedure.

Act II

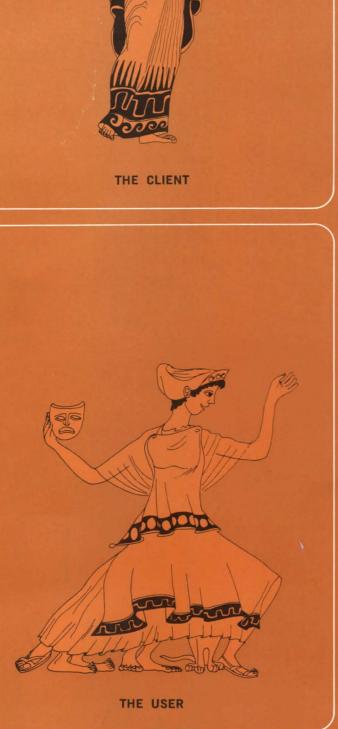
"FUNCTIONAL DESIGN AND THE CONSULTANT" Place: An Embattled Field Time: Several Months Later In which particulars of conflict arise when the charmed territory is occupied by various forces. The struggle that ensues. Of the details concerning this dramatic tension and how they are resolved – leaving the outcome of the piece, however, still in doubt.

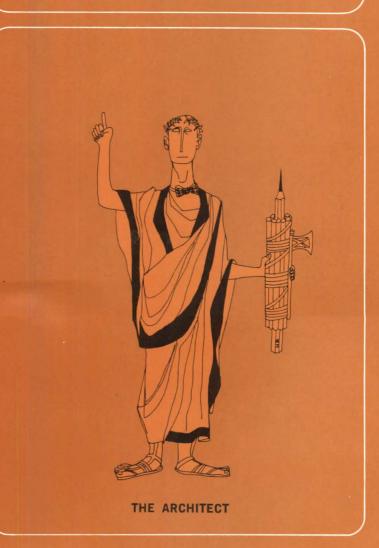


"TOTAL DESIGN AND THE ARCHITECT" Place: An Empyrean Height Time: Now and Then Of classic hopes and practical realities. How the instigators of design seek to unify the warring factions to a happy end. On the misunderstanding of this intent and how a truce is urged on the conclave of characters.

Epilogue: The chorus attempts to admonish the audience, give the development of the drama to this date, and point to the future. A *deus ex machina* appears to hand down the right Promethean fire.

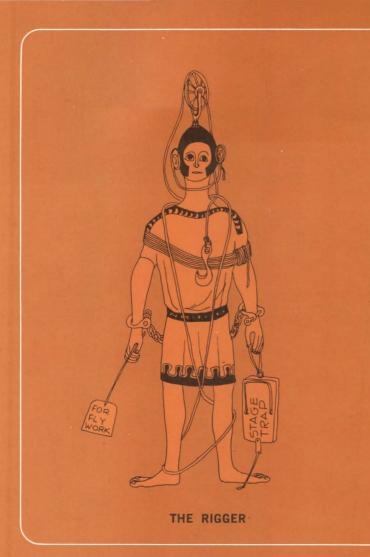
"O pardon! since a crooked figure may Attest in little space a million; And let us, ciphers to this great accompt, On your imaginary forces work." SHAKESPEARE: "HENRY V"



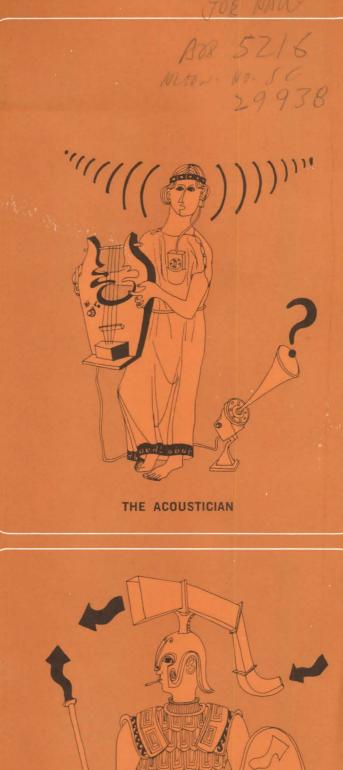














Dramatis Personae

P/A, acting as director, stage manager, prompter, amanuensis, has assembled the following cast of architects, consultants, and clients experienced in the programming, design, and construction of theaters and auditoriums. They will appear in the dialogue of Acts I, II, and III, identified by their functions and surnames.

THE ARCHITECTS

Abramovitz, Nax. Harrison & Abramovitz, New York, N. Y. Krannert Center for the Performing Arts, University of Illinois, Urbana, Ill./Philharmonic Hall, Lincoln Center for the Performing Arts, New York, N. Y./Spingold. Theater, Brandeis University, Waltham, Mass. Briggs, William A. Richmond, Va. Author of "Night and Day." a survey of cultural facilities in 200 cities/lectures in the field of theater and recreation/has designed sets for community theater/member of the Theater and Auditorium Committee of the AlA/on board of directors of USITI/ member of AETA. Brill, Michael. Helge Westermann/ Richard Miller Associates, New York, N. Y. Project architect for Smith College Center for the Performing Arts, Northampton, Mass./Asst. Professor of Architec-ture at Pratt Institute/Member of USITT/has acted in community and sumer stock theater/ has done set design for semiprofessional productions. DeMars, Vernon A. DeMars & Reay, Architects, Berkeley, Calif. University of California Auditorium-Theater, Berkeley/ set designs for Sam Francisco Opera Company ballet. Engele, Burghard, M. Office of Edward Durell Stone, New York, N. Y. John F. Kennedy Center for the Performing Arts, Washington, D.C./St. Louis Statium, Mo./ Ford "Ideal Theater" project/ Little Theater, Hamilton College, Clinton, N. Y./formerly in office of theater architect, Dr. Clemens Holzmeiser, Austria. Franzen, Ulrich. New York, N. Y. Assisted Jo Mielziner on Beaumont Theater, Lincoin Center for the Performing Arts, New York, N. Y. Assisted Jo Mielziner on Beaumont Theater, Lincoin Center for the Performing Arts, New York, N. Y. Assisted Jo Mielziner on Beaumont Theater, Cincinnati, Ohio/University of Toledo Performing Arts Center project with Hann & Hays/scenic Hardy, Hugh. New York, N. Y. Assisted Jo Mielziner on Beaumont Theater, Lincoin Center Theater, Washington, D.C. Hutchinson, George A. partner, The Perkins & Will Partnership, Chicason, I.H. Knox College Theater, Galesburg, III./six high school auditoriums/member OSITT. Johansen, John M. New Canaan,

III, identified by their function
 Rudolph, Paul. New York, N. Y.
 Weilesley Fine Arts Center, Mass./ Ford "Ideal Theater" project/ Colgate University Fine Arts Center, Hamilton, N. Y./Southeastern Massachusetts Technological institute theater, Southeastern, Mass./Tuskegee Cultural Center, Tuskegee, Ala.
 Samton, Claude. New York, N. Y.
 Nina Jacobson Theater for the Dramatic Arts, Windsor Mountain School, Lenox, Mass./Indian Hill (outdoor) Theater, Stockbridge, Mass./Cinema I and II, New York, N. Y. with Abraham Geller/ Civic Center, Kiruna, Sweden, with Ralph Erskine.
 Snibbe, Richard, New York, N. Y.
 Fine Arts Building, State University College, Geneseo, N. Y., with Edgar Tafel, associate-in-charge/Fine Arts Building, State University College, New Paltz, N. Y., with Ballard & Todd.
 Stone, Edward Durell. New York, N. Y. John F. Kennedy Center for the Performing Arts, Washington, D.C./Beckman Auditorium, Pasadena, Calif./Tulsa Civic Center, Okla./Fine Arts Center, State University of New York, Albany/Ford "Ideal Theater" project/Little Theater, Hamilton College, Cinton, N. Y., and others/ director of ANTA.
 Woollen, Evans. Indianapolis, Ind.
 Clowes Memorial Hall, Butler University, Bloomington, Ind.
 THE CONSULTANTS

THE CONSULTANTS

THE CUNSULTANTS Birkle, Paul G. President, Peter Albrecht Corporation (manufac-turers of stage rigging), Milwaukee, Wis. Metropolitan Opera House, Lincoln Center for the Performing Arts, New York, N. Y./Clowes Memorial Hall, Butler University, Indianapolis, Ind./Boston War Memorial Auditorium, Mass./Civic Auditorium, Gary, Ind./Civic Auditorium, Gary, Ind./Civic Auditorium, Genter for the Perform-ing Arts, Ottawa, Can./Member USITT. Bowman, Ned A. Assistant Professor

Auditorium, west Paim Beach, Pla./ Canadian Center for the Perform-ing Arts, Ottawa, Can./Member USIT. Bowman, Ned A. Assistant Professor of Theater Speech and Arts, Department of Speech and Theater, University of Pittsburgh. Has written articles on theater design and technology/Member USITT and AETA/Editor, USITT Journal. Brannigan, Robert P. Technical consultant, New York, N. Y. Lincoln Center for the Performing Arts, New York, N. Y./Saratoga Performing Arts Center, Saratoga Springs, N. Y./formerly Broadway technician for 15 years. Burris-Meyer, Harold. Theater Planning and Acoustics, Boca Raton, Fla. Director of University/ Atlanta Cultural Center, Ga./ Comunity Theater, Lynchburg, Va./two theaters for Howard University, Washington, D.C./ Co-author, with Edward Cole, of Theaters and Auditoriums and Scenery for the Theater/member of American Institute of Physics, USIT and AETA; fellow of Acoustical Society of America and Audio Engineering Society. Feder, Abe. Lighting Consultant, New York, N. Y. John F. Kennedy Center for the Performing Arts, Washington, D.C./Philharmonic Hall, Lincoln Center for the Performing Arts, New York, N. Y./ San Francisco Civic Certer. Calif./restoration of the Springer Opera House, Columbus, Ga./ member of USA, IES, and Archi-tectural League of New York/was U. S. delegate to the In-erational Theater Conference in Paris (UNESCO)/lighting for Broadway productions. Fisher, Jules, Lighting consultant, New York, N. Y. Westbury (multi-

s and surnames. purpose) Music Fair, Long Island, N. Y./lighting systems for repertory theaters and Broadway shows. Izenour, George. Theater Engineer, New Haven, Conn. Loeb Drama Center, Harvard University, Cambridge, Mass./Loretto Hilton Center, Harvard University, Cambridge, Mass./Loretto Hilton Center for the Performing Arts, Webster College, Webster Grove, Mo./Krannert Center for the Performing Arts, University of Illinois, Urbana, III./Fathers of the Confederation Memorial Buildings, Charlottetown, Prince Edward Island, Canada/Alley Theater, Houston, Tex./Ford "Ideal Theater" project/has worked on more than 50 theaters/member of USITT/ amateur acting and directing. Jewell, James E. Engineer. Consult-ant with Holzmueller Corporation (architectural, theatrical, and TV lighting equipment, rigging, and appliances) San Francisco, Calif. Director of theater architecture project for AETA/regional director of ANTA/member USITT. Knudsen, Dr. Vern O. Acoustician. Professor of Physics, Emeritus, University of California, Los Angeles, Calif. Co-author of Acoustical Designing in Architec-ture. Kook, Edward. President, Century lighting Inn. New York N. Y

ture. Kook, Edward. President, Century Lighting, Inc., New York, N. Y. Author of Images in Light for the Living Theater/vice-president of ANTA Board of Standards and Planning/member USIT. Lee, Ming Cho. Set Designer, New York, N. Y. Designer of Mobile Shakespeare Theater and Truck for New York Shakespeare Festival; Juillard Opera Theater, New York, N. Y.; José Limon, Alvin Alley, and Gerald Arpino dance companies; San Francisco Opera Company; New York Metropolitan Opera Company; Broadway and Off-Broadway productions. Mietziner, Jo. Theater and scenic designer, New York, N. Y. Stage and lighting consultant for Krannert Center for the Performing Arts, University of Illinois, Urbana, Ill./collaborating designer for Beaumont Theater and Forum Theater at Lincoln Center for the Performing Arts, and ANTA Washington Square Theater, New York, N. Y./ consultant for Los Angeles Music Center, Calif./Ford "Ideal Theater" project/scenic design for 250 Broadway shows/chairman of the Board of Standards and Planning for the Living Theater/author of Designing for the Theater. Miller, James Hull, Theater Designer, Shreveport, La. Olathe High School, Olathe, Kan./Roberts, Theater, Grinnell College, Grinnell, Jowa/a principal advocate of "open stage" design and space scenery with projected backgrounds/ has 57 theaters to his credit. Newman, Robert. Acoustician Bolt, Beranek & Newman, Cambridge, Mass. Clowes Memorial Hall, Butler University, Indianapolis, Ind./ Warner Concert Hall, Oberlin, Ohio/ Place des Arts, Guebec, Can./ Benedicta Arts Center, St. Joseph, Mo./Tanglewood Music Shed, Lenox, Mass./Kresge Auditorium, M.I.T. Cambridge, Mass./audi-torium at University of Caracas, Venezuela/associate professor of architecture at M.I.T./Iecturer, U. S. and abroad/author of many articles on acoustical society of America/his firm is involved in approximately 100 auditorium projects each year. **Rosenthal**, Jean. Lighting Designer, New York, N. Y. Clowes Memorial Hall, Butler University, Indianapo-is, Ind./Los Angeles Music Center, Cali

Minn./Canadian Center for the Performing Arts, Ottawa, Can. Rubin, Joel. Educational and Community Theater Consultant. Vice-president of Kliegl Brothers Lighting Company, Inc., New York, N. Y. Smith College Fine Arts Center, Northampton, Mass./former administrative vice-president of AETA/member of ANTA and Illuminating Engineering Society/ past president USITT/co-author of Theatrical Lighting Practice. Schlanger, Ben. Consulting Theater Architect, New York, N. Y. All seating and sight-lines for Lincoln Center for the Performing Arts, New York, N. Y./Los Angeles Music Center, Canl/Ford "Ideal Theater" project/member USITT. Skilling, John, Structural Engineer. Worthington, Skilling, Heile & Jackson, Seattle, Wash. Seattle Civic Center's Little Theater and Opera House, Seattle, Wash./ Music Hall, Oberlin College, Oberlin, Ohio/20 auditoriums/ member Municipal Art Commis-sion, Seattle, Wash. and NAE. Sööt, Olaf. Consulting Engineer. New York, N. Y. Specialist in movable structures and stage facilities/John F. Kennedy Center for the Performing Arts, Washington, D.C. Beaumont Theater and Metropolitan Opera building, Lincoln Center for the Performing Arts, New York, N.Y./ studios for ABC-TV, New York, N.Y. Swinney, Dr. Donald. Technical Director of the Hofstra Playhouse and Associate Professor, Hofstra University, Long Island, N.Y. President of USITT; former manag-ing editor of the American Educational Theater Journal/ member of AETA. Thompson, Richard D. Theater Division Manager of Lighting and Electronics, Inc., Brooklyn, N.Y. Technical Secretary of USITT/member of AETA and IES/author of "A Proposed System for Fire Protection of the Proscenium Arch in the Flexible Theater." Unruh, Dr. Walter, Engineer, Weis-baden, Germany, Consultant on the Metropolitan Opera house for Lin-coln Center for the Performing Arts, New York, N.Y./formerly tech-nical director of the Dresden Opera and the Hamburg Opera/Edi-tor of Buhnentechnische Rundschau, a technical theater journal. Veneklasen, Paul S. Acoustician. Los Angeles, Cal

CLIENT-USERS

CLIENT-USERS Gory, Percy, Managing Director of Suppliers), Manchester, England, Expert on theater architecture and lighting and consultant on a number of British theaters/author of Lighting the Stage; Amateur Theatreaft; Planning the Stage; Guthrie, Tyrone. Director, designers with Tanya Moiseiwitsch of the Shakespeare Festival Theater at Guthrie, Tyrone. Director, designers with Tanya Moiseiwitsch of the Shakespeare Festival Theater at Guthrie, Tyrone. Director, designers with Tanya Moiseiwitsch of the Shakespeare Festival Theater at Guthrie, Tyrone. Director, designers Shakespeare Festival Theater at Stratford, Ontario, Canada, Younder of the Guthrie Theater Company. Hendry, Thomas B. Executive Director of the Canadian Theater Center, Groonto, Canada, Manchester University, England. Director of repertory theater in Dublin and Bristol/director of the Old Vic in London and the Elizabethan Theater Trust in Australia. Sverschulter, William, General Manager, Asfilated with Los Angeles Light Open Company.

PROLOGUE

"... Pardon, Gentles all, The flat unraiséd spirits that hath dared On this unworthy scaffold to bring forth So great an object. Can this cockpit hold The vasty fields of France? Or may we cram Within this wooden O the very casques That did affright the air at Agincourt?"

We might add, in presenting the Prologue to this issue of P/A on "The Changing Practice" and its reflections in the design of theaters and auditoriums, the beginning of the Prologue to Shakespeare's Henry V: "O for a Muse of fire, that would ascend/The brightest heaven of invention" For we have chosen one of the most involved design problems - theaters - to illustrate what is now and to come in the architect's dealings with his own practice, the consultants he usually must employ to assure a functioning building, and the clients he must work for and with to achieve a realized result. Although the theater, as Shakespeare indicated, is a concept that goes beyond the ability of man to encompass his emotions, panorama, history, it is at the same time a building form in which architects must deal with experts in other disciplines to provide a stage and a pit, a platform and an auditorium, a "wooden O," if you will, to shelter the back-and-forth of audience and performer. Theater architecture is seen by some as a unique form. Lighting consultant Richard Thompson says, "The theater differs from all other types of architecture in that only in the theater is the architect faced with a second art form. We have theater and architecture in juxtaposition. Both the architect and the theater client have strong demands and desires of what the building should be and should be capable of doing." This is true, but no truer than that the hospital and the institution are special places where the architect must deal with the sick and those who care for them, or that schools are places where the architect must provide environments for learning and deal with school boards and educational directors to achieve the best results.

We have chosen theater design "to hold, as 'twere, the mirror up to [the] nature" of "The Changing Practice," chiefly because of its singular resurgence in recent years. The so-called culture explosion has brought forth a rash of commissions for community cultural centers, theaters, concert halls, performing centers at schools, and other types of auditoriums. Architect William A. Briggs remarks: "The exploding population, longer life span, shorter working hours, automation – all add up to more leisure and the demand for ways in which to use it. There *are* ulterior motives, of course: promotion of conventions, tourism, revitalization of downtown, attraction of industry, capturing the foreign dollar. But it seems to me there is another *unmentioned* reason. I think we have a subconscious or suppressed fear of the very strides in nonphysical types of communication that we are scientifically so proud of . . . that the reaction has set in, and that we are thirsty for the See, Hear, Touch, and Yell things in life both as Doers and Communicants." The need for more direct involvement than watching the Beverly Hillbillies over a TV Dinner provides, is also voiced by architect and theater designer Hugh Hardy: "As television and flicks and all that traumatize themselves, and as the glitter wears off a little when people get bored, the sort of primeval, gutsy, bear-pit, smelly theater stuff is very exciting."

This new emphasis on, and new techniques for, the design of theaters and kindred types of buildings for the performing arts has led, many are convinced, to a greater intricacy in the planning of these facilities. Some people, indeed, speak slightingly of the architect who does "the same old kind of hall." Because of the technologies amassed in our day, it is frequently thought that we must always be doing something entirely new. T. S. Eliot once observed that purity is the problem of our age, and that, in all the arts today, the goal is to achieve something never before seen by God or man. Since many technical innovations have not yet been assimilated, however, mistakes are often made when new things are attempted, as is the case when any experimentation is undertaken. Certainly the quest on the part of some for that illusory dramatic bluebird, the "ideal" theater, has built-in pitfalls: a conflict between an eagerness to incorporate the most advanced techniques that can be put to the multitudinous needs of the theater and a lagging ability (on the part of both users and designers) to master those innovations.

With the burgeoning of theater construction has come a concomitant increase - perhaps

fragmentation would be the *mot juste* – of expertise in theater design and construction. The architect's role, therefore, has become more intricate, illustrating the changing patterns of his practice. In addition to the traditional structural and mechanical engineering consultants, he must deal with lighting consultants, seating consultants, acoustical consultants, and a number of specialists in ancillary services. Depending on the attitude of the particular architect, this development can expand, contract, simplify, or complicate his practice. Philip Johnson says: "I guess you might say it complicates it, but if it saves the theater or the library from being a nonworking one, then it's a very important part of your work." Max Abramovitz thinks that "The role of the architect is really expanding, but he has to, if he expands, use more and more specialists, because it is getting to be so complicated." Johnson thinks otherwise.

In recognition of this changing situation in all buildings types, the AIA has issued a formalized recommendation that calls for provision of "expanded services." Systematized in Dudley Hunt's book, *Comprehensive Architectural Services*, the concept is that architects must offer more than planning, design, and construction – the "standard services" – in order to obtain "better architecture and other environmental design." Some of the additional services they should offer include: feasibility studies; operations; programming; site analysis, selection, and acquisition; project financing; and planning of promotional programs.

Comprehensive Architectural Services recognizes that not all of these services are required for every project, nor is every architect expected to be able to provide all of the services alone; consultants are usually mandatory. In fact, it is foreseen that certain architects may become specialists in one or more architectural functions without practicing the entire range of architectural services. Thus, one might specialize in feasibility studies or programming, while another might concentrate on design and leave programming to other firms. But, however subcontracted, either to nonarchitect consultants or to other architects, CAS envisions that it is the architect who must perform many additional services, "co-ordinate the work of others, obtain and direct some services, and analyze or review still others."

Behind the AIA manifesto seem to be two basic notions:

First, to prevent architects from losing commissions to nonarchitects (which would seem not so relevant to theaters as, for instance, to industrial buildings, shopping facilities, etc.).

Second, to prevent architects from being saddled with conditions that were arbitrarily – or at least not so carefully – established previously by others.

There is no hint in the concept of comprehensive services that an architect can or should know everything. Yet, in using consultants, he must continually evaluate their recommendations, and perhaps modify or dismiss some proposals. How, if he is not as expert as his consultant, can he legitimately do such a thing? What is his responsibility as far as the consultant's specialty is concerned? These are questions posed in this issue.

Strangely, there seem to be few official statements on the part of the professional organizations of consulting groups about the responsibilities of the consultant. For instance, the U.S. Institute for Theater Technology, whose purpose is to analyze and promulgate information about the functional aspects of theaters and auditoriums, is only now preparing such a policy statement. The Acoustical Society of America, according to its president, Dr. Cyril Harris, "has no policy in this regard." And "The Practice of Consulting Engineering," which was published by the Engineers Joint Council, is currently out of print. The AIA *does* have a policy statement on the "Functions of the Consultant" and a Committee on Theaters and Auditoriums report on "Current Practices in Planning and Building a Theater."

Architects and consultants are, of course, quite vocal about their relationship, as will be seen in Acts I, II, and III. Reactions on this score range from technicians labeling the architect, pejoratively, "artist," to architects viewing consultants as blindered but necessary pests who think a theater is fine if their one specialty works. Hardy comments, "It seems to me, you should define what is a consultant, what is an architect. Then you would cut out some of this warfare about architects taking over, because you'd make it clear that most architects are lousy, if that's your definition of the word. And most consultants are probably correct in resenting that. But by the same token, consultants must understand that they are not architects."

Fighting words? We hope so, for perhaps they will lead you, the audience, from this Prologue through the rest of our play to the Epilogue, where we hope to tie the strands of this drama together. This presentation is not proposed for dramatic rendering at AIA chapter functions – "If this were played upon a stage now, I could condemn it as an improbable fiction," as Shakespeare said in *Twelfth Night*. We intend, however, that it initiate some thinking and lessen internecine warfare among architects on their actual roles in their practices and their dealings with those omnipresent protagonists, the client and the consultant.



"America," murmured European-born architect Max Engele (in sotto-sorrowful Peter Lorre-like tones), "America is suffering a cultural explosion." It is undeniable, we are in the midst of a Culture-Building-Boom that is sweeping the country: There is a hue and a cry and a scramble for culture – to make Los Angeles more cultured than San Francisco, or vice versa – and we are frantically erecting palaces to culture without much idea of what it is, where it is, where it comes from, or how you grow it. The idea seems to be: Build a splendid house and somewhere the Muses will get wind of it, be attracted to it, lured into it – then slam the door and you've got it.

There is nothing particularly wrong with the boom itself, nor with the boundless enthusiasm; the only difficulty is that it is generally a vague desire, couched in amorphous terms – and is impractical. The architect is stumped at the very beginning of a project. How does he write a program for a client who generally cannot express exactly what he wants, is not familiar with the performing arts, does not know that they have conflicting architectural specifications, and is concerned with a glittery notion of the Broadway import which may not be valid two years from now, or ever valid for a place 2000 miles away from the source? How can the architect write a program for a building which will work, and will work not only now, but 10 years from now, when the basic premises and purposes of the theater may be vague, erroneous, or misguided?

The architect's confusion is compounded in that the theater itself is in the process of change, growth, and experiment. There is no traditional stage form for the designer to follow; he cannot simply take out the manual and copy specifications. Supposedly every theater man has a different idea of what theater is, every theater consultant has an idea, every director, every playwright. Moreover, if an artistic director is lucky enough to be a client, it is probably the first time in his life he has had the opportunity to put his ideas into fresh architecture rather than modifying an old shoe factory. The theater arts are in the very process of defining their needs.

Some of the confusion of the theater and the performing arts is apparent in the discussion that follows. But if each confusion is pursued to its logical conclusion (albeit in a somewhat Platonically predetermined fashion), they appear to lead to one irrefutable source of murkiness: the client trying to build a house before he knows what is to go inside it; and without a specific user, the client is faced with a mass of decisions with nothing to guide him. Once he has a specific user – a director, resident theater, or orchestra – many of his difficulties are solved. He immediately has a concrete civic purpose, and an artistic direction from which to proceed – to choose his consultants and his architect. He also has a specific practical problem that can be solved.

The architect, on the other hand, may feel it is outside the bounds of his practice to take so much responsibility for what is being done: to question the civic purpose of the client, to question his values and long-range directions in the programming stage. Yet this seems unavoidable if he is to build something other than a white elephant, something which does not work, or something which will be torn down in five years when the client has a better idea of what his aims are. Secondly, in order to contribute anything to the theater, to the evolving stage form, he must also commit himself to expressing the ideas and needs of the artistic user: in short, to immerse himself in an art form other than his own, to expand, or limit, himself – whichever way you look at it.

From the practical standpoint of the architect, who is to translate an idea into a building, preprogramming is essential in making sure that the fundamental ideas are sound, are clear in the client's mind.

Why is preprogramming so necessary?	Abramovitz (Arch.): If you don't have the right program, if you don't have a good idea, then your end result can't be very good. Because the architect, in enveloping and developing the idea in physical terms, adds a good number of things. But if it is basically not a good idea, then you're off in the wrong direction. Brannigan (Cons.): An architect is most likely to get into trouble when he is building a theater
	in a city that doesn't have a permanent company, whether it be opera, ballet or, permanent orchestra. It tries to do all things for all people.
	Ming Cho Lee (Cons.): If the purpose of the theater is not made clear from the beginning, you end up with what is prevelant throughout this country – the stages work, but not particularly well for any one thing.
	Rubin (Cons.): My experience has been that where something has gone wrong with the building, the building program, it's because the program was never really determined to begin with, because the owner said, "I want to build a structure for the performing arts, or the fine arts," and he never really enlarged upon it. Then the architect proceeded to try and drag out of him
	what facilities were to be in this building, and out of all that a program was set and published and

agreed upon. Then a scheme was developed and then the first proposals were put together. When all this had been done, the owner woke up and realized that's not what he really wanted, or that he wanted something else.

Feder (Cons.): The key thing is, "What kind of theater, fellas?" For what purpose? If you build a 16-cylinder Cadillac, you have one problem; if you build a compact, you have another. Everyone thinks he is doing "My Fair Lady," but he is really building something with the scope, size, and shape of a restroom.

Why is it difficult for the client to specify his wants and needs? Isn't he someone involved with the theater, with the performing arts; isn't he a user?

Who is the client?	 Architects and consultants (together): Our clients are: the naval bureau, President Popjoy of the University of New Mexico, the Government of Canada, a private foundation, a corporation, the municipal government of the City of Buenos Aires, the district school board and its administrators. Izenour (Cons.): There is one categorical answer to your question: The client for theaters is practically never theater people. Most theaters in this country are built by public-spirited citizens, city governments, or educational institutions.
What should be investi- gated and established in preprogramming?	 Engele (Arch.): Find out what he [the client] wants to put on the stage – whether it's drama, or music, or light musical comedy, opera, ballet, etc. And then find out how elaborate he wants to get – whether it's only a roadhouse or a permanent theater, preferably a repertory company, which unfortunately is rare in this country. Then we'll find out about the budget, the number of seats, etc. Hardy (Arch.): You want a theater? OK. You want a theater in the round, in the square, in the open, in the closed, in the up, in the down? The architect has a problem right away, just because there is no commonly accepted agreement on what the theater is these days. Just in regard to performances, there's no accepted agreement, let alone a kind of building to house it in.

If clients for theaters are generally civic bodies, governments, or private citizens interested in constructing a civic theater, it would seem they would be concerned with developing a civic user, theater group, or local tenant. This is frequently not the case, however, and the client seems not to have asked himself a basic question:

What is the purpose of the theater within the community?	Veneklasen (Cons.): Since in almost all cases the owner will be dependent for his audience upon the public, the owner group must at least be civic-minded. While this seems almost a trite thing to say, it is amazing how often this orientation must be developed.
What is culture? Is it something you can im- port, or is it home-grown?	 Engele (Arch.): If you suggest anything except a proscenium stage in this country, everybody gets very upset. They say we'll never use that, we have to bring in shows from all over the country. Percy Corry (Cons.): If you are going to have a civic theater, it must be a theater which will accept the national theater. Hugh Hunt (Director): I hope a civic theater will not merely receive tours from the national theater, but that it will produce plays that originate from it. The national theater, as far as I can see, belongs exclusively to the metropolis. Brill (Arch.): By building cultural centers and stocking them with outside culture, you're really doing what America did in the 1700's or 1800's, which is to bring in fake English, to transport everything. They started to call Chicago barbarian because they were doing something that was native, indigenous American. It may not be good or bad, but it was real and had vitality.
What are some opinions on the fate of the road show?	 Guthrie (Director): The touring theater in the United States is largely packing up. Nothing tours – nothing can afford to tour – that is not a cast-iron box-office proposition: "My Fair Lady," "West Side Story," that kind of thing. Hardly any straight plays can afford to tour. The journeys are too great. And, anyway, plays seldom do good business, because the touring theaters are so enormous. If you are sitting at the back of a theater that holds 3000 people, you don't see the actors at all, and you only hear them if their voices are relayed by a loudspeaker. It is a disappointing and dreary experience. Stone (Arch.): At the JFK center in Washington, we will be dependent on plays that originate on Broadway, and on Broadway all the theaters have proscenium stages; all the playwrights write for them, and all the designers design for them. In a repertory theater, you do something different, but where you're running a rental establishment Sööt (Cons.): The equipment should be there, so that in 10 years or whenever they can have their own company, they will have their own company. Engele (Arch.): In Washington, a few groups came in – experimental actors and avant-garde dancers who wanted a place of their own. Also, universities and student groups who would want to have something different from just a proscenium stage; so we added an experimental theater.

Franzen (Arch.): The experience of involvement is becoming rarer and rarer; we are all watchers. A theater becomes more of a problem than just serving the needs of a particular group of artists. As in our case, we're building part of a civic center in a booming new city. The city is the audience, the people are the audience, and they're also involved. And you try to involve them.

What is the value of community theater?

Brill (Arch.): What is exciting is that people do go to community theater to see their friends, because it doesn't cost very much; but they can also treat it as part of their lives because of that. It doesn't matter if the performance isn't top-notch. What matters is that something is happening – a spark is being generated. The whole business of these White Temples to the Muses being constructed in Los Angeles and the Midwest – just like the Government buildings in Washington – is that they have nothing to do with the human beings who use them or look at them or ride past them. There is no sense of involvement. There is something out of scale, both physically and mentally. They are the shrillest flowers of our degenerative process.

Faced with this type of client, there would seem to be three things an architect could do. First, you can say "OK boss, you want it, I'll make it," but I don't think that's functioning as an architect. Second, you can say, "I don't think you're right, let's talk about it." Then you go through this business of basic programming: impact of the community, concept of the project itself; and if that doesn't work, you can always say, "I can't do it, morally." That's the third and most drastic. But I think the salvation lies in the middle one, which is a type of education. You want to get the client personally involved in his project. He has to squeeze it out of his blood, the same way you do, because if he doesn't, he's not fulfilling his responsibility, which is a hell of a lot more than just paying for it. He felt the need in the first place. He's got to clarify the need with your help. He has to be able to re-evaluate that need from the larger viewpoint — from the community, the social viewpoint. He can't just go to Bermuda.

What have the Canadians decided about the civic center and permanent tenants?

Hendry (Exec. Director): I sat as a member of a committee to develop the functional aspect of a civic theater. On the committee were representatives of the architect, a number of potential users, certain people like myself who were assumed to have a good general knowledge of theater, and representatives of the center itself. Among the potential users, the feeling was almost unanimous that one user should have been picked as principal tenant and his wishes respected 90 per cent of the time; or that an artistic director ought to have been picked who could have been charged with the job of organizing a new company, which ought to be principal user. We have the feeling here in Canada that buildings and theater companies ought to be inseparable.

Leaving aside the question of the civic theater for a moment, the other principal client has been the educational institution. Surely this client has a user – the drama department; surely he confers with the user in this case?

What's the typical routine **Rubin** (Cons.): To give you a typical example of what happens all the time: I receive calls from in programming theaters people who say, "It's Friday. My dean has just called me and said that by Tuesday I have to for educational institusubmit a comprehensive program to his office because the president has just decided that this year tions? we're going after so many million dollars' worth of state funds for a fine arts building." Now, this is so typical that it probably happens 15 or 20 times a year. This staff may have been dreaming about this kind of project; they may have done this same kind of forced labor over the weekend several times during the course of their tenure. But at one point, though, the college president is really going to say "yes," and go through with it. So he comes up with the fact that he needs a theater that seats 750, and this, that, and the other, and the president puts a price tag on it - \$7,500,000 or \$8,000,000, or whatever - and that starts the building program. Now, that may be the last time that little man down in the department of drama is ever really in firm control of this building. He may see the plans after they've been formulated by the university

If the client is not familiar with what he wants or needs and has no knowledgeable user to dictate his requirements, whom should he turn to first to help him clarify his aims: the architect or the theater consultant?

are they are very firm at that point - by the time he really gets back into it again.

Should the client hire a consultant before he hires the architect?

Thompson (Cons.): If the client is ignorant of the requirements for his facility, then a consultant should be called in prior to calling an architect, so that at least some preliminary form of preplanning and programming has been accomplished before the architect arrives on the scene. Furthermore, the consultant – assuming he is capable of consulting in all fields of theatrical discipline – should be the owner's representative. In this way, there is a better chance of the facility being built to the owner's requirements rather than the whim or desire of an architect, as has quite often been the case.

architect or by the project architect; he may have a chance to comment on them; but the chances

Swinney (Cons.): It would certainly be advantageous if the owner hired the consultant. Not necessarily that the consultant would come in before the architect, but that he would probably be of greater service working for the owner. He would have a great deal more to say. If you are working for the architect, he is your boss. You can be the devil's advocate a great deal more easily,



How far might a consultant take programming? if you're working for another party. The owner must always have veto power. **Roche** (Arch.): If the client is going to get a consultant, they should hire him first. It seems heresy to say so, but the consultant can be useful to them in many ways the architect could not be. The group should know enough about what kind of person they want to work with. The architect should write the program, but in order for him to write an intelligent one the client has to be brought up to a certain point. This is where the consultant comes in. By talking with him, they

can begin to crystallize their ideas. P/A: There seems to be a contradiction here. The client may need a consultant, but he must know enough about what he wants to choose one. However, if he doesn't know that much, can the architect be helpful in choosing the consultant for the client?

Hutchinson (Arch.): In my judgment, the architect should be called in first, so that he may participate in the choice of consultant if there is to be one. The architect's experience may be fairly broad, and he may have some ideas as to which consultant of the many may best serve the client.

Brill (Arch.): In establishing the aims of an institution in the broadest sense, the consultant may be performing a service. The problem is that often they are not content to stop there, but actually begin to give sizes and shapes to rooms and perhaps even a budget for the job.

Rudolph (Arch.): I can conceive of a client turning to a theater consultant to program what they think should be done, but then that relationship should be complete. The architect who was commissioned and given the veto power should be in a position to say, "Yes, I think I would like to continue working with the theater consultant, that's fine"; or, "No, I really do not think I could continue to work with him."

Swinney (Cons.): The architect can contribute more to the ultimate building if he comes in early. The consultant and the architect can and should share the responsibilities in the very early stages. **Brill** (Arch.): The person who really has to work to prepare the program is the architect, because he is ultimately the one who has to cope with it. Any building which is complex is an expression of the program. He has to become intensely involved with the program itself, both on the microscopic level and on the long-range planning level. He can no longer be valuable if he's going to be called in when the program has been crystalized. The architect has often very basic questions to ask of both client and user.

Briggs (Arch.): We, the architects, normally study the over-all needs of the client, and the specific needs of all potential users in detail. We find that the very process of interviewing each organization promotes personal and group interest and cohesion among the entire community. In other words, we find ourselves doing a public relations job whether we intend to or not. But this is healthy for the realization of the over-all project.

Rudolph (Arch.): In certain circumstances, it would be wise for the consultant to write the program. But when you get a specialist, he looks at it only from his viewpoint. And there are many, many other viewpoints in regard to any building that must come into play.
Briggs (Arch.): The architect is the logical person to write the program. While many individuals are knowledgeable in many aspects of the theater, usually the architect alone is capable of interpreting the needs into square feet or dollars.

Abramovitz (Arch.): The way I'd like to do it is, I'd like to go to the people who know about the theater and have them tell me what they want, not what it will look like. Then let me go over it. I think a program grows; you can't put it on a piece of paper. They can put down what they want, and the why and how. Then you see the loopholes and you get help. Then you go through the process of trying to organize it on paper the way an architect does, and then you go back and say these things are compatible, these aren't, and the program is refined. They are not any more gifted than you are, and why should they hit it right the first time. They don't have a three-dimensional sense and they don't know what happens. That's where a good architect with a good sense of programming is necessary.

Underlying the entire discussion up to this point, there is a basic uncertainty as to what type of consultant is necessary in the preliminary stages of programming. There seems to be a general desire for a generalist but when this ideal is pursued, he turns out to be an elusive vision rather than a reality.

What is the ideal general theater consultant?

What is the architect's

contribution to program-

ming?

Weiss (Cons.): A general consultant is of the greatest value at this stage. Specialists are certainly desirable in particular instances, acoustical specialists being of prime importance, but the general consultant will do the client and the architect the most good at the outset.
 Swinney (Cons.): The consultant should examine all the possibilities and explain these to them. If they are insisting on committing themselves to a theater in the round, the consultant should

explain to them exactly what this means. Hopefully, the consultant is trained to make the owner see what he needs.

Roche (Arch.): A good consultant will not approach the problems with a set of preconceived ideas – that he thinks something should be this shape or that shape. He should just offer very constructive ideas. They will be more open-minded, and, when the architect gets on the field, will not dictate.

Is there such a person as the ideal general theater consultant?



Mielziner (Cons.): The very fact that I am not just a lighting specialist, not just a sightline specialist, not just a stagehouse designer, gives me an over-all sense of values with which I can better hope to realize a total theater.

Schlanger (Cons.): I wouldn't do a seating job now because you can't separate it from the entire thing.

A Voice (Arch.): The problem with going to a specialist is that he sees the whole plan in terms of his specialty.

Johnson (Arch.): At Lincoln Center, Schlanger was much more than a seating consultant. His title was "Consulting Theater Architect."

Hutchinson (Arch.): During the programming of one theater, we called in a general theater consultant but his views were found to be too specialized or rather limited to be acceptable to the client (the president of a college) and also to the theater director.

Hardy (Arch.): I'll tell you something else that's dangerous about consultants in working with them: They tend to be peddling a specialty, a specific point of view about something. And if they didn't start out that way, society or culture reinforces it, because the way to get established is to push some specific kind of thing. If you get back of a specific kind of seating consultant, you will find a very rigid notion of what theaters are. If you get behind a particular lighting consultant, most often – you will get some exceptions – you will get a formula. The formula is fine, perhaps, if you're designing the specific kind of theater he has in mind. But if you are trying to do something and don't even know that it could be something else, you're not going to understand that he is compromising the thing you're trying to do, and you'll end up with a dog.

Engele (Arch.): There is a whole new breed of people who really don't know enough about it but call themselves stage consultants. They are people who have been connected with set design or stage lighting, and suddenly all of them are theater consultants and claim to know everything about every aspect of it.

Veneklasen (Cons.): In very few cases has there been an over-all theater consultant. There are very, very few persons alive today who qualify for this description.

Briggs (Arch.): In our work, we have acted as the over-all theater architect.

It would appear, then, that there are very few "general theater" consultants, but there are proficient and skilled technicians who have developed, specialized, and refined certain types of stage forms for particular uses: George Izenour advocates a flexible mechanized stage; Oenslager is the dean of traditional Broadway theater; James Hull Miller specializes in the open stage; Joel Rubin knows a great deal about community and college theater. These specialists have, in fact, provided the theater with a form and tradition when the artistic user was incapable or reluctant to pursue it, or was simply absent. The question at this point is:

Does the client know that generally he is getting a specialist, not a generalist? **Rubin** (Cons.): I'm sure the owner knows, when he hires an architect, what his building is going to look like. When he hires a theater consultant, I really wonder whether he knows that he's going to get a very strong, predetermined solution. Certain consultants apply the same solution to all kinds of owner's requirements. I've seen plans that were put into theaters for women's colleges that were the same plans put into theaters for community theater groups. The exact same plan. My field is educational and community theater. I don't think I would dare consult on a legitimate road house without doing considerably more investigation or taking some good guesses as to what the trends will be in touring and professional production, because I could make disastrous mistakes very easily. I would probably refer the client to someone else. **Hardy** (Arch.): Before you go to a consultant, you ought to be able to say this is the kind of a building this thing is. Because people who study a technical facility obviously can play on all the notes on the piano, and if they just push them all down, then you're short-changed.

We have come back full circle to the old argument: "If the client does not know what he wants, has no user, and does not know that his consultant may be a specialist, he may end up with a Cadillac when he really needs a compact. He has two choices. One, he can make an intelligent investigation, choose as best he can, and allow the architect to review the preliminary programming in detail to determine whether it is appropriate. Second, he can get himself a user.

Is there not a need for an artistic director? A Voice (Arch.): One difficulty is that clients turn to specialists because of their technical knowledge, as a substitute for a theatrical tradition. They might consult a primarily technical man who recommends a flexible theater. The theater is not technical; it's artistic. There are many communities or universities where theaters are being built where neither have a tradition in the artistic direction; so everybody builds these flexible theaters to serve all masters. Guthrie (Director): I agree with Izenour that there is no technical reason why a theater shouldn't be ideal in all positions. It's only a matter of time before the technologist comes to that. But I think that limits – tight limits – are necessary to an artist's imagination. You must not be able to feel that you can do anything. I think more great art has depended on the artist's imagination being limited. Franzen (Arch.): Lots of people in the theater think that there's a great need for a director who

Franzen (Arch.): Lots of people in the theater think that there's a great need for a director who has an artistic point of view - to become one of the limiting factors around which the architect and some of his consultants design.

Hendry (Exec. Director): Designing theaters differs from other designing because theater is a very personal expression in art; and in no other context, except perhaps in the designing of an artist's studio, or the lab of a very specialized scientist, can I think of a need for more cooperation between main user (artistic director) and architect.

Roche (Arch.): One theater group we know of first off hired a director and stage designer, worked with them for years before starting, then began looking for an architect. By that time, they had an intelligent point of view.

Franzen (Arch.): Once there is an artistic purpose, the technical decisions can be made and you can find something that suits this direction. It always comes back to that it governs all other disciplines.

Now the question invariably pops up: Doesn't the client run into the difficulty of commissioning a theater that can be used by one person only, one director? Is that not a limited program? Everyone seems to answer his own questions:

Isn't it a pity a theater is Hendry (Exec. Director): It is a saddening realization that a theater built according to the wishes of tailored to suit one direcone artistic director will be used best by that one director in his lifetime. Others may learn to use it, but only he will use it fully. Stratford is a good example of how this works. The theater is an tor only? embodiment of Guthrie's entire personality, career wishes, philosophy.... But wasn't there a suc-Because others have accepted the context he created, the theater works as well as ever, and, in a cessor for the same theasense, continues to house a portion of his spirit. ter? Roche (Arch.): There are all kinds of theaters. Each producer, each director, each theatrical group has specific ideas about the kind of instrument they want. In any theater, it is possible to have a great deal of flexibility. In spite of that, a decision has to be made at the outset about precisely what kind of theater is wanted. Doesn't every theater man Abramovitz (Arch.): The thing that bothers me, and I don't know what to do about it, is that want something different? there is a very peculiar quality about a theater man. He always thinks the other guy stinks. I've never found two theater people agreeing that the other guy is right. When you come in as an architect, you have some interesting problems. I can finish a thing sincerely the way my group thinks, and then all of a sudden they commission another person six months later to put on a show, and he has another philosophy. And automatically certain things won't work. "That architect was stupid" . . . "The man he picked was wrong" . . . "How could he be so dumb." . . . Doesn't the architectural I would like to see the theater going in two directions – one, an exercise in how far you can go in challenge lie in finding a flexibility; the other would be to do many different kinds, done very simply. Just think how suitable form for each wonderful it would be if they had a real theater school with half a dozen permanent little boxes. specific need? Now there are people who say you ought to design for change. In theory, you can do it; in practice, it is very difficult. Right now, I'd rather do the many kinds, the different ones, because it would give you a chance to find a character for each one. This would be more emotionally satisfying to me. Assuming the client has **Guthrie** (Director): What I would demand of an architect, were it mine to be choosing somebody, procured an artistic direcwould be some philosophy of the theater that we shared, some idea of what was the purpose of

procured an artistic director, what kind of direction might the latter give the architect?



would be some philosophy of the theater that we shared, some idea of what was the purpose of the performance, and what were the sort of ideas to which the performance should aspire. Then I would set him to work to create a building in which those things could be realized. But, too often, architects pay tremendous attention to the wishes of the patron, who is probably somebody like the chancellor of a university, or the head of a county council, or the lord mayor of a big city, or somebody who is just there because he is chairman of the relevant committee (not because he is expert or even vitally interested), and he will suggest that there should be a suitable retiring room with the right facilities, and that the foyer should be handsomely decorated — irrelevancies like that. When I have seen theater-in-the-round at its best, it has produced more excitement in the audience, particularly in the 20 minutes after leaving the theater (which is the important time) than the proscenium theater at its best. [However], no one should be asked to actually sit on top of the garbage cans. The theater-in-the-round doesn't mean that they have to be breathing down each others' necks. There should be a moat — a psychological moat — if you like — which allows the actor to be close with just that gap between you.

Unfortunately, it is a utopian dream to assume that for every building project there can be a director with an inspired idea of what the theater should be. But this probably applies to every art across the board. According to Herbert Blau, director of the Repertory Theater of Lincoln Center: "There are never too many ideas around in art, architecture, or theater. One day we will have a director of vision, and an architect of vision, and then we will have a theater that nobody has imagined. In my wildest dream, I would like to have someone like Gaudí design me a building – any which way, toward organic form – and I would knock myself out trying to find out how to use it."

The buildings on the following pages are perhaps less spectacular than Gaudí, but many of them do have vision – and this has come from directors, housewives, consultants, and architects: wherever the inspiration could be found. Nearly all of them have had a clear purpose or specific user, and this has been both their springboard and – in large part – their solution.



Alley: A Director's Dream

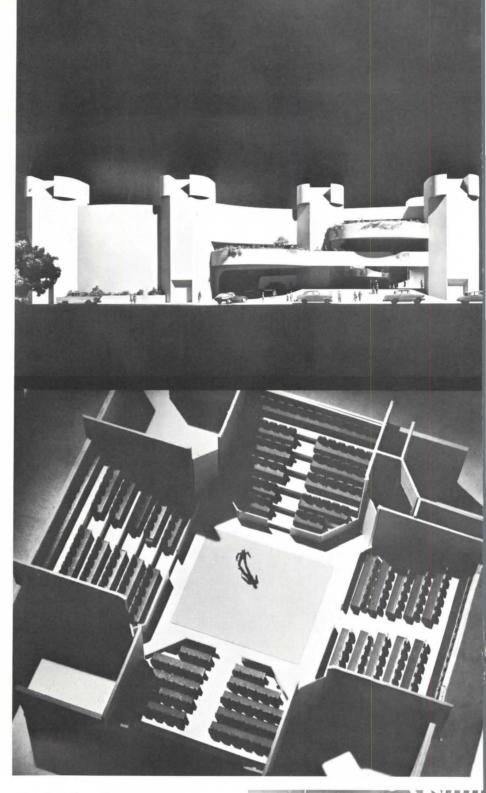
ALLEY THEATER (project), Houston, Tex. Architects: Ulrich Franzen & Associates; Associate Architects: MacKie & Kamrath. Consultants: George Izenour, Theater Equipment Engineer.

The new Alley Theater in Houston, Texas, will be a director's theater. Both the architect, Ulrich Franzen, and the consultant, George Izenour, played supporting roles to Nina Vance.

But the sympathetic support of the architect was important to the client/director because of the very nature of the theater tradition she had developed. After more than 20 years of work with a resident company in Houston, Miss Vance was well known for her skillful use of the arena stage: "In this type of theater, the actor and audience are in a single room . . . and the division of labor so common in proscenium theater, where the architect designs everything in front of the curtain and the theater designer everything in back, was neither wanted nor possible." She needed an architect with an ear, and she got herself one.

There are two theaters in the new building: one is a replica of the old theater form she had evolved in an old fan factory; the second is an experimental stage. "Although we were at complete liberty to revise and improve and reshape the old arena theater," says Franzen, "it was very difficult to do. We kept coming back to what they had developed in the fan factory; in an imperfect setting, they had evolved something which is nearly perfect for that particular artistic direction." This theater is a 300-seat arena stage. Improvements were made in the comfort of the seating and more efficient lighting.

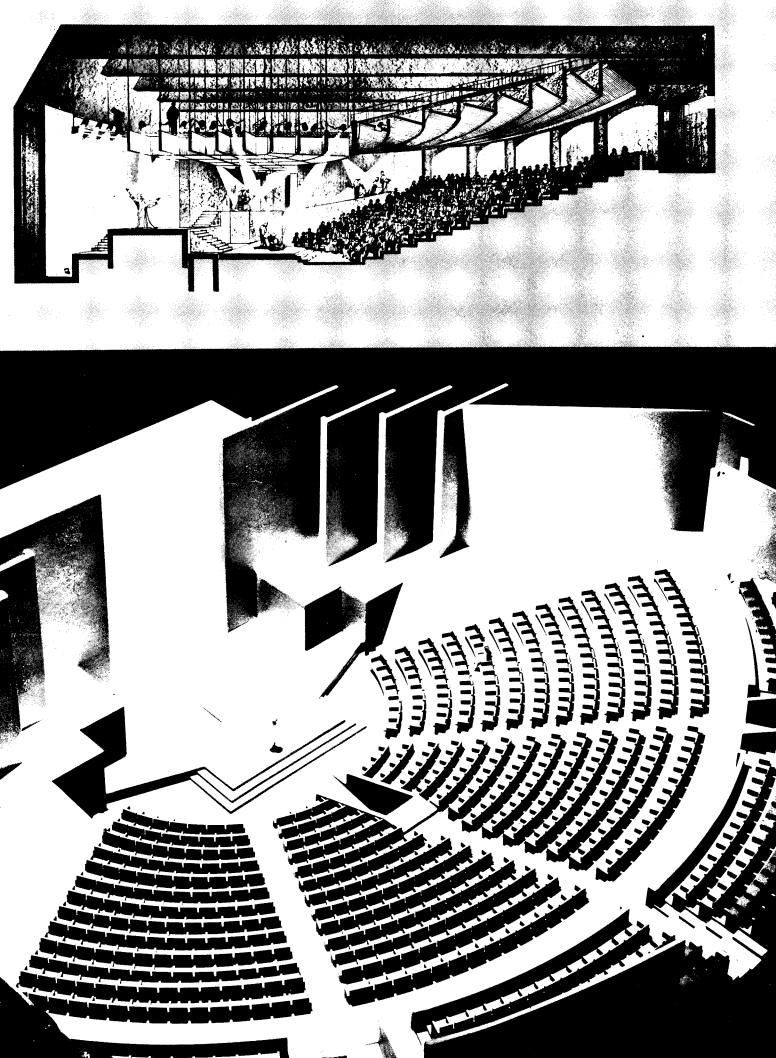
The second theater represents a search for a new tool with a larger seating capacity and a broader artistic scope. It continues the tradition of the open stage, with a close relationship between actor and audience, but it attempts to avoid the inhibitions of the theater-in-the-round form and some of the inefficiencies and lack of intimacy of many apron stages. This theater is a "multispace" stage that combines a proscenium with an open stage, and has caliper extensions; the stage in this case surrounds the audience. The 800 seats are arranged in a 90° fan-shape. Artistically, it is a theater designed to explore the poetic and theatrical possibilities of light. The stage itself is the setting; scenery is almost nonexistent. A grid suspended over all acting areas conceals nearly all the light sources from the audience but also defines the stage area and subtly separates the

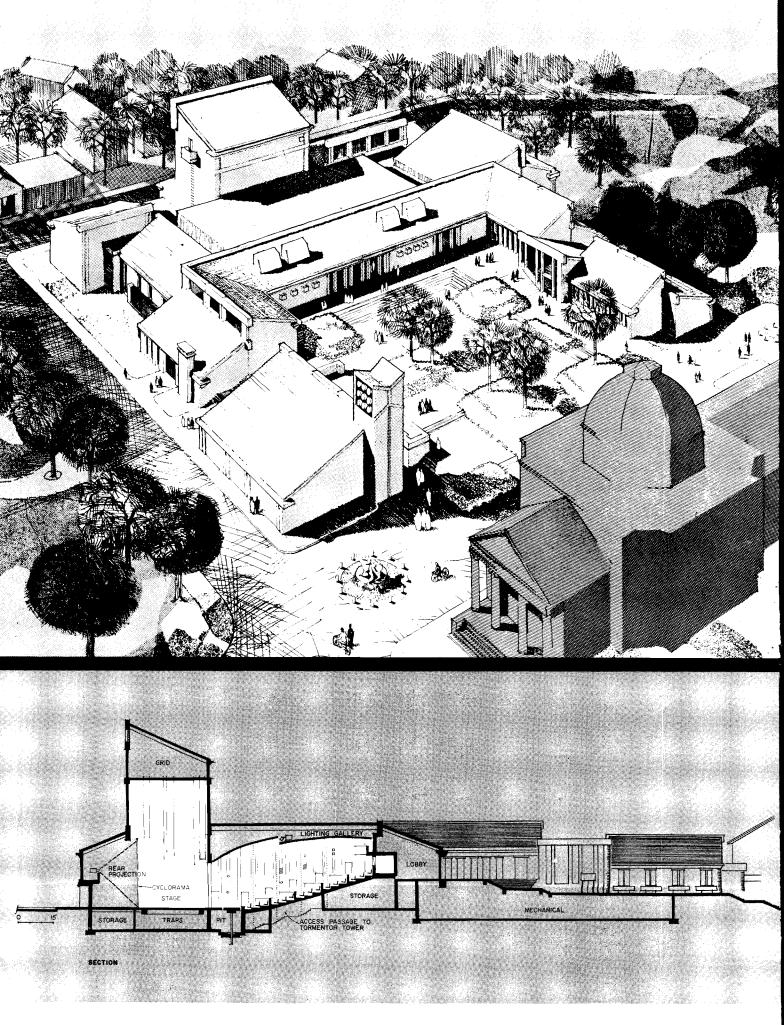


actors from the audience.

There was no attempt to design the building before the form of the two theaters had been decided on. "But theater," according to Franzen, "becomes more of a problem than just serving the needs of a particular group of artists. The city is the audience, and you try to involve them." The building was programmed to attract pedestrians during nontheater hours: An arcade, running through the building, will house stores, an inexpensive restaurant, and a café. The large-scale elements of the building, having been placed on the side of the freeway, serve to attract the attention of the approaching motorist from a considerable distance. In addition, a drive-in box office has been provided.







Smith: Finally a Faculty Finds a Tongue

SMITH COLLEGE CENTER FOR THE PERFORMING ARTS (project), Northampton, Mass. Architects: Helge Westermann/Richard Miller & Associates. Consultants: Joel Rubin, Theater; Dr. Vilhelm Lassen Jordan, Acoustics.

Smith College girls are stump-and-step sitters: In the coldest weather, at the faintest hint of sun, they are out of doors, curled up in some corner, sheltered from the wind reading, talking, cogitating.

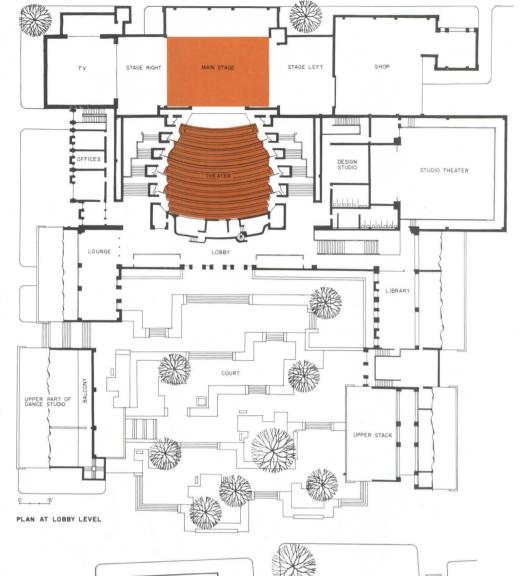
When architects Westermann and Miller were given the job of designing a theater for Smith College, they were given two programs, neither of which contained such relevant or peculiar bits of information about Smith girls. The first program, prepared by a group of management consultants, analyzed enrolment figures for 1977, outlined space requirements, and fixed a budget for the building per sq ft, on the assumption that the structure would be high-rise. Unfortunately, the consultants were not familiar with the space requirements for a theater, and the report failed to clarify the needs of the faculty.

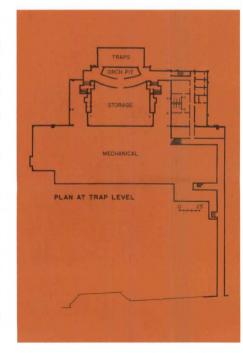
The second program, prepared by the faculty itself, outlined the basic needs of the users; but it was only the third program, prepared by the faculty and administration with the architect and consultants, which finally provided an initial analysis of the specifications, broadened them, and translated them into realistic and workable spaces. As the design proceeded, a TV studio and a music library were added to the original dance studio and two theaters: "The process of programming is inseparable from design; it never really ends," says Michael Brill, project architect.

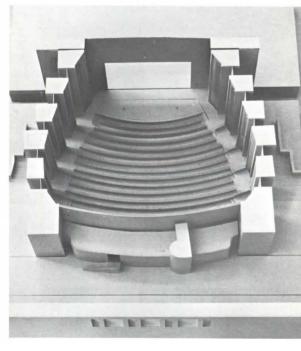
Joel Rubin, the theater consultant, helped tailor the building to the needs of a female labor force with minimum lifting loads: the major part of the rigging was mechanized, and stagehouse floors, scene shop, and TV studio were kept at ground level.

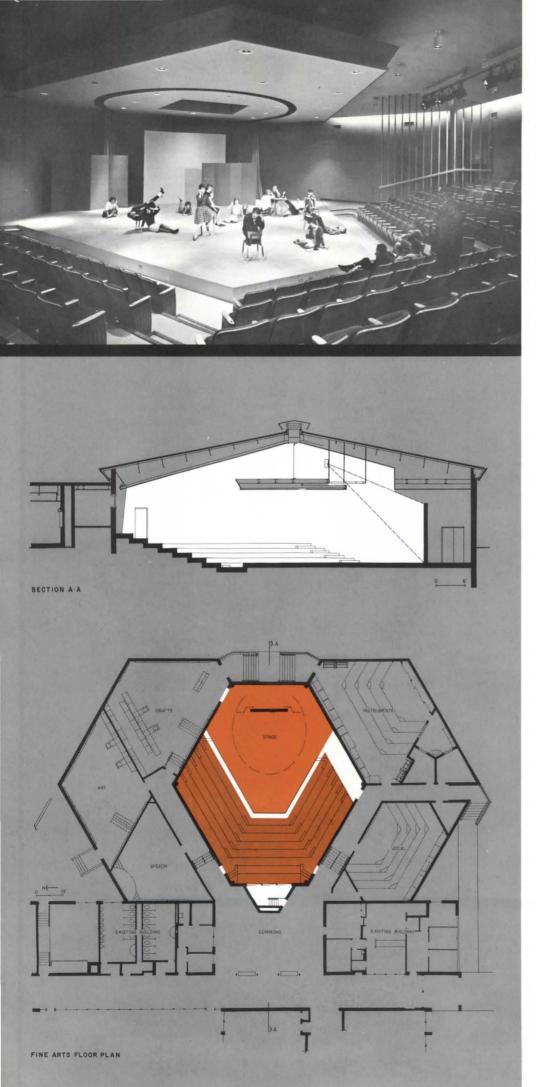
The larger theater in the complex is a 450seat proscenium stage with continental seating divided by balustrades into groups of three rows. All vertical traffic is in passageways outside the auditorium proper. The lighting "wells" between the doorways are connected by a catwalk in the basement below. A mechanically operated orchestra pit provides an apron extension. Experimentation, however, is left primarily to the studio theater, where banks of manually movable seats permit various stage forms.

The "architectural" aims of the administration were to use the theater site, which borders the town, to help define the campus limits. By keeping the different facilities in individually defined volumes and tying them together around a courtyard, it was possible to create a campus "border" along the street, as well as visually incorporating the nearby college buildings without overshadowing them. The design, which naturally expresses the complexity of the fine arts program, will also draw the stump-and-step-sitters into the area, making it a well-frequented facility.









Olathe: Consultant to the Rescue

OLATHE HIGH SCHOOL THEATER, Olathe, Kan. Architects: Shaver & Company. Consultants: James Hull Miller, Theater.

The Olathe High School Theater in Salina, Kansas, is a design that profited from the "specialty" of a consultant rather than the personal artistic requirements of a director, or a knowledgeable user. James Hull Miller, the consultant on the project, was responsible for the radical form of the auditorium—the open stage. Although this is Miller's pet form of design, it appears admirably suited to the needs of an educational facility.

At the time Olathe planned the theater, it had no permanent drama director. Wayne Fick, the superintendent of the school and the client, knew that the school was moving toward a teaching system consisting of large weekly lectures supplemented by small student-teacher classes: The theater had to be used for lectures as well as drama. Fick turned to John Shaver, an architect well known in the Midwest for his work in flexible school facilities. Shaver, who has designed some 10 educational theaters, has long been interested in guiding them toward a more usable facility. "Most educational theaters are imitations of Broadway; they are unimaginative proscenium stages with auditoriums tailored to hold the entire student body at one time-at those rare times when they are about to enter or leave the school."

For most of his projects, Shaver has hired Miller as consultant because his open stage gives an educational institution an imaginative theater facility as well as a practical and flexible one.

At Olathe, Miller's open stage is surrounded by 265 seats arranged in a 120° spread. The audience is thus closer to the actor, musician, or lecturer, and acoustics are simplified since both groups are in one room. A canopy above the stage, however, gives a degree of psychological separation not common to open stages.

A projected scenery device (a Miller specialty) is located in the canopy above the stage, together with the lights, and is reached by a simple ladder. The projection device eliminates the need for an expensive fly loft and scenery and gives the director a versatile and economic tool. At Olathe, Miller introduced a circular curtain that cuts off a rear portion of the stage; when opaque (a lighting trick), it can be used to mask a scene change; translucent, it adds depth to the stage.

The open stage does require special techniques of lighting and directing, but Miller is no build-and-run consultant. Each time he designs a new theater, he holds a workshop to instruct the potential users in the technical and artistic operation of its stage. At Olathe, the students and a community theater group met with Miller and a lighting specialist for one week, and learned a new tradition of stagecraft. From a consultant. And why not?

Ypsilanti: Zeus Strikes Housewife with a Solid Vision

YPSILANTI GREEK THEATER (project), Ypsilanti, Mich. Architects: Harry Weese & Assoc. Consultants: Eldon Elder, Theater.

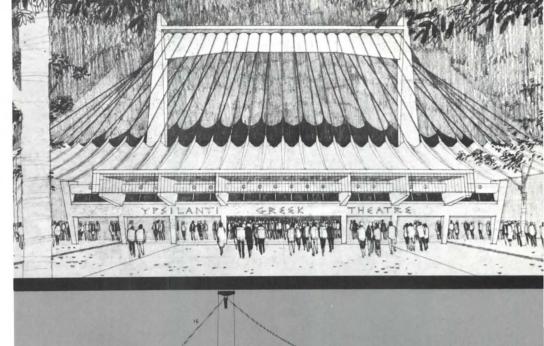
The Greek theater in Ypsilanti, Michigan, grew out of a suggestion by a local housewife and teacher, Clara Owens, at the bridge table one day: "Wouldn't it be a good idea for Ypsilanti to have a Greek theater with a festival of Greek plays?" (Ypsilanti was named after the George Washington of the Greek Revolution and thereby hangs the tie-in.) The proposal was met by the usual enthusiastic but unhelpful retort: "Good idea, why don't you do something about it?"

Many other civic projects have died at this point, but Clara Owens was probably three jumps ahead of most Bring-Culture-to-X endeavors in that she had a specific, concrete idea. She wanted a center for Greek theater in the U.S. with a repertory company that would put on contemporary translations of Greek plays. The theater would be used by local educational institutions such as the nearby Eastern Michigan University, as well as attract people from farther away. From this specific idea, she was able to proceed with astounding logic and success.

From the bridge table, she took the idea to the city council, interested the local university, and tested it out on a meeting of Greek educators in San Francisco. She formed a committee of citizens, persuaded the town to donate some land for a theater, and took herself to New York's ANTA theater to get some advice on a director. After conferring with their nominee, Alexis Solomos, director of the Greek National Theater, she hired him. Harry Weese was chosen as architect.

She also wrote to Tom Patterson, originator of the Shakespeare Festival in Ontario, to engage him as consultant and administrator. Eldon Elder, Broadway designer and also a Guggenheim student of Greek theaters, was a logical technical consultant. It was also understood he would be scene designer for the theater when it opened. Had he been called in earlier in the planning, some of the theater problems could have been ironed out before the architect had drawn up the preliminary proposals. (See below for comparison of plans.) It was one of those common procedural errors-failing to call in the users or technical consultants early enough to avoid visions and revisions.

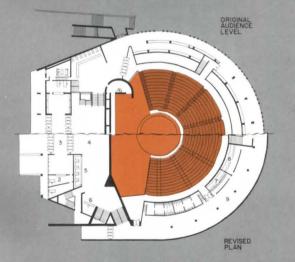
The theater that has evolved is essentially a 1900-seat Vitruvian Greek theater with a host of additions: an orchestra mounted on movable elevators, a sound-amplifications system for music, a curtain in the cross aisles to reduce the number of seats to 1000, an additional 300-seat theater, and a roof. The roof, developed by the architect, consists of cables strung from the stagehouse (making splendid use of this architecturally awkward member) down to a steel ring around the circumference of the building. The cables will support terracotta panels.

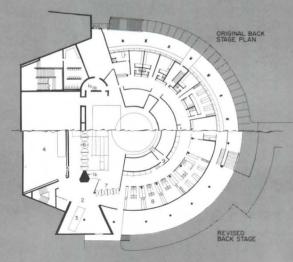


- (1) Stagehouse end walls changed (1a) to columns (1b) to save space, (Beam between columns supports roof cables.)
- (2) Wing space increased.

REVISED SECTION

- (3) Area for wagons and scene changes increased with direct access to stage.
- (4) Scenery paint shop placed on same level for direct lateral movement from stage.
- (5) Soundproof wall.
- (6) Tentative proposal for swinging panels at rear of stage.
- Actor's entry space increased. (8) Dressing rooms have flexible parti-
- tions, so sizes can be varied.
- (1) Orchestra-1900-seat theater
- Orchestra-300-seat theater
- Jacks and access to traps (3)
- (4) 1900-seat auditorium
- (5) Lighting drop lines
- (6) Control
- (7) Stage
- (8) Back stage Paint shop (moved to same level (9)
- as stage for accessibility)
- (10) Scene storage
- (11) Foyer for large theater (12) Lobby for large theater
- Staff offices (13)
- (14) **Roof compression ring**
- Suspension roof
- (15)
- (16) Open cables
- (17) Cable supporting beam
- (18) Upper gallery
- (19) Intermission gallery
- (20) Dressing rooms (21) Lobby to little theater
- (1) Audience (space between rows of seats reduced from 36 in. to 34 in., to bring spectators closer together and increase cohesion of audience)
- Tickets (2)
- (3) Foyer
- (4) Lobby
- (5) Coats
- (6) Programs
- (7) Bar
- (8) Concession
- (9) Intermission gallery





Saratoga: Two Performers in Hand Are Worth Twenty in the Bush

SAPATOGA PERFORMING ARTS CENTER (project), Saratoga Springs, N. Y. Architects and Engineers: Vollmer Associates, Partners in charge: Arnold H. Vollmer, Robert L. Rotner. Consultants: Paul S. Veneklasen & Associates, Acoustics; Robert Brannigan, Technical; Ben Schlanger, Seating and Sight Lines; Joseph Loring, Mechanical.

The idea for a performing arts center in Saratoga originated with the Saratoga Springs Commission (a division of New York State's Department of Conservation), headed by Harold G. Wilm. The center was to be an extension of a recreation area that included swimming pools, bath houses, tennis courts.

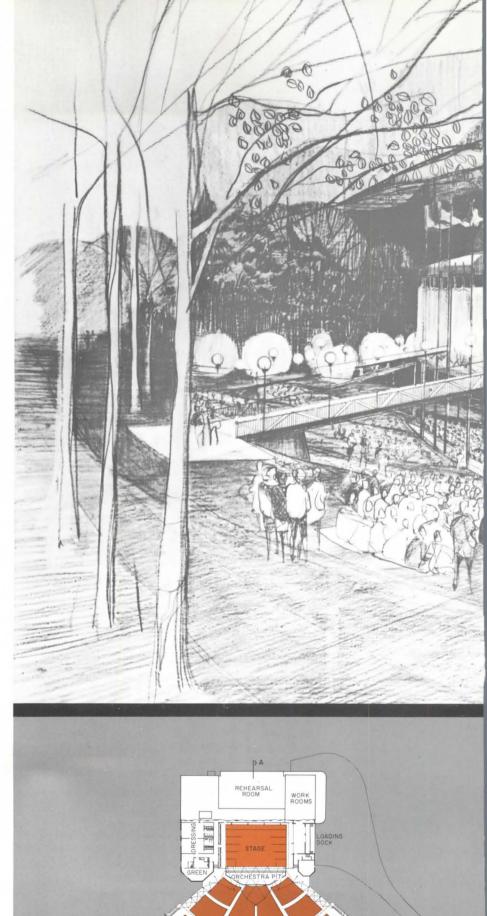
Vollmer Associates, architects and planners for the other facilities in the area, initially prepared a feasibility study for a "summer home for a ballet and orchestra company." The client wanted a semi-open-air structure, and, at this stage, Bolt, Beranek & Newman were hired to establish the maximum volume for such an auditorium—"5200 under cover, with outdeor seating for 7000."

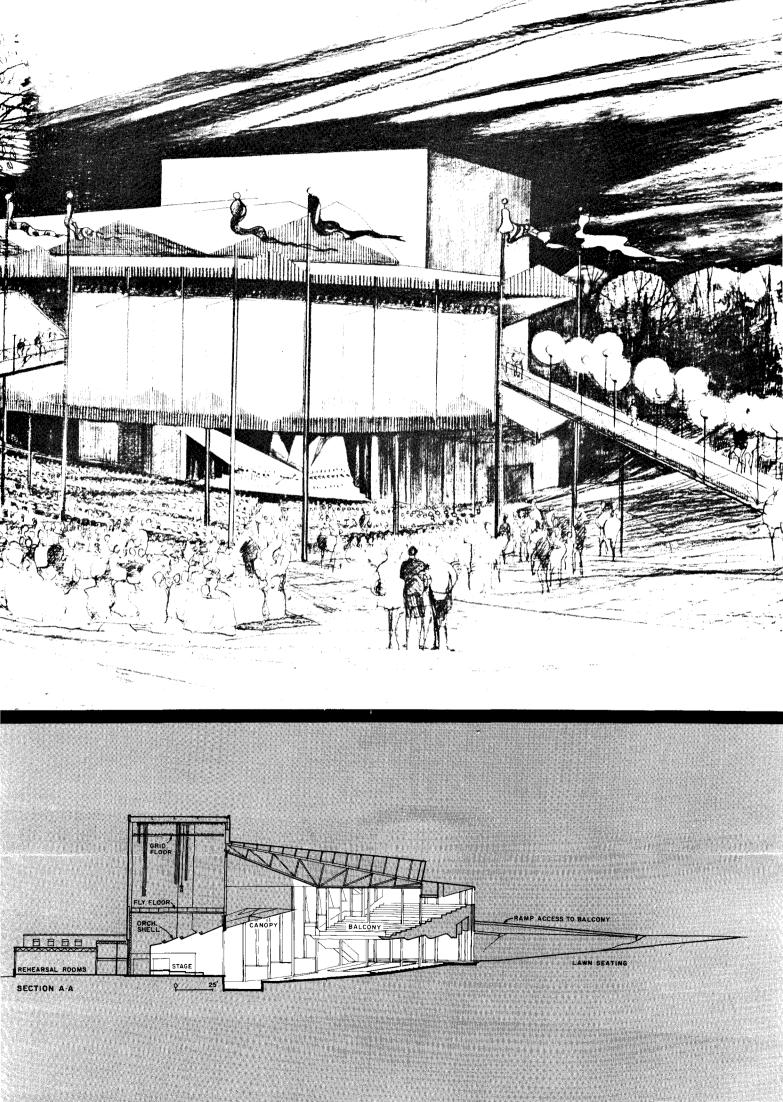
Saratoga then organized a committee, and the "client" was born. Dick Leach, formerly with Lincoln Center, was named executive director and installed himself in an office in Saratoga and one in New York that was 10 floors below the architect's. Before money could be raised, however, it was known you had to have guaranteed tenants: "Come hear the Orchestra," doesn't raise money. "Come hear the Philadelphia Orchestra" is much more successful. So the New York City Ballet and the Philadelphia Orchestra were signed up as tenants.

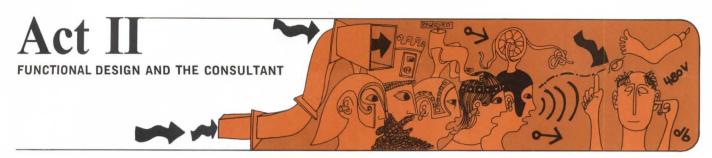
Once the identity of the users had been established, the logical consultants readily followed: Veneklasen had designed a shell for the Philharmonic; Brannigan had worked as liaison man between Philip Johnson and the Ballet at Lincoln Center.

In programming the details of the facility, a merry-go-round of conflicts and resolutions between the two users is evident and reads something like this: "The height of the stagehouse was initially determined by the ballet's needs for scene storage, but it turned out that it provided a 'necessary reverberation' for the orchestra as well. To profit from this, the top of the proscenium arch was made transonant — a mask which allows sound to pass through. However, because the hall is open at the sides, the major volume of the orchestra had to be directed outward to the audience and not be absorbed overhead. Therefore, removable panels are placed over the orchestra and an acoustical canopy projects into the hall. Luckily, this canopy provides a convenient location for the Ballet lights, since the conventional balcony position was too low to provide a proper angle and the architects were reluctant to suspend poles from the roof of their 'Architecture.'

"As with most new theaters, of course, we won't know if it will work until we've had at least one season."







Once the program has been established, the architect's job is presumably well under way. Depending on the size and complexity of the project, a general theater consultant is probably also in the picture, helping to determine the essential nature of the project and the functional interrelationships of its parts. It is now – if not before – that the technical complexities of the theater begin to become agonizingly apparent. Whatever else the theater will be, after all, it must "work." Is the architect competent to handle the various technical complexities special to theater design, or must he turn to specialists in each field? Who are these specialists? How can he determine if he needs them? How early should he decide? How does a team work together, if in fact it is a team? And what are some of the complexities of this collaborative part of the design process – complexities that are additional to the more purely technical complexities of the theater itself?

The architect obviously wants the particular theater to "work." And the point is naturally underlined by consultants who feel that only through them can the architect get a well-functioning theater. But partly because there is more to architecture than function, here may be conflict between those who want to give form and those who want to serve function.

junction, nere muy be confit	ci between those who want to give form and those who want to serve function.
Do you see theater design primarily as a problem of form, or one of function?	 Veneklasen (Cons.): I contend emphatically that successful auditorium architecture must begin with the functional requirements. The most discouraging results are those which start with some imaginative exterior form, and some of these have come from our most illustrious architects. Johnson (Arch.): Of course, a building should work. I take that part for granted. I call that the kitchen side of architecture. You can't leave it out. But if you let it run things, you'll never have a building. Rudolph (Arch.): I'm not interested in the backstage in the same way that I am in the theater itself. Just as I'm tremendously interested in what comes out of the kitchen, but I couldn't care less about the kitchen myself. I'm very happy to have the technicians do as they like, backstage. Samton (Arch.): Some of Wright's buildings don't work, and some of Kahn's, and they are among the greatest buildings we know. A building has to function; but the broader dimension of architecture has to have an equal share with function. Swinney (Cons.): It's an old idea that the way to design a theater is to begin at the front of the stage and build all ways from there. Mielziner (Cons.): Both the auditorium and the stagehouse are so irrevocably joined together that there can never be even a thought of dividing the design of this two-sided heart into two separate spheres of responsibility. Roche (Arch.): The responsibility of the architect, of course, is to make the house work, and work in every way – not just the machinery, but also the whole environment.
commission – whether the th	however, that the technical complexities of the theater make it an extremely difficult architectural heater is being compared to other building types, or whether the modern theater is being compared even with those of only a decade ago).
Why is theater design so difficult?	 Engele (Arch.): A theater is about the most complicated building you can imagine. In a hospital, there are more spatial relationships, more traffic problems. But mechanical, acoustical, air conditioning are all more difficult in the theater. A hospital still deals with normal-sized rooms, but the huge space of a theater doesn't occur anywhere else, except maybe in a church. Hardy (Arch.): Good theaters in the past were built with tradition providing their framework. You knew where the stage was, you knew where the seats were, you knew that the balcony sloped down. And you knew they had good acoustics, because the ones that worked were repeated; the ones that didn't, weren't. Rotner (Arch.): But the standards have changed today, and rightly so. Five years ago, nobody in the audience knew what acoustics were – probably some sort of hearing aid. But now ask anyone in the street, "Have you been to Philharmonic Hall?" and they'll say, "Oh, that place with the acoustics." Rubin (Cons.): During the last ten years, people have been trying to do very much more with the building type – multiform and multitype weren't spoken of so strongly until five or six years ago.

If it is not expected that the architect know all about the technical problems that are special to theater design, does he know enough? Is he realistic in appraising his knowledge? Does he need the special knowledge of a variety of consultants? Does he know that he needs them?

Does the architect know Stone (Arch.): An architect has seen a lot of theaters, thought about them, studied them. So we start off designing what we think is the proper plan.

Engele (Arch.): I'm what you might call Edward Stone's inside theater man. We also may have various consultants, but I am the man in the office who is supposed to know everything about theaters.

Rotner (Arch.): You're educated enough to know what you don't know. If you're aware that a stagehouse has a gridiron, and that you might be dealing with any one of a number of rigging systems, you're already confused enough to realize that you'd better call in somebody. Especially when you see a set of steel drawings with members 36 in. deep and 10 ft on center. That's a lot of steel – you figure it isn't just holding up the roof.

Roche (Arch.): Architects can't solve theatrical problems alone, any more than they can solve acoustical, structural, or mechanical problems alone. We might begin to know enough about it, if we took the time to produce a play, but this isn't reasonable.

Bowman (Cons.): Designing a theater requires an understanding of what the art form is all about. Architects don't tend to be theatergoers. But good architects – first-rate architects – are.

An architect will turn to various specialists for the solution of technical problems. "Consultants" range from the "general specialist" whose decisions affect the basic shape and type of house (if consulted, he will ideally have been retained early enough to participate in these decisions), to the experts who know special spaces and equipment that are neither seen nor noticed by an audience (they will also, ideally, be retained early enough to participate in the preliminary design decisions). Consultants may be engineers, manufacturers' representatives, stage designers, or others.

Who are the consultants? With what expectations and attitudes does the architect look to them?

Swinney (Cons.): The best theater consultants are the ones who have a technical orientation. **Rosenthal** (Cons.): Over the past 30 years, the general technical problems concerning theater lighting have been organized into a group of specific needs, i.e., ceiling coves, wall coves, footlight positions, flexibility, etc., and nobody questions the need for a lighting consultant. In the field of rigging and scenery technology, these parallel areas have not been sufficiently developed to be accepted as a general requirement.

Rubin (Cons.): The rigging field is in the hands of the manufacturers of rigging devices. This doesn't mean that they are less inclined to press for innovations, being allied with the manufacturers; in the past five years there has been much experimentation.

Hardy (Arch.): As programs get more complex, you will ultimately have a dressing-room consultant. What we really need, though, is a graphics consultant. Why should tickets be dull? **Thompson** (Cons.): The majority of consultants are not as knowledgeable as the architect may think. Many of them depend upon manufacturers to supply them with the information that is then transmitted verbatim to the architect.

Rotner (Arch.): You can get into trouble, using an equipment distributor as consultant. You can find yourself with a lot of equipment you don't need (and equipment gets outmoded very quickly, especially lighting) or spending a lot of money that should be spent elsewhere.

Franzen (Arch.): There are no consultants who can speak with expertise as well as sensitivity. **Stone** (Arch.): It's presumptuous to tell Donald Oenslager how to trap a stage or Abe Feder what kind of a switch panel you need. The architect isn't going to decide all these things – exactly how you fly every piece of scenery, how many traps you're going to have in the stage, the extent to which elevators are justified. One has to rely pretty heavily on their judgment.

Johnson (Arch.): That's why you have consultants – same reason you go to a doctor. But you have to have good consultants.

Acoustics, of course, is a special case, and here the discussion reaches a new decibel level. (Architects who have passed through Hunt Hall at Harvard will be interested to learn that architectural acoustics actually began when Harvard's President Eliot asked Wallace Clement Sabine in 1895 to "do something" about the acoustical problems of the new semicircular lecture room designed by Richard Morris Hunt. Judging from Hunt Hall today, it would seem that after a certain point the acoustician may not have much he can "do" in alleviating a difficult situation given him by the architect.) There are few facilities, today, that are built without benefit of acoustical advice.

Does this hold true for	First Voice (Arch.): It's just black magic, that's all.
acoustical consultants,	Second Voice (Arch.): You only hire them because it looks good to the owner; you're doing the
too?	right thing, even if you don't intend to listen to them.
	Rotner (Arch.): You can't ignore them. Can't design a theater today, paint it, carpet it, and add
	the acoustics.
	Newman (Cons.): The acoustics consultant will help the architect determine the basic shape of the enclosure of the auditorium – working in collaboration with the seating consultant, of course. The over-all dimensions of the space will be determined on the basis of the seating capacity and the reverberation time to be achieved.
	 Rubin (Cons.): Most theater consultants exclude acoustics as part of their intended field of concentration. And with one exception, no acoustical consultant renders additional services (although they sometimes feel they should be offering more). Hardy (Arch.): I heard an acoustical man read a paper at a conference as if he were a scientist. He's not, he's a technician.
	Schlanger (Cons.): It is still a subjective field – different people like different qualities in sound.

Abramovitz (Arch.): They don't have an absolute science any more than we do.

Samton (Arch.): An acoustical consultant is useless on a small building. Any architect knows the rules of thumb if he's been awake at all in any physics class.

Rudolph (Arch.): Out of self-defense, you have to know acoustics. It's a matter of asking very specific questions. You know what you want. If you don't get it, you get another consultant.

Knudsen (Cons.): The use of optical and acoustical models is outside the purview of the architect, and such studies can be performed satisfactorily only by a competent acoustician with adequate laboratory facilities.

Stone (Arch.): We're going to make these concert halls so beautiful that people won't give a damn whether they can hear or not.

The rise of consultants, in areas other than the traditional mechanical-structural-electrical ones, has resulted in a whole new team from what has existed previously, a whole new system of professional relationships.

team from what has existed previously, a whole new system of professional relationships.		
How do you, as architects, see your role on this team of specialists?	 Johnson (Arch.): The architect should do the whole thing, then get the consultants to do their part. Roche (Arch.): The architect gets to exercise his administrative ability. But this isn't necessarily anything that is seen, when the whole thing is finished. Franzen (Arch.): An engineer ties the strings onto the instrument, but the general configuration of the instrument is the job of the architect. Briggs (Arch.): This is not, in any way, intended to belittle the importance of their contributions, but few technical consultants would want the responsibility of coordinating the complex process of constructing a building, which is the architect's job. Hardy (Arch.): Someone has to keep all this mess together. I don't see how anyone except an architect can do this – with the kind of training a good one gets. Rudolph (Arch.): I'm all for listening to specialists, but that doesn't mean the art of architecture must be forgotten. Of course, it's no good asking a consultant to work with you and then not giving him every opportunity to function, to see the job through. My point is that architects should be in control of the situation. There are already too many things that are out of our control. I know I sound autocratic about this. But I'm against the idea of "The Team" being the only way to produce architecture, because it means that it is always someone else's fault. I think we have to be responsible. I'm against all this Kafka-like "no one is there." Abramovitz (Arch.): There are a great variety of creative people in the theater, each of them creative in their own way — the public, the manager, the playwright, the technicians. But the architect is being creative, too, when he selects his team On a hospital, there often is a consultant working with the doctors; I haven't done this in theaters, and I wouldn't want to, because that would really be giving my job away. I like to know what everyone is thinking and why. If a strong man comes in between,	
That makes an overwhelm- ing case for the architect. Do you, as consultants, agree with this evaluation of the architect's role?	 Knudsen (Cons.): The architect should be the final authority and decision-maker. Sööt (Cons.): The architect is responsible for the whole project. The basic idea comes from the architect – the consultant is there to see that it works. Hendry (Exec. Director): Within his own area, the architect ought to be a humble dictator. Schlanger (Cons.): Why shouldn't the executive architect have control. He is merely getting the help of a consultant, and shouldn't be subordinate to him. It would be drastic if the consulting architect took over and the architect may into a difficult problem in the design of an auditorium – creating a space that will be pleasant on arrival, that will let the audience "participate" in the performance on stage, that will let them see and hear without being aware of the mechanics of achieving good seeing and hearing, and in which they will be comfortable and not annoyed by drafts, by people passing back and forth in front of them, having to get up each time someone wants to get in or out, etc. This total integration can be achieved by the architect, but only if he incorporates into his design the essentials of what his advisers tell him. Feder (Cons.): I don't know of any battles fought without generals. But in the course of the chain of command, the specialist must be responsible for what he does, too. 	

Sooner or later there may be conflict – between different specialists, or between the architect and any of the consultants. The architect's problem is then one of evaluating complex data and proposals in fields where he lacks full technical knowledge himself.

Whose word should prevail in areas of disagreement? How much latitude does the architect, in fact, have? Snibbe (Arch.): An architect who doesn't follow his consultant's advice on technical questions is out of his mind. Most of the time, the aesthetics of the building and the technical requirements can be integrated into a common solution if there is the will to work together.
Hendry (Exec. Director): I don't think the architect need follow anything but his artistic conscience; but this is an organ greatly in need of development in many individuals.
Johnson (Arch.): The architect should win, of course. I did, with the baffles in my theater. I didn't

want those clouds, and I said I'll get an acoustical consultant who will design a ceiling without clouds. And for every consultant who said I'd have to have them, I'd go to another one, until I found a consultant who said I *didn't* have to have them.

Stone (Arch.): Either by brow-beating or by humor, I seem to be able to work with all these experts, and end up friendly. You have to ride with the punches. It is your job to find out when to compromise. We reshaped all our auditoriums to meet acoustical requirements.

Rotner (Arch.): You have to consider all their suggestions, or you won't get new solutions. But there's no reason to think you must incorporate everything a consultant offers.

Hardy (Arch.): It's absurd, today – you get somebody who is an architect and you get somebody who is an acoustician; they're both designing shapes at each other, and they get together and they both say, "I don't like your shapes, mine are prettier." Nonsense.

Abramovitz (Arch.): The architect has to know enough about their fields to ask questions – Are there other ways of doing this? – but also has to know enough to feel that something is wrong. If they are honest, they will admit that there is a lot of variance, and that they're not as sure as they pretend to be. I can get into a hell of an argument with a consultant, but can't really get angry if he's sincere. I want honest consultants, whether they agree with me or not.

Woollen (Arch.): Indeed, the consultant is still quite valuable when you might ultimately reject some advice, for he has caused you to re-evaluate what you might have taken for granted.

Passonneau (Arch.): An architect is an "expert" himself and he therefore knows how imperfect is the advice of "experts."

Hutchinson (Arch.): The architect shouldn't blindly accept the solutions and ideas of the consultant any more than he holds the client's views to be absolutely sacred.

Franzen (Arch.): The architect is strong and knowledgeable, as much as any consultant. We can be just as wrong as somebody else, but generally we won't be.

Samton (Arch.): Sometimes it can be a matter of scale: How does the person look on stage, for instance, rather than the size of the proscenium opening per se. It may not be so much a technical question as an aesthetic one. We should please ourselves, rather than any of the consultants. **Stone** (Arch.): You have to act as referee. Yet, when an acoustical engineer says that something "looks better acoustically," we have to laugh. If they're going to judge by the same criteria we reserve for ourselves, we're going to do it *our* way.

Some of the conflict may lie in the very nature of specialization. Any specialty views its own world with greatest perception and most fondness.

Is the inevitable narrowness of specialization a cause of some of the conflict?



Do consultants agree?

Can you offer advice to the architect about the occasionally disastrous effects of his decisions? **Samton** (Arch.): The consultant always wants the ideal situation for him. If you had to do this, your whole building would end up as a frame for lighting.

Abramovitz (Arch.): Theater people are so intense in their certain areas that they have blinders. But a man with blinders sometimes goes farther in one direction than a man who sees many sides of the picture. It's the architect's job to be big enough to absorb the peculiar blinders that special people, almost as a rule, have. An architect has to pull all these people together; he has everyone angry at him. If you give everyone a little piece, and make it peaceful, you have a neutral house where no one can hit a high point. If you hit a high point in one, you get a low point in the other. **Hardy** (Arch.): Behind each specialist is a rigid formula. This is OK if you're designing the specific kind of theater he has in mind. But if you don't even know that it could be something else, you don't understand that he is compromising the whole thing. Every consultant, whether he says so or not, comes with a specific point of view — or he can't be any good as a human being. It's nonsense to think that because you've hired an acoustician, you are suddenly going to have all that taken care of. You're not, you're just going to get a point of view on it.

Swinney (Cons.): If a consultant is a working technician, he will naturally have certain preferences, but if he tries to operate fairly with the client he will attempt to avoid influencing him. **Newman** (Cons.): Each specialist involved in the design of an auditorium *must* realize he is going to have to compromise many of his ideal requirements in the interest of a total design. The acoustics man will have to give to the lighting man and vice versa. The mechanical equipment design will certainly be influenced by acoustics and perhaps by lighting requirements, and so on. The consultant is particularly sensitive to the ways in which an architect, either willfully or through ignorance, may compromise a work.

Newman (Cons.): The speed of sound and the directional sensitivity of human ears cannot be altered by the whim of the architect.

Veneklasen (Cons.): The architect can make acoustical success impossible if he proceeds too far before we are called in to assist with the design. Another misfortune is that engineers and architects do not, in general, thoroughly investigate auditoriums – both old and new – before designing; it is even more regrettable that they do not go back into their own auditoriums, especially during performances, to evaluate what they have achieved.

Weiss (Cons.): As a consultant who has tried to assist clients dissatisfied with the architect's work, I can attest to the problems the architect can create. In all cases with which I have been involved, the architect had *not* had the services of a consultant. In one instance, the architect had taken advantage of the space overhead at the sides of the stage to locate the air-handling equipment, thereby limiting the use of this otherwise valuable scene-shifting space. Often, the architect has

short-changed the lighting of the theater by not providing adequate facilities for mounting or operating lighting equipment over the auditorium. This is a mistake that is so often made because of an architect's ignorance that stage lighting is constantly reset from production to production, making easy access to the equipment essential. This assumes, of course, that he has provided a location for such lighting. One almost assumes that an architect considers footlights such a clear symbol of the theater that it suffices for all theater needs.

Does the architect also have his gripes about the ways in which the consultant operates?



Rotner (Arch.): There's a great communication problem. Consultants give you information in another language. They give you charts and say "beta, gamma, delta, tangent, and radius," and, "We've got it." Then, as you develop the acoustics into architecture, if you change it and it doesn't work perfectly (because you wanted to make it into architecture), they say, "See, I told you so." **Stone** (Arch.): The temptation is for every consultant to show everything he knows. They won't be simple, disarming, natural.

Johnson (Arch.): Most of my consultants complain they don't get enough credit. But that's the way of consultants.

Roche (Arch.): A consultant should never say what it has to look like; he should just tell you the problems.

Hardy (Arch.): The problems I've had haven't been with theater consultants or with acoustical people, but with mechanical types. They're often just greedy people, with no discipline at all. It's wrong to say that so much of the budget is mechanical, and just throw it away.... You should go to all consultants and force them to think – to ask them questions, not go with open arms and say, "Make it acoustical."

The consultant responds, urging a give-and-take collaboration of "continuous modification." **Rubin** (Cons.): Once I explain the theatrical necessity for some suggestion, very few architects are going to object. If the architect says he doesn't want his stagehouse loft to be twice the height of the proscenium, for instance, which is the rule-of-thumb generally used, you point out the problems — not that the facility will be unusable, but that it will be usable with more difficulty.... The problems come when the scheme is developed, and the form is there, and you're trying to make it work as a theatrical structure. When the architect then says he can't do something, you try to make the best of it.

Brannigan (Cons.): We learn to adjust; we earn a living adjusting.

Sööt (Cons.): No theater was ever built where the decisions were made beforehand, and then you built a movable structure to fit these decisions. It is a process of continuous modification. *Finally, a defense of the architect, by a consultant:*

Rubin (Cons.): If you're in the picture early enough, he will rarely cut you back.

And of the consultant, by an architect:

Briggs (Arch.): Good consultants have no desire to dictate to the detriment of the finished product.

Yet when the finished product is less than all had hoped for, there are recriminations.

Who gets the blame? Whose fault do you think it is?	Johnson (Arch.): It's the fault of the people who know about these things. I can't possibly know all there is to know about stage design, about stage equipment. I may be at fault for picking a perfectly lousy set of consultants, though.
11 13.	Weiss (Cons.): All too often, a bad job is blamed entirely on the architect, sometimes rightfully, sometimes not. He can protect himself from the client, as it were, by consultation.
	Rubin (Cons.): The buildings getting most of the criticism have never had the benefit of responsible consultation, or a responsible owner who was prepared to say what he needed.

Obviously there are technical problems in the theater that have not yet been solved, and there are certainly inadequate answers to the questions now being posed. Consultants are among the first to admit this.

What are some of these unsolved or unposed ques- tions?	 Veneklasen (Cons.): In general, auditoriums are becoming larger, a fact basically dictated by the economics of the performing arts. This is in many ways unfortunate, because several problems are greatly exaggerated. The achievement of visual intimacy for stage performances is most difficult and most needing of solution. Izenour (Cons.): There is no dearth of ideas in the theater, but where the whole thing comes apart is in the execution of them in the building process. There seem presently to be two schools of thought in this business: (1) the complete romantics who philosophize verbally and in the press, and (2) the engineering-scientific approach that believes in things working. I belong to the latter school, and feel that the theater as buildings won't get very far in this age until those things that require engineering answers are subject to that kind of rigorous discipline.
What about the sources of information?	 Rubin (Cons.): There is little basic research, no records of operation. Information is lost when you can't find out how the consultant came to his conclusions; you can only take it off the plans. Hardy (Arch.): There ought to be somewhere to go to find out what the words mean. The consultant can tend to make a mystique of these things. Veneklasen (Cons.): Unfortunately, to my knowledge, there is no really authoritative guide or textbook to many of the problems of auditorium design.

Various educational proposals are being undertaken. The AIA Committee on Auditorium and Theater Architecture is exploring the possibility of assisting the architectural schools with the conduct of student problems in design of performing-arts buildings. A first step in this direction, in fact (not from the AIA but from the USITT), will be the design problem given to third-year architectural students at Pratt Institute this spring with the assistance of USITT members. But although the primary emphasis of the Pratt problem will be on programming, the working out of the design problem will have obvious educational value to the students in their collaboration with technical people, and in their access to the knowledge and point of view of the consultant. And for the consultant, George Izenour's program in theater engineering at Yale is a first step.

What is Yale's degree program for theater consultants? **Izenour** (Cons.): Since the time the degree program was established – three years ago – we have had three students complete the program for the degree: a masters of fine arts in theater engineering. The program works like this: The first year is spent in the drama school, taking the basic courses required of all graduates of the school. The student then specializes in his chosen field of electrical-electronic engineering, mechanical engineering, or structural engineering for the next two years. He then does a thesis, which must be designed and executed in the electro-mechanical laboratory of the drama school and which is supervised by the staff members. This is either a full-scale model of a control device, a test model of a structural system, or similar project. (The laboratory consists of a complete experimental model machine shop and fully instrumented electronics laboratory.) This idea is beginning to catch on in a small way. At present we have five students, and two more will enter next year.

An architect offers an idea for the training of one specialist:

Abramovitz (Arch.): What I would do to train an acoustician is to find someone who knows music, maybe who flunked out of Juilliard. Then I could be damned sure he could hear. I find a lot who don't hear, who don't really know what they are hearing. Then I would try to find someone who had a sense of the third dimension.

And a consultant suggests a complete revision of the architectural and engineering education: **Skilling** (Cons.): Many architects feel they have no sense of communication with technologists. This is not necessarily the fault of architects but perhaps of the technologist – and, basically, it is the fault of the educational system. Education is the key. Schools should offer joint courses for all technologists and architects together so that they can learn to talk to each other.

A major item of information that is difficult to obtain is the name of a competent consultant. The USITT is seeking to remedy this, with a list of consultants now in preparation. In the meantime, architects find consultants in various ways.

How can an architect find the appropriate consultants?



Should the architect himself, perhaps, become a specialist, only doing theaters? **Peña** (Arch.): Through magazine articles by or about consultants. **Passonneau** (Arch.): We asked dozens of people for recommendations.

Fisher (Cons.): I would recommend using people for recommendations. **Fisher** (Cons.): I would recommend using people who spend part of their time actually working in the theater. Lighting and scenic designers who are employed in the commercial theater, as well as being consultants, bring an up-to-date outlook of the theater needs of today and tomorrow. **Jewell** (Cons.): For educational building, ask the American Educational Theater Association. **Miller** (Cons.): I don't know how an architect can find an appropriate consultant, other than by word-of-mouth or published articles. AETA and USITT aren't making this job any easier at the present time. I have always advocated the consultant listed writing his own "credo" in a concise paragraph and have resisted numerous attempts of the publishing institution to set up safeguards and certifications.

Weiss (Cons.): Look up buildings of the type you have in mind and find out who consulted on them. Hardy (Arch.): They ought to have labels on them, even within each specialty. Every note of the piano is in a different place. You choose how to play them, based on what they are. Burris-Meyer (Cons.): Get the authority who wrote the book.

Rubin (Cons.): It would be marvelous, for the sake of the theater. When an architect arrives at a certain level of understanding, he's willing to open up the question again and see if he can't make progress with the next one. Also, if he's done a theater before, he can accept many things without discussion.

Rotner (Arch.): But there are so many different types of theaters, that the next one might be entirely different, perhaps wouldn't even require the same approach.

Hardy (Arch.): With one man seeking to refine and refine, wouldn't we be setting up what we're all against? The necessity for ordering things, providing some kind of framework, is demanded by human beings, but to establish it as a list of rules is impossible. They did all that in the 19th-Century.

There are undoubtedly "do's" and "don'ts" that both architects and consultants could suggest to others embarking on a specific type of theater, but the detailed problems that might arise in any specific collaboration between architects and consultants are too numerous to catalog here. Perhaps the one single piece of advice, often repeated, is that the consultants (number and type to depend on the size and type of the project) be engaged as early in the proceedings as possible. It goes without saying that no matter when the collaboration begins, it will be enhanced by a respect between all parties and a genuine effort to understand their conflicting aims and their common purposes. The projects on the following pages are illustrative of various technical problems that have been solved through successful collaboration between owner, user, architect, and consultant.



Texas: Client Draws the Plan

EXPERIMENTAL THEATER, UNIVERSITY OF TEXAS, Austin, Tex. Consulting Architects: Jessen, Jessen, Millhouse & Greeven; Associate Architect: Bartlett Cocke. Consultants: Building Committee of the Department of Drama (Loren Winship, Francis Hodge, James Moll, John Rothgeb, Neil Whiting).

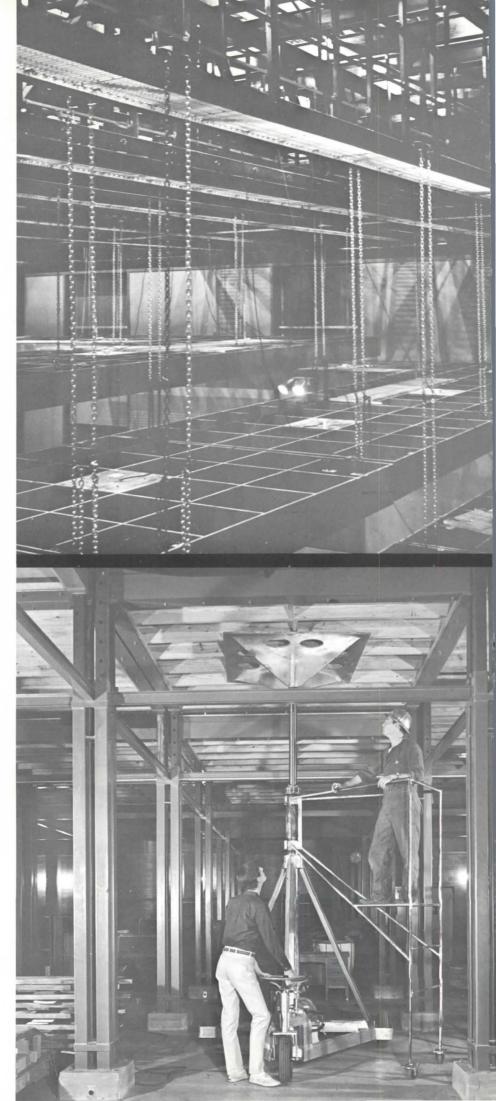
In this unusual formula for a "collaboration," the user = the client = the consultant, and the architect is only slightly > 0.

The 350-seat "experimental" theater in the new drama building of the University of Texas was designed by faculty members of the drama department who have served for many years in their locale as theater consultants. (On this project, they had what they call "consulting architects who designed the building from our ground plan.")

The aim of this experimental facility was no less than "total flexibility"-the ability to change wall, ceiling, and floor to meet any stage form a director might design, and to vary the stage-audience relationships through a broad range of possibilities. Essentially, the theater is a square box 60 ft on each side. the whole divided into 36 modules 10 ft square. While it was in the design stage, Dr. Loren Winship, chairman of the drama department, described the project as proposed: "The 10' x 10' floor segments will raise 3 ft above floor level, lower 2 ft below floor level, changing the level manually by means of hydraulic jacks. The ceiling segments will be raised or lowered independently or in groups by an electric winch system (Izenour's system, but the egg-crate ceiling was designed by our staff, and the whole theater was actually designed quite independently of Izenour). Above the egg-crate sections-or below, if desired-will be pipes and lines that can be located anywhere in the ceiling, thus permitting us to change locations of temporary walls (drapes, scenery, etc.)."

Now in operation, the theater can indeed provide the many forms and relationships anticipated. The ceiling mechanism, however, was not installed as planned. (The sole manufacturer went bankrupt; another, in the process of developing the same equipment, entered a bid that was too high for the school to afford, at present.) It is thus possible to adjust the ceiling only manually with block and tackle, and with difficulty. The floor sections are also changed manually, by means of a simple jack that moves on casters.

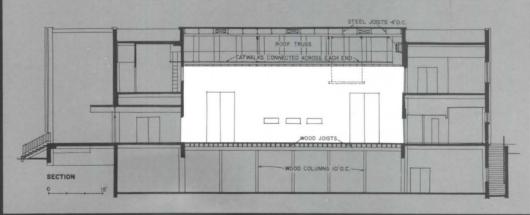
Doors on three sides of the theater extend the full height of the theater, permitting entrances from either the first or second floors. The entire theater is enclosed by double walls that have an outside measurement of 24 in.

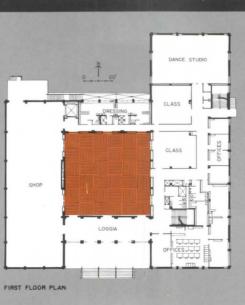


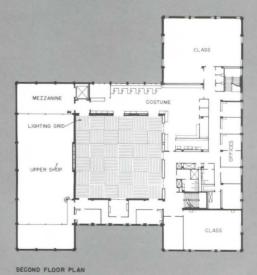














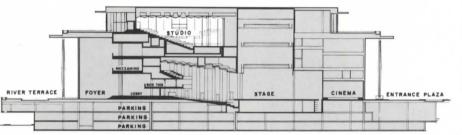
JOHN F. KENNEDY CENTER FOR THE PERFORM-ING ARTS, Washington, D. C. Architect:

Kennedy: Riding with the Punches

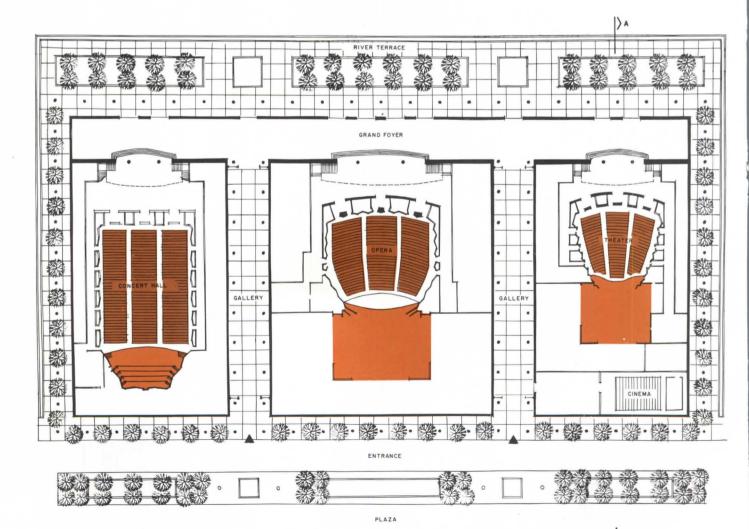
Edward Durell Stone. Consultants: Donald Oenslager, Stages; Ben Schlanger, Seating and Sight Lines; Cyril Harris, Acoustics; Olaf Sööt, Stage Machinery; Abe Feder, Lighting; Syska & Hennessey, Mechanical; Severud-Elstad-Kreuger, Structure.

Kennedy Center, a collection of five theater facilities in one building, was initiated by civic-minded Washingtonians, in conjunction with local managers and artistic directors, so that the nation's capital can house all the performing arts and make state occasions of performances.

Roger L. Stevens, the distinguished Broadway producer who is chairman of the Center, consulted potential users from all over the country, as well as local musical and theatrical groups, about their needs. But since none is to be provided a permanent home there, each facility was designed not for a



SECTION A.A



specific resident user but as an ideal theater for visiting performing groups.

The facilities deemed necessary to house all the performing arts adequately include: an opera house, a symphony hall, a proscenium playhouse, a multiform theater for intimate drama, and a movie house.

Edward Stone has been designing theaters ever since he worked on the Radio City Music Hall. In his office is architect Max Engele, who has worked on theaters here and in Europe, including the Salzburg Festspielhaus (designed by Clemens Holzmeister) and Stone's "Ideal Theater" project for the Ford Foundation. So the architects are hardly unknowing about theater design.

Nevertheless, a rajt of consultants has been assembled to perject what has been called one of the most over-consulted buildings in the country.

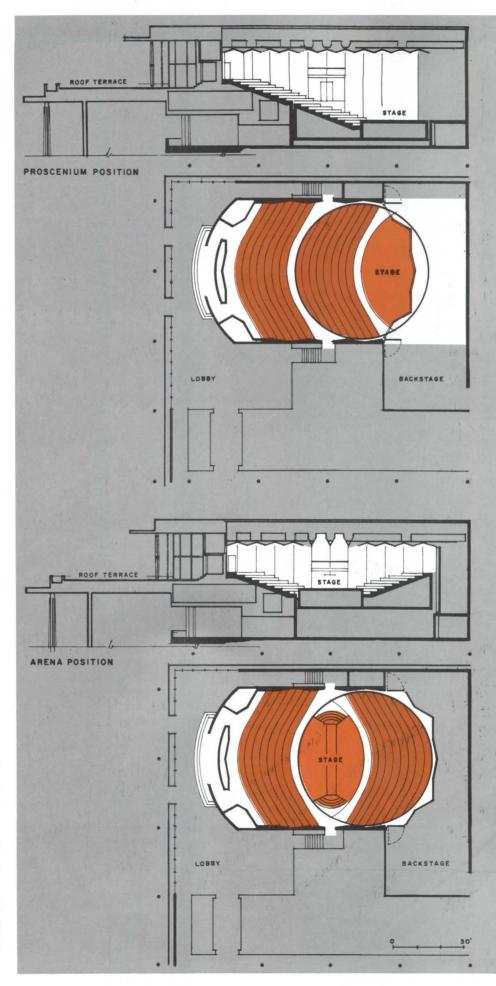
Stone, whose aim is "to make complicated things seem simple," wanted to give everyone what was wanted. About his consultants, with whom there has been exemplary give-andtake (including altering the shape of two halls), Stone says, "You can't say categorically, 'It's got to be this shape.' You have got to be able to ride with the punches."

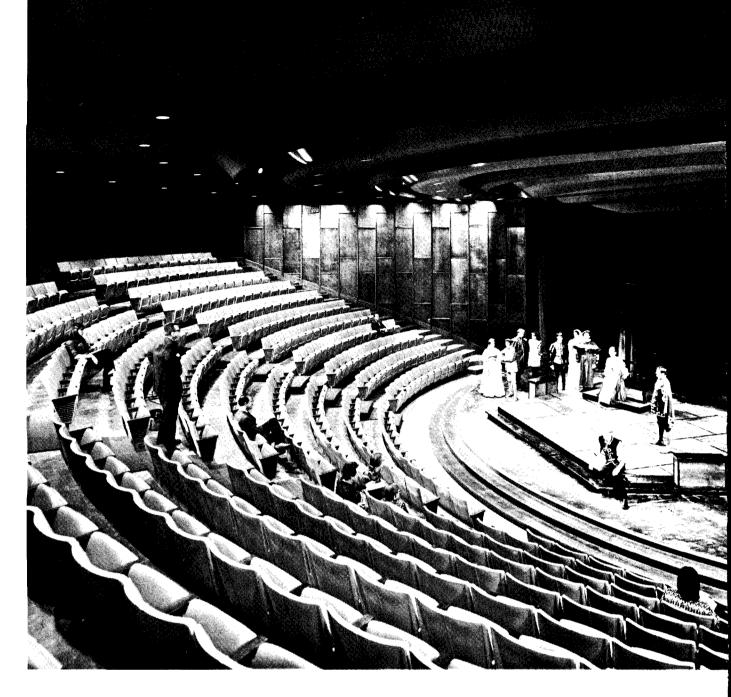
The 2200-seat proscenium opera house has an auditorium with halls of convex panels, which are to be covered in red silk, and red plush upholstery. Project architect Page Donhauser describes how the flexible proscenium can become a consistent fourth wall when the auditorium is used for inaugural balls. "The auditorium is designed as a room," he explains.

The 2750-seat music hall is a recreation of Boston's Symphony Hall, which is considered one of the best in the country: white-and-gilt walls, red upholstery, a Waterford chandelier. Acoustically also, this seems safe.

The 1150-seat proscenium theater, which is designed for traditional Broadway productions, will have walls of wood panels.

"The jewel of the project so far as theater engineering is concerned," says Olaf Sööt, "is the Studio Theater"-a 510-seat hall planned for intimate drama. This theater has a multiform stage that is mechanically changeable by means of a turntable, which is operated on eight jackscrews; proscenium, openthrust, and a combination of the two, as well as arena, can each be achieved. Derived from the Gropius Totaltheater plan, the turntable carries both the front half of the prosceniumplan audience and the open-thrust stage; when the table is revolved, the open stage becomes an arena. Furthermore, the turntable lifts when revolved, so that the audience seating is at consistent levels on opposite sides of the section; the top of the proscenium arch then becomes the jourth wood-paneled wall of the arena auditorium. "Our intention," Max Engele explains, "was to design a multiform house that does not look like a multiform house: when it is arranged as an arena theater, no one would think it could be anything but an arena theater." The scheme promises to be one of the most successful designs for all the different stage arrangements.





Knox: Turning the Table

FINE ARTS CENTER, KNOX COLLEGE, Galesburg, Ill. Architects: The Perkins & Will Partnership. Consultants: Bolt, Beranek & Newman, Acoustics: Dr. Walter S. Dewey, Rigging and Lighting.

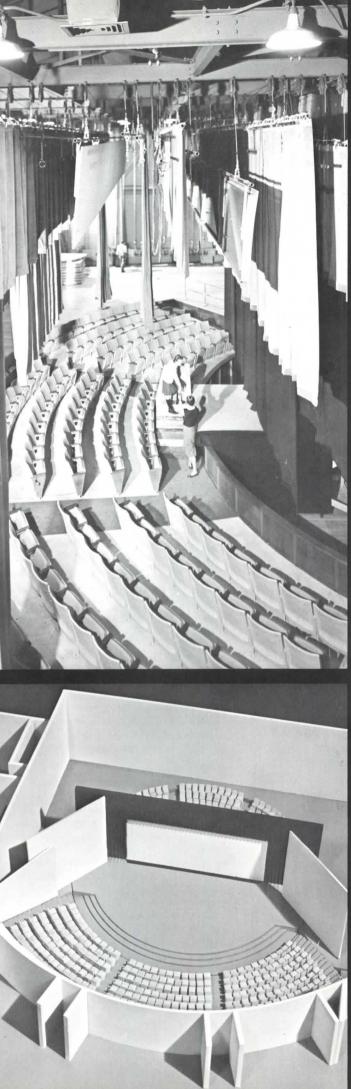
The music, theater, and art departments at Knox have been grouped into a new blocklong building that is the largest on campus and one of the largest in the Galesburg area.

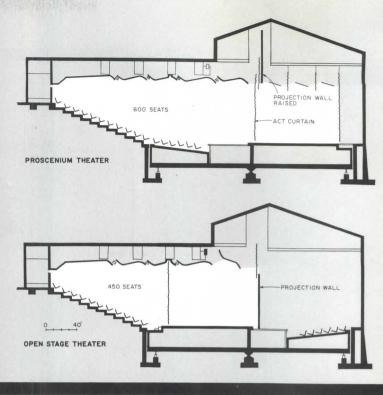
In the theater department, the architects have created a single space that can be either an intimate space for open-stage productions, or a larger audience space for the more traditional proscenium presentations. At the focal center of the fan-shaped form is a large turntable, 66 ft in diameter, which has a performing area for both types of productions—including traps, electrical outlets, and orchestra pit. Also on the turntable are 150 fixed seats. When the theater is in its open-stage form, 450 seats fan out from a low stage; 150 seats are unused backstage. (Scenery can be projected on the solid wall at the back of the open stage.) By reversing the motor-operated turntable, a proscenium theater for 600 is provided. (The projection wall of the open theater can be flown.)

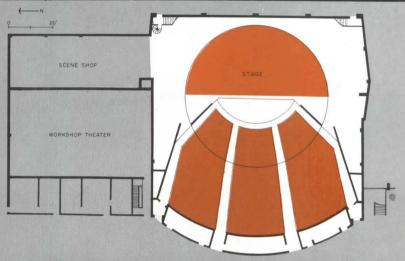
George Hutchinson, a partner in The Perkins & Will Partnership, describes the turntable stage as growing out of "the desire of the client (specifically the college President) to have a theater which would fulfill the requirements of the theater director (who preferred an open theater) but at the same time permit creation of a proscenium theater." It was important to give students experience in all types of drama. (Theater-in-the-round at Knox is in an adjoining workshop, which is flat-floored and has movable platforms and seating.)

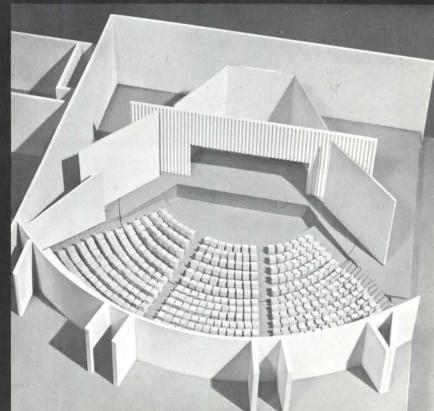
The turntable's large stage area permits use of scenery wagons, and thus eliminates a high stage house. The turntable was designed for a total load of 765,000 lbs (675,000 lbs design load + 90,000 lbs weight of the turntable). It was completely assembled in the outdoor yard of the manufacturer, for testing; later, installed, it was found to have "not more than V_{16} in. variation in radial dimension" as it rotated throughout the circumference of 207 ft.

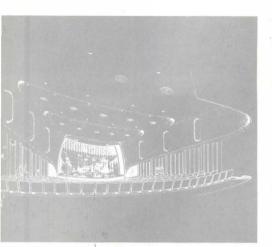
The turntable solution was developed essentially by the architects, although they acknowledge that the front projection idea was adapted from some of the work of James Hull Miller. The lighting-rigging consultant, selected and engaged directly by the theater director, entered the picture after the concept had been achieved. Acoustical consultants were engaged by the college under a direct contract.

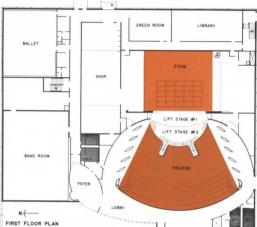


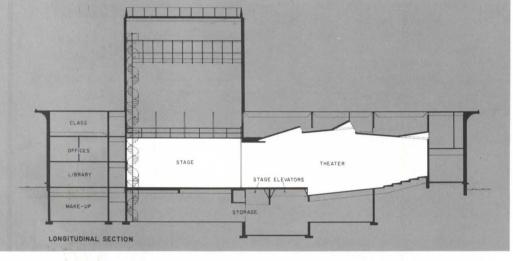




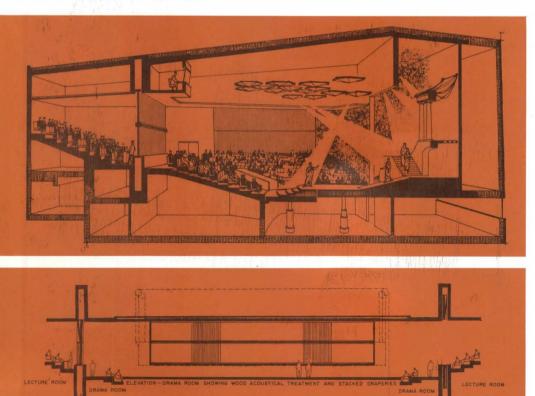








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Oklahoma: An Extra Lift

FINE ARTS CENTER, UNIVERSITY OF OKLAHOMA, Norman, Okla. Architects: Stanfield, Imel & Walton. Consultants: Dr. Paul Bonner, Acoustics; Dale Watt, Electrical; Neal Watt, Mechanical.

The theater in Oklahoma's new performingarts building (first of three buildings in a Fine Arts Center) exemplifies the principle that if one elevating stage is good, two elevating stages are better.

It was first suggested that two separate theaters were needed, but the double-lift stage literally adds a new dimension to the proscenium form, turning it into a thrust stage whenever desired. (A room now being used for instrumental rehearsals will eventually be converted into an arena theater.)

The stage is in three sections: a main proscenium stage with a 40-ft-wide opening; then, in front, two independently operating crescent stages, projecting a total of 26 ft into the theater. Both lift-stages can be held at floor level to provide additional seating (adding 80 seats to the regular capacity of 588), or one stage segment can be used as an orchestra pit while the other carries seating. Stand-by seating is stored beneath the theater and is loaded onto the lift stages at basement level.

There was no special theater consultant, although a three-member faculty, headed by Nathaniel Eek, head of the Drama Department, consulted with the architects "in planning the size, relationship, and functional features of the building."

Hilton: Technology Equals Architecture

LORETTO HILTON CENTER FOR THE PERFORMING ARTS, WEBSTER COLLEGE, Webster Grove, Mo. Architects: Murphy & Mackey; J. D. Murphy in Charge of Design; J. Wofford, Project Coordinator and Stage Design. Consultants: George C. Izenour, Sir Tyrone Guthrie, Jo Mielziner, Theater; Bolt, Beranek & Newman, Acoustics; Albert Alpert, Structure; Paul Londe & Associates, Mechanical.

The architect lists 21 possible uses for the Loretto Hilton Center for the Performing Arts.

Seating may be varied from 500-1200 by opening soundproof walls adjoining the auditorium, making three classrooms part of the larger space. Sound isolation is accomplished with horizontal by-parting $\frac{1}{2}$.in. steel walls resembling two huge I beams; the largest is 10 ft high, 65 ft long, with 22-in. flanges. The web of the "beams" is used for blackboard and chair storage on the classroom side and is covered by wooden paneling on the theater side. The theater paneling is covered by curtains for sound absorption when required. Movable ceiling panels also aid in acoustic adjustment.

Flexibility was achieved with a minimum of mechanical operation. Counterbalancing of the steel walls makes them operable with

N. BON WIN

a one-half horsepower motor. An air-tight sound seal of beryllium copper seals the beam sides.

Total cost was about \$1,600,000, fully equipped. An initial grant was made by EFL for preliminary research.

Izenour comments: "We live in an age that is essentially the product of technology. Since the theater is part of life, it can't escape being influenced by these things ... Human muscle and human sweat is no longer the cheapest form of energy. It is unthinkable that our technology will not also produce a unique architecture for the performing arts... Our age is beginning to understand that aesthetics is dependent upon technology."

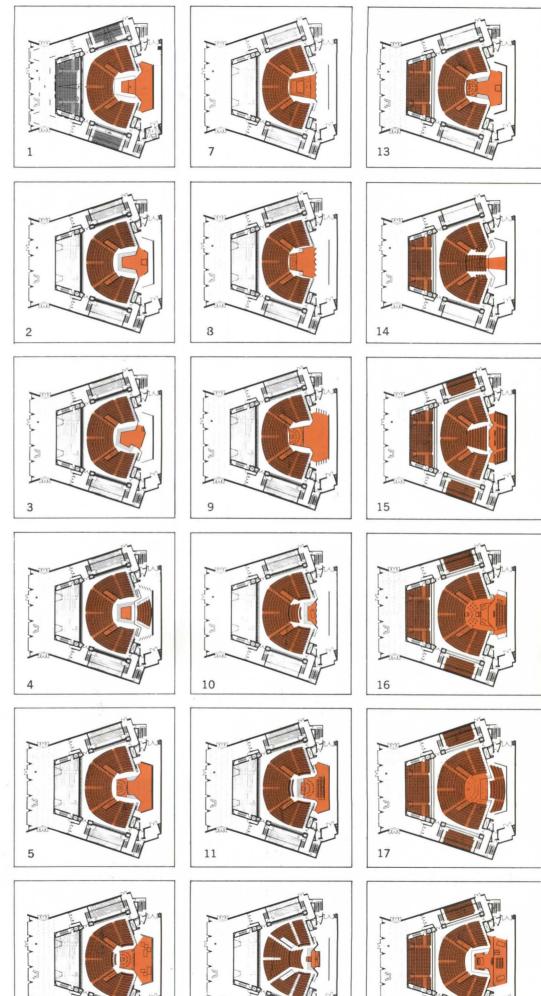
Architect Murphy said of the Webster College theater: "After the program was tentatively set forth in words and diagramatic studies, the validity of this tentative program was tested against the ideas or advice of fine consultants. The client's and architect's purpose was to confirm, change, or even possibly reject their own tentative program.

"Their advice, often conflicting, was invaluable to the client and architect.

"As preliminary drawings progressed, we asked our client to retain their services for the duration of the planning and construction....

"It is the architect's responsibility to make the final decision. A completely well integrated, efficient, and beautiful building is possible only with unified, intelligent, thoughtful, and considerate architectural leadership."

- 1 Independent and simultaneous use of the principal rooms
- 2 Drama (500): Thrust stage; symmetrical
- **3** Drama (500): Thrust stage; dissymmetrical
- 4 Drama (600): Theater-in-the-round
- 5 Opera (500): Thrust stage; orchestra pit for 20 musicians
- 6 Opera (500): Traditional grand opera stage; orchestra pit for 30 musicians
- 7 Opera (500): Experimental thrust stage; orchestra pit behind stage for 16 musicians
- 8 Ballet (500): Thrust stage; orchestra pit for 15 musicians
- 9 Ballet (500): Traditional stage; orchestra pit for 26 musicians
- 10 Recital (500-600): Solo, or duo-vocal, or instrumental
- 11 Recital (500-600): Chamber music, 20; small chorus, 30 to 40
- 12 Recital (500-600): Organ concert
- 13 Musical Comedy (750): Orchestra pit for 23 musicians; one movable wall open
- 14 Lectures (850): Single speaker; one movable wall open
- **15** Commencement (1000-1200): Seating on stage; three movable walls open
- 16 Orchestra, Organ, and Choir (1000-1200): Orchestra, 30; chorus, 60; three movable walls open
- 17 Symphony Orchestra (1000-1200): Audience in the round; orchestra of 50-60; three movable walls open
- 18 The Mass (1000): Thrust stage for sanctuary; three movable walls open



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Berkeley: A Baroque Wall

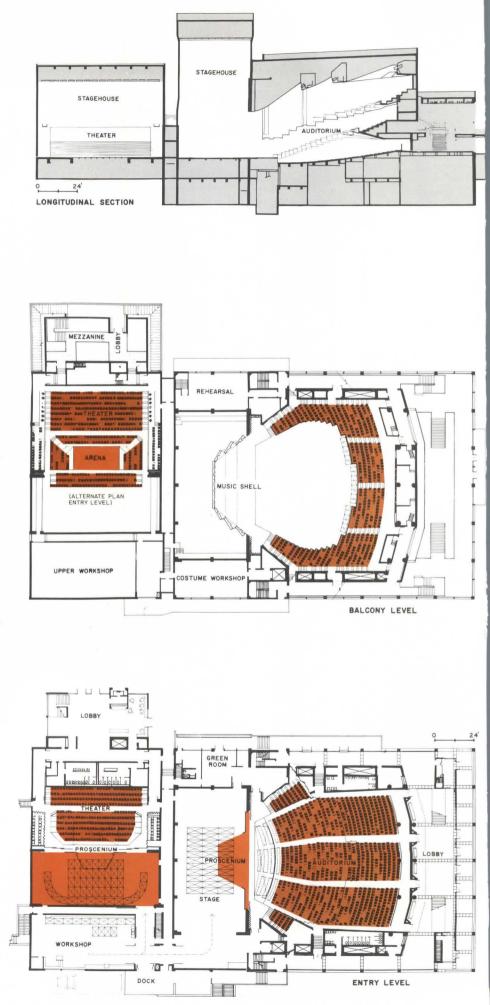
AUDITORIUM-THEATER, UNIVERSITY OF CALI-FORNIA, Berkeley, Calif. Architects: Vernon DeMars & John Wells for DeMars & Reay; Donald Hardison for Hardison & Komatsu; Thomas Aidala, Design Group Leader; Jack Bogan, Job Captain. Consultants: Stefan J. Medwadowski, Structure; Keller & Gannon, Mechanical; Vern O. Knudsen and W. W. Soroka, Acoustics; Paul Landry, Rigging and Lighting; Ben Schlanger, Seating and Sightlines.

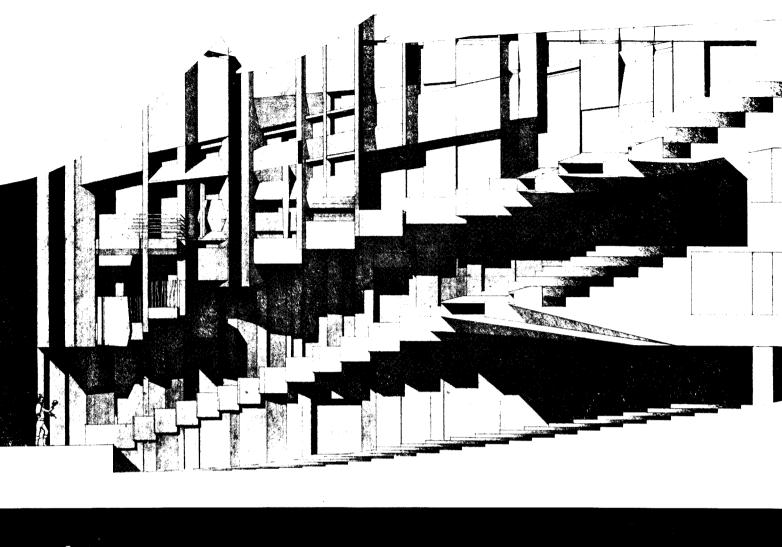
"If we had to do it all over," says Vernon DeMars, "we'd probably do it just this way again." The projected Auditorium-Theater for the Berkeley campus of the University of California is a prototype in several ways. The architects suggest that in size, type, and budget (\$5,500,000), the Auditorium-Theater is what many cities might want. It is a facility that serves various needs without having a separate house for each: music, dance, and traditional drama are to be in one 2000-seat auditorium; intimate events and experimental theater will be in a 500-600-seat multiform theater. The project is also a prime example of the way in which the architects, who called their association on this project a "Joint Venture," were attended by a number of consultants, labored long, and brought forth-Architecture.

Its massive facade, unspectacular and "like a gym," does not prepare one for what is inside. The architects are aware that theater is, in a sense, a special world; and that its dramatic impact is realized only when one is inside it, involved in it. From outside, the Auditorium-Theater is the last of four elements enclosing an urban plaza-the others are the student union, dining commons, and student office building. (For a notated tour through this plaza, see pp. 132-133, JULY 1965 P/A.) The entire Student Center complex was the winning design in an invited competition in 1957. It went on to win a P/A Design Award in January 1958; it is now in working drawings.

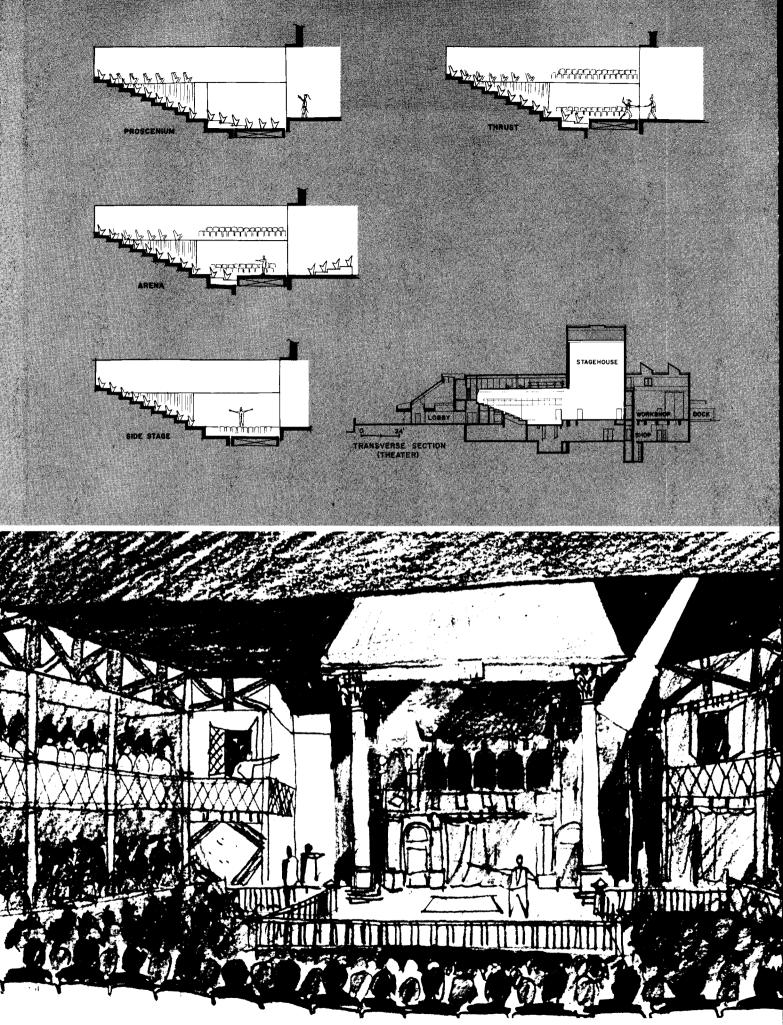
The process by which the preliminary design evolved into the final one included considerable give-and-take with various consultants. "We wanted the best acoustical engineers available," says DeMars, "and felt they should be near at hand so as to be able to give the close and continuous attention that the project demanded. Our solution was to choose the team of Vern Knudsen, acknowledged dean of American acoustical engineers, and Soroka, eminent in his own right and professor on the Berkeley campus. We asked Philip Johnson about a theater consultant, and he said, 'The best in the business is right in the next room-Ben Schlanger.' But for the electrical, lighting, and rigging, it was most important that the man be close by." The extent to which each of these consultants contributed to the final design (without compromising the final goal of architecture) makes an interesting case study.

The auditorium, seating 2000, is described as "the maximum capacity consistent with











good sight lines, seeing distances and acoustics." Originally, it was designed for 3000. in a wider shape. The architects had been very impressed by the hall at Malmö, Sweden, but found that the overly broad Greek shape presented certain difficulties. A wide hall brings people close to the stage, but sight lines suffer for cinema and for proscenium stage events. A wide hall is also acoustically poorer for many musical events. But a narrow hall, considered ideal for concert purposes, puts as much as half the audience too far away to see well. The advice of Ben Schlanger narrowed the hall by 24 ft; the farthest seat in the second balcony is 110 ft from the proscenium, compromising the 65 ft ideal distance (for drama) in the interest of the other purposes of the hall. Schlanger says, however, that one must judge a theater by the number of seats within a fixed distance, not by any one measurement of "farthest seat."

Acoustical considerations affected the hall in various ways. The concave ceiling elements are "precise acoustical responses." Originally, the ceiling was higher; the front of the house now plunges lower than the architects would have liked, but the alternative of some kind of clouds at a height of 30 ft seemed excessive. An unusual acoustical device is pulling the ceiling away from the side walls to give added reverberation time (the auditorium needed 1.7, the swallow's nest organ needed 2.1). There are also removable sections in the plaster ceiling, to make more voids or less, let the sound leak through, bounce back and forth.

Most brilliant acoustical feature, however, is the entire side wall of the auditorium. (It is not just an acoustical feature, but one with significance for the theater as a theater, and the theater as architecture.) "The idea for the wall," says DeMars, "stemmed from a discussion I had with Bob Newman in 1956 concerning desirable architectural treatment for the interior of such a hall as we were planning. He proposed that, for musical use, the ideal treatment of the wall areas would be the very balconies, columns, niches, 'swags, and cherubs of the baroque opera house-all in hard materials. In order to achieve the acoustical diffusion desirable, a contemporary version of such sculptural treatment would be OK, if at a similar scale of boldness." (Beranek, in fact, notes in his book that the walls of the best concert halls are rarely covered in wood, although it is generally assumed that they are.) As this wall developed, it also became a grand sculptural camouflage for various theatrical necessities and niceties. The wall contains two of the major vertical lighting positions-one at the stage, a second half-way back in the house; three little balconies near the stage, available for actors, musicians, trumpeters, chorus; and "windows" where TV monitors could be set up. The entire interior will be covered in heavy dash plaster, of Ronchamps scale, painted medium to dark gray, but there will be strong accent colors in odd windows and niche locations, brought out or wiped away by lighting. Shallow spaces behind the sculpture at different levels allow access to

the lights. About the design of this wall, which is both theatrically and visually exciting, DeMars appropriately says, "I guess you could say, Tom Aidala 'Nijinskied' it to my Diaghilev."

Summing up his view about the single hall being designed as a multipurpose space (music, dance, and drama), DeMars says, "To say that there has been compromise isn't defamation; it is definitely legitimate, and realistic, for many communities to have only one hall."

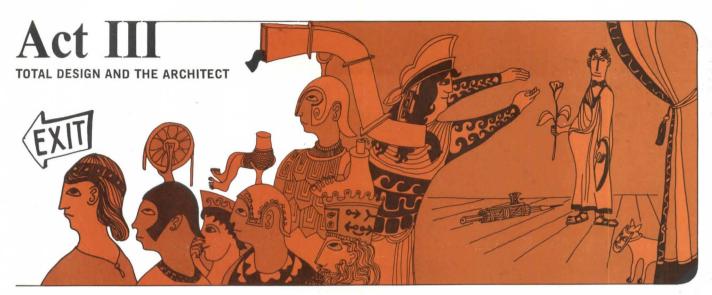
But the Berkeley complex, in addition, has a small multiform theater; there seems to be a growing recognition, today, that a "performing arts complex" must have at least two halls. This small theater can be an arena, a space stage, or a proscenium; it can thus be arranged for the majority of classic theater forms or for completely experimental relationships. It can also be used as a classroom. (The entire facility was programmed with a building committee acting for the university, but, more specifically, by the eventual users, the Department of Dramatic Arts.)

In the theater, there are 300 fixed seats in a steeply raked bleacher, with end access; other seats are movable, located in side galleries or on modular platforms, raised by hand jacks or by a single forestage-orchestra elevator. No seat is farther from the stage apron than 60 ft. The rapid knockdown of the platforms will make possible one-hour changes. It will immediately be recognized that Ben Schlanger's ideas from his Ford Foundation study are very much in evidence here-the straight seats, the wide stage. Schlanger says: "Any theater without a proscenium goes toward the Ford Foundation recommendations, but the Berkeley facility is much more flexible. The Ford proposal had a larger open stage, but without the possibility of changing the seating arrangement."

But another consultant, Paul Landry, was also intimately involved (with the architect) in the success of this multiform design. One of the major problems with a multiform theater is the lighting of performers and the moving or suspending of scenery for the different forms. Landry says, "Our answer was to open the area above the forestage and arena portion of the theater to the roof slab, and suspend lighting fixtures (and scenery if desired) on movable channels." The open area is approximately $20' \times 66'$, the same size as the pit. Access to the grid supports at the roof is by two rolling bridges spanning the 20' distance.

Landry, whose usual work is as an over-all theater consultant, says that his prime work on this job has been technical, "with no attention required of me in developing program space requirements or building design." His domain on the project included stage rigging, stage lighting, communications, stage sound (not acoustical), and scenery shops.

What, then, was left to the architects? Simply — architecture. Says DeMars, "The theater contains certain inflexible functional relationships, whose violation would negate its entire purpose. This is the base. Architecture starts from here."



An idea frequently reiterated by certain theater practitioners is that the final goal – and thus the primary job – of the architect is to build a theater that functions. For this reason, it is said that it is the architect's duty and obligation to follow the experienced advice of his specialists in order to achieve that goal. If designing for technical functions is, therefore, primarily the creation of the consultant, where does that leave the architect? If he, too, is a specialist – like the lighting man and the rigging man and the stage engineer and the sightlines man – what is the thing he is supposed to be a specialist in? What is forgotten (or probably unsuspected) is that an architect must surmount and walk on a sea of confusion – codes, innumerable technical details, and the sundry topics and controversies discussed in our colloquy – in the hope of arriving at the far shores of art.

What is the architect's specialty?

Stone (Arch.): What I strive for is to make very, very complicated problems very simple. This is my major concern. I think this is what an architect's specialty should be: to find something that is simple – not necessarily obvious, but inevitable. I like to believe that our plans have a certain inevitability.

Engele (Arch.): Architecture is not only designing something in a certain style and beauty; it is much more coordinating all the others. This is 70 per cent of the architect's job, and the other 30 per cent is actually designing.

Rubin (Cons.): I'm a firm believer in the architect – by virtue of his study and training and sense as an over-all designer and planner. I mean this sincerely. And where he takes the more or less technical things which all of us tell him as consultants, and finally pieces them together into a workable package, and brings with it that over-all sense of design, of course, that is the major function he has accomplished. We're all fond of saying that architects are no better or no worse as a class than other people. But, in fact, they've been trained to study, to criticize, and to criticize themselves in general. As a group, they operate at a much higher level than almost any other group of professionals it's been my business to be associated with. They're more thoughtful, they're more considerate, they're more amenable to suggestions, and they'll give you two ideas back for every idea you give them.

Hardy (Arch.): I think his specialty is thinking. His specialty is not drawing (that's just a means to an end); and I don't think his specialty is making models, or getting tempera renderings. But if there's anybody who is going to make some sense out of all these specialties, it's somebody like an architect. You see, an architect ought to be able to go to each one of these consultants – in total ignorance but with integrity and a questioning mind – and say to him, "OK. What is it? I'm going to force them to think." Now, obviously, you can't rip the skin off all of humanity and say "Question thyself" and they'll all sit down. Come on, get off it. Those people who will, will; and that's how you get exceptional buildings. But most people don't. Most people are just "architects." **Brill** (Arch.): It would seem that the people who are best equipped to be architects – who have an affinity for it, and function well within its strange confinements – are those who do have this method of thinking, of taking in many things. What should make a good architect is an ability to cope with an incredible number of variables: It's really a profession which is based on it.

That all seems plain: an architect must ask the right questions – both of his clients and consultants when writing a program and of his technical consultants and himself when designing the building. He is the counsellor-coordinator-administrator, it is agreed. And it follows that such an administrator must have an analytical approach. All serious work requires integrity and courage in thinking, yet architects have no exclusive claim on these attributes. Thinking and judgment are the specialties not only of an architect but of an administrator – and it must be added, of a specialist too. Although the architect may also be an administrator in addition to his other work, that is not what makes him an architect. What is the architect's exclusive "technical" specialty? What can the architect – and he alone – do? Should he not "think visually" – spatially? Perhaps we had better go about the question again, but indirectly. Do you consider "design" to be the satisfying of functional requirements? Of other requirements? Birkle (Cons.): Design should satisfy the functional requirements above all else.

Veneklasen (Cons.): The challenge of successful design is to define, assess, and provide all of the essential functional requirements; to integrate them all into a successful functioning design, and to embody that design and those functions into a pleasing form composed of pleasing and well-integrated components. I contend emphatically that successful design must begin with the functional requirements. The most discouraging results are those which start with some imaginative exterior form, and some of these have ome from our most illustrious architects. **Burris-Meyer** (Cons.): In part only.

Mielziner (Cons.): Far more than simply satisfying functional requirements.

Jewell (Cons.): It is the enhancement of those requirements, as well.

Unruh (Cons.): Depends on the usage of the language.

Hardy (Arch.): When people say "design," everyone has a different idea about what it means, so you can't really use that word and have an intelligent conversation. "Design" to so many people means "shape." They don't say shape; they say design. "Hey, that's a good design," meaning, that's the most novel thing I've seen. From my point of view, that has nothing to do with design at all.
Miller (Cons.): To say that "design" is the satisfaction of function is to call for a definition of "function." If we use "function" in its deepest sense, we satisfy emotional as well as logical needs.
Fisher (Cons.): Yes. Also beauty and comfort. The beauty in a theater structure must be of such a nature that first, a theatrical presentation may be presented and enjoyed by an audience; second, that the audience feels comfortable in the surroundings. Ideally, this would be a structure that is also beautiful for its own sake.

Rosenthal (Cons.): "Design" carries more of a responsibility than satisfying the functional requirements. A public building is committed to creating an experience that is sympathetic with the building's use, but this cannot be narrowed down to the physical aspects of function. These are important aspects, but not the whole story.

Bowman (Cons.): Yes, I do consider design to be the satisfying of functional requirements. Hell, what do you mean by "other"? Design involves two or three other minor things and I don't have just "the application of ornament" in mind. I have yet to work with an architect who conceives in the beginning how a theater space should be different from all other experiences — "building-type" experiences, if you will: what is unique about being in a theater; how should a theater be unique and different as a place. That is the singular functional requirement of the theater: the creation of a very special kind of environment. And that's where most theater architects run aground.

DeMars (Arch.): The successful satisfaction of functional requirements alone does not produce design. When "design" becomes the end of a work rather than a means, we have a situation akin to the "styling" neurosis of Detroit.

Izenour (Cons.): I consider design as satisfying infinitely more than mere functional requirements, but I do not see why functional requirements cannot be satisfied at the same time as the aesthetic requirements.

"Just what," asks Dudley Hunt in Comprehensive Architectural Services, "is architecture? A definition is desperately needed for registration, legal and other reasons. It is equally important to any discussion of great and expanded roles for the architect in our time. Since everyone seems to be attempting it," he concludes, "perhaps one more try might do no harm." (So let all characters here intone in full polyphonic chorus.)

In your opinion, what is architecture? (Give a concise definition, if possible.) Birkle (Cons.): Architecture is the design of a living space for people to perform a specific function. Severns (Client): 1 do not feel equipped to answer this question. As a professional theater man, 1 have had very little experience with architecture.

Weiss (Cons.): Architecture is the creation of an environment for the producing of an atmosphere conducive to the activity which takes place in a particular building.

Jewell (Cons.): Architecture is the provision of an attractive envelope for the useful articulation of internal spaces for a specific or general task requiring enclosure in a building.

Feder (Cons.): I'm getting kind of confused about that myself.

Kook (Cons.): Architecture is art. It is the combination of originality in design to which the architect applies science, techniques, and economics in planning and executing a functional and safe building that has in it a feeling that will bring pleasure to people whom the edifice must serve. The building must be in harmony with its surroundings. It must embrace in close kinship the arts of painting, sculpture, poetry, and music.

Bowman (Cons.): Architecture is the ordering of space. And you can publish that. That's concise. **Rosenthal** (Cons.): It is the design of a building to create a physical structure and an atmosphere compatible with its use.

DeMars (Arch.): Architecture is the creation of environments and forms which are charged by emotion and capable of being used by people.

Miller (Cons.): Designing for a given activity a shelter which is beautiful to regard and efficient in arrangement.

Fisher (Cons.): It is the design of a structure that is both beautiful and serves a special function.

Knudsen (Cons.): Good architecture must satisfy all primary functional requirements. This is necessary, but not sufficient; it also should be a work of art, a creation of beauty. Johansen (Arch.): Architecture is the *poetic statement* of the technological requirements. Unruh (Cons.): It is the artistic form of a construction, especially of a building. Mielziner (Cons.): Architecture is the mother art of total planning for the structures in which man lives and works. Architecture may go far beyond the conception, design, and execution. It can control the total environmental master plan of which a single structure may be only a small part. Hardy (Arch.): An architect does something magical; nobody knows quite what it is. The AIA, God knows, can't define it - except it does have "beauty" in it all the time. In some quarters, "space" is all of it. Somebody said, "Architecture is the art of wasting space beautifully." Some guy wrote it down and laughed and tittled and adjusted his beady glasses. But it's just a smaaat thing to say; it doesn't really mean anything. Of course, architecture isn't just the humdrum hardware of sticking a bunch of consultants together. It's all supposed to come alive and be, not "beautiful," because that keeps changing all the time, but the result has to be exciting. That doesn't mean that as you walk into a room - "Boy! Is that exciting! There's so much going on." This is so far removed from how do you make a better subway train, and how do you make the jets fly faster, and so far removed from pragmatism and what happens most often, that it leads you into using those words we don't know how to define - "Beauty, truth, hope, happiness"; those words that have become weasel words. And so we don't know what "good" is anymore, and so it's difficult. Yet we demand that the thing be exciting and alive. The word *architecture* is terribly confusing because architects make of it something which is free-standing objects, which are monuments to themselves. "That's what architecture is." Architecture could be nonbuilding; it could be taking buildings away; or it could be preserving buildings in relation to other buildings. It could be all kinds of things.

Thus, two aspects of architecture are recognized: (1) an objective, analytical approach, and solution to the functional requirements of spaces; and (2) a visual order in building.

Professor Unruh goes back to Aristotle for his definition: Architecture is the art of building. The logic is as follows: Building is a craft – the craft of constructing buildings. Architecture transcends that craft by expressing something new and (hopefully) incisively accurate about the spatial functions in a visual scheme, a visual order. That is what makes architecture more than a craft, what makes it an art.

For instance, in the past, that visual order has been achieved by emphasizing a myriad number of the elements of building: sculpture and decoration, or structure, or massing, or form, or textures, or materials, or spaces. And within these stylistic categories there has been great variation in both imagination and taste. All of these directions, of course (stylistic preferences notwithstanding), are contributions to the art of building, to architecture.

The craftsman may refine physical dimensions and surfaces; he refines a methodology. The artist transcends the physical craft by providing a new insight into it, which issues from his inspiration and personality. Art is thus always intimately bound up with psychology and psychological effects.

Like many elusive, affective subjects, little has been written to explain architecture in these terms, and perhaps that accounts for the inadequacy of most of its definitions and for the lack of understanding of architecture (and consequent indifference) on the part of the layman.

Doesn't the fragmentation of research, however, lead to aesthetic fragmentation, to architectural decorating?

Schlanger (Cons.): No, because with what the researcher-architect delivers, the designer-architect should come up with architecture that is better aesthetically.

Swinney (Cons.): An architect has two functions: He must satisfy the functional requirements of a theater, and then wrap it in an attractive package.

P/**A**: Isn't that an overlay?

Schlanger (Cons.): It is an overlay in any case. You can make different designs from the same set of premises.

Rotner (Arch.): What I want to do architecturally is often challenged and modified to a tremendous extent by acoustics and other considerations. And it isn't because we've added these considerations; we've been working with them from the very beginning.

Samton (Arch.): When it comes to architectural proportions and masses and spacing, an architect generally has an idea of what he wants to do and will stay with it. That idea of what he wants to do is already based on some kind of understanding.

Weiss (Cons.): The architect can hardly divorce design in the aesthetic sense from design in the functional sense. Each plays its very significant role.

Hardy (Arch.): The architect also has a responsibility to the idea of unified design.

P/A: Does the artistic purpose of the theater in any way determine its outward appearance? **Franzen** (Arch.): It gets into your system, certainly, as any client's life or the life of a problem gets into your system. You can always articulate it.

Does anyone have further thoughts about the sociological aspects of architecture, which seem to have been slighted when **Roche** (Arch.): There is the whole arrival and social exchange part; that is secondary. Johnson (Arch.): My people always say about my museum in Utica, "That's a very nice room, Mr. Johnson, but where are you going to hang the pictures?" Well, I said my duty to this city isn't just loft space, wall space, pictures every two inches. I've got to have a place that gives an elevation of feeling for the community, so they'll say, "Have you seen *our museum?*" All the definitions were offered? Isn't this a vitally important aspect of architecture? What can an architect offer the theater beyond the building? architecture has to go beyond "making it work." I designed the State Theater for the intermissions, obviously.

A Voice (Cons.): I thoroughly disagree with Philip Johnson's philosophy. He designs a theater from society's point of view; he's interested in the act of going to the theater – getting dressed up and that sort of thing seems to him the major enjoyment of going to the theater. **Engele** (Arch.): It's more a matter of interest in the "theater" and of experience.

Samton (Arch.): No, I don't think that's so. Every building has this to some degree. It might not be this illusion or excitement of the drama; it might be just expressing a different type of function. When you start with a concept of a theater, you seek to express what the theater really is — basically, what it is as opposed to another building. In the theater, you want to begin already with a sense of drama as you approach it. As you enter the theater, you want to have the feeling that this is something a little special, a little bit unusual.

Hardy (Arch.): For example, there's this confusion about Nervi being an architect, and he's not. His buildings are absolutely superb, but they crash into the ground where they have to pick up all the rest of the services that make up a big public building. (If you've ever been in some of the buildings which have men's rooms, the men's rooms are always at the front door; and it's a dreadful place.)

Franzen (Arch.): An architect can give spiritual form just as he gives physical form.

Rudolph (Arch.): Building any kind of a theater involves many more things than just the stage or the auditorium. The period before and after and during intermission is an important experience. I don't know what the major contribution is.... For me, architecture is a matter of addressing oneself to many levels. In the morning, one thing is important; in the afternoon, another. When you're young, one thing is important; when you're old, another thing. I just couldn't say what is the most important thing at any one time.

Izenour (Cons.): The social aspects of going to the theater, the opera, the concert should provide the architect with a sufficient outlet for the exercise of his aesthetic judgments in the design of the ancillary spaces adjacent to and required by the main room.

Johnson (Arch.): Certainly. The crowd's watching something.

P/A: Is the creative influence of the crowd more important in a church than in a theater? Johnson (Arch.): Everything's more important in a church. A theater, you darken; a church, you never darken; you're always in the space. Sometimes, in movie theaters, you don't know what theater you've been in, because there are never any lights. But churches are the greatest because you are less constrained by consultants; and in the hospital it seems to me you are constrained mostest. **Hardy** (Arch.): On a church you will get exactly the same discussion, really. Of course, a church has functional problems: they say they can't see. (Nobody says the acoustics are bad because they rely on speakers.) Actually, it's even more difficult because you're cut loose farther into words we have no common understanding of. I say to you "holy," I say to you "religious," I say to you "space," I say . . . you know; and already it's lost. There's not supposed to be anything about a church except "holy, holy." Yes, like a church, a theater involves so much that is symbolic, so much that is intangible.

Feder (Cons.): The theater is in many ways like a church, with its long tradition, its attempts to stretch a man to something bigger, and, certainly, with its obvious symbols to prepare him for this coming experience.

Rudolph (Arch.): Well, a theater is basically a good-time place. Maybe some people think of the church as being that; I happen not to.

P/A: Some new plays are not very good-time plays.

Rudolph (Arch.): That's true, that's true. Things are changing, you see.

Rudolph (Arch.): Of course. It's for the public, isn't it? I'm sure it's for the actors and directors and scene designers, and all of those people, too, but it's also for the public. All architecture is, for me, a matter of participation of the human being – contrary to what a lot of people have had to say. I regard it as memorable space. It must be acoustically and visually rewarding. You should be aware that you have arrived at a room where theater is going to take place. You ought to feel you're absolutely at the same level as the performance. I don't think it can be just any old room; it needs to be a breathing, dynamic thing.

P/A: It has been said that to build a theater where the walls are papered with people – faces – was an 18th- and 19th-Century idea that is no longer applicable in our society. Johnson (Arch.): I think that's a very broad statement.

P/A: Even when we no longer have a society where people go to the theater to look at one another? **Johnson** (Arch.): Well, I don't think you have to look around. It's just the nicest way to have theaters.

Hendry (Exec. Director): Ideally, the architect's responsibility is to interpret to the society around him, in terms of his art, the nature of the theatrical experience – which is at once collective and individual – as it will be expressed by the particular artistic director who will run a given theater. Within his own area, the architect ought to be a humble dictator.

In terms of functional success, few people seem to say, "That's a bad church because I can't get to the cruet table." Is there a similarity between the design of a church and the design of a theater?

No other art form is so intimately bound up with its physical surroundings, its factory. Shouldn't we define some of the psychological aspects of interior theater architecture? Is the public a large factor in the theater building? **Franzen** (Arch.): You know, the theater is all about involvement – commitment and involvement. It's not watching spectacles. It's the opposite of a nation of spectators. It's there that I think it's great. The potentials are great. You do get involved.

Johnson (Arch.): The only analogy that works is that people respond to great spaces with their guts.... I am not sure that the public can specify at all.... But I think people have an instinct for space. It's something they like, like good food, sex, or anything else, but the *last* thing they can do is to talk about it. It is best to watch their eyes.

In that emphatic respect, architecture has something in common with the theater: for "architectural space" read "the performance"; for "people" read "the audience." Now, between the performers and the audience, while the play is on – that spark of unseen electric current that, on happy occasions, galvanizes the entire theater (both audience and stage) – is as real and as indescribable as the general reaction to architecture. Is that so?

Brill (Arch.): A spark is being generated.

Rudolph (Arch.): Well, they're related, but that spark is a very complicated thing. It's not made up of just one single element. You can't really, finally analyze it completely. But you know that many considerations have gone into making that spark work. It's a different thing, isn't it? **Hardy** (Arch.): Theater really is unlike almost anything that happens now. It's a kind of ritualistic place. The difference between watching a movie in a plane, and watching a movie in a flick house, is fantastic. Here is the most advanced kind of technological achievement: all those little people listening like this, ears pressed together, hurting; you can have that film going on up there and not burning up - all that happens, and a lot more. And yet the last thing that a plane interior is designed to be is a movie theater; it's dreadful. You're peeking through people's heads, and you put your head out in the aisle and the hostess clonks you in the back, and the person in front wants to read, and so forth. Airplanes are brilliantly designed to do everything possible except show movies in. But then that's another problem, because the more comfortable you make everything in the live theater, the less emotion is being spent. Somebody was saying that people were leaning back in their seats farther and farther all the time, and of course as soon as you make 48 in. in between the seats you get this way – horizontal. It's a tradition from looking at movies. But it has nothing at all to do with the theater. In the good ones, the real bear pits, you feel everybody leaning forward, elbow-to-elbow. It's one of the most marvelous things about the traditional theater, where everything comes around and bends down to the stage. It's really quite a gasser. The whole idea of people gathering together in groups is so much different than what happens in the 20th-Century, when they're getting in little cars and trying to get away from each other. The whole idea of that is communal, primitive (it is primitive, damn it). The whole notion that people have emotions is quite exciting; by and large we pretend that we don't, and the theater denies all that.

Stone (Arch.): Traditionally, they've had crystal, they've had red velvet, red brocade carpets. Why resist this? This doesn't stifle one's imagination at all. Why give them terrazzo and plate glass and all that stuff that is alien to the tradition of the theater? Pour it on, give them what they need, what they expect. Gilt, red, crystal – all those things. And you've got to think about women: They are the ones who make these things successful. You don't go putting in a bunch of lousy fluorescent lighting, which takes all the color out of their faces. Give them the equivalent of candlelight; you've got to imagine that you're in the 18th Century. It used to be that one sought character in architecture; nobody seeks character today. . . . I don't think there is enough emphasis on character, on what is suitable.

Hardy (Arch.): When you use the word *theater*, you're really out of it, because the average person, when you say "theater," thinks red plush, curtain, seats like that . . . the puppet show. But there's so much more happening in the theater by professionals who work in it than that, that you're really terribly constricted if you feel you need those things. And even the people who are the most traditional, whom I don't know anything about, who work in the theater, want cake too. They want to have this *move* or that, and so on: noodling around with the proper proscenium, making the apron a little sort of spongy place that comes and goes. When there was a theater tradition, everyone had a commonly accepted knowledge of the theater. But we ain't in the 19th Century.

Rudolph (Arch.): The architectural concept of the theater itself: I don't know who should do that except an architect. Of course, I feel very strongly about that.

Hardy (Arch.): I personally don't see how anyone except an architect, with the kind of training that a good one gets, can do that.

Rudolph (Arch.): I'm interested in architectural space, and the effect it has on people. And I think I know something about that. That's what makes me tick. And no one is going to tell me about that, you see – least of all a structural consultant, a lighting consultant, an acoustical consultant, a mechanical engineering consultant, *any* consultant. No one is going to tell me about that... I really mean this. You know, there are just so many hours in a day, and you have to pick and choose what you are going to really exert your efforts on. Otherwise, your time runs out. I know what I'm interested in, and what I want to do.

Someone remarked that a certain director could put on a play just as well at any street corner as in a theater. And the simple, uncommitted, all-black, "nonarchitectural" boxes that serve as flexible theaters are reported as being always busier and more in demand than the elaborately mechanized multiform facilities. Imagination does not seem to be stifled by the simplest off-Broadway loft or by the church basement.

Perhaps there is too much "architecture" complicating the theater today?



Hardy (Arch.): The part that bothers me is that when all this stuff is formalized, something does seem to go wrong. The energy – the life – seems to go out of it. And theaters are such funny places. I *do* think they're more complicated. Look, what's the reason for building this damn thing? People get up on a stage and make noises which involve their emotions. It may be feigned or otherwise; they may be real emotions sometimes. And because of all that, something happens to you as an audience. I personally think that there ought to be a hell of a lot less architecture and just people in a space.

Rudolph (Arch.): I find that once the proceedings start, I forget about the architecture completely – almost. I think one should do that, yes. The way the theater uses light, for instance. The space has boundaries, of course, but within that space, the lighted actor, or objects, or whatever it is, quite often gives the illusion of almost endless space. And that can or cannot be connected with something else. What can be done with light in the theater, as I see it, is a fantastic and wonderful and special thing, and can certainly be open-ended.

Voice: One of those way-out Happenings, actually, was all architecture: As the play was proceeding, a character stepped out between audience and performers and began to lay up a concrete-block wall. As the performance continued, and the wall got higher, people began to stand up, then stand on chairs, finally straggling out as the stage was blocked from view. Some sort of play was still going on, behind the wall, as the audience thinned out and the evening ended. That is a kind of nonarchitecture on stage.

Izenour (Cons.): The architect is required to provide a space for another art form that has virtually nothing to do with his architecture, because when the lights go down and the performance starts, the building practically disappears.

Thompson (Cons.): The architect's statement in terms of architecture can be compared to the selection by a painter of a very fine frame in which to place his masterpiece: The painting must complement the frame as the frame must complement the painting. The same holds true in the theater: the performance upon the stage must be complemented by the architecture, and vice versa. However, once the performance has begun on the stage, the architecture must become subservient to the theater, and the audience must not be consciously aware of its presence. I'm sure most architects will disagree with this statement.

Johnson (Arch.): Oh yes, an auditorium has to be anonymous when the light goes down. When I say dark, I do not mean it has to be so dark you can't see; it is just that you don't want it to distract you.

Roche (Arch.): The architecture of theater building is somewhat different from the architecture of almost anything else. In that the inside of the house is properly the one place where there is almost no visible architecture at all – if you do it properly. There is no house, only actors and the set, so that the stage, actors, and sets have nothing to distract from them. The stage becomes the focal point, and there really is no architecture to speak of except darkness. It is only a theater while the lights are off and the play is going on. And it is nothing when it is empty. An architect has no opportunity really to do the inside of the house. Not too many architects are interested in making it an architecture of a void. It is very hard for an architect to think in these terms. Architects, by nature these days, think only in terms of what one sees – the spectacle of the thing. And anyone who creates a spectacle inside is putting an elaborate frame around the picture. Yet the picture may show itself better without a frame.

Who would like to conclude for architecture and the architects?

Is it equally important to establish an architectural concept?

Will theater people know, though, what this other part—"architecture"—is and why it is even equally important? **Rotner** (Arch.): What is the most important thing: to create a piece of sculpture which is exciting visually, even though it might have functional limitations, or, let's say, whether the lights are where a particular group wants them today? Is it more important to establish an architectural concept?

Rotner (Arch.): I'm an architect, so I think it's of prime importance. And I don't think they're incompatible.

Rotner (Arch.): I think they do. I've found that they do. People who are company managers and production managers – people who handle these artistic groups in music or dance or drama – are more concerned today than ever before that it not only works but that they're going to be housed in a place that is beautiful, that is architecturally valid. Architecture, I think, is more prestigious today than it was before. My recent experience with clients and users is that they're very concerned and very, very knowledgeable, and they're also very sympathetic to the architect's problems as well as the technician's problems.



Cincinnati: Small Building Metamorphosis

THEATER IN THE PARK, Cincinnati, Ohio. Architects: Hugh Hardy; Associate Architect, Herman Shapiro.

The Theater in the Park is a small theater that is motivating its own transformation from a meeting house to a unit of a modest performing arts center. This originally Victorian building will eventually be part of a wellintegrated complex that will include an art gallery, a new 500-seat theater, and a bandshell for outdoor chamber music recitals the whole complex to be surrounded by an ample promenade.

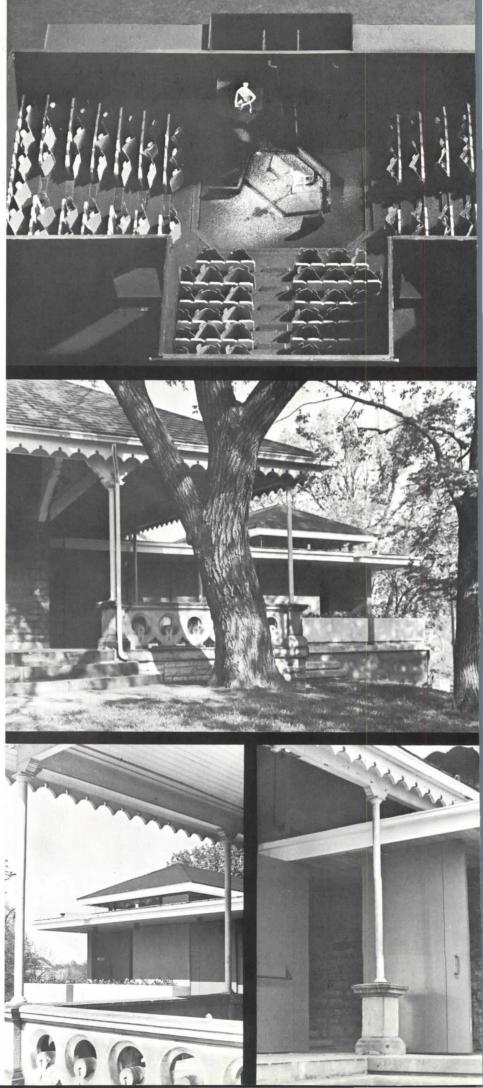
Originally conceived as an alteration to the 1880's building, the interrelated parts are evolving gradually through user-architect collaboration. The theater is small and houses no major mechanical equipment. It seats 227 on three sides of its thrust stage. The entrance between stage and backstage is divided by an existing masonry-enclosed flue, which must await completion of the larger theater and its heating plant before it is removed. This will create a proscenium opening, which can then avail itself fully of the stagehouse already provided.

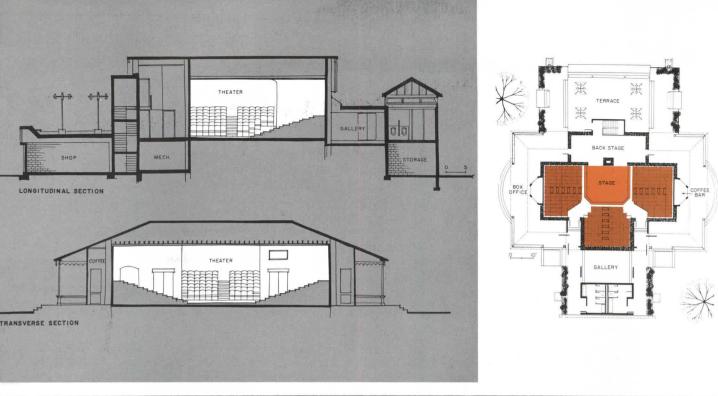
The building's front terrace, which roofs the shop and dressing rooms, is presently used for chamber music concerts. It will eventually be provided with an acoustic shell. Dressing-room access to backstage is via stairs that continue up to the balcony in the stagehouse. Stage equipment is delivered up these stairs or through the large theater entrance doors.

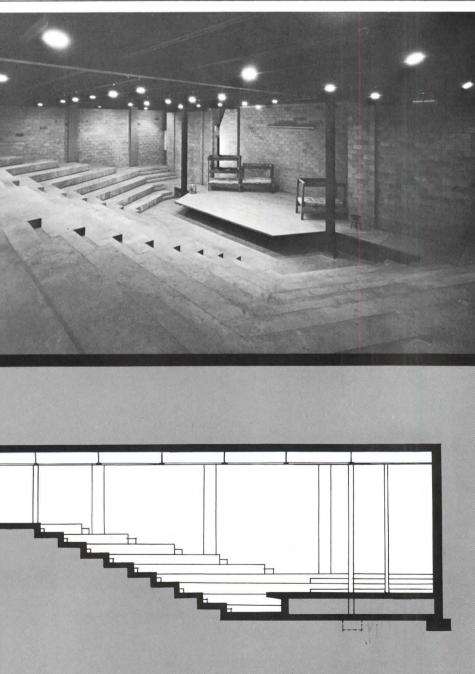
Necessary acoustic treatment was minimal, having been limited to treating the theater wall with sound-absorbing material. Existing bay windows were partitioned off from the theater area and now function as ticket booth and refreshment bar serving promenade patrons.

During the first phase of construction, the architect built plumbing facilities at the rear of the theater. In tying the two structures together, he created an outdoor sculpture gallery that can be enclosed by sliding doors.

Hardy feels that this theater is unique in that its motivating force is a local group of theater-users — The Theater in the Park Group. The group had originally contemplated a 500-seat revision to the meeting house, which they were successfully using for theatrical performances. After consultation, it was decided to continue with the small theater concept, and, if continuing success warranted, to build a 500-seat theater. Apparently this was a soundly conceived idea, for the larger theater is now planned as the next element of the complex.





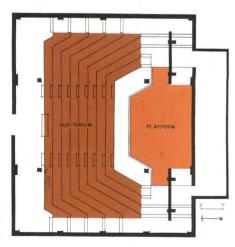


Darrow: A No-Budget Addition

DARROW AUDITORIUM AND GYMNASIUM BUILD-ING, New Lebanon, N. Y. Architects: George S. Lewis, James Baker. Consultants: Hugh Hardy, Theater; Henry Pfisterer, Structure; Harold Hecht, Mechanical.

The 300-seat theater was conceived as a nobudget addition during the period the Darrow School was under construction. Its rough and ready treatment, compounded of necessity and design, has not affected the theater's popularity. Besides being successfully employed by the school, use of the facility is also sought by members of the surrounding community. The designer feels that the intimate relationship between audience and actors is its most successful feature.

Budget restrictions have not yet allowed the inclusion of benches on the concrete steps, or ceiling treatment over the exposed bar joists. The room is therefore a little more alive acoustically than the designer had originally intended. However, the annoyance of a little extra reverberation can surely be overlooked in the enjoyment of an entirely "surplus" theater.



Jacobson: Creation of Illusion

NINA JACOBSON THEATER FOR THE DRAMATIC ARTS, WINDSOR MOUNTAIN SCHOOL, Lenox, Mass. Architects: Samton Associates. Consultants: Paul Gugliotta, Structure; Paulo Squassi, Mechanical; Abe Feder, Lighting.

"We've had very strange reactions from the kids up there," says architect Claude Samton. "High School kids, 14 to 18. . . . Some of them say, 'Boy is this crazy.' . . . 'I've never seen anything like this.' . . . 'This is wild.' . . . 'A nutty thing.'" This exuberance was expressed on a smaller scale by the architect himself when describing his design purpose in creating the Nina Jacobsen theater. "I thought that a theater building had to express the fact that it was a dramatic building in which you create illusion-like a different world." It is a dramatic building, but it is the quiet drama of architecture whose reality will not fade when the house lights dim, signifying the beginning of the drama on stage.

The 306-seat, three-level theater is located on a former private estate that now belongs to the Windsor Mountain School of Lenox, Massachusetts. Set into a tree-covered site chosen by the architect, the theater stands well away from the main building and parking facilities. Its structural body—concrete block walls, plywood box beams and trussed partitions—is costumed appropriately in western cedarboard-and-batten to blend with its surroundings.

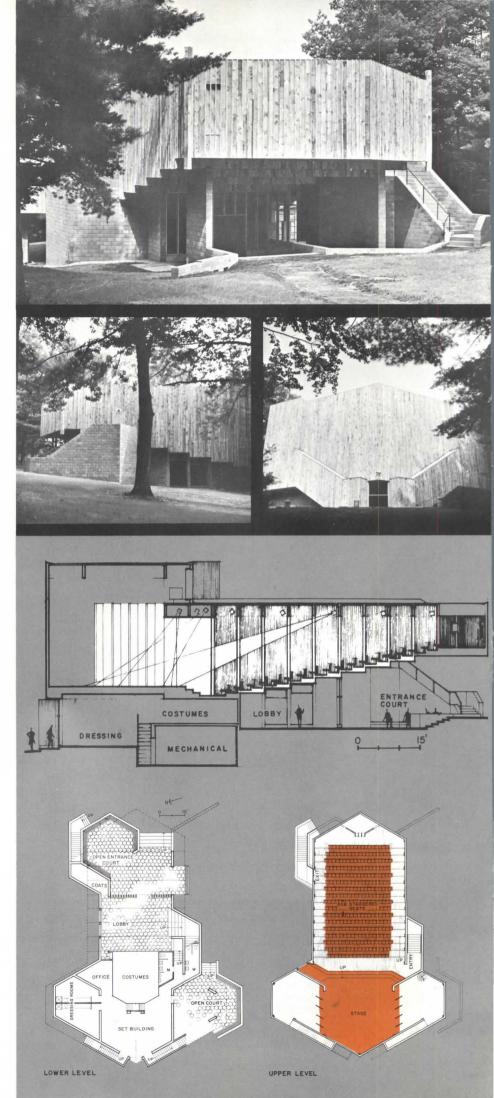
To enter, one walks down a sloping lawn, onto a ground-level open entrance court paved with herringbone brick and ceilinged with cedar board. Passing through the court, the auditorium is entered by ascending stairs. The exit is a free-standing stair at the north wall of the auditorium, which wraps down around the east exterior wall.

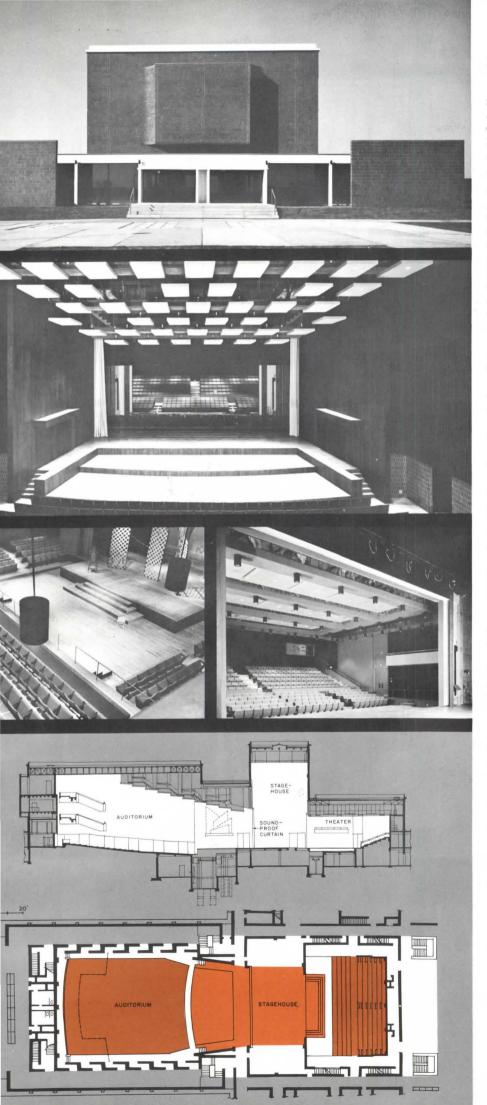
The ground level of the auditorium building is used for dressing rooms, costume storage, set building, and offices. It has two staircases leading to the theater backstage. Concrete block walls perforate the building, forming a fire wall between stage and auditorium.

With proscenium and low stage, the theater is single form. Three continuous steps barely separate it from the audience. The unusual feature of a full-length window on the north wall of the stage lights the daily assembly of students addressed by the director. (During theatrical performances, the window is blacked out.) Seating is fixed and onedirectional.

Interior finish consists of random length cedar strips varying in depth, for sound diffusion. Wood finish interior and exterior is undressed. The auditorium has a plank ceiling and oak floors.

The building fulfills the school's needs of auditorium, assembly hall, drama, dance, cinema, and lecture space, as well as summer theater.





Benedicta: A Common Stagehouse

BENEDICTA ARTS CENTER, St. Joseph, Minn. Architects: Hammel, Green & Abrahamson. Consultants: John Ditmore, Sister Coleman, Theater; Jack Jordan, Rigging; Bolt, Beranek & Newman, Acoustics.

The auditorium and theater of the Saint Benedicta Arts Center are unique in being joined through a common stagehouse, which, although primarily designed for the theater, is operable for both spaces. A 20-ton soundisolating wall divides the auditorium from the theater, permitting simultaneous use. The partition, located to seal sound from the auditorium side, prevents sound loss into the stagehouse. Raising the acoustic wall and closing off the forestage of the theater gives the auditorium use of the stagehouse.

Three lifts, one in the theater and two in the auditorium, add flexibility to these spaces; they also serve as elevators from the storage rooms below. In the auditorium, the lifts may be raised to add thrust to the proscenium stage. At floor level, they add space that allows an additional 200 seats to augment the auditorium's 1000-seat capacity.

The 350-seat theater has a traditional proscenium stage when the lift is at floor level. With the lift raised, a thrust stage is added. Seating, which rests on the lift platform on manually operated stage wagons, is divided and moved to the sides to create a threequarter seating pattern for thrust-stage performances.

The walls of both theater and auditorium are a combination of brick, wood, and fiber mesh. Behind the open wood and fiber mesh walls, electronically-operated burlap curtains can be moved to adjust the spaces acoustically for varying types of performances. Ceiling panels are also electronically operated.

The auditorium will be used for a variety of functions, including lectures, movingpicture projection, as well as orchestral and operatic performances. An additional small, 120-seat theater, located on the lower level, is also part of this arts center. Called the arena, it is used for student experimental productions and educational television programs that are made available by the school.

The architect, who had been working on the campus for eight years, had never designed a theater before. He toured facilities with the client, whom he describes as knowledgeable, and termed their relationship ideal.

The acoustical consultant is regularly engaged by the architect's office. The other consultants—in the fields of theater technology, lighting, stage rigging and projection were selected jointly by the client and architect.

Architect Green makes the following comments concerning theater design and architect-consultant relationships: "Theater design is just beginning to develop and react to new thinking, which makes it extremely interesting. Further, it involves large and small volume, not necessarily dictated by efficiency analyses."

Tulsa: Palace of Culture

TULSA ASSEMBLY CENTER, Tulsa, Okla. Architects: Edward Durell Stone; Associate Architects, Murray-Jones-Murray. Consultants: Severud, Elstad, Krueger & Associates, Structure; Netherton, Bellmeyer, Solnok, Mechanical and Electrical; Abe Feder, Lighting; Bolt, Beranek & Newman, Acoustics.

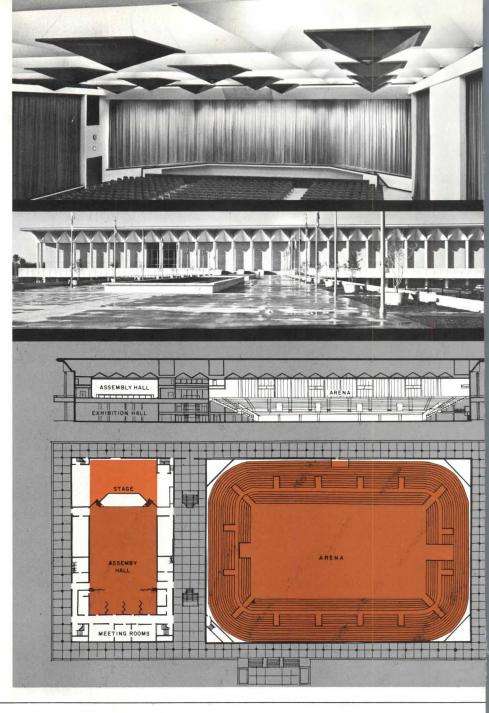
Edward Durell Stone's Tulsa Assembly Center comprises three multiple-use spaces for an aggregation of functions ranging from cow 'palace to theatrical performance. The arena will seat 10,100 for a boxing match, 8700 for basketball, 7700 for hockey.

When "culture" demands, part of the arena can be masked off with curtains from roof to floor for theatrical performances. Lighting provisions include specially designed lighting and remote-control panel besides special theatrical lighting.

The assembly hall, which begins with a modest seating capacity of 1200 in onedirectional viewing of its proscenium stage and sunken orchestra pit, can be enlarged by moving flexible partitions. These convert side meeting rooms to part of the auditorium space, adding an additional 550 seats. Balcony meeting rooms can also be opened and, when ramped seating is added, another 350 spectators can be accommodated, for a total of 2270.

The arena and assembly hall ceilings are 20-ft inverted pyramidal-shaped panels with sprayed asbestos surfaces for acoustic control. All major zones of the building have separate air-conditioning controls and thermostatic adjustment of individual spaces.

The popular appeal of the Center is reflected in its unique programming. Ten committees of Tulsa citizens, comprising such professions as communications media, fire and safety, assembly, catering, etc., met with the architect and his consultants to formulate programs and iron out difficulties. A unique method, which the architect says functioned well.

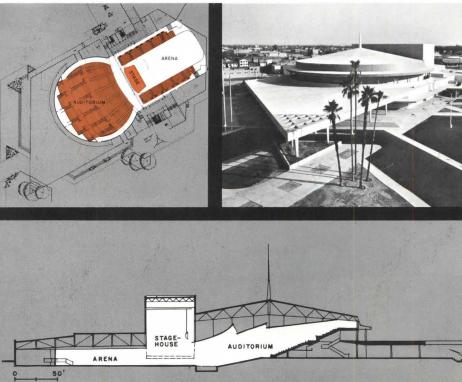


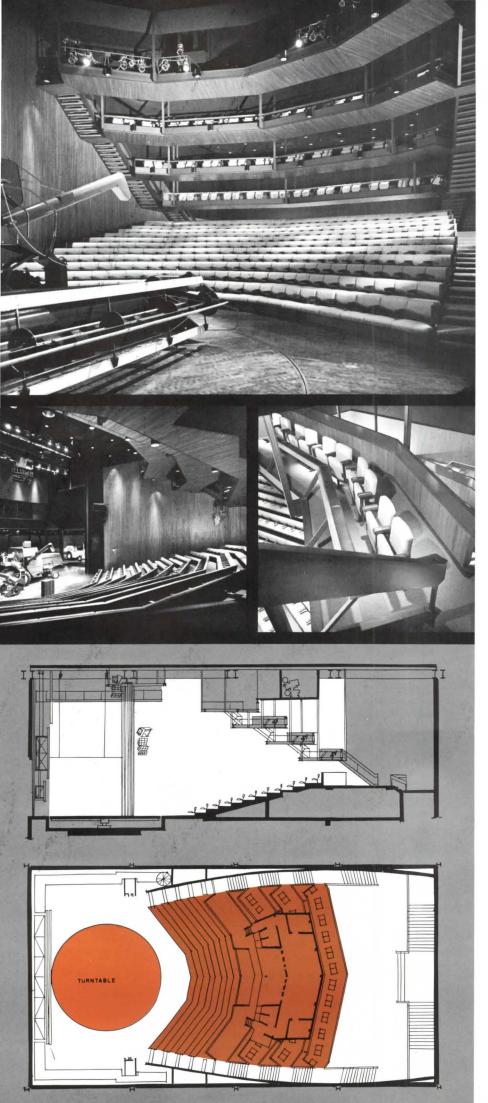
Bakersfield: Buildings Combined

BAKERSFIELD CIVIC AUDITORIUM, Bakersfield, Calif. Architects: Wright & Metcalf. Consultants: Vern O. Knudsen, Acoustics; Lindsley C. Lueddeke, Auditorium; Hillman and Nowell, Structure; C.D. Walz & Associates, Mechanical; R.L. Grosh & Sons, Rigging.

The Bakersfield Civic Center, housing what the architect believes to be the second- or third-largest stage in the world, is actually a complex of convention buildings combined into one structure. The arena and auditorium are connected through one stagehouse and separated by two 10-in. soundproof curtains.

These sound barriers can be used in a variety of combinations. Closing of one and opening of the other alternately permits the use of the stagehouse by the auditorium or arena. Closing of both walls converts the stagehouse into a separate room, providing for simultaneous use of all three spaces.





Deere: Balconies Forward!

DEERE TRACTOR THEATER, Moline, Ill. Architects: Eero Saarinen & Associates. Consultants: Ammann & Whitney, Structure; Burns and McDonnell, Mechanical and Electrical; Bolt, Beranek & Newman, Acoustics; Richard Kelly, Lighting; Stanley McCandless, Stage Lighting.

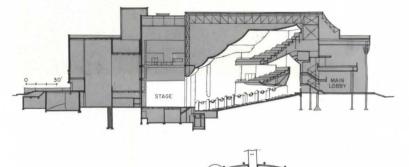
The John Deere auditorium is part of the Saarinen Deere & Company administrative office complex at Moline. Designed primarily for the display of farm machinery, it can also be used for moving-picture projection by lowering a back-wall projection screen.

The theater has a large proscenium opening and stage area at floor level. Equipment is driven directly onto a 32-ft-diameter mechanized turntable through two 28-ft-wide doors at either side of the stage. The back wall of the stage is of glass, covered by a movable panel. The panel, when moved, allows use of the outside courtyard as a display area.

Acoustic treatment is fixed. Side-walls are of random-length planking with carpeted floors and aisles, and the ceiling is exposed in the theater area with a hung ceiling over the back balcony entrance section.

The most unique feature of the auditorium's design is its reverse balcony, which projects from the rear of the theater toward the stage in four tiers. Three of the tiers contain single rows of paired seating of 22 seats each; the fourth is used for stage lighting. The main floor of the auditorium seats 318 in rows of continuous, backed seating.

Hugh Hardy has this to say about the balcony design: "Now it's fashionable that all balconies are staggered toward the rear, and the seating consultants sell you that as a shape. Suppose Saarinen's section becomes fashionable where balconies reverse themselves. There are people all around the room, and it's very exciting. Then one of them will say: 'Hey, buy one of those! Who is a consultant for that? Let's have one of those too.'"



GRADY GAMMAGE MEMORIAL AUDITORIUM, ARI-ZONA STATE UNIVERSITY, Tempo, Ariz. Architects: Frank Lloyd Wright; William Wesley Peters, Chief Architect; John Rattenbury, Staff Architect. Consultants: George Izenour, Theater; Vern O. Knudsen, Acoustics; Robert E. McKee, General Contractor.

Frank Lloyd Wright's only major public building in Arizona, the Grady Gammage Theater, was completed in September of 1964 (November 1964 P/A).

In plan, the theater forms two overlapping circular shapes, one embracing the stage functions, the other the audience and its facilities. Extending out from the level of the balcony and grand tier, two bridges span 200 ft to ground-level parking areas.

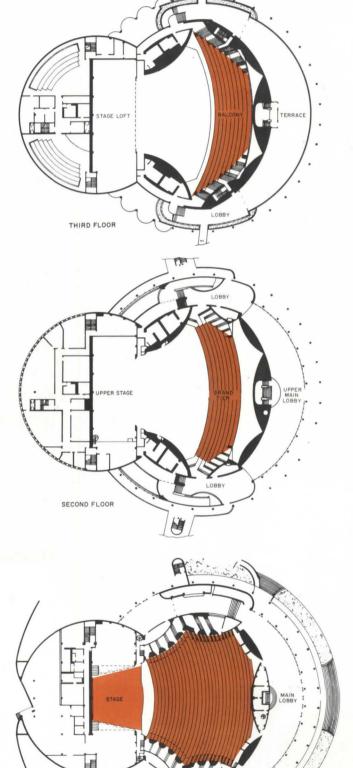
The theater stage is single use, with a proscenium opening that can be reduced from 64'x 30' to 30'x 15'. Its forestage may be lifted to extend the 140-ft-wide stage into the audience, or lowered for an orchestra pit, or used to accommodate additional seating.

Total auditorium seating is 3000, with 1643 on the main floor, 601 in the grand tier, and 669 in the balcony. Continental seating eliminates radial aisles. The most distant seat is 115 ft from the stage.

Although the stage is single use, the auditorium can also be used as concert hall, auditorium, and theater through the medium of a telescoping bandshell. The steel shell, which extends from the rear wall, is large enough to surround an entire symphony orchestra. The remainder of the auditorium acoustic treatment is stationary. Probably the most unusual architectural acoustic feature of the auditorium is in the detaching of the grand tier and second balcony from the rear walls. It was an idea that had always been dear to Wright and went back beyond the idea of correcting air volume; it went back to Dankmar Adler at the Chicago Auditorium.

Interior decoration was done by Mrs. Wright. The total construction cost of \$2,460,000 averages about \$800 a seat.

Architect Wesley Peters commented: "I feel that we must work from generals to particulars, and the particulars must be filled in by the consultants. If it happens the other way around, you end up with a mess where the mechanism is designing the organism.... Any over-all architectural preconception ought to be so wide and so broad that it would permit any number of architectural solutions."



FIRST FLOOR



Colgate: Creativity Can't Be Delegated

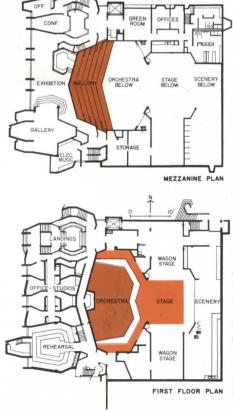
CREATIVE ARTS CENTER, COLGATE UNIVERSITY, Hamilton, New York. Architect: Paul Rudolph. Consultants: Edward C. Cole, General Theater; Harvey R. Smith, Lighting; Cambridge Acoustical Associates, Acoustics.

Colgate University's 400-seat proscenium theater, a part of Paul Rudolph's Creative Arts Center (p. 57, May 1964 P/A), was intended by the client to house drama, music, and art lectures. "These uses are very often conflicting," Rudolph observes. "Drama had the major say, by predetermined policy. One day, the musicians will have a separate auditorium; lecturing and the theater are not at war with each other, of course." Given these objectives, the architect talked principally with the drama department head. "He wanted a proscenium arch," Rudolph explains. "He also felt—and I quite agree that you can't have everything; you must make a choice."

Rudolph, who has built a theater at Wellesley and designed an "Ideal Theater" project for the Ford Foundation, advises, "If you're going to do a theater, you really need at least two people to elaborate it with: a general consultant and a lighting consultant."

There is no stagehouse at Colgate, much to the consternation of both architect and consultants; one will be added in the future, however. Instead, stage wagons are used to provide horizontal movement and storage space, a system Rudolph considers more flexible and more generally useful than vertical storage.

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"I personally don't feel that the word of an expert is the last word at all," Rudolph states. "Usually there's more than one way of doing things. As I see it, it's like playing an orchestra: you pick and choose and balance one thing against another."

The Colgate Theater has some of the features of an Elizabethan theater: four side stages (two levels on each side) and an apron that projects into the audience in a V form. The stage continues in front of the side stages, and along the sides of the audience. "It is the level you actually enter on," Rudolph continues. "Part of my notion is that when you enter the theater you are on the stage, and then you go down and take your seats."

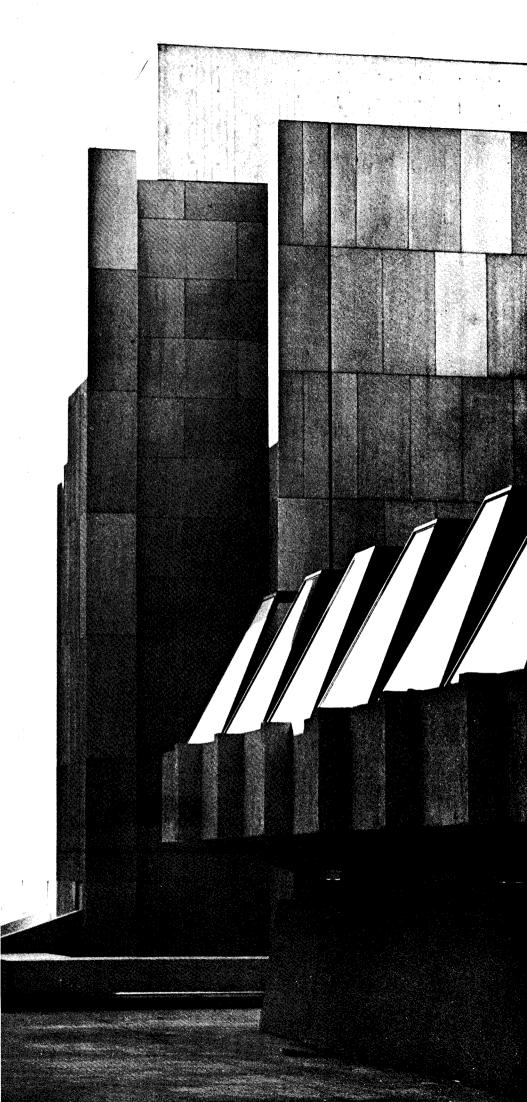
As an extension of the encircling "caliper" stage, there is a light bridge around the top of the auditorium. "The consultants didn't suggest either the stage form or the lighting bridge," Rudolph reports. "I asked their opinions after the theater had been perceived as an architectural space (and indeed they were modified). I don't want to say the way I work is right or wrong. I just know the way I work best. You can't delegate creativity."

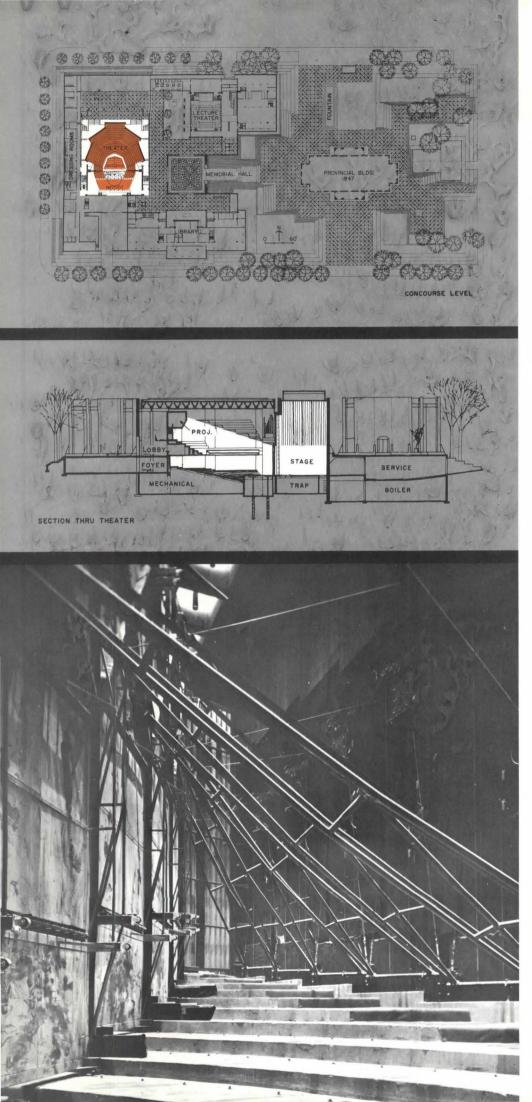
FATHERS OF THE CONFEDERATION MEMORIAL BUILDINGS, Charlottetown, Prince Edward Island, Canada. Architects: Affleck, Desbarats, Dimakopoulos, Lebensold, Sise; Partner in Charge, Dimakopoulos; Town Planner, Norbert Schoenauer. Consultants: Adjeleian & Associates, Structure; James P. Keith & Associates, Mechanical and Electrical; George C. Izenour, Theater; William Lam, Lighting; Bolt, Beranek & Newman, Acoustics; Dr. E. R. Arthur, University of Toronto, Professional Advisor.

"Someone said, 'Let's move out the walls,' and we worked it out with Izenour." According to the architect, this is how the idea of manipulating the theater's interior volume to conform with changed use came into being.

The 970-seat theater can be altered from proscenium to thrust stage by utilizing boomsuspended, mechanically-operated side walls, sacrificing a minimal eight seats in transition. Seating blanked off in narrowing the auditorium is compensated for by raising a seating bank stored underneath the permanent orchestra seating on the thrust stage lift. A smaller lift positions the foreportion of the proscenium stage and rear section of the apron stage. This lift is also utilized as an orchestra pit floor or elevator to the trap room.

Acoustic regulation is as diverse as the remainder of the theater's mechanical flexi-

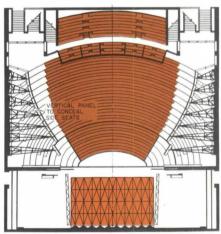




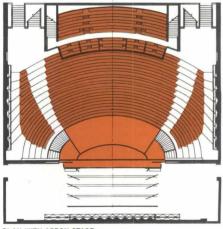
bility. Ceiling panels were designed for acoustic functions as well as a masking device for audio equipment. Side-wall panels are adjustable for sound reflection and absorption and draperies over hard front and rear walls modify these surfaces as required. Seating is made more sound-absorptive by exposing the under-upholstered surfaces.

Programming of the theater was included as part of the Memorial Center Competition. The competition outlined conditions for the design of the center, which consists of theater art gallery, museum, memorial hall, and library on a tight 6.3-acre site in the center of the city. The focal point of the complex is the 1847 building, which was the meeting place for the negotiators who met to confederate the Canadian provinces.

Several consultants and a professional adviser worked with the architect, who described the relationship as "very satisfactory." The architect further comments: "The design of theaters does differ very much from the design of other building types. It is terribly important that the architect should have a very good knowledge of the meaning of theater in its broadest sense and have a fairly good understanding of the art. I think it is safe to assume that no architect can be an expert technologist in the detailed operations of the functional aspect of production. The role of the architect, therefore, is similar here as it is in any other building. In a way, he is to act primarily as creator and artist. I am afraid that his ability to judge his 'expertise' has to be left to a large degree to his 'nose' and his conscience."



PLAN WITH PROSCENIUM STAGE



PLAN WITH APRON STAGE





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and the second second



"Our revels now are ended. These our actors, As I foretold you, were all spirits and Are melted into air, into thin air: And, like the baseless fabric of this vision, The cloud-capp'd towers, the gorgeous palaces, The solemn temples, the great globe itself, Yea, all which it inherit, shall dissolve And, like this insubstantial pageant faded, Leave not a rack behind."

After all is said and done, there is usually more said than done. Given the selected confines of our presentation, are there any comments on the status of the theater and its design that might permit some extrapolations about the changing nature of architectural practice? Johnson hopes that it is "in a healthy state of chaos, like [all] architecture." Like all architecture, the theater, some think, changes (or does not change) as the activities it houses change: "You can write all the plays that you want to," comments Hardy, "but you don't change anything in the theater until the play, and the directors, and all that stuff changes too. Because of that, it's a very complex social institution, which changes slower than any of them." Franzen believes that there "is really an evolutionary thing going on in the theater," while Schlanger says, "I don't think theater presentation techniques are changing as most people think." Bowman believes that "great" theater architecture will be impossible "while the present eclectic spirit prevails among theater directors and designers."

Since in all periods of technical innovation there is little time for the development of a craft tradition, the craft of building theaters similarly has little time to develop today – owing both to the past hiatus of theater building and the consequent loss of experience, and to the new furor of experimentation and innovation.

Thus, despite the furor and all that discussion, several problems relating to theater design remain to be solved. The first of these – having parallels in other types of buildings – involves the complexity of the client, as discussed in Act I. Particularly, the problems incurred when the client-owner is untrained in the theater, as opposed to being a theater-oriented group of users. Not until the real client stands up and it is determined who the theater is really for – who the art of the theater is really for – can this matter become clear and be ultimately resolved.

As has been pointed out, the present user may not be the ultimate user. And the mirage of the ideal theater in the minds of theater people makes for all the greater difficulty in the use of a building by groups than the one for which it was designed. The custom suit fits only the man for whom it was made. Even if the *perfect* suit were ever made, of course, it would fit only the *perfect* man. Therefore, in theater design, it would seem that the omnipresent problem is how to design for the changing user. "I suppose in theory you could build a theater so flexible that it could work for many people," Abramovitz observes. "No one has done it because the economics are terrifying. You would have to have a flexible backstage and sidestage and a proscenium and no proscenium. You would have to have the walls change and the ceiling of the house change and sometimes the floor of the house change. You can't really do that." "A theater is not a constant thing," Roche thinks, "it varies with the people using it."

Some think a possible way out of this dilemma is the use of uncommitted black boxes, those simple rooms with anonymous atmospheres and flat floors and grid ceilings into which simple platforms and other devices can be fitted to produce virtually any form of stage desired. Some architects would rebel at the very anonymity, no doubt. "Not for me," Johnson insists. "Anybody can do a black box. I don't feel very pleasant in that little black box."

In the opposite direction lie extreme flexibility and/or fragmentation of uses. Abramovitz would like to see these two directions explored. "Somehow permitting some exercise in flexibility that involves moving everything and is highly mechanistic – forgetting the old statement

that you can't find anybody that will do it; students can't do it; you can't find a technician to keep it working; it will cost too much; and so forth. Forget all that. Another direction would be to have many, many theaters of all different kinds done very simply. Just think how wonderful if they had a real theater school and had half a dozen of those little black boxes and wouldn't have to knock one down to do another one. Also, if you had several concert halls instead of one that has to be for modern music and 10 minutes later for baroque music and after intermission for romantic music. And then little and big drama theaters. Many, many kinds in one complex and a certain number that can vary. Right now, I'd rather do the many kinds, because it would give a chance to find a character for each one."

Perhaps none of these is the appropriate direction, and maybe that is what is wrong. Everyone wants a physical form that changes to another or one that can encompass a diversity of uses. Right now, perhaps, we can only determine that no type of public building is so personal and private as the theater. Theaters certainly do not seem to have the flexibility for future uses as commercial buildings - or even private houses, which can adapt to new owners. The question should be raised, even though it cannot yet be answered, whether theaters that can be used efficiently by a wide variety of performing groups might not be achieved by some means other than multiform flexibility or extravagant imagination and "form-making." Possibly the only way this "other" will be found is through the time-honored means of try and try again. As we have seen, the problem must be preprogrammed, programmed, intensively planned and researched by the architect and his consultants, then nourished into architecture. "It is the misfortune that engineers and architects who are about to undertake design do not in general thoroughly investigate auditoriums, both old and new, to assess their problems," Veneklasen says. "Even more regrettable is that many of these same persons do not go back into their own auditoriums, especially during performance conditions, to evaluate the degree of success of problems they have achieved." The architect must view himself, in a way, not only as a member of the audience, but as a performer; he must realize how the thing looks and works from backstage. Feder says that "80 per cent of the people who build theaters have never seen a show presented from behind the curtain line." The establishment of architects specializing only in theaters is not the answer, on the other hand. "You could make a theater czar," according to Hardy. "You could take somebody who had done a good theater and then let him do another, and then a better, and a better. Now look out, because they die. But before they die, you could collect all that in a book or impress it on somebody else, but that always somehow turns sour; I don't think this could be done." As Shakespeare said:

> "As in a theater, the eyes of men, After a well-graced actor leaves the stage, Are idly bent on him that enters next, Thinking his prattle to be tedious."

Concerning the matter of expanding practice, it becomes patent that an architect must exercise strenuously the faculty that many claim is his specific specialty – analytical thinking. He must ask the right questions, not only of his clients and consultants, but also, and most importantly, of himself. For, beyond his activity as coordinator of building projects, the architect must maintain an inquiring mind about his own creative specialty: the psychology and aesthetics of buildings.

Also, the architect must continually ask penetrating questions about his practice, in particular about its procedural steps. For example, he needs to know as early as possible when the traditional orders of procedure need to be examined in further detail and subdivided into separate stages – or even abandoned or violated. For architectural practice is changing, and only with inquiring minds and clear vision can architects control and influence these changes for the better.

Furthermore, with the expanded length from conception to realization of projects, there will be required, and, doubtless, only painfully mastered, the patience, endurance, and momentum to see a project through with full control from three to seven years, in most cases.

If the procedural process of design requires thoughtful unraveling on the part of many architects, then each step must be seen for its own significance and evaluated in adequate light. P/A has tried to provide an object lesson in this evaluation:

ACT I. A three-way discussion between owner-user, consultant, and architect may be necessary to do preprogramming and programming. For a good (beautiful and well-functioning) building can follow only after a good (accurate and far-sighted) program has been written. ACT II. The position and influence of the technical consultant, a crucial factor today, must be clearly delineated at the outset.

ACT III. What both the client-user and the consultants may have to be instructed in is that one of the functional requirements of architecture is that it have an emotional and aesthetic content that makes it more than a building – that makes it the *art* of building.

But it would not be the editors' intent, or a reflection of the facts, if this discussion seemed so tidy a codification of the problems that it appeared to any reader as precluding or completely satisfying his own thinking processes on the matter. The danger of any clarification of a chaotic situation is that the new light might appear the only light. After all, individuality defies classification, and, as every architect knows, he must rethink all procedures in terms of his particular problems.

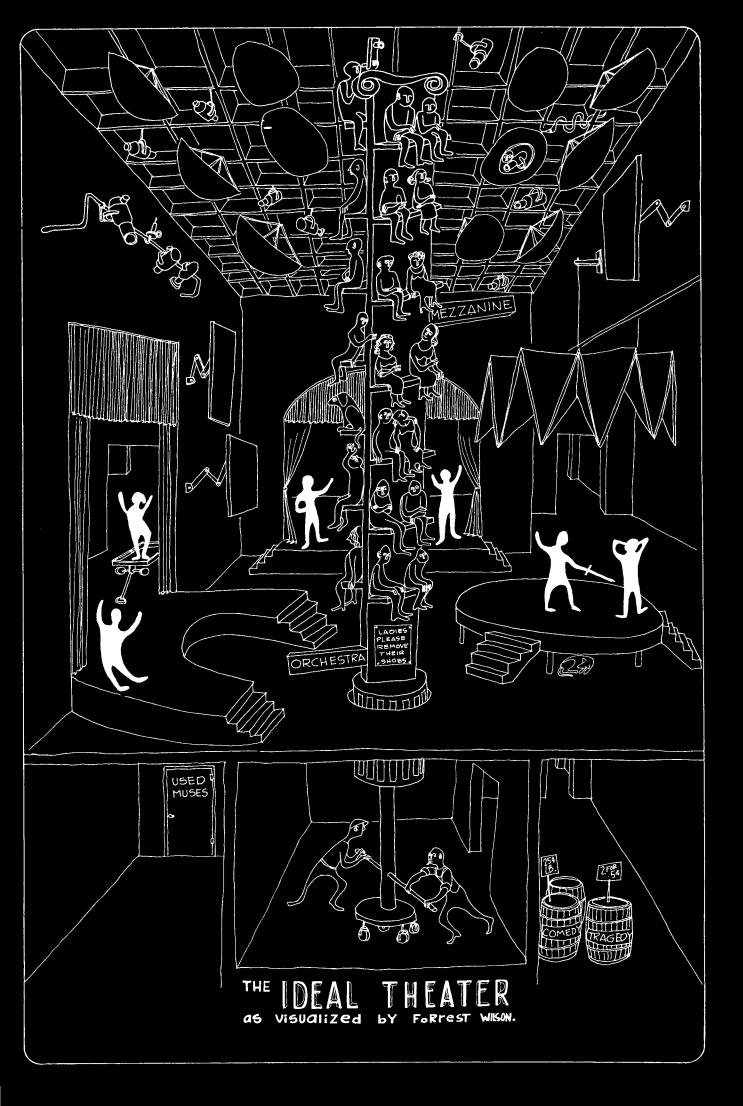
The problems of the changing practice, or the increasing use of consultants and experts from other fields, will continue to disturb those who regard design as an individual and private thing. Johnson muses: "The question I don't think anybody can answer is, will we expand our services or narrow them by the vast use of consultants that we're forced more and more to use? In an era of specialization you become typed, as it were — as a hospital architect or a theater architect or something — and then you don't get a chance, really, to build. My main aim in life is to design, is to do total environments." Brill thinks that the architect — the AIA version of "expanded practices" aside — must get into "the problems of overpopulation, high densities, the incredible changing aspect of the city." "It's we Anglo-Saxon architects with our concern for form as the be-all and end-all of architecture who are degenerating," he says. "There's just so much you can do with form. Since the architect gave up roads and bridges to the engineer, and housing to the speculator, and sort-of-everything-else is being taken away from him, he seems to concentrate (a) on business, which I fear is a large part of the expanded services program (you know, being more knowledgeable about financing, and so forth), or (b) being a tastemaker or formgiver."

Comprehensive Architectural Services states, "We have . . . been able to do a better job through expanded knowledge." This statement – and indeed the entire concept – has implications for architectural education. If the architect is going to act as leader, and be respected as such, he has to be trained for it. "The architect never keeps leadership unless he's worthy of it," says Abramovitz. "You can't lead without being a leader. It's a combination of ability, ideas, situations, and the rapport between people."

Our play having ended, what have we witnessed, a comedy or a tragedy? A sometimes comedy of errors, perhaps, in the frequent lack of communications between architect, client, and consultant. Seldom a tragedy, except when one man's insistence on the overweening importance of his particular specialty is allowed to ruin a building. Perhaps documentary is the best term for this investigation.

Classical plays usually had a *deus ex machina* descend from the heavens in the last act to tie together all the strands of the drama and set things aright amongst its warring participants. Our *deus ex machina* is, oddly enough, a consultant, engineer John Skilling, who gave his estimate of what the architect's leadership should be in a talk he gave to students at the 1965 AIA Convention:

"Design is a process of logical thinking – of organizing procedures from start to end. It always begins with determination of the objective. It proceeds with thoughtful consideration of everything that may bear upon the attainment of that objective and the relationship and integration of these factors. . . . Design requires the individual thinker and innovator. It requires specialists in many fields. At the helm it requires a manager-coordinator, with the ability to communicate with the technologist, and with a total grasp of the environment which the system is to create or in which it is to function. If we - the architects and engineers of our environment are to continue and not be replaced by a new breed of systems engineers, then you, the future architects, must accept this helm. You must pursue and learn the art of communication with the technologist.... You cannot do this by accepting the standard, the norm, the written word, the obsolete code. It will take lots of hard work. The days of designing buildings on the back of an air sickness bag are passé. The routine development of design from a pretty sketch to working drawings is no longer possible. The development of design is a blood-and-guts, hardwork, delving, communicating, translating, coordinating, systematizing process. You must accept the challenge to strike out beyond. The secret is *communication*. The alternative will be a sterile environment produced by the technologist without the benefit of your leadership."



P/A OBSERVER

UNIVERSITY OF ILLINOIS, CHICAGO CAMPUS

Transition, Tradition, or New Approach?

The new Chicago campus of the University of Illinois by Walter Netsch, Jr., of Skidmore, Owings & Merrill raises significant questions concerning the design and planning of the contemporary institution of higher education. Not since SOM's Air Force Academy has there been an educational project of such scope, and the Academy was a unique problem. At the Chicago campus, the architect was confronted with the problems of creating a university that was integrated with the urban fabric yet that at the same time possessed its own identity as a seat of learning; of providing facilities and spaces appropriate for today's instructional methods, which must be adapted to different methods as they appear on the fast-changing educational scene; of creating an atmosphere, an ambiance, that will have a deep meaning for the commuting student body and the faculty; of re-examing the instructional structure of a university and developing buildings and pedagogical areas that reflect a much less hidebound, departmentalized system than has the traditional school.

To examine these questions and others as they pertain to the new campus and to future campuses, P/A Senior Editor James Burns went to Chicago for a lengthy discussion with Walter Netsch, Edward Dart of Loebl, Schlossman, Bennett & Dart, and Leonard Currie, Dean of the School of Architecture and Art on the new campus. Presented here are the highlights of that discussion, touching generally on the larger problem of new university design as sparked by the University of Illinois Chicago campus, and specifically on Netsch's campus, its planning and its architecture.

"At the Chicago campus of the University of Illinois we have, in reality," Dart said, "a traditional campus. By a traditional campus, I mean a series of buildings related to each other in an interesting manner around a mall or the like. I believe this originated from the practice of individual donors giving buildings, and those buildings having to be things apart. There are

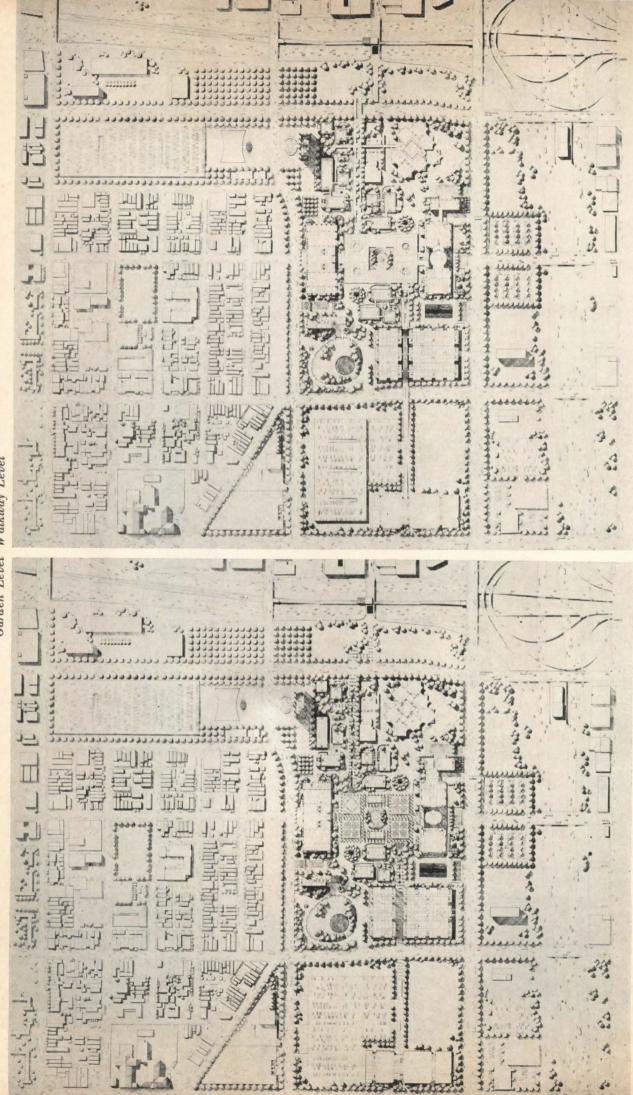






Photos, except as noted: Harr, Hedrich-Blessing





Garden Level Walkway Level

beginning to be campuses for everything: for colleges, for elementary schools, for industrial parks, for businesses; before you know it, there will be campuses for houses, where we'll have to go outside to get from the living room to the dining room. In a climate as unkind as ours in Chicago, this campus maybe could have taken the approach of a more original concept, one less in conformity to tradition. As far as I am concerned, Walter, this comes back to a discussion you and I and several others had some time ago: that it would be great if we architects could get together now and again and criticize each other's work, hoping for a better thing. We never have, and that's why I am glad about this discussion."

"Your point on campuses is interesting for two reasons," replied Netsch. "You referred to the placing of buildings on a traditional campus for individual donors. The placing of buildings here in Chicago also had reasons in the previous placement of utilities and the economics of the project. The bridges that connect everything here represent a systematized effort to make major and minor connections to enforce what we agree is the goal-a unified totality-and to develop a network. Obviously, the center of the campus is not the village green; it is distinctly urban in setting. The lecture center that supports the central plaza joins the library and the student union, and then the classrooms surrounding it, obviously in a matrix system. It's a problem of phasing from 5000 now to 20,000 with the original educational program, and of changing with future educational programs. One of the important problems is not only the acceleration of school design, but also the capability of growth to almost infinite limits in certain changes of educational patterns. The Architecture and Art Building will be the last building on campus and in many respects is the synthesis of what we have learned about intercommunication."

Currie commented, "I agree with Ed in his general desire to get a more concentrated urban campus,

and I certainly agree with his general definition of traditional campuses-individual buildings set in a green. But this campus has deviated greatly from that tradition of the American university. This is a campus that ultimately will service 20,-000 undergraduate students, so it is going to be almost as large as any other single campus in the country. The academic core here-leaving out some of the parking areas, landscaped areas, and play areas-is 34 acres, whereas the traditional state university campus or land-grant college is apt to have about 150 acres doing the same job. I see this concept as a very urban one; in the heart of the campus we have, instead of the green, this paved plaza, which is more reminiscent to me of the agora of the Greek city or the Piazza San Marco."

"This scheme was developed in about six months," Netsch said, "and, if I may be conceited, I feel the group we were working with was strongly forward-looking, considering the complexities of phasing (to a larger student body) and economics. This is a transitional campus that stems from tradition, that has some radical departures, but that is not the completely systems-organized single building we had actually hoped to do. If you will look back at the evolution of the central plaza design, you will see we had trees on top of the plaza. I showed this to Bush-Brown and he gave me hell for it. We came back to the idea that trees, like human beings, should be where there is dirt going all the way down. And we took the trees off the plaza, and that also made us think about people. On the original presentation, I think you will see benches all around the edge, a linear thing, kind of park benches in a row. We came to a more spontaneous thing -the plaza and its 'excedra'—out of a greater effort at social communication. This has been an additive, and I think the lecture center and plaza are elements in the nontraditional sense."

"The elevated walkway, which is the spine of the design, done in granite rather than green, is still the same concept of a central sort of

space," Dart insisted. "My only urban disturbance in this is that, in our damn climate, this thing will be vacated between December and March."

"Well," retorted Netsch, "you use the lower level, and go into a controlled climate inside. Then we have the times when you don't have to sit in the air-conditioned climate and you can sit in the open and let the wind blow in your hair. It's a seasonal kind of thing that I think all of us want."

Dart replied, "I am not talking about a hermetically sealed, canned environment where there is nothing but air-conditioning. I just feel that this circulation is a very strong part of the design—its spine—and that all the efforts that have been made to make this a plaza in some way should have made it a more useful plaza."

"I walked on it last winter," Currie stated. "It was cold; it was unpleasant. It was not always a happy situation. But I don't think it was any different than it would have been walking along those other sidewalks in that same terrible weather in Chicago. I am not sure that when the wind is blowing I would not rather be up there than underneath where you get a wind weir effect. I might walk underneath on a very hot day to get shade, or when it is raining, to get protection, but when you're talking about the cold winter wind of Chicago, it's going to blow on you whether you're on Michigan Avenue, or on top of that ramp, or below it."

"This reinforces the desire I have of making this even more compact than it is" Dart urged. "An example is the school Aalto did, or is doing, in Finland at Otariemi. It is a compact university complex in a climate worse than ours. Not that this is the total solution to the problem, but I sincerely think that this is the direction in which to go."

Netsch expanded, "The interesting issue between European and American planning is the problem of scale. Ed refers to the centrality of the scheme. There will be 20,000 students on this campus. We have 10-minute walking distances between classes. We have a commuter campus, where men and women go to work as well as go to school. There are 4300 seats in the lecture center in 16 different kinds of lecture rooms. There will be 6000 seats in the library. The Student Union is designed for the campus as a whole. So if there is a centrality, it does go back in a sense to the Greeks, where the areas of social communications were concentrated.

"We made several studies before we arrived at this solution. One of them was of four separate colleges. The centrality in that case would have been those things shared by all four-the technological, library, and the rest. We discovered in doing that that we also set up numerous separate departments — English, mathematics, and so forth. The university made a study and found that the problem in acquiring enough staff at the rate of four heads of everything plus even the faculty salary problem when we're trying to get seven universities going in the state was not possible.

"This is the difference in the way our scale works. The real, basic things we have to ask ourselves as we move forward on every frontnot only increasing opportunities but increasing scale and increasing performances and increasing demands —is how far can we go, where can we go, how can we recognize the individual in this; so this becomes a problem to be worked out with each solution. All of us, architects and educators alike, will learn a lot when more of these universities -California and New York State, for instance — are finished and evaluations can be made."

"About the spine," Currie reiterated. "I find it quite a departure and quite a unique thing. You can get on the subway in front of the SOM office at the Inland Steel Building downtown and in four minutes you can get off at the university station, go up the escalator, get on the pedestrian ramp, and go anyplace on this campus and never cross vehicular traffic. To do this in a city the size of Chicago is an entirely different thing than we have ever done before, and I don't care if you're walking on grass or mud or granite or whatnot. From the traffic and circulation point of view this is quite different and quite important, and a significant step in taming the automobile."

"This really defines the difference between this walkway and the walkway you find in a shopping center, which is related to the store," observed Netsch. "This is a systemsoriented pedestrian communications network that says: I want to go to the classroom; I want to go to the high-rise; I want to go to the library. No one is trying to appeal to me to go to the drugstore. The walkway is performing a very different function than the one we traditionally find. If it could be a single matrix, then it would be even more clearly articulated."

Burns asked, "What about the problem of an existing urban campus such as New York University in Greenwich Village, where Philip Johnson has been called on to try to tie it together and has used a large 'galleria' to get people out of Washington Square and off the sidewalks and into the school proper?"

"I think there are going to be a lot more of these," Currie replied. "Take the problems they have at Columbia and here at Roosevelt University—using existing buildings and converting them and tying them together in a meaningful complex in the heart of the city. Walter's campus is an urban renewal—urban development—thing."

"This is an 'instant' campus," added Dart. "The others perhaps just grew."

"As an urban renewal problem and an urban campus problem," Burns continued, "if the city and the state tell you they have a certain amount of land, do you have to take all the land? Can't it be used otherwise? Can you simply say, 'I want this much' and make it denser and more compact—perhaps higher?"

"We made two studies," Netsch explained. "Since the university was not originally an urban campus, they made the original assumption there would be no high-rise buildings, there would be walk-ups. We were asked to determine the acreage in that case; it was 150 acres. And we didn't get 150 acres. So obviously that demand of theirs had to give way. The other study was how small an acreage could we develop, and we developed a single building and it took about 10 acres. It was interesting in this case that, to move 20,000 people on this 50-minute class cycle, which is not an ordinary urban system (it was like a small town or a baseball park changing over every 50 minutes), involved a system of skip-floor escalators and the cost would have been absolutely prohibitive."

"Don't get me wrong," cautioned Dart; "I'm not talking of a huge Pentagon-type building. I'm just wondering if some of these academic spaces, which are at least connected by covered walkways, could not be more interconnected.

"I agree," agreed Netsch, "and that is why I say that it is a transitional solution and that the proposed Architecture Building is a refinement in the direction you are talking about.

"The real problem in this area, aside from the utilities that we could not move on this campus, is the problem of moving in almost 1,000,000 sq ft increments. That, again, is an example of the American scale that even those of us who accept such projects know that this is still a transitional type of thing. We should think about that, if this is the scale in which the city is going; then this campus is a microcosm of an urban environment, and we can understand the reasons and ways of handling this change of scale in the manner we have been talking about with all its complexities. Maybe then we'll have begun to solve the problem of urban environments. It doesn't have to be the single building of immense square footage; that, again, is a kind of transitional solution. When we slide over to the last building on the campus, Architecture, then we are perhaps going in that direction. A series of forms that are individually articulated, but less definite and with a kind of growth capability that goes beyond the individual buildings. This is, of course, a perceivable problem—250,000 sq ft—but how do you make 3,000,000 sq ft perceivable with diverse social goals?"

Dart replied, "Your statements about growth intrigue me most, because I think you could have an organism—that is, an organism as a plan—that grows, that has the capability of growth, not so much as the annular rings of a tree, but in which disciplines might be rooted, so to speak, in a common core or service area, yet that have the ability to grow individually as their needs dictate."

"It's interesting that your description is linear," Netsch said. "Take just the problem of science and engineering here. We have to realize these people have problems in proximity. This campus is unique in developing just five centers of interest, instead of the traditional 30. They have divided the programs into systems, energy, physics; there are five, and even with those five, we have some wonderful three-dimensional mathematics in their growth. These university people are interested in environment and have been the resource for architectural advances. The methods with which areas like the energy boys are expandingtheir needs for their own proximities-I could project into a beautiful three-dimensional Swiss cheese, where the expansion has to recoil and then come back. One vital element is the system of umblical cords that furnish the utilities and energy supply to one kind of room versus another. These vary extremely. So we're asking for the machine that has this tremendous capability and we're all on this threshold: and industry, which has been spending all its time in space instead of the human environment, has not been pushing these kind of expansive capabilities to reach these goals."

"But the expansion here on this campus is still linear," Dart insisted. "The engineering is, the architecture also."

"I'm talking ideally", retorted Netsch; "we have to move things. It would be unfair to ask scientists to establish limits; none of us want to establish limits. But I think if you sat down to a problem where you said every 'limit' worked to infinity, you'd have a difficult problem to put it in finite terms. An interdisciplinary character has to eventually evolve into the three-dimensional matrix I referred to, rather like three-dimensional chess. I will accept the criticism that the science and engineering building is in essence still linear, but I think that your proposal is still linear also.

"At the new campus. I have described the scheme as a drop of water with the intensity in the middle. As you go out, there is less intensity in terms of communication-the threehour lab versus the 50-minute lecture hall. We're not talking about Harvard when we're talking about these state universities of 20,000. We're talking about techniques that are going to go into television, into teaching machines, into trying to give the individual his choice in time, and by preserving the professor's opportunity to work with the students at the seminar level in which the basic communication on a particular discipline has already been engendered in the student. In the lecture center, the four radial lecture rooms occur around a round room in the middle. Albeit designed as an acoustical experience at this time, it eventually will lodge technological equipment that will permit simultaneous showing of four different things in those lecture rooms. So it would be the equivalent of an all-night movie in the future, and you could take your English at three o'clock in the morning."

"Walter referred to the great new industry of mass education and communication," observed the Dean. "In a way it is, and in a way it is a very forward-looking industry. But it is also a traditional industry, and while many of the people in a given discipline are pushing the edges of knowledge in their own fields, they are often reluctant to change their environment and the whole set of relationships they are used to in the university."

"Are you saying that we're stuck with the traditional form I described?" asked Dart.

"No," Currie replied. "I'm saying only that we have residual resistance to change within the university community."

"I appreciate the three-dimensional qualities of this school," Dart stated. "I just wonder how some relationships, such as architecture and science-engineering, which are at opposite nodes of the campus, could have been improved in this context."

"Well," proposed Netsch, "if we consider it as the palm of the hand with fingers able to make it a circle, it might be more clear. Also realize that the vestigial utilities plans we had to work with—plus substations —are legacies of Daniel Burnham's plan.

"This is really the third civilization on this campus. There was pre-Chicago fire, post-Chicago fire, and now this. More freedom from this imposed restriction might have led to another kind of solution, but I would like to point out that your previous suggestion is in the same general character as the linear organization."

"This has been compared to the 'celestial' architecture of Maharajah Sawai Jai Singh in Jaipur,—you know, the more-than-life-size astronomical instruments built in the 18th Century," Burns said. "While this is admittedly a superficial look on the part of casual observers, what do you think of the monumental aspect of the campus.?"

"Well, the width of the granite walkways looks terribly big now that they are practically empty," Netsch replied. "The ultimate number was determined not by me but by someone who was knowledgable about traffic conditions.

"What would be nice, when the walkways and plaza get too crowded, would be to be able to say 'Stop!' and go build another place as they did in previous times. But that isn't going to be possible, and, looking at it now, none of us have seen the campus in its fully-utilized appearance."

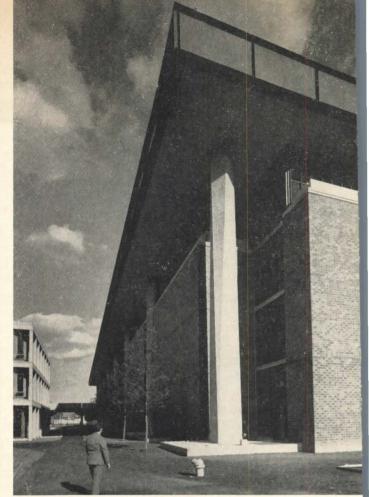
"Even now, though, those connections to the three-unit classroom clusters have gotten pretty jammed up," Currie observed.

"A good point," agreed Netsch. "We have already recognized that, and are probably going to have to complete the loop of the classroom

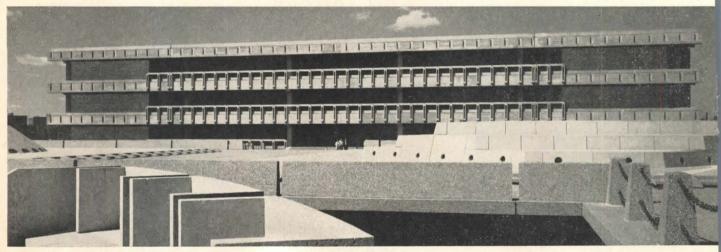




"There are 4300 seats in the lecture center in 16 kinds of lecture rooms."



Science & Engineering: "These people have problems in proxim

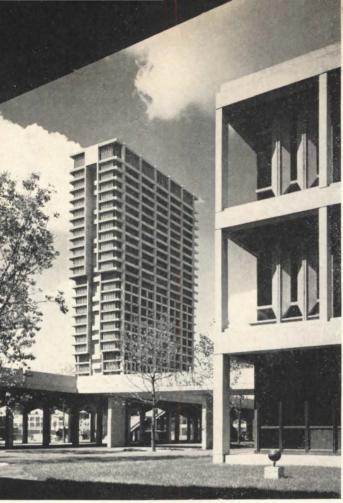


"There will be 6000 seats in the library."



"The scheme [is] a drop of water with the intensity in the middle."





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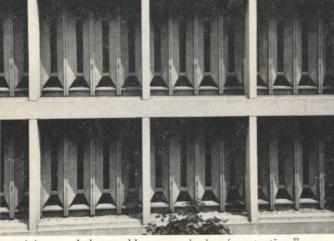
"Not a search for uniqueness . . . some very real problems."





delight and interest of some of the ground space levels between vildings."

Design for future Architecture & Art Building



capricious and thoroughly unconvincing fenestration."

clusters back to the walkways. But that is one thing we think the scheme has—this adaptability."

"One of the things I have noticed is the 'expressway' quality of the granite walkaways," Currie added.

"You see someone you know, and you can wave to them, but you can't stop and talk to them. So I think we are going to have increasing use of the central plaza as a socializing space. Perhaps if the walkways had had little nodes coming off them. ..."

"Cost was one factor there," Netsch pointed out, "but if you will look at the drawing on the lower level, you will see that this is where the perambulating area is—where the gardens and the colonnades are."

Burns asked, "This is not really a 'lolling' campus anyway, is it? It seems to me a very *fast* campus you go to the classes, the library, the student union, and leave."

"The kind of organic (pardon the expression) or nucleus campus I am proposing might have better chance of a controlled architectural expression," Dart mused. "You know, I wonder if what has happened at Yale and many other campuses, where each building that each architect does becomes his 'terminal' expression—the building to end all buildings—I wonder if the traditional campus doesn't *breed* this sort of architectural gymnastics."

"That's true, but I don't think it's necessarily bad to have the kind of variety that has gone on at Yale," Currie opined.

"Oh, I think Yale is a mess," Dart insisted.

"Well, Yale's a mess," Currie granted, "but when Yale was all collegiate Gothic, or when the University of Chicago was all collegiate Gothic, I don't think we were too happy with that either. There was an architectural unity, a homogenity about it, but it was deadly."

"Well, I don't mind Stiles and Morse and I don't even mind the Colonial things, because they are college enclaves within the whole university," said Dart. "I do object to the Yale whale and the Art and Architecture building and things of

that nature that are personal statements or platforms."

"Let's look at the University of Illinois campus," Netsch compared, "where I think Charles Murphy Associates did not attempt to make a personal statement with the student union, and I think Harry Weese's design for the future gymnasium is very polite. You can see it working here. I believe. On the usual streetline urban campus or city university, it is going to take a tremendous amount of self-discipline on the part of the architect not to become personal. But where we get into single objects in a particular, existing environment, we're really going to get into attitudes of taste.'

"There has been some criticism of the new campus as not being related to the community," Currie stated, "but when you're thinking of an all-purpose university of large size in a city like Chicago, you might say the relation to the close-by community is more important than the relation to the entire city or metropolitan region."

"I get the feeling, on experiencing this campus, that you draw these commuting students into it and create kind of a feeling that this university is in relation to Chicago as the amphitheater is to the university," Burns said. "And you bring them in more closely even than that, into the courts and into the classrooms, which are either under the central plaza-roof or behind a pronounced sculptural window treatment."

"Yes," agreed Netsch, "this was an effort to try to relate scale. This was not the problem of the Air Force Academy, where you have 2600 cadets marching en masse here and there. So we tried, in the little piazzas near the classrooms, to attempt to let 50 people get together and feel their dimensions versus the larger scale in the big plaza with its excedra. In one other space, which will not be complete until the gardens are, we will have individual chairs, where you will be able to take a chair and sit in the sun or sit in the shade or go off by yourself and say people are no damn good."

"The scale of the buildings is fine; the relationships are swell," conceded Dart. "I am concerned about the scale of the high-rise, which reads as a landmark from a distance but doesn't read from the campus, because it doesn't come down to the ground."

"This is where it is not traditional, like a campanile; it is occupied," Netsch replied. "We didn't want the feeling of Big Brother watching you; it would have been unfortunate to have the high-rise dominating the plaza. We wanted to identify it with the expressway, not with the campus, but the students still feel it relates to them.

"Incidentally, in the town and gown problem, we may have a fortuitous break on this campus. Since it was planned as a commuter campus, if it ever goes residential, the residences have got to go into the heart of the city, and will not be isolated. You might say this is a beneficial byproduct of an extremely difficult situation."

"I feel that after one acknowledges the delight and interest of some of the ground space levels between the buildings," said Dart, "the ingenuity of the structure of the elevated granite walkways, the remarkable quality of the exposed concrete surfaces, and the charm of the lecture theaters below the elevated plaza in the center, one must face the disconcerting nervousness in the detail of the buildings. The capricious and throughly unconvincing fenestration of the classroom buildings. for example, indicates a sort of ferocious compulsion to have to do something to everything for effect."

"You object to the seeming uniqueness of the window design on the classrooms and the high-rise because it becomes architecturally very strong in the environment," Netsch rejoined. "We had two problems that lead to a search for a solution. One: Since this is an all air-conditioned campus, and it is not done on a rent basis, you couldn't knock that off the income tax, but it comes from tax dollars that you and I pay. We had to find a way of reducing the amount of glass so the air conditioning load would be less. Second: There was a feeling on our part that we did not want to do enclosed, interior classrooms. This brought up the grave problem of what do you do to reduce the amount of glass on your façade in terms of heat gain, and still provide an opportunity for looking out. There was also the maintenance aspect of who owns the Venetian blinds, who cleans them, who repairs them, who leaves them up and who leaves them down. So we also wanted to get rid of Venetian blinds. Thus, we have, in essence, five different kinds of transparencies of glass. In the window design you see with the vertical slit, there are various intensities in various buildings. The middle portion is always the sameabout 3 per cent transmission, allowing you to look out even in bright sunlight. The upper portion and the lower portion vary in intensity-11 per cent, 28 per cent, and 55 per cent-depending where we thought there would be need for projection, when you would just turn out the lights. The biggest response we have had against this has been in the high-rise building. I think we made an aesthetic descision there that was in error-not that the window is wrong, but that the color of the storage walls is wrong. We have a window wall which, following this theme of looking out and loss of transmission, has a very elegant texture of the acid-etched concrete. But then we also picked a dark value for the storage wall, which gives a dichotomy in relatively small rooms between looking at the storage wall and looking at the window wall. It is, I would say, a controversial aspect of the design. But I want to stress it was not a search for uniqueness. There were some very real problems. It was like the evolution of the ground concrete block in the classrooms: how could we develop a surface that was pleasant, real, and at the same time not involve maintenance."

"This is personal," Dart replied; "I feel very depressed in the rooms. On an August day, you feel as though it were February 15. Windows, I think, are things to let the light in and look out of, even at the risk of having to pull blinds and increase the air-conditioning load. I just wanted to make that point—that the fenestration has a formal thing to it that is pulling strongly at the design."

"It might be that there could have been a little more variety in these window walls," Currie suggested, "that if this concrete frame that goes on so long and so often had been interrupted with areas that do not appear obstructed."

"I disagree," Dart exclaimed. "There's too much variety!"

"I too; I feel quite the contrary," Burns concurred.

"We tried more than one solution to solve it," Netsch resumed. "On the library, you'll notice our windows are perpendicular to the outside, and this exposes the column in the sense of sections. On Architecture and Art, we have the big windows such as in the studio room, as an effort. I have to admit, too, that it is not a perfect solution. The effort was, shall we say, heavy in trying to solve it. The results have satisified many of the basic criteria. Many people respond to it. And there are those who respond negatively."

Dart admitted, "When it comes to fenestration, I'm a dyed-in-the-wool traditionalist, really.

"The whole design thing is this remarkable choice you have to make. To bring off a great thing, you must bring it up to a precarious point, a precipice. Go too far one way, and it topples into ostentation or the sort of 'personal statement' we were talking about. Don't take it far enough, and it can slide back into something not fully realized."

"One of the things we have tried to do on the campus is provide a sense of being in touch with reality," Netsch said. "We have done the campus using natural materials: concrete, brick, wood. One thing we have done in the structure is to set about to use standard-strength concrete and minimum steel. If a column is big, or a beam or a girder, it is because it had to do a particular job." "This is the thing that comes off —the quality of the concrete and your attention to detail, and the texture between concrete and brick in the materials," Dart observed. "Those are things in this campus that are real . . . And scale: when I speak of scale, you can touch it, you can feel it. Damn good to the touch."

"On the whole," Netsch concluded, "I think education and architecture have changed; are changing. These young people are probably more aware of the larger context of civilization. You can be young and spend a summer in Mississippi and have guite a different attitude toward planning and architecture than people had in the past. Really quite a different attitude than our saying, 'I lived through the Depression.' One is *living through*, the other is participating in. This is the real problem when we talk about an increase of scale and the different capacity of the individual to understand a more complex problem, then contrasting that with the capabilities of technology to create a new myriad of opportunities and freedoms if properly used. This is the kind of great question that even the Great Society hasn't gotten into, because they are interested in establishing the Great Society first and then worrying about how we can do the technical details. But that's one of the critical details of our times: technological capability contrasted with the capability of individuation in relation to a project. And this is something that none of us has yet resolved."



Le CORBUSIER: A PRELIMINARY ASSESSMENT

The death of Le Corbusier considerably reduces the constantly dwindling number of architectural giants. A long-range, historic assessment of the man, his complete oeuvre, and his influence on architecture present and to come is still premature. However, we can study estimates of the man by architects, critics, and historians who knew him, worked with him, and studied his works through the years. P/A asked a number of these men for their evaluations, which are presented on the following pages, introduced by a thoughtful essay by Henry-Russell Hitchcock.

Response to our request for personal evaluations was so fervid that we plan to continue this series into next month's P/A OBSERVER.



Within the last six years, the two greatest architects of the 20th Century have died. In 1959, there was no state funeral in Washington, no eulogy by a cabinet minister for Frank Lloyd Wright-with us, such things are reserved for statesmen. In France, we are always told, the arts receive more recognition than in America: Le Corbusier, finally, in his seventies, had received from the French State the commission for the Musée d'Art Moderne in Paris, a more tangible tribute from Minister of Culture André Malraux than a funeral discourse, and something Wright never received even in his eighties.

If there seems a certain irony in this official acclaim-more than 40 years after Le Corbusier's iconoclastic Voisin project for the total reconstruction of Paris-for this architect who was not even born a Frenchman, much less a product of the state's École des Beaux Arts, it is in France a familiar one. There, it has long seemed as if all the writers who were the most ardent rebels in their youth ended in the Académie, and the most revolutionary canvases -a bit later, well after their painters were dead-on the walls of the Louvre. Perret, the only other 20thcentury French architect of real importance, even though he had refused to complete the course at the École des Beaux Arts, began receiving state commissions in his fifties: and, through most of the rest of his life, he increasingly dominated French architecture during decades of depression and war when very little was being built, to end by rebuilding Le Havre in the 1950's. This had hardly been true of Le Corbusier, except in the broad sense that much of the frenzied postwar building in France of the last 10 years echoes generically the International Style of the 1920's, of which Le Corbusier had been one of the three or four principal adumbrators. But the Le Corbusier of the 1940's and 50's has had less influence in France than elsewhere.

For all his early decision to become a French citizen, this Swiss is best considered not within the narrow framework of French archi-



Villa Savoye, Poissy



The Algiers Plan



Modulor at Unités d'Habitation



Ste. Marie de la Tourette, Eveux



Swiss Pavilion, Cité Universitaire





Nôtre-Dame du Haut, Ronchamp



Brazil Pavilion, Cité Universitaire

tecture but in relation to that of the whole modern world, whether we think of his early executed work of the 1920's, commissioned more often by American, English, Belgian, and Swiss clients than by French ones, or of his work of the 1950's, when his most considerable work was in India and when he was also building in Japan and the U.S.

In the case of Frank Lloyd Wright, whose mature production ran through the first six decades of the century, there is good reason to consider that he had two careersthe "classic" period of the Prairie houses at the opening of the century, so influential abroad; and the more varied phases that occupied the last quarter-century of his life and regularly received international acclaim, if not emulation. So also for Le Corbusier there was the first revolutionary period following World War I, and the later-not dissimilar in some respects to Wright's later period-following on World War II.

There are two ways of considering the executed work and the influential projects of the years 1919-1932. The historian will be most impressed by the relevance of such things as the Citrohan House projects at the beginning of this period and the Savoye house toward its end, to the early formation and the rapid advance to maturity of the International Style. The critic will look instead, even at this late date, for the excitement, the creative intensity, the special aesthetic and functional innovations that distinguished Le Corbusier's work from that of his Dutch and German contemporaries.

Yet, in all honesty, historian and critic alike must admit that it is hard 40 years later—as for that matter with many of the contemporary paintings by the masters of the École de Paris-to grant this early work the very high quality it once seemed to have. Too much that was novel then is taken for granted now-for concrete construction; example: large glazed areas; windows as horizontal ribbons or vertical slits; cantilevered roof slabs and terraces: open planning. On the other hand, to our current sensibilities, which

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have been so much modified by, among other influences, Le Corbusier's own later work, other aspects of his executed houses of the 20's seem merely démodé. This is true of the smooth painted stucco walls (against which he himself began to react as early as the League of Nations project of 1927) and the resultant boxlike cubes-"boxes on stilts" Wright called them-whose internal structure is revealed only in the *pilotis* below. Then there are the excessively Spartan interiors, sparsely furnished with a few commonplace Thonet chairs and overstuffed pieces that would be unacceptable even in industrial buildings today; the furniture became more interesting, but never in the sense of Mies's chairs, "classic," after Le Corbusier began to collaborate with Charlotte Perriand in the late 20's. Very evident also, and much criticized even at the time, is the frequent wastefulness of the planning and the highly personal ideas of function-more personal by far than Wright's-not to speak of the crudity of the concrete structure, crude even for the 20's, which the stuccoed rendering attempted to cover up, a very gross breach of the structural honesty for which his writings of the day were calling.

But we readily forget the context in which these early houses were produced and publicized (for Le Corbusier executed little but private houses in the 20's, except for the disaster of the low-cost housing project at Pessac outside Bordeaux), as well as the projects for a "City of Three Million" of 1922 and the "Plan Voisin" for Paris of 1925, not to speak of that for the Palace of the League of Nations.

Paris was still the world center of art in those years; there, revolutions in the arts were expected to be initiated. Even if Braque employed Perret to build his house and Picasso no architect at all, it was in Paris that a new movement in any of the arts *must* have its center (so it seemed then). And Le Corbusier —himself in those years almost as much a painter as an architect and a founder of Purisme—the close friend of Lipchitz and Léger, whose pictures hung on the walls of his Pavilion de l'Esprit Nouveau at the Paris Exposition of 1925, was obviously the great new leader in architecture; he said so himself. (That was why, according to the legend, Gertrude Stein told her brother that he must employ Le Corbusier to build his house at Garches, although she considered the architect too boorish to be received in her salon.)

Above all, one must rememberand new editions of later years have made this easy-that Le Corbusier in the 20's was a prolific and even, in avant garde and some professional circles, a popular writer. If his periodical L'Esprit Nouveau soon became so rare that few of even the greatest architectural libraries today have a complete file, those who then mattered in architecture, his contemporaries in Holland and Germany, regularly read it-lending their copies until they wore out. Moreover, his books, beginning with Vers une architecture of 1925, were within a few years made available internationally in German and English translations.

The legend of the Bauhaus has somewhat obscured Le Corbusier's key position in the formulation of the International Style in the 20's. And Mies's later importance as an American and international chef d'école in the postwar period has led many to forget how very limited, even by the modest standards of avant-garde production of the day, were his executed works in the 20's, how late and how brief his major contributions to the early development of the International Style at Stuttgart in 1927 and Barcelona in 1929.

Even though Le Corbusier's work of the early period already belongs to history, it has only begun to be seriously—and skeptically—studied by architectural historians. If there is a "Bauhaus legend," there has been, almost from the first, a "Corbu legend" as well. The initial volume of the remarkable *Oeuvre compléte*, edited by Boesiger and Stonorow, appeared in Switzerland in 1929. Prepared with the fullest collaboration of the subject, this series of

volumes, unique in providing nearly the total creative activity, decade by decade, of a major living architect, has been in some sense a "house organ" shaped like much of the literature concerning Gropius and the Bauhaus as regards its inclusions and exclusions by the subject and his professional "family." Excluded is almost all the early work in Switzerland, except for the Villa Schwoff at La Chaux de Fonds, illustrated largely because its facades represent probably the earliest use of tracés regulateurs, although perhaps less remarkable for 1916 than the house he had built for his parents some years earlier. Among the insufficiently appreciated early projects, otherwise largely concerned with low-cost housing-something at which he had no practical success prior to the Unités d'Habitation at Marseilles of 1947-52-is a fascinating plan for a seaside villa for Paul Poiret, far more premonitory of the positive qualities of the houses he built in the 20's than the Domino and Troyes housing schemes. But this is dated 1914-1915, during World War I, which seems extremely unlikely; while stylistically it is far closer to the Citrohan and Artist's House projects of 1919-21 than to other projects of the war years, much less the Villa Schwoff. If there are these gaps and ambiguities in the authorized record of the earliest years, one must suspect there are equally important ones for the more productive decade from 1922 to 1932.

The early writings retain a good deal of their rhetorical persuasiveness independently of the work produced, to which they do not always seem very closely related. But the interest of the executed houses has become largely historical; on the other hand, the work of the last 20 years remains actual, a proper subject still for critics more than for historians, and preferably for critics who never knew at first hand the period of the 20's. For all the rather pathetic attempts to follow its extraordinary line of formal development, one may say, I think, that the implications-structural and aesthetic, if not in terms of religious ex-

pression-of Nôtre-Dame du Haut at Ronchamp, completed 10 years ago, have not yet been fully digested by other architects: perhaps they never can be, so nearly is the church like much of Gaudi's work-a large-scale piece of hand-made sculpture. The Unités at Marseilles, the Jaoul houses at Neuilly, the series of government buildings at Chandigarh, and the Monastery of La Tourette at a Eveux have been more readily understood and hence far more influential, and, except in the case of § the Jaoul houses, very positively and fortunately so. But first-hand knowledge of the entire roster of the late work, located all the way from Tokyo to Cambridge, Massachusetts, is impossible to all but a few critics ; who have been able to travel very widely-John Jacobus, for example, who is now at work on a threevolume study of Le Corbusier for a German publisher. And, for both Americans and Japanese, that knowledge is inevitably distorted by the special circumstances under which the Museum of Modern Art in Tokyo and the Carpenter Center at Harvard were produced, without the advantage (or was it in some respects a disadvantage?) of Le Corbusier's direct supervision.

I write here more as historian than as critic. It is better to leave to younger men, men who have known in the last decade the excitement of discovering Le Corbusier in their twenties and thirties (as men of my age did in the 1920's), the evaluation of the late work. But even . a historian may already write, as with Wright, that the genius of both men-for there was unmistakable artistic genius in both, whether or not there were also serious gaps in their practical talents as builders-continued to be manifested to the end of their lives. Indeed, as with Wright (the roster of whose oeuvre now includes such major projects as the Marin County buildings in California and the Humphreys Theater in Dallas, both carried out since his death), one may hope that there are still Corbusier works to come for which sufficiently complete drawings exist to permit their execution by others.



High Court Building, Chandigarh



National Museum of Western Art, Tokyo



Carpenter Center for the Visual Arts



The Rio de Janeiro Plan



Plan Voisin for Paris

WALTER GROPIUS Cambridge, Massachusetts

An unending, prolific abundance of architecture, art, poetry, and inventiveness characterized the work and life of Le Corbusier, this Universal Man. He has created a new set of values, deep enough to enrich generations to come. In every field of urban planning and architecture, he has offered basic answers and has renewed his messages by ever-fresh and surprising architectural images. He never repeated himself, evidence that principles must not lead to rigidity, but permit an unending variety of interpretations.

JOHN ELY BURCHARD Dean Emeritus of the School of Humanities and Social Science Massachusetts Institute of Technology

When the news of Le Corbusier's death shocked us all, the ready comments bracketed his name with those of Mies and Wright as the three great and seminal architectural geniuses of our day. On the one hand, this ignored the impressive contributions of Gropius; on the other, it understated the stature of Le Corbusier, who stood alone. In the early days, many lesser men accused him of having lifted ideas from them, a high compliment, since it was always the reverse of the truth. He was the one genuine theorist of the century, the one true urbanist among architects. Better than anyone else, save perhaps Alvar Aalto, he understood the needs of simple people and simple materials and methods. He fathered almost every important innovation in design, though he soon abandoned many. He was, in the best sense, a genuine classicist. Least likely to be noted is that he was a great humanist and human being. He was not difficult when he trusted people; he was not arrogant. He was a man who knew that an accommodation must be made with the machine, but that the accommodation need not be that of the human. He showed this best perhaps at Eveux, where he opened the private monastic cells not only to the interior life, as they had traditionally been opened, but also to the life of the paysage, viewed privately. His face would light up

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to anyone who showed he realized this. The reputations of our other great may rise or fall with time; his is secure and can only wax. I did not always think this way, and am ashamed now that I was so blind.

LEWIS MUMFORD Amenia, New York

Le Corbusier's life and work mark the beginning and the end of a period; one of those minor periods that in perspective proves to be only a ripple in a much longer wave. His genius dominated this period by his aesthetic originality and his persuasive polemical power; while his defects as both a social thinker and an architect warped the work of a whole generation, giving it arbitrary directives, superficial slogans, and sterile goals. At each end of his life, Le Corbusier expressed himself in a classic structure: the Esprit Nouveau pavilion in 1925, and the Church at Ronchamp in 1955. Between these two poles of Le Corbusier's thought-the architecture of Cartesian rationalism, reorganized by the machine, and the architecture of fantasy, reunited to tradition—any architecture worthy of the name today must in the end move. But the task of fusing these two com-ponents in an integrated design, incorporating every relevant human need and purpose, is the challenge Le Corbusier left to the coming generations.

ALVAR AALTO Helsinki, Finland

The death of Le Corbusier is a family loss to us all and to "the great family of art."

It is equally a great loss for culture in general, of course, but his great architecture and highly admired theory remains.

He was highly appreciated and admired the world over for his theoretical work.

But the real man behind the official image was a master of the arts—one of immense stature, a man with real "courage," which went beyond the usual boundaries, to do things even when they were outside his theories and beliefs. This is what made him historically great—the key that enabled him to do all the various buildings, so

individually varied, suited to such different climates and cultures. All showing the enormous charme that is possible only through the hands of a real master; and, may I add, a master with a realistic sense that has added to his position in the history of art.

A good friend is gone. His work, and all the help and influence he has given the art, stays written in illustrious lines.

G.E. KIDDER SMITH New York, New York

Le Corbusier gave nobility to an age of architecture in which wretchedness prevailed; he produced scale when a repetitive grid mocked man's stature; he stirred imagination—ever sparkling, ever quickening-when our mental resources lapsed into dreariness; and he achieved a working comity between architecture, painting, and sculpture that had seemingly perished centuries ago. In short, Corbusier extended the horizons of architecture and urbanism further than any architect who ever lived. Thank you, small Switzerland, for giving us this giant, and thank you, France, for harboring him. Requiescat in pace; your monument can be seen throughout the world.

PAUL F. DAMAZ New York, New York

Le Corbusier is not gone. He will remain with us for a long time to come.

For a long time, he will remain the model of the ideal creator: the precursor with integrity and perseverance who fought for his beliefs against overwhelming odds; the artist who never allowed his work to become a frozen style; the teacher who was never constricted by clichés, old or new; the thinker who, until the last day of his life, kept a searching mind and a fertile imagination.

Le Corbusier is too alive to enter history; he will remain a continuous source of inspiration to future generations.

We are still discovering his humanistic message.

We have not yet fully understood Ronchamp.

No, Le Corbusier is not gone. He will be with us for a long time to come.



Le Corbusier's Studio

PHILIP JOHNSON New York, New York

Of the two poles of modern architecture of our time, Mies van der Rohe and Le Corbusier, I chose, way back in the 20's, the Miesian. Mies the classicist; Mies the detailer; Mies, the builder; Mies's use of beautiful material; Mies's "Less is More" all attracted me. Le Corbusier, almost exactly the

Le Corbusier, almost exactly the the same age as Mies, the other great magnet for our generation, is now gone. It is inevitable therefore that one try to assess the importance of his role. In balance, the Corbu pole is the stronger. His creative intimacy with the formwill of our times insured his leadership. Curiously, the very fact that he had freed himself from the lowly building processes of his time also increased his lonely stature above the field of common architectural practitioners.

In contrast to Mies, he was a sculptor, a shaper of gigantic forms that, just barely buildable, aroused our admiration and delight. His pyrotechnics amazed a generation.

The two poles (though it was by no means obvious in the 20's that these two were to be the poles) were clear even at the Weissenhof Exposition in Stuttgart in 1927. The International Style was then in full flower. All the buildings at the Fair were, and are, stucco. All roofs are flat. Most windows are ribbons. Mies designed a solemn, quietly symmetrical, well-proportioned group of flats; Le Corbusier, two roofterraced, floating cubic volumes, tinted his beautiful pinks and chocolates. They were poems, slightly low-ceilinged and uncomfortable, but poems.

The bipolarity ends up in Seagrams and Ronchamp. From my sober-sided, prejudiced point of view, Seagrams is great architecture, Ronchamp perhaps the most exciting juxtaposition of large sculptural shapes of the century. The historic future of the two

poles? Why ask?

The death of Le Corbusier touches us more than that of any other architect possibly could. That this is so is proof that we live still, regardless of the fact that he was nearly 80 years old, in the Age of Le Corbusier.

Now that he is dead, I feel it the stronger, since when he was alive, I never found him a sympathetic person to be with. His pathological bitterness, his selfisolation from his own world of art and architecture, his downright rudeness, kept him from the position of personal leadership he might have had.

But artistically, let us admit he was the architect of the present generation. The death of Frank Lloyd Wright left no such mark. Le Corbusier was our architect.

BALTHAZAR KORAB Birmingham, Michigan

Le Corbusier was the humanist par excellence of our time. His deep and incorruptible concern about man, man's well-being and enrichment, were les tracés regulateurs of his life's labor.

His concept of life was that of a poet, illuminated, inspired, for which his Sun stands as symbol of his handiwork; an eruption of the genius of the earth, that creative Hand symbol reappears and reappears throughout his oeuvre.

He was a relentless teacher, without a doubt the true prophet, yet the voice in the wilderness. The power of his hand's work reached us first. The robust truth and beauty of that hand did find followers in all echelons of understanding. His influence, wide and deep, would be hard to analyze here and now. It will keep learned scholars busy for years to come.

Much more difficult, yet more important, the task of measuring Le Corbusier the poet, the integrated thinker. The time was not ready for him, except as a prophet; hence his impulse to be always the "call in the wilderness." Still, he echoed his message obstinately for decades.

His example—the Grand Designer with deep sense of humanity and poetic vision—is the one we most need now. Our age calls for a new concept of man, of the architect as carver of cultures and not ivory towers. This call our profession can hardly answer now, yet the bold example of the Renaissance Man Le Corbusier is with us. He is with us.

MIES VAN DER ROHE Chicago, Illinois

Everyone recognizes by now that Le Corbusier was a great architect and artist, a real innovator. Ever since 1910, when I first came to know him, he has reminded me of the great Renaissance artists who built, painted, and sculpted, all at the same time.

To me, his deepest significance lies in the fact that he was a true liberator in the fields of architecture and city planning. Only the future can reveal how those who have been liberated will use the freedom opened up to them by his courage and imagination. Any liberation can result in a new confusion, a new Baroque, or, in what we can hope for from those who will follow Le Corbusier—an essential expression of our civilization.

JOSE LUIS SERT Cambridge, Mass.

Le Corbusier and his work are an entity. One cannot separate the man from the architect or the city planner; the painter from the sculptor, nor the poet from the writer. The key to his work was his interest in life itself and his attitude toward what he called les joies essentielles, the components of joie de vivre. These elements led him to the discovery and choice of the newest, most lively and human architectural vocabulary of our times. His work cannot make sense to anyone who does not share his attitude toward life and what made life meaningful to him.

Le Corbusier had more to give than any other architect of our times, and he could express his ideas with precision and clarity. Although he never took up teaching in any professional school, for the privileged few who were in his atelier during the course of the last 40 years, he was the greatest of teachers. His particular approach to architecture and city planning problems carry the most promising seeds for future development. His genius was the rare kind that opened new doors

and perspectives to the future, and only a few of his most important ideas were carried out during his lifetime.

The younger generations of architects will carry out, I am sure, many of the dreams that he could not develop. The results may not be the same as if Corbu himself had seen these dreams materialize; but his gallant fight has not been lost, and, in times to come, more and more people will be grateful for his significant contributions to humanity.

JAN C. ROWAN Editor "Progressive Architecture"

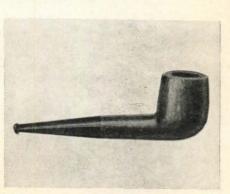
That he was a great artist, there is no doubt. His genius could turn the most improbable shapes into things of beauty. He was a great carver of solids and a great carver of voids—a poet of form and a poet of space. History, surely, will always give him credit for that.

But was he also a great philosopher, a prophet of the world to be, or merely a contagious pamphleteer, whose catchy phrases turned the minds of a whole generation of architects away from the essential task of creating an urban environment?

Much of what we see today the ubiquitous modern cityscape of isolated, monumental, widely spaced buildings—is the result of Le Corbusier's plea for soleil et verdure, for a sort of high-rise countryside.

Today, many of us are swinging back and picking up again the scattered pieces of the past. All the concepts destroyed and abandoned by the architectural revolution that was so much influenced by Corbu's writings now are being re-evaluated by the postrevolutionary generation.

Only time will tell what will happen in the end—who was right and who was wrong.





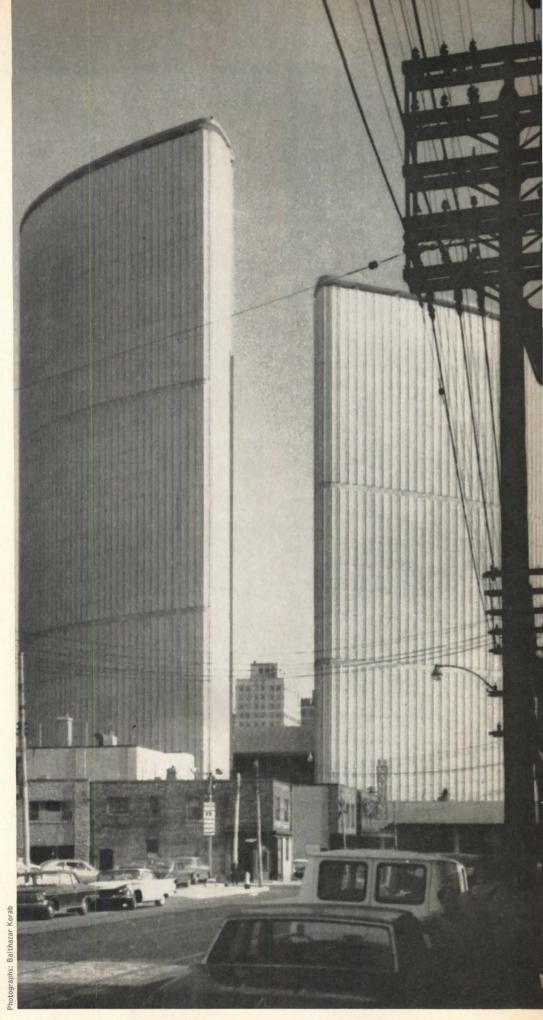
VIEW OF THE TORONTO CITY HALL

A very personal assessment of the competition-winning Toronto City Hall, which just opened, by an architect turned architectural photographer who worked with Le Corbusier and Eero Saarinen.

BY BALTHAZAR KORAB

I made three trips to Toronto. First, to visit the site, with the competition program in hand, my mind wrestling with what a City Hall should be. Next, a return to the site to consider what the *jury* [Eero Saarinen, Ernesto Rogers, Sir William Holford Graham, C. E. Pratt, and Gordon Stephenson; professional advisor, Eric R. Arthur] might think a City Hall should be. And, just recently, I returned and saw what a City Hall should not be.

Thus spoken, I should rest—sapienti sat—and let the photography, or rather the building, speak for itself. Since I have indicated that I competed in the program and may be suspected of sour grapes, it might be safer to hold my own counsel. But no, be my view subjective or not, I would like to speak, mainly for the benefit of future muni-



cipal buildings. (Dallas has a city hall coming up, for instance.)

On my third visit to Toronto, expecting to find that some magic had occurred between the design and the reality (even with misgivings about the concept and the exaggerated "plastique" approach). I found nothing more than a metric enlargement of the model. It seems incongruous that someone with the genius to transform and enrich such personal solutions-Eero Saarinen-allegedly had the lion's share of influence in picking this winner. I do not believe, of course, that any richer detailing, finishing, or tactile qualities could have completely saved a building of such dubious concept.

The two curved towers of *almost* identical height, placed back on their platform, are not yet high enough or assertive enough to achieve stature. One has only to look at the receding-based high-rises on Park Avenue to find a comparison for this mistake. In New York, how well Saarinen knew the rules, when he shot CBS up from under the street level.

The symbology of the Toronto City Hall is equally disturbing. To mold a split image of the city and the region into stone and steel is to hark back to the past, to erect a monument to administrative schizophrenia. It is true the competition program stated: there is the City, and there is Metropolitan Toronto, A.D. 1957. Yet to take such a program literally, a program usually drawn up by bureaucrats and statisticians, is to renounce the architect's basic responsibility: his creative role in forming our future.

This solution may be just an archaic, naive interpretation of "form follows function," as a 1957-dated diagram of the city-metropolitan area balance. This unevenness is emphasized by the same amount of horizontal divisions on the concave, and the same number of mechanical floors on the convex sides. It calls more for the humorist's pen than for a passionate critic's. If there was an attempt to make the slabs count monolithically, it failed, mostly because of the uneasy turning of the wall skin around the corners and edges.

There was a curious attempt at symbol-evoking when this project was published. I remember the pearl and oyster, protective hands, towers standing vigil

images made current, I hope, not by the architect but by some poetic public relations man. These were ideas no more ealrelevant than all the "soaring bird" talk the about the TWA terminal at John F. las-Kennedy International Airport. A valid symbolism and expression is

A valia symbolism and expression is truly needed, especially in such a case as a city hall, which traditionally and logically stands for the spirit of a city. To achieve this is extremely difficult, I agree, but it seems hardly to have been attempted seriously here.

over the city fathers, and so forth-

The drama of the concept—the chamber enclosed by the walls—so attractive in plan, fails to come through as an actual spatial drama. It reads only from distant points or from the upper floors reserved for clerical and secretarial help. The best part of it is the public access roof terrace; but once there, the crude detailing spoils the feeling.

The general composition within its quadrangle takes no serious note of the most important element of the site: the old City Hall. Conversely, once outside in the cityscape, the passerby does not take serious note of the new City Hall. These once fashionable forms, with their



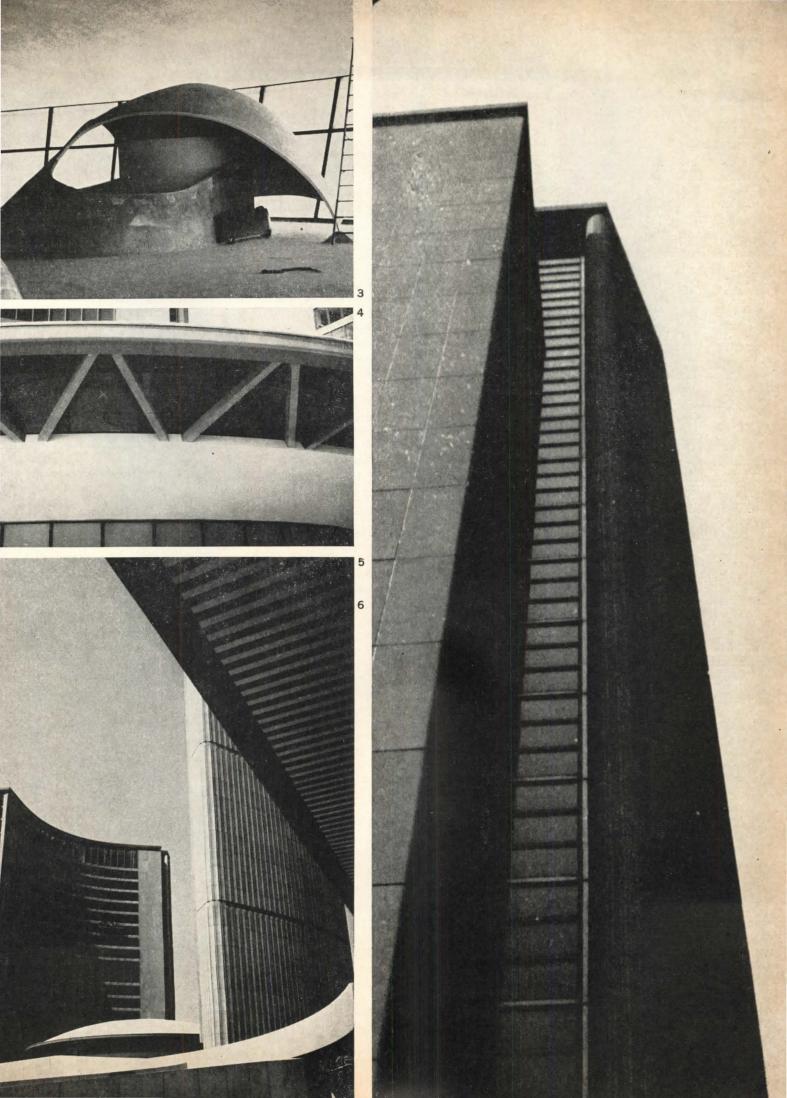
pallid hues and overtones of opening day at the World's Fair, have no *presence* on this site. It is academic to speculate whether future developments in the area will tend to improve this situaation.

From the street going into the plaza. one passes under a heavy-handed gallery to discover a semidesert scattered with antiseptic design elements, such as a reflecting pool (skating in winter), three unconvincing arches (the only effort to take the old City Hall into the composition 2), a changing pavilion. an amateurish flower bed, concrete pavement, and benches that appear borrowed from a French suburban railway station. As a whole, this is a failure to create either a monumental ceremonial platform or an inviting city square (1). The ensemble may discourage even those dependable habitués of civic plazas, the bums.

I have referred to the insensitive detailing; a few prominent cases deserve particular notice. The center of the composition, the chamber, is disappointing inside and out. One expects a polished, jewel-like quality, but, while the interior is just playful on the wrong scale (3). the exterior is quite crude. The V-shaped beams, the junction of the exits and glass walls have primitive handling (4). The lack of clear character of the towers within is also due to poor detailing. It is not a curtain wall, nor does it convey a solid wall effect (5). The verticality suffers, too. The return of the edges from convex to concave shows unsure handling (6). These are crudities that do not fall into a convincing pattern, such as most of Le Corbusier's and some by the Brutalists.

The term *style* inevitably arises in any critical analysis: I will refrain from attempting a definition. However, we may call it the backlash of the International Style. The building's basic weakness lies in its lack of that intangible essence—force of expression, architectural credo, style, manifestation of the age, call it what you will—that distinguishes a noble building from an unsuccessful attempt. I left the place unmoved.

Architect: Viljo Rewell Associate Architects: John B. Parkin Associates



MECHANICAL ENGINEERING CRITIQUE

Environmental Design for Theaters

BY WILLIAM J. McGUINNESS

How the consulting engineer aids the architect in solving the problems of theater design is discussed by a practicing mechanical engineer.

Since theater design involves more specialties than other design projects, an architect can find himself assembling a team of consultants. The mechanical engineer, who can usually speak the same technical language as some of these specialists, is able to simplify communication between the architect and the rest of the consulting team.

Syska & Hennessy, Inc., mechanical and electrical consultants to Philip Johnson, architect for the New York State Theater at Lincoln Center, accomplishes this in two ways. John F. Hennessy, Sr., personally supervises the work of a "preliminary group" that offers high-level guidance in the selection of systems and in the major coordination of the architecture with the space requirements of these systems. The engineer, who will later be the project manager, is a member of this group. He continues with the project when it is turned over to the production group to provide continuity under the partner-in-charge.

Paul Meuer, project manager for the mechanical and electrical services of the New York State Theater, summarizes a few of the difficulties peculiar to theater design in its relation to air conditioning and ventilation: (1) conflict between the architecture of the hall and the necessary air openings; (2) physical difficulty of finding space and routing for ducts; (3) air distribution problems; and (4) control of sound in the hall caused by the mechanical equipment and by moving air. Meuer points out that the volume occupied per person is smaller in theaters than in office buildings. The deceptively large bulk of the hall, when divided by the large number of closely positioned occupants, results in an index that poses difficult problems in items (1) and (3) above.

Air, if admitted through the side walls, must enter at such a low velocity (to avoid audible sound) that it does not efficiently reach the center of the seated group (the controlling limit is noise coefficient NC 20). Increasing the air speed above to about 400 to 500 fpm jet velocity at the room air terminal in an attempt to produce a proper "throw," often produces too much noise. This shifts consideration to the ceiling.

Below the structural roof the the New York State Theater are two suspended ceilings. The upper one is shaped and positioned for acoustical purposeslargerly for sound strenghtening. Below the upper ceiling are lights and ducts hidden by a lower ceiling of open mesh construction. The first plan was to discharge air in the space between these two ceilings and let it filter down. Since added velocity was needed, however, diffusers and registers were used just above the open mesh. This air, after being given a slight downward push, is induced to an improved flow by return grilles below the seats. Excessively heated air above the top lights is allowed to rise and is exhausted directly.

Balconies pose a special problem, since the space between them creates a situation of even greater audience density than in the orchestra. Distribution from side walls is still more difficult in this case. Admitting air from a space underneath the balcony above, generally near a midpoint, is a solution that results in discharging air near and at the back of some occupants. Drafts from the rear, which are the most uncomfortable, must be carefully handled. Air is drawn out of spaces below balconies by the same method used in the general orchestra areas-namely, through return grilles below the seats. In utility areas, ducts are so closely packed that curved transition elements are almost wholly lacking and the squared angles of branch ducts utilize interior duct-turns or vanes to smooth the flow.

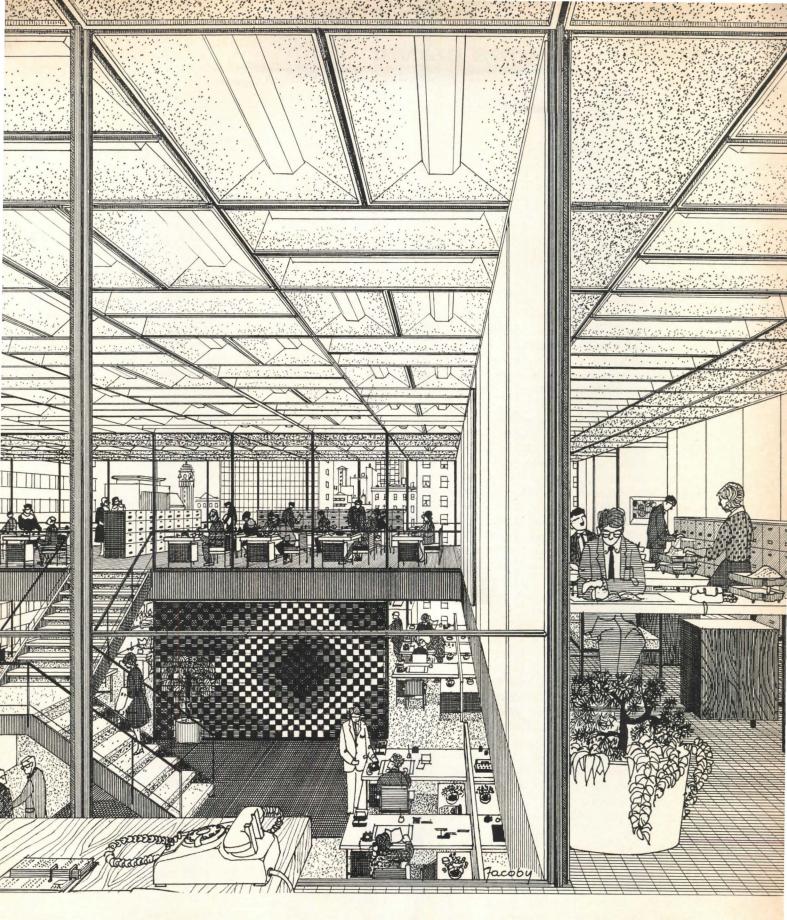
Temperatures are usually maintained

in the mid-70's, and summer humidity held to about 50 per cent RH. Humidity in winter is not allowed to drop below 50 per cent RH because of its adverse effect on acoustics. Heat gain in the hall is limited largely to people and lights; the effect of the sun and outside temperature does not penetrate strongly to the hall. The great speed with which the heat-gain load changes makes it difficult to cope with. As the audience enters or leaves, or as the lights are abruptly turned on or off, the thermal machinery must respond promptly and accurately. Every effort is made to minimize a considerable flywheel effect. The operator can often anticipate changes and prepare for them.

When the system has been balanced, it is still necessary to scan the hall for temperatures and other comfort conditions at many locations. A central console indicates conditions that are evaluated by sensing devices at remote locations, eliminating the need for staff members to walk these locations to read instruments. Fresh air is admitted to the recirculated air at a rate generally greater than the New York City Code minimum of 5 cfm per person. Designed quantities frequently used are $7\frac{1}{2}$ or 15 cfm per person.

The heat gain of lights in the stage area makes it generally impossible to plan maximum comfort for the performers. If sufficient air were circulated for comfort, the scenery (generally of flimsy material), would be visibly agitated; air rates would be excessive. Positions for registers on a stage are difficult to fix because of the flexibility needed in the sets. Cool air is introduced, however, at controlled rates and the actors report tolerable conditions.

A problem is encountered in maintaining an air balance on either side of the curtain so that it does not billow. The engineer constantly recommends use of a heavy curtain because of this condition; it is still necessary, however, to adjust the air pressure on both sides.



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Overspecifying

BY HAROLD J. ROSEN

Economies gained by the selection of proper materials, tests, and standards in the specifications are discussed by the Chief Specifications Writer of Skidmore, Owings & Merrill, New York City.

Specifications writers are in a position to control construction costs through the quality of materials they select and specify, the standards of workmanship they establish, the testing procedures they propose, and the extent to which they include certain other provisions as contract requirements in the specifications. In effect, the specifier, like the structural or architectural designer, must establish specifications limitations and cut the cloth to fit the suit.

A structural engineer does not use 5000-psi concrete where 2500-psi concrete will suffice. An architect does not double the space requirements if he can tailor the client's requirements to the correct solution. The specifier is, in effect, a designer and should exercise judgment in the selection of materials, workmanship, and installation procedures. He must be realistic and meaningful, but not unduly burdensome.

The specifications writer is in a good position to control costs, and, by reexamining his current specifications, effect further economies.

When specifying testing, he should not call for the same test procedures on a relatively small amount of work as he would on a large amount of work. In some instances, the cost of testing may exceed the cost of the particular phase of work. As examples, he might reconsider test requirements for compaction of fill, cylinder tests on concrete, tests on masonary mortars and masonry materials, sealants, and paints. He might weigh the volume of work as against boiler-plate test procedures. He might consider certifications in lieu of tests. For small amounts, he should specify one brand in which he has utmost confidence.

In the area of protection, he should not call for floors to be completely covered until final acceptance, but should make the contractor responsible for protection; let him use his judgment and experience in providing this protection. As an example, in a large Governmental agency, protection of finished wood gymnasium floors was specified by calling for covering with kraft paper and taping the joints. A credit of several thousand dollars for its omission was obtained when the onus of protection was put on the contractor without specifying the method, but simply the results.

When the specifications writer specifies tolerances, he should be realistic. The incorporation of certain statements in a specification does not necessarily mean that the provisions can be achieved. A specification requiring $\frac{1}{8}$ -in. tolerance in 12 to 15 ft in the level of a concrete floor is difficult to obtain; $\frac{1}{8}$ -in. in 8 to 10 ft is within the realm of possibility.

With modern latex paints, two coats will assure complete coverage where three coats were previously specified. Most white ceilings can be successfully painted with only two coats. Why overspecify? As a matter of fact, after the second paint coat is applied, the specifications writer may never get the third coat, nor the credit for its omission to which he would be entitled.

Can ¹/₄-in. window glass be used where invariably ¹/₄-in. plate glass is specified? Can B-quality glass be used where A-quality is often installed? The project and the glass to be selected for specific areas should be re-examined. The specifications writer may save his client money and himself embarrassment.

Waxing of resilient flooring can be

omitted. Asphalt tile is furnished with a factory-applied coat of wax that needs only to be polished upon completion of the work. When a building is completed and turned over to the owner, these floors receive considerable abuse during the moving-in process and generally need waxing and polishing again. Why specify and pay for an item that serves no useful purpose.

Elastomeric sealants of the polysulfide, urethane, neoprene, and acrylic variety are available at increased cost. The oldfashioned, oil-based calking compounds, however, can still be used effectively in many instances. In a sense, the specifier should be a designer. He should select the material on the basis of its ability to perform well in a given situation.

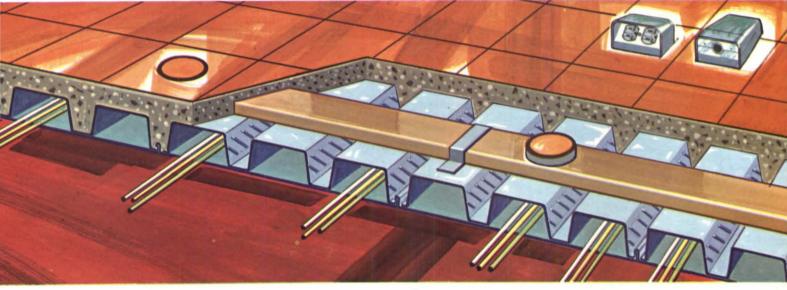
Another area of specifications writing that requires editing to reduce costs is the use of certain specifications language. Each statement in a specification. whether it is for materials, for installation, or for workmanship, carries a dollar sign alongside it. The contractor expects to be paid for each order given him by the specifications writer, and his bid reflects every statement in the specifications. Using vague, ambiguous language indicates that the specifications writer may want something but is unsure about demanding it. For example, statements such as: "tests will be required unless waived"; "additional shop drawings and samples may be required"; "uneven surfaces may be cause for rejection."

The contractor has no choice but to include the item in his cost because he can take no chances on the specifications writer changing his mind.

Specifications language should be precise, not vague. The precise specification can be enforced; the vague one may be difficult to enforce and will still cost the owner money because the contractor has included it in his bid. Illinois Bell Telephone Building, Chicago, Illinois Architects and Engineers: Holabird and Root General Contractor: William E. Schweitzer & Co. Structural Steel: Joseph T. Ryerson & Son, Inc. Allied Structural Steel Co. Foundation Contractor: A. L. Jackson Co.

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Discharge of Contractor and the Construction Contract: Part 2

BY BERNARD TOMSON AND NORMAN COPLAN

In the second of two articles, P/A's legal team concludes its discussion of a recent case in which a contractor was prematurely discharged for default in performance of the construction contract.

In last month's column, we reported on a recent New York case (Tibbetts Contracting Corporation v. O & E Contracting Company, Inc., and Vioe Realty Corp., 15 N.Y. 2d 324) involving the discharge of a general contractor by the owner for an alleged default in his performance. The general contractor had contracted for the excavation, grading, and drainage work on property the owner was developing for lease to a department store and had subcontracted the drainage work to a subcontractor who completed that work after the owner had declared the default of the general contractor. The subcontractor filed a lien against the owner's property and instituted an action to foreclose the same. The owner and the general contractor, in a separate suit that was consolidated with the foreclosure action, each claimed damages against the other for breach of contract. The New York Court of Appeals ruled that the subcontractor's rights were dependent upon the determination of the issues in dispute between the owner and the general contractor. The court further ruled that there was no separate contract implied in law between the subcontractor and the owner although the owner accepted the subcontractor's continued services after the declaration by the owner of the general contractor's default.

Thus the basic question presented for determination by the New York Court of Appeals was whether the general contractor had abandoned the project, thus justifying the owner's declaration of default. The contract between the general contractor and the owner provided a flat price of approximately \$127,000 for the performance of all excavation, filling, drainage, and grading. The construction

contract contained no specified time for completion, although it provided that the work was to proceed "expeditiously and sequentially." The contract also made provision for delays caused by the weather. The owner, who was under pressure to complete this site for the department store by April 1959, apparently wanted more equipment and men on the job than the general contractor had been using, or had been obligated by the contract to employ on the job, in order to hasten its completion. However, in March 1959, the general contractor moved his bulldozers and pans to a nearby job. This was at a time when the ground was frozen. The general contractor contended that it would be wasteful and costly to refill and grade in frozen ground and that it would have taken only a short time to move his machinery back to the project site. The owner, on the other hand, contended that the action of the general contractor was an abandonment that justified his discharge.

The court pointed out that the general contractor had received 70 per cent of the total job cost as of the time the owner declared a default. The Court concluded that the owner would not have countenanced such payment unless that proportion of the work had substantially been completed. This fact, taken together with the consideration that, at the time the general contractor temporarily removed his equipment to a neighboring site, continuance of the work would have been inordinately costly due to the frozen ground, caused the court to conclude that there was no abandonment.

The owner had contended that the terms of the construction contract provided that the owner "shall decide all questions which may arise as to the performance, quantity, quality, acceptability, fitness and rate of progress of the work or materials furnished." It further provided that, if the contractor "delays the speedy progress of the work . . . so as to cause loss or damage to the builder or to the other contractors, then it shall reimburse the builder or such other contractors for such loss." It addicionally provided "that work shall start immediately and proceed in accordance with schedules determined by the builder [owner] . . . and in sequence and direction as required to meet the builder's schedule," and that the work was to "be prosecuted and completed with all possible diligence and speed or as otherwise directed by the builder." The New York York of Appeals, in referring to these provisions, referred to them as "Draconian clauses" that it would not literally apply. The Court said:

"Language in contracts placing one party at the mercy of the other is not favored by the courts, and, while such clauses have some effect, the literal absolutism with which the owner's counsel insists upon language construed to mean that the general contractor had to resort to any means whatever to expedite a contract entered into without completion date, at the categorical dictation of the other party is not supported by the decisions."

In concluding that the owner's discharge of the general contractor was without validity, the Court ruled that the owner, by permitting the subcontractor to complete the drainage work and at the same time insisting that he look only to the general contractor for remuneration, waived its notice of termination of the general construction contract.

The reluctance of the Court to literally apply those provisions of the construction contract that empowered the owner to determine questions concerning the contractor's performance, seems at variance with determinations of the United States Supreme Court in respect to government contracts (see IT'S THE LAW: MARCH 1950 P/A; OCTOBER, NO-VEMBER 1951 P/A; FEBRUARY 1952 P/A). It is interesting to speculate whether the Court's conclusion would have been different had the construction contract provided that the architect shall determine any question concerning the adequacy of the contractor's performance (see IT'S THE LAW, JULY 1958 P/A).



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BOOK REVIEWS



The Profession and the Theater: Some Current Books

Architects and Thespians

BY WILLIAM BRIGGS

ACTOR AND ARCHITECT. By Tryone Guthrie, Richard Southern, Sean Kenny, Christopher Stevens, Hugh Hunt, John English. Edited by Stephen Joseph. University of Toronto Press, Front Campus, University of Toronto, Toronto 5, Ontario, Canada. 118 pp., illus., index, \$4.25. The reviewer, an architect practicing in Richmond, Va., is on the board of directors of USITT and has acted on a semiprofessional level.

Reading beyond the scrim, contradictory and colorful ideas make exciting reading for actor, architect, and audience in this chronicle of a conclave held in 1962 by the Department of Drama at the University of Manchester. Ten Britons of note in the theater and in theater architecture participated in informal discussions with the theme "Actor and Architect" as the point of departure.

248 Book Reviews

The recorded results do indeed depart and meander afar. This is fortunate, because herein are expressed the heartfelt opinions of these professionals concerning the past and future of theater in England, its place in our world, and the forms it may take in the future.

Out of a total of 118 pages, 29 have been consumed by the editor with his own commentary, which concludes as follows: "There is, after all, nothing 'mere' about entertainment; it is a phenomenon that shows mankind enjoying his humanity. Drama has long been recognized by poets and philosophers as the essence of civilization. This is why it is worth taking seriously. Actors and architects should keep this in mind."

Tyrone Guthrie plays his part in 18 confusing pages, while the 9 other panelists make their mark within 4 to 12. Guthrie says that architects can't be expected to "be on very familiar territory" where theaters are concerned, that the

first thing the selected architect asks for is a "substantial cheque" to go look at theaters, and Guthrie feels this is needless. He says there is nothing to be learned by visiting theaters and that the architect should simply go to the library and look at plans and pictures. He follows this with: "What I would demand of an architect, were it mine to be choosing somebody, would be some philosophy of the theater that we shared." How can Guthrie expect to find an architect who does or does not share his philosophy, if the architect has never seen any theaters? He says he cannot read a plan, but that "an architect should be able to read a plan." This cues the observation that little training is required to read a plan or to enjoy a play. But it takes training, skill, imagination, and dedication to draw a plan or to produce a play.

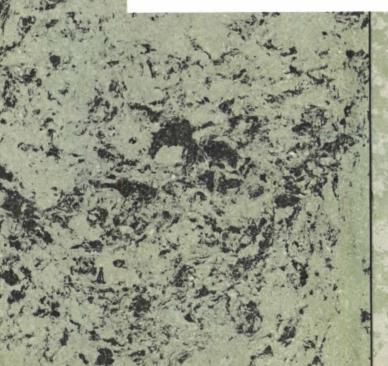
The contributing professionals who are gifted in indelibly engraving images upon *Continued on page 254*

OCTOBER 1965 P/A

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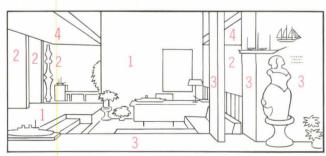
How's that for versatility. One material being used in every nook and cranny (except for the ceiling and accessories) of a large reception room. The walls, floors, partitions, furniture tops, baseboards, wainscottings —all made of J-M Colorvein. As a matter of fact, the only thing that can limit the uses of this new material is the imagination of the user.

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 3. Green in black Colorvein
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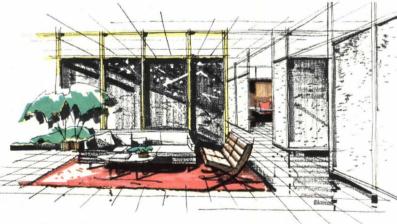
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Continued from page 248

an audience of five hundred or a thousand lack the ability to give credence to their convictions when left without props, lighting, rigging, and a stage—be it proscenium or thrust! Most of them expose a defensive approach, probably attributable to their feeling that today's British theater is waivering.

Out of all this semantic smorgasbord, the idea comes through that a play must be presented in compliance with the production techniques dictated by the playwright. Such a belief is certainly unflattering to the director's imagination, to his vested responsibility, and to his license to present plays in whatever manner he may conceive. (I have seen *Tobacco Road* done on proscenium, thrust, and round stages. It is most gripping in the arena, but it was a sell-out on Broadway, using proscenium.)

Richard Southern contributes an excellent, illustrated explanation of the origins and development of various actoraudience arrangements. Other panelists offer useful information and a philosophy on theater—present and past.

Hugh Hunt's point of view differs from that of his colleagues, most of whom would like to forget the fly-space. Says Hunt: "It is not beyond the skill of an architect aided by technologists to devise a form of theater that combines the picture-frame, the open stage, and the arena within one building. Even if these forms are not all housed in the same auditorium, the auditoria can at least be placed close enough to each other so that the stage and their amenities can serve each other."

That is the challenge we have been given and it is an important one. But the preoccupation with theater terminology is becoming trivial.

Architects have good rapport with obstetricians and undertakers, with priests and plant managers. The product of their effort can be no better than the degree of communication and cooperation they are able to command. Let the director don the apron and dictate exactly how far he wants to thrust his stage, or else let him find an architect whose philosophy he trusts, or at least one he can talk with.

Knowledgeable architects talk easily with knowledgeable thespians.

Professionalism vs. Mediocrity

BY DONALD H. SWINNEY

THE PERFORMING ARTS: PROBLEMS AND PROSPECTS. The Rockefeller Panel Report on the Future of Theatre, Dance, Music in America. McGraw-Hill Book Co., 330 W. 42 St., New York, N. Y., 1965. 258 pp., \$1.95 (paperback). The reviewer is Professor of Drama at Hofstra University and President of the United States Institute for Theatre Technology.

For the last 2500 years, the performing arts have played a varying role in the social milieu, one that has ranged from a position of highest esteem to the depths of degradation. During the Golden Greek period, the performing artist, poet as well as actor, enjoyed a position of great prestige, and public performances were festive state events attended by the entire populace, freeman and slave alike. But at other times, the artist has been regarded as Satan's emissary.

Regardless of the position accorded the performing arts or the form they have assumed throughout history, they have seldom been suppressed for long, or far removed from an active role in social development. They have weathered the most vigorous opposition.

The Rockefeller Fund report regards the performing arts

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as central and vital to a mature civilization—a view that is gaining increasing support among all who are concerned with the social and cultural development of contemporary society.

This report should be read by every member of our society. It may clarify many of the misconceptions that still exist regarding the place and function of the performing arts. This is especially vital at present, when material affluence has created leisure time that may prove a community problem, but that may also provide a natural atmosphere for development of the arts. Among those who should be particularly concerned are educators, civic, state, and national leaders, administrators of programs and philanthropies dedicated to fostering understanding, training, and experimentation in social, scientific, educational and political development, and, of course, the artists themselves. All of these people have an important role to play if the performing arts are to attain the position of cultural significance that the members of this panel believe they should—a position no less important than that of libraries. art galleries, museums, and even schools.



As stated in its pretace, the intent of this report was "to engage the attention of the American people and to waken their concern about the performing arts in the United States." The report presents a comprehensive assessment of prevailing conditions and problems; it does not attempt to state definitive solutions. One of the most significant bits of advice points out the need for thoughtful outlining of goals, careful planning, and leadership. All too frequently, wellintended plans flounder or are only partially successful because of haphazard organization. Business and Government leaders can aid the performing arts significantly by lending their organizational and promotional skills, thereby involving the many rather than the few. Through a critical and analytical exploration in depth, this report has assembled factual data, hitherto unavailable, on the present status and possible future potential of the professional performing arts in America.

The facts of this survey reveal that the vast expansion of the live performing arts during the last 20 years has been almost exclusively amateur. Significant though the amateur theater is in its contribution to our cultural development, the greatest responsibility for the highest level of artistic or creative achievement must logically rest with the professional artists and the organizations that support them. If those who should offer the most fail to meet this responsibility, we are doomed to the mediocrity that would prevail if scientists and educators failed to meet the challenges of the times and plan for the future. Failure is in fact evident in that, of the 100 cultural centers that are in the planning or build ing stages throughout the nation, only about one-third are centers that can accommodate all the arts. To find the term "art center" or "cultural center" applied to facilities so poorly conceived that they prove to be little more than sports arenas or assembly halls reveals a lack of the leadership and vision so necessary to artistic development.

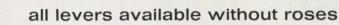
The conclusions of this study support the view, long held by a relative few. that drama, music, dance, and opera can and should receive far greater support from all sources (individuals, Government, industry, social organizations, and philanthropic agencies) than has thus far been the case. Estimates indicate that the professional performing arts are supported by approximately 1 per cent of the population. Many performing arts organizations (notably some of the fam-

Continued on page 264

OCTOBER 1965 P/A

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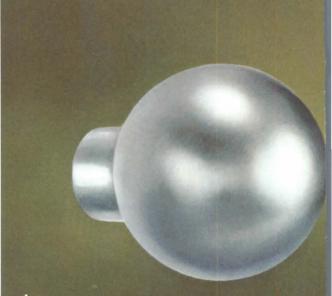
Sleek looks in a lever that's purely lyric. And the Northcoast is functional right down to the sculptured design of this lever's return. Sargent created this lever as a startling objet d'art. $4\frac{13}{22}$ "* long. Here in aluminum. The same sculptured, classic feel of levers is carried to the new Sargent knobs cast in brass, bronze and aluminum. Choose from a wide variety of finishes, some of which are shown here. Available also with square or round roses — or with Sargent exclusive rose-less trim.

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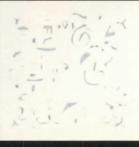


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Continued from page 256

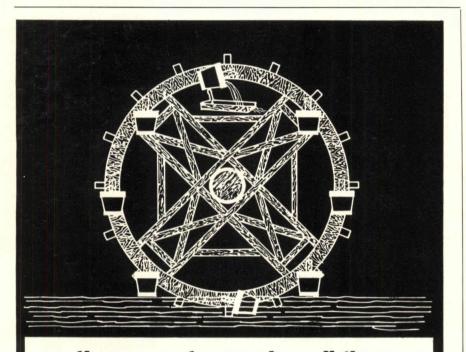
ous orchestras and opera groups) have survived and brought distinction to themselves as well as their communities through the devotion of a small group, or in some cases individuals, when they should have been the concern of the entire community.

The book is thorough and easy to read. One may not agree with all that it has to say, but it should not be ignored, nor its value denied, if one is concerned for the future of the arts. The panel charges that it is our responsibility to insure that the highest standards of artistic endeavor are brought within the reach of all members of society and to thereby educate them to recognize and support the performing arts as an integral part of their lives.

Still Its Old Self

BY JOEL E. RUBIN

THEATERS AND AUDITORIUMS, 2nd Edition. By Harold Burris-Meyer and Edward C. Cole. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. (1964, 376 pp., illus. \$20) The reviewer, who holds a degree in engineering, is a consultant in theater planning and light-



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ing, a vice-president of Kliegl Brothers, and a founder and past president of the USITT.

The virtues of the second edition of *Theatres and Auditoriums* are recognizable at a glance. It contains many new illustrations in a handsome typographic and visual setting; it is hard-nosed in its organization and still the prime work in the English language in the field of theater planning.

When the first edition of *Theatres and Auditoriums* was published in 1949, the postwar theater boom in America was hardly anticipated. As the only major work available to most architects and clients, it had a substantial effect upon theater building in the boom that followed. Arguing from the premise that theatrical form derives from theatrical function, the authors proceeded to the logical position that the development of a theatrical plant must stem from its operational requirements.

The second edition of Theatres and Auditoriums has been issued in the midst of a continuing period of extensive theater construction. The last 15 years have witnessed an unprecedented wave of new theater building throughout the world. Literally thousands have been built, the vast majority of them in the United States. From the programming, building, and operating of these new theaters, much new knowledge has been gained. We could properly expect the second edition of Theatres and Auditoriums to have profited from the experience gained in theater planning over the past decade and a half.

The first edition was notably unaware of staging forms other than the proscenium. It afforded no practical assistance to those who wanted to investigate a variant-proscenium, a non-proscenium, or a multiform theater. The second edition offers more constructive help with the functional and spatial analysis of these other forms, but the examination is sometimes cursory; it is intermittent and frequenty less than comprehensive in its approach.

Variation of theater form is only one major area of a typical theater design problem today. The necessity for variation of use within the same facility is a second major problem area. It would not be correct to suggest that *Theatres and Auditoriums*, first edition, did not give recognition to problems of use. A large part of its structural organization stemmed from an analysis of performance type. Charts of such divisions occupy many pages of the book. This



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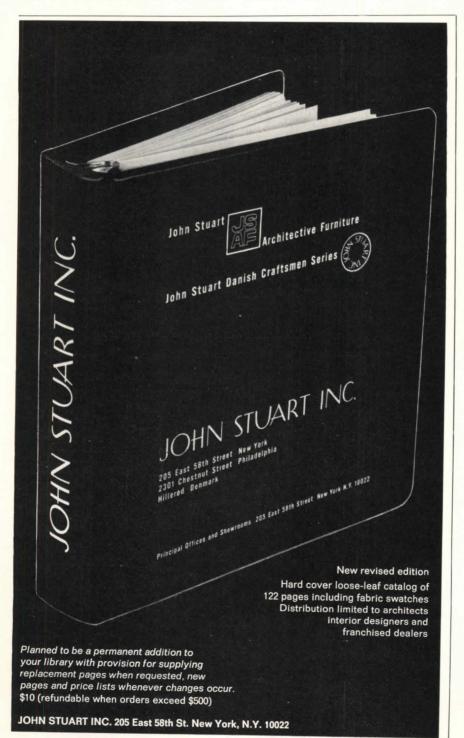
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second edition maintains the same format. Being treated independently, and nearly pigeonholed, as it were, there is a curious lack of coupling between the information in the charts and the problems of the planner. The planner finds himself hard-pressed with the combined housing of ballet, concert, spoken, and lyrical drama all within the same structure. One would hardly recognize, even from the second edition, that this condition of design is, unfortunately, typical of much theatrical construction today.

The second edition of *Theatres and* Auditoriums therefore exists in a rather ambivalent state. The result is a partial vacuum—a curious *un-treatment* of the two major problems of analysis that currently face almost everyone concerned with theater planning.

The authors write factually, although the volume is not without those occasional non-facts and indiscretions that become apparent to the close reader. The section on air conditioning of stages would seem to offer some ground for dispute by experts; the material on synchronous winches is surely questionable, in view of the notably bad performance record of these devices and their with-



drawal from the commercial market; few patrons could remain for long with the uncomfortable platform slopes shown in the diagram on page 107; and the cutaway section of Philharmonic Hall was inaccurate long before the building opened in September 1962 (page 110). But these and similar lapses are flaws in an otherwise well-patterned fabric.

What is more apparent throughout the book is a lack of factual data. Just at that point where hard factual information would be of real assistance to the theater planner, the volume stops short. Picking Chapter 11 as an example: One will not find any vector analysis of a working gridiron, any recommended construction for a counterweight set of lines, nor any analysis of single as opposed to double-purchase rigging systems. Surely American theater technology is past the point where our only source of such information must be manufacturers' catalogs.

Finally, this reviewer must admit to a certain amount of displeasure with the nonuniformity in style and presentation of line drawings (although greatly improved over the first edition); with the unevenness and antiquity of the illustrations; and with the lack of a scale bar or marked dimension on many of the theater plans and sections. There is a certain quality of availability rather than necessity about many of the illustrations selected.

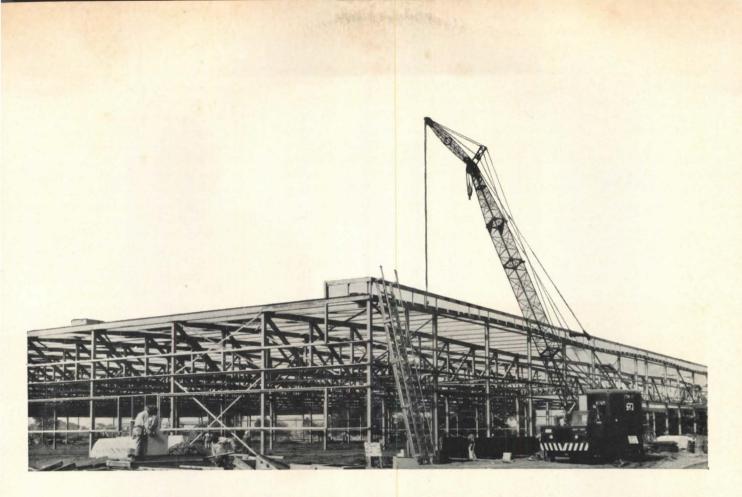
If I have dealt at length with what seem to be the book's flaws, it is only because it is a little sad to report that an old friend is back with us—in handsome new dress, and with some new illustrations, but underneath it all, very much its old self. Alas, the times call for more.

Down in Front!

BY BEN SCHLANGER

PROSCENIUM AND SIGHT LINES, 2nd edition. By Richard Southern. Theater Arts Books, 333 Sixth Avenue, New York 14, N. Y., (1965. 235 pp., \$5.95) The reviewer is a theater consultant specializing in seating and sight lines.

A large portion of this book should prove valuable to the novice desiring to work in theatrical scenic design. Detailed instructions are provided for amateur mechanical drafting and the measuring of existing structures. Skimming rapidly through these pages, the architect unfamiliar with the work of staging a theatrical performance in a proscenium theater will be rewarded with a good introduction to the elementary yet impor-*Continued on page 270*



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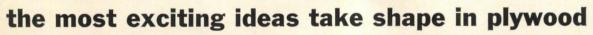
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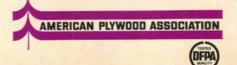


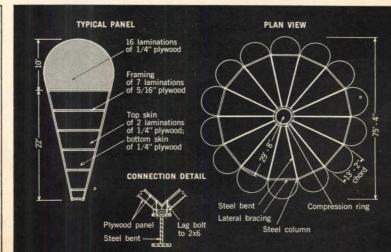




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Continued from page 266

tant problems to be dealt with.

When the author says "plan the stage first and then plan the auditorium," it becomes evident that the book does not deal with the entire problem of designing a proscenium theater. It is most important to be aware of the interplay of the problems of audience viewing of the performance and the staging of the presentation.

Viewers' sight-line problems are presented in considerable detail, but the discussion is limited to seating positions that are up front and to the side, those close to the stage, and those in remote, high locations. These viewers represent a very small percentage of the total audience. The author is mostly concerned with the problems of obstructing (masking) from these relatively few seat locations any and all views of the stage volume beyond the scene, and, of course, the performers who are waiting to make their stage entrances.

The problem would not be completely solved by eliminating some of these difficult seating positions. It would have been most valuable, however, if some criteria had been presented for a seating pattern that would lessen the stage masking problems, and to have indicated some tolerance of visibility of off-stage space, especially if it were above the range of a comfortable viewing angle.

Sizes of proscenium openings are quoted without sufficient reference to the relative usefulness of variously sized openings for the many theatrical disciplines. This in itself has a most important influence on the design and capacity of the auditorium's seating capacity. When scenic designers and stage directors learn to use wider openings effectively, it will be possible to provide more useful seating positions. Use of proscenium stage remains with us as a basic theatrical device, and it is not likely to be completely replaced by such rival concepts as the open and space stages. For this reason, the author could have updated his work, which was originally published many years ago.

The economics of theater design and presentation, reflected in probing potential seating capacities, is not dealt with, thus leaving neglected an important key to proscenium theater design. This book should be most valuable as a checklist of what *not* to do, especially with scenic design, given limited stage dimensions and conditions. Given the necessary time and the opportunity, it would be interesting for an architect to use this guide to participate in staging a theatrical presentation, as a first step toward learning to plan and design a theater.

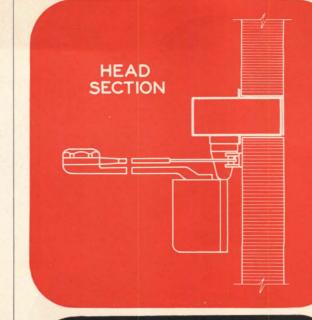
In Search of a Bible

BY MICHAEL BRILL

PLANNING FOR THE THEATRE. By Ned A. Bowman, William Coleman and Glorianne Engel. Department of Speech and Theatre Arts, University of Pittsburgh, Pittsburgh, Penna. (1965, 75 pp.) The reviewer, an Associate of Helge Westermann/Richard Miller Associates and an Assistant Professor of Architecture at Pratt Institute, is actively involved in the programming and design of theater projects.

This is a strange kind of checklist. It is really a subject-bysubject bibliography of much of the existing literature on theater building design. If you want to find a "bit" (as they say in the computer world) of information, you must first locate it under one of the broad spatial categories the authors have chosen: "The Total Building," "The Audience Space," "The Acting Space," and "The Service Space."

Continued on page 274



Application Details

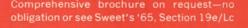
for 4010 series SMOOTHEE[®] door closer installation shown on opposite page (see drawing above)

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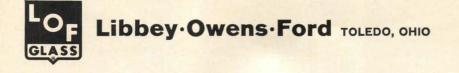
Methodist Publishing House, Park Ridge, III. The Perkins & Will Partnership, Architects

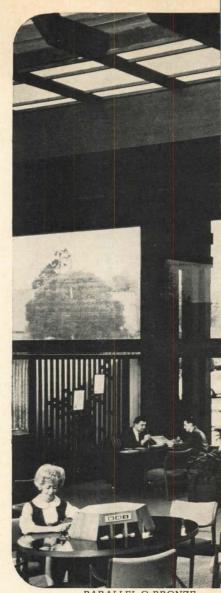
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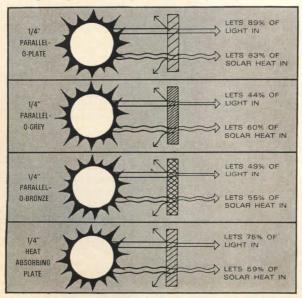
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dwood National Bank, Napa, Calif. Architects: Neill Smith & Associates, San Francisco. Glazing by Cobbledick-Kibbe, Oakland.

PARALLEL-O-GREY — Decatur Federal Savings & Loan, Decatur, Ga. Architect: Pope H. Fuller, Decatur. Glazing by Binswanger Glass Co., Atlanta.



Continued from page 270

Under these headings, items are alphabetically arranged. When you find your "bit," the actual information is not there, but, instead, a number corresponding to another publication where it finally is found.

Examining the frequencies of referral, you find there are four main sources: the Burris-Meyer and Cole *Theaters and Auditoriums*, with 418 references out of a total of 697, A.N.T.A.'s *Open Stage Check List* with 159, while Percy Corry's *Planning the Stage* has 82, and the authors themselves supply 108. Most other articles are referred to once.

Here, at the origins, the search ends sadly. We must differentiate between "hard" and "soft" information—"soft" being rule-of-thumb, intuitive, and unsubstantial. The greatest bulk of information found in *all* the sources is "soft"; the "hard" stuff of building theaters is just not there.

It is quite possible that the design of theaters has too many interacting variables to ever permit an all-inclusive, at-all-levels checklist. Certainly these authors have tried and have performed a valuable service, but the value of a bibliography must rest on its sources. Theater planners still need a "bible." Until that event, we must make do with the existing store of writing, a growing body of knowledgeable consultants, and common sense.

A Valuable Service

BY GEORGE A. HUTCHINSON

THE OPEN STACE, BASED ON THE DESIGNS OF JAMES HULL MILLER. Bulletin N. 109, Published by Hub Electric Company, 2255 West Grand Ave., Chicago, Ill. (1965, 71 pp., \$1) The reviewer is a partner in The Perkins & Will Partnership.

The open stage, in its pure form, is an essentially simple and consequently economical stage form. If it is skillfully designed, built, and equipped, an open stage can accommodate very satisfactorily many types of public performances. Used by an imaginative director and creative technicians, it can contribute in significant ways to the art of the theater. For these reasons, the authors feel that *The Open Stage* should be of interest to anyone contemplating, or engaged in, the creation of a new theater.

The book contains an abundance of technical information directed to architects, engineers, theater directors, scene designers, and stage and lighting technicians. Due to its inherent simplicity of construction, stagecraft, and lighting equipment, the open stage is suggested more and more great American architects are using Marmet

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as being particularly adaptable to highschool stage needs.

The text suffers from what seems to be an unnecessarily defensive comparison between the open stage and the proscenium stage (the arena form is practically ignored). A number of supporting statements are of questionable accuracy and validity. The presentation bears an unfortunate resemblance to an equipment catalog in organization, format, and in its somewhat crude illustrations

These several factors tend to detract from the dignified quality the publication might have been given. They do not, however, diminish the value of the service to the theater performed by the Hub Electric Company, James Hull Miller, and a respected panel of contributors in making available such a comprehensive treatment of the open stage.

New Theater Journal

BY MICHAEL BRILL

THEATER DESIGN AND TECHOLOGY. Journal of the U.S. Institute for Theater Technology. Edited by Ned A. Bowman. Published by the Institute at 1117, C.L., 4200 5th Ave., Pittsburgh, Pa. (1965, 35



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"The Coat Rack People" ELMHURST, ILL. On Readers' Service Card, circle No. 447

pp., illus. \$1.50) The reviewer's professional affiliations were noted in the previous review.

Reading this journal gives you the same feeling as walking into your first party in a new neighborhood-everybody knows everybody, and there is talk of events and projects you know nothing about but would like to.

This first issue of the USITT's journal feels as if it had been published for years. It refers to, or gives partial results of, at least 15 different projects "in the works," many of which promise sorely needed information. The same people involved in these also contribute articles and reviews, and even appear on the editorial board. I must assume that a tight core of the "faithful" launched this newest theater journal, and it is this vigorous feeling that flavors the complete publication.

A periodical should be judged by its attitude toward its material, not the material itself, since that keeps changing; the attitude of this journal can be described as vigorously catholic-anything goes. Ranging far and wide, it is conceptual and it is also nuts-and-bolts technical. It has an ethereally moody, romantic cover photo of Sullivan's and Adler's Chicago Auditorium, yet inside it has the "tight" graphics of plans and photographs of theaters and old-fashioned patent drawings of new theatrical devices. This mixed-bag approach is both the strength and weakness of the journal. Two other flaws are the typefaces chosen and the abstracts of each article. The typefaces are all sans-serif and hypnotically dull, while the abstracts smack of indulgence of lazy readers. In all, however, it's a good start.

Sounding Out Space

BY WILLIAM RANGER FARRELL

ROOM AND BUILDING ACOUSTICS AND NOISE ABATEMENT. By Willi Furrer. Translated by Evelyn R. Robinson and Peter Lod. Butterworth, Inc., 7235 Wisconsin Ave., Wash., D. C. (1964, 226 pp., charts, diagrams, illus., \$11.95). The reviewer is an acoustical consultant presently affiliated with Ranger Farrell & Associates.

This book is a technical text on acoustics that is addressed to architects and builders. Written by a highly qualified expert in the technical aspects of sound, it may well be the only text on the subject that is also reasonably up-to-date and written in a manner that should make it understandable to any architect or builder.

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The book is divided into three sections: The first deals with some of the fundamental principles and behavior of sound and also includes some very useful acoustical data. The second section describes the design of rooms for the control of reverberation and echoes, and for uniform distribution of sound. It deals primarily with "audience rooms," and, to a lesser extent, with studios. The material is presented clearly, with few and simple formulas, and with a careful avoidance of higher mathematics; there is, for example, no reference to calculus. The third section deals rather briefly with the general area of noise control, including a general discussion of transmission loss and impact noise. It covers noise control in residential areas and then outlines acoustical considerations in a number of special building types, such as hotels and bowling alleys.

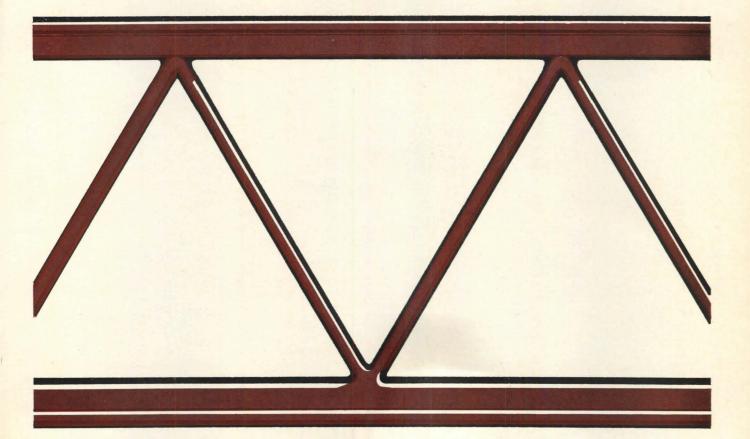
The translation is not without minor flaws. The presentation of tables and formulas in both English and metric units, rather than just metric units, would have made the book much more useful to English-speaking architects. The text contains formulas that have been broken down to the simplest working form, with only the variables and a constant term reflecting both the physical constants and the metric constants. Unfortunately, the supposed simplicity is lost if one must convert the constants in each case to the English system.

Considering the common prejudice among American architects that acoustics is almost exclusively concerned with concert halls, auditoriums, and studios, the author's emphasis on these rooms may be justified. This reviewer, however, believes that, although the greatest interest may lie in such rooms, the most important aspect of acoustics deals with the much greater number of more mundane problems, such as sound transmission in offices, hotels, and apartment houses, and that a more detailed description of solutions to these problems might have been in order.

Since the book's major emphasis is on audience-room acoustics, some brief indication of the design of electronic amplification would have been helpful. Furrer lists approximate maximum room volumes within which, for example, a man can lecture without electronic reinforcement. In addition, the architect would have been helped by learning some of the bare rudiments, such as loudspeaker size and placement and control positioning for best results.

Professor Furrer, in dealing with sound Continued on page 282





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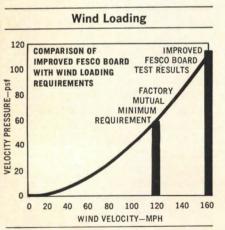
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Continued from page 278

transmission, unfortunately does not take into account the importance of masking noise. He falls back on the common practice of presenting sound-transmission loss requirements in tabular form, stating, for example, that with an average soundtransmission loss (a somewhat discredited value in itself) of 50 db, normal conversation will be unintelligible in the adjacent room. This is only true if the ambient noise in the listening room is of the order of 25 db in the middle-voice frequencies. Admittedly, the ambient noise frequently does approximately this, but not always.

More importantly, however, Furrer has given an excellent presentation of acoustics for architects and builders. It is clear and understandable; it covers each area with a sound basis of technical knowledge, and should serve as a very useful text for its intended audience. The typography and figures are excellent. Particularly interesting are the large number of photographs, plans, and sections of auditoriums, concert halls, churches, and studios throughout Europe and America. Architects should certainly add this volume to their technical library.

The Art and Instruments of Scenic Projection

BY KEITH KROEGER

IMAGES IN LIGHT FOR THE LIVING THE-ATER. By Edward I. Kook. Published by Century Lighting, 521 W. 43 St., New York, N. Y., 1964. Distributed by Drama Bookshop, 150 West 52 St., New York, N. Y. (258 pp., illus., \$4.50). The reviewer, an architect, is with Ullrich Franzen Associates, and has recently been working on a theater project.

In view of the number of new theater structures and the recognition of the coming of age of the American Theater, it is appropriate that the techniques and experience of theater craft, particularly the pioneering ones, be as widely shared as possible. Edward I. Kook's book, a study supported by a grant from the Ford Foundation, makes this possible. The study is an extremely thorough and stimulating investigation of the art and instruments of scenic projection. A challenge to all concerned, its thoroughness makes it of interest to theater people, to the technicians in the theater lighting equipment industry, and the architect who may be planning a theater structure.

The study includes a complete description of the history and basic tech-Continued on page 288 Doly extruded ceramic quarry tile offers so many features . . . tough enough o withstand impact, abrasion and wear in a power station . . . inherent, permanent beauty that requires no waxing . . . weatherproof qualities for exterior uses . . . and a range of colors, sizes and shapes to provide virtually inlimited floor designs. Next floor, specify Summitville Quarry Tile if you vant unequalled durability or design versatility or everlasting beauty . . . or all three. Summitville Tiles, Inc., Summitville, Ohio 43962.



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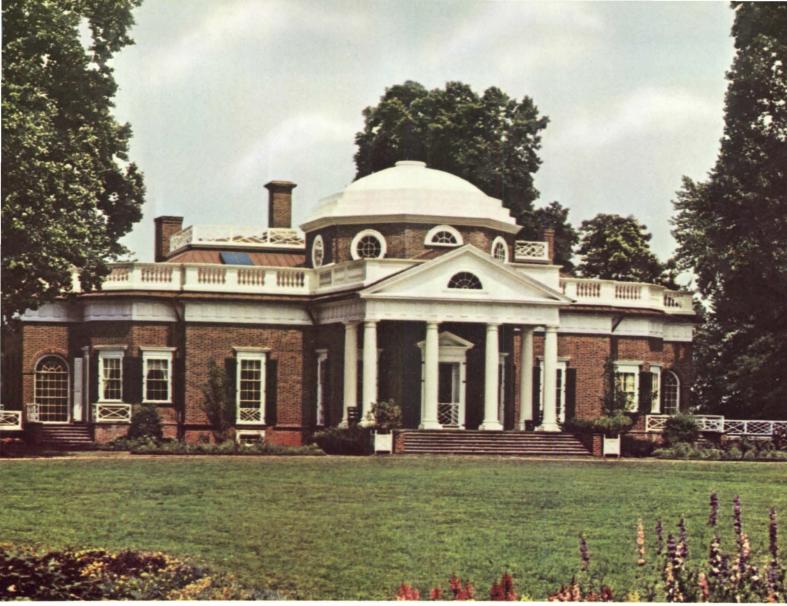
Continued from page 282

niques of scenic projection, along with detailed technical descriptions of available projection equipment and the optical principles involved. With regard to available equipment, it is clear that much work needs to be done, especially in the development of a projector that will give greater brightness. Kook is the head of one of the leading concerns manufacturing stage lighting equipment and can no doubt be counted on for future developments in this area.

One of the basic problems of scenic projection is the limitation posed on it by the physical arrangement of the theater space. Both front- and rear-view projection require a distance from the screen that is proportional to the size of the screen and desired image size. Front-view projection has the additional problem of maintaining the projector at such a distance and angle as to keep the actor from casting a shadow on the screen. In the Broadway theaters, with their shallow and generally small backstages, projection has severe limitations placed on it. However, the opportunity today to plan for the use of projection in a new theater makes it imperative that the architect and theater artist working together, explore the basic requirements of the technique.

Kook is an ardent supporter of the use of projection and he enthusiastically brings forward all those ideas that argue for the technique. One of the best known is that of economy. Projection can often be used to eliminate bulky, expensive, painted scenery and time-consuming scene changes. However, Kook makes it clear that he is not by any means proposing that the medium be used on economic grounds alone. Projection has the potential for being an artistically valid means of expression. It is of the poetic advantages of the medium that he speaks most convincingly-using it to produce continuous action on a vast scale of mood and environment. While it is clear that the use of projection depends greatly on the director and scenic designer, Kook hopes that the technique will become better known and understood by playwrights.

Kook's report is certainly to be recommended for theater artists, students of theater, and playwrights. Although it is certain that a wide range of existing plays produced within the limitations of existing theater can employ projection under the direction of a skilled artist, it is the future of projection in the hands of the playwright and in the new theater that holds great promise.



Monticello, a 35-room structure on a 658-acre tract atop a lofty plateau in the Blue Ridge Mountains of Virginia. Begun in 1769, it developed over 40 years in the Greco-Roman-Colonial style. Its dome inspired those built later on the U.S. Capitol and the Jefferson Memorial in Washington. Jefferson was as much an avant-gardist as Frank Lloyd Wright was to become generations later.

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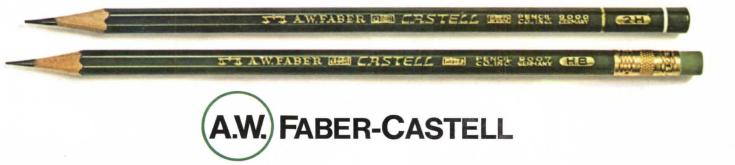
There may be a contemporary genius to match Thomas Jefferson, but nobody has ever met him.

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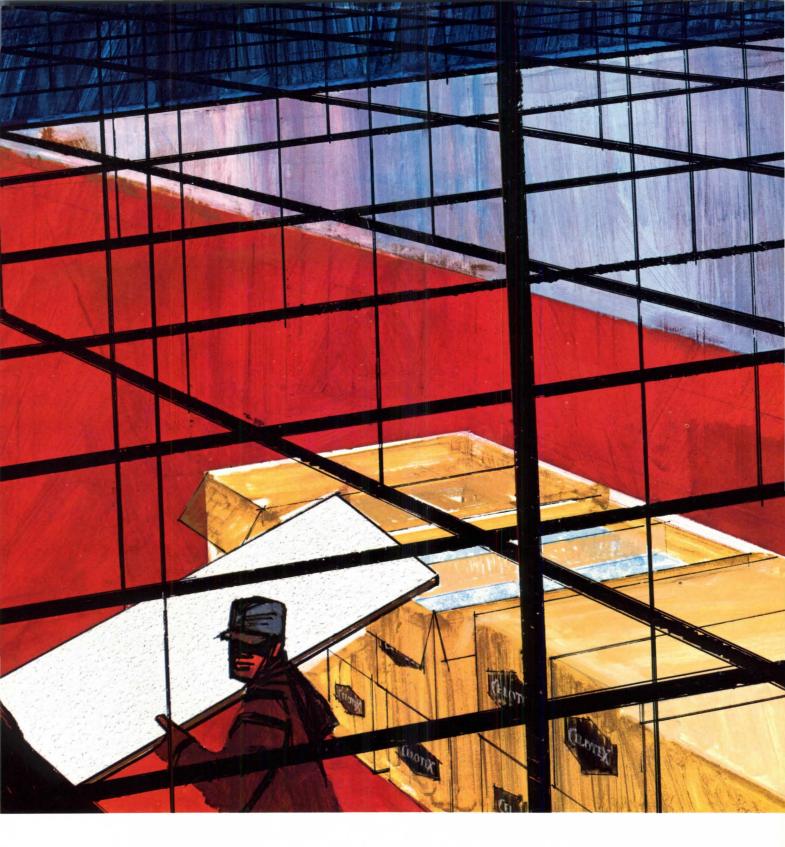
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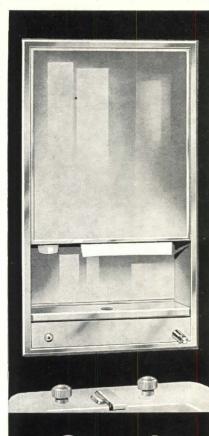
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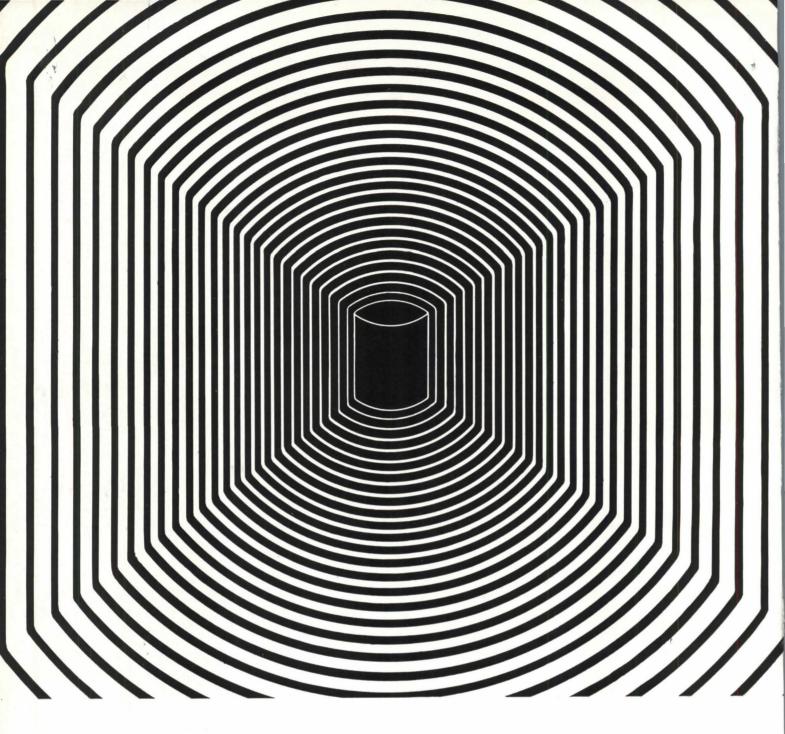
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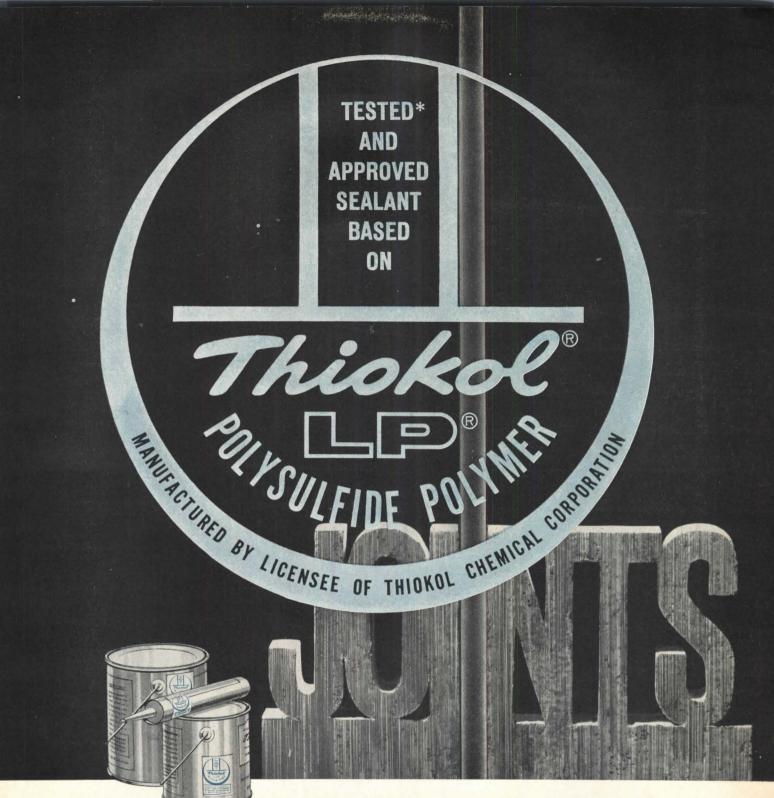
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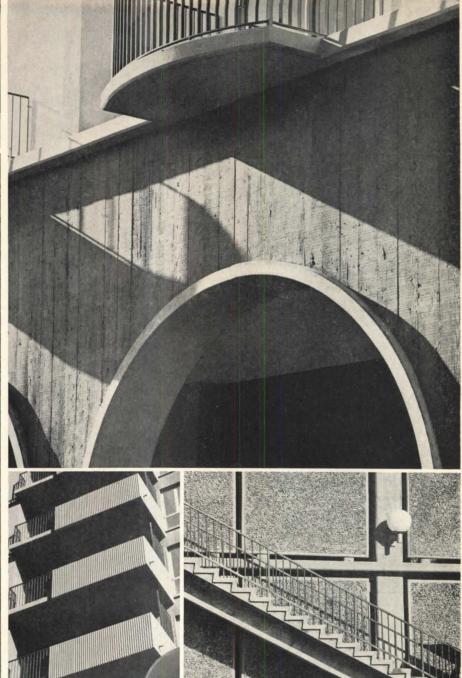
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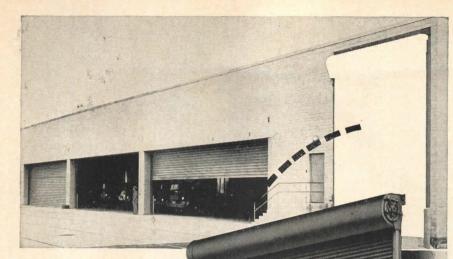


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DIAMOND & SANKO, Architects, 36 Richmond Terrace, Staten Island, N.Y.

ECONOMIDES & GOLDBERT, Consulting Engineers, 110 E. 30th St., New York, N.Y.

JIM HABERLAN, Architect, 726 Stuart Bldg., Lincoln, Nebr.

J. JAY HILL & CRAIG G. ANDREWS, Architects, 7831 Marble N.E., Albuquerque, N.M.

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New Partners, Associates

CAUDILL, ROWLET & SCOTT, Architects, Planners, Engineers, Houston, Tex., have named five new associates: JAMES FALICK, M. K. GOODMAN, DAN R. STEW-ART, CHARLES B. THOMSEN, and ROBERT D. WILLIAMS.

ECCERS & HICGINS, Architects, New York, N.Y., have appointed E. ALLEN DENNIson an associate.

HELLMUTH, OBATA & KASSABAUM, Architects, St. Louis, Mo., have named KING GRAF executive vice-president together with 12 associate directors and six new associates.

MORRIS KETCHUM, JR. & ASSOCIATES, Architects, New York, N.Y., have named IAN C. BROWN an associate.

J. N. PEASE ASSOCIATES, Architects-Engineers, Charlotte, N.C., have named STUART BAESEL a senior associate.

SCHWARZ & VAN HOEFFEN, Architects. St. Louis, Mo., have named HEINZ E. ZOBEL an associate.

STROBEL & RONGVED, Consulting Engineers, New York, N.Y., have announced as associates: GEORGE KOSTRO, HELMUT E. NIMKE, and MILTON ZANGER.

WHISLER/PATRI ASSOCIATES, Architects, San Francisco, Calif., have appointed ROBERT H. GREEN associate in charge of all staff production operations for the San Francisco and Monterey offices, CARL E. WISSER was named Senior Partner.

Continued on page 304

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When you have a challenging project—whether it's an office building, country club, bank, hospital, motel or shopping center—you want to specify the best of everything the budget will allow. One mistake can spoil a great piece of work. For example, you don't want the wallcoverings to shrink, discolor, peel, crack or look old within a short time. That's why you should specify FABRON or PERMON—100% pure virgin supertough vinyl. These high-quality wallcoverings are certain to stay like new five to 10 years after others have to be replaced. The secret is the exclusive three-ply *fabric base/color film center core/clear top film* laminating process. This unique process "locks in" any of the 700 new beautiful colors, designs and textures so that they are impervious to smoke, sun, scuffing, abrasion, damage, heavy wear. FABRON and PERMON are available in several different strengths to meet the damage-resistance demands of every project. Your client pays no more for FABRON or PERMON.

Stauffer

23 big advantages! Free design service, samples, estimates!

Send for your free copy of this exciting new booklet. It contains helpful information, and outlines the 23 big advantages of FABRON and PERMON.





Frederic Blank & Co., Inc. Established in 1913 A STAUFFER COMPANY P.O. BOX 388, PASSAIC, NEW JERSEY 07056 On Readers' Service Card, circle No. 309

INNER-SPACE MISSION



First of 400 Lennox 16-ton DMS cooling units being installed on prototype building of Ford Foundation SCSD project in California.

It's the new frontier in climate control.

Heats, cools and ventilates simultaneously.

Provides up to 12 separate zones with 12 different climates.

Flexible ducts that permit walls to be moved.

A rooftop unit, of course.

It's the Lennox Direct Multizone System.

Designed with flexible ducts to permit schools to move walls around.

But available with fixed ducts for any commercial application.

It filters and ventilates continuously. Cools free at any temperature under 57°. Gas, hot water or electricity fuel it.

It is remarkably inexpensive to install, maintain, operate.

Designed for the School Construction Systems Development project, it is being enthusiastically received nationwide.

Sixty-eight units are being installed in a single Nevada school district!

But, it is uniquely ideal for any

building where design or occupancy demand multizone control.

Write for literature to Lennox Industries Inc., **548** S. 12th Ave., Marshalltown, Iowa.





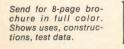
Offers thin-line seat design with deep upholstered comfort.

New concept replaces bulk and obsolete spring construction. In use in furniture, automotive, aircraft, truck, boat seating.

First really new idea in seat suspension in 50 years. It's a complete seat platform, scientifically designed to cradle a person in floating comfort. Exceptionally durable.

When in search of modern design and comfort, incorporate the elastaSEAT Suspension in your seating specs.

REAT SUSPENSIN





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Continued from page 300

Elections, Appointments

AMERICAN INSTITUTE OF STEEL CON-STRUCTION, New York, N.Y., has appointed ROBERT R. LORENZ as its assistant chief engineer.

BURKE, KOBER & NICOLAIS, Architects-Engineers, Los Angeles, Calif., have appointed DAN POWELL vice-president and director of interior design.

DANIEL, MANN, JOHNSON & MENDEN-HALL, Planning, Architects, Engineering, Systems, Los Angeles, Calif., have named L. K. MADSEN vice-president and THOMAS J. SPENCER project director for defense and aerospace activities.

FRED S. DUBIN ASSOCIATES, Consulting Engineers, Hartford, Conn., have admitted THOMAS E. CALABRESE to the staff.

FLING & EEMAN, INC., Consulting Structural Engineers, Columbus, Ohio, have admitted WILLIAM W. FALLOW and JOHN E. SADLER to membership in the firm.

GIFFELS & ROSSETTI, INC., Architects-Engineers, Detroit, Mich., have made ALBERT H. FIEDLER a member of the staff.

JOHN GRAHAM & COMPANY, Architects-Engineers-Planners, Seattle, Wash., and New York N.Y. have named, R. ALLEN NORRIS a senior partner in the Seattle office, and JOHN BOOGAERTS, JR., and ROBERT J. BARR members of the New York office.

S. T. JOHNSON COMPANY, Engineers, Oakland, Calif., have named RUSSELL H. GREEN project engineer.

JACK LENOR LARSEN, INC., Fabric Designer, New York, N.Y., has appointed FRANK HUGGINS president of its Win Anderson Fabrics Division.

MARBLE INSTITUTE OF AMERICA, INC., Washington, D.C., has named WALTER R. FRAZIER as its new Technical Director.

MARIN COUNTY PLANNING COMMISSION, Calif., has elected Felix M. WARBURG as its new chairman.

NICOL & NICOL, Architects-Engineers, Chicago, Ill., have named LEROY J. KNOEPPEL educational consultant.

PACIFIC INTERNATIONAL RESEARCH LTD., San Jose, Calif., has appointed EARL G. RICHARDS director of architectural programs.

AMERICAN INSTITUTE OF ARCHITECTS, New York Chapter, has appointed How-ARD JUSTER chairman of the Hospitals and Health Committee.

PAUL ROCERS & ASSOCIATES, Consulting Structural Engineers, Chicago, Ill., announce the election of new officers: ELI W. COHEN, vice-president and chief en-

Continued on page 312

END STUCCO SHRINKAGE CRACKING WORRIES

Get new design freedom with Stucco



X-59 is being specified by architects as a direct substitute for lime. When plaster

stitute for lime. When plaster or stucco is properly applied, a beautiful job is produced every time with X-59.

Estimates are often lower because of reduced call-backs for patching. Many contractors cut application time by 50% through machine pumping instead of hand troweling. Finish coat goes over brown coat same day without delamination. Walls work cooler. Scaffolding removed sooner.

Put X-59 in your specs. We'll answer all contractor questions. Pick up specs. from SWEET'S; Architectural, 12b/Ca; Industrial Construction, 16d/Ca.



Ultra-modern service station of Gulf Oil Corporation in Pittsburgh, including new protective canopies surfaced with stucco... General Contractor; R. W. Lynch. Plastering Contractor: J. J. Morris & Sons, Inc. "Using X-59, no shrinkage cracks after 10 months on any of the stations which we did." W. C. Morris

CABOT CORPORATION 125 High Street, Boston, Mass. 02110 (617) 423-6000

1712 Commerce Street, Dallas I, Texas (214) 741-6850

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If it weren't for the cold, you wouldn't need Dow Corning 780 building sealant. Most sealants stiffen with cold and lose elasticity. The colder it gets, the harder they become. When this happens, expansion and contraction often cause the sealant to crack or pull away—and that's the beginning of a costly and embarrassing leak.

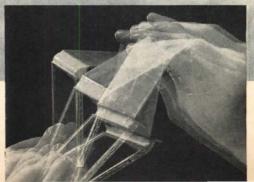
One sealant that applies easily and stays flexible at all temperatures is Dow Corning[®] 780 building sealant. A true silicone rubber, this elastomer is unaffected by extremes of cold and heat, direct sunlight, ozone and ultraviolet. That's why Dow Corning 780 building sealant maintains a watertight seal indefinitely.

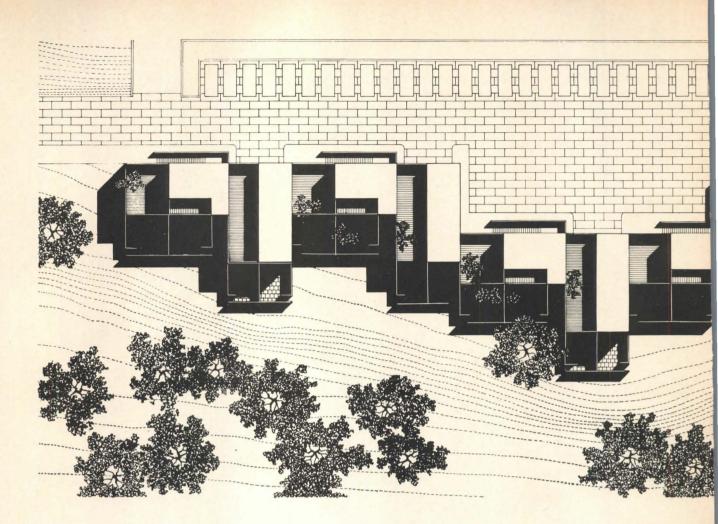
FREE SAMPLE:

We'll send you a two-ounce sample tube of this remarkable sealant for your own cold weather evaluation.

flexibility at 20° below

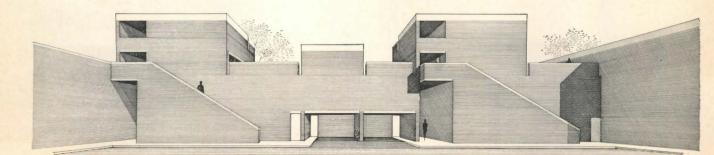
Write Dow Corning Corporation, Dept. 8722, Chemical Products Division, Midland, Michigan, 48641. For nearest distributor, see Sweet's Architectural File.





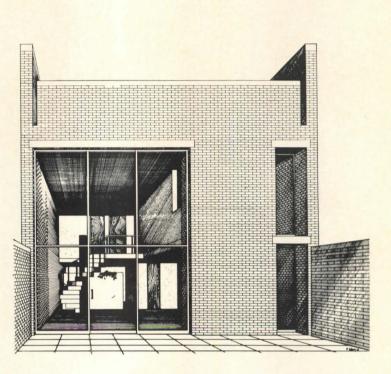
Marvin Hatami designs an apartment house

Utilizing Zonolite[®] Masonry Fill Insulation he cut operating costs \$600 annually and handed his client a 206% return on his investment





Zonolite prototype building #11: a walk-up apartment complex.



Architect Marvin Hatami and consulting engineers Cator, Ruma & Associates, both of Denver, Colorado, were commissioned by Zonolite to design this spacious, 35 apartment complex.

One of the problems to be faced was engineering the structure to withstand Denver's severe winters, yet remain consistent with budget requirements.

To do this, Mr. Hatami specified Zonolite Masonry Fill Insulation. The addition of Masonry Fill increased net costs by \$3400. However when this is figured against a 20 year mortgage life, at 6% interest, the annual cost becomes only \$292.

Compared to the annual \$600 reduction of operating costs, Zonolite provided a \$308 a year saving for the client. That's a whopping 206% return on his investment.

The reason for this high return is the low cost, combined with the effectiveness of Zonolite Masonry Fill Insulation.

Masonry Fill also reduces initial building costs because smaller, more efficient heating units can be utilized. And because of the insulation's sound absorption qualities, each apartment is quieter.

Additional facts worth investigating are contained in our Bulletin MF-113. Write Zonolite, 135 South La Salle St., Chicago, Illinois 60603.



ZONOLITE DIVISION W.R. GRACE & CO. 135 SO. LA SALLE ST., CHICAGO, ILL.

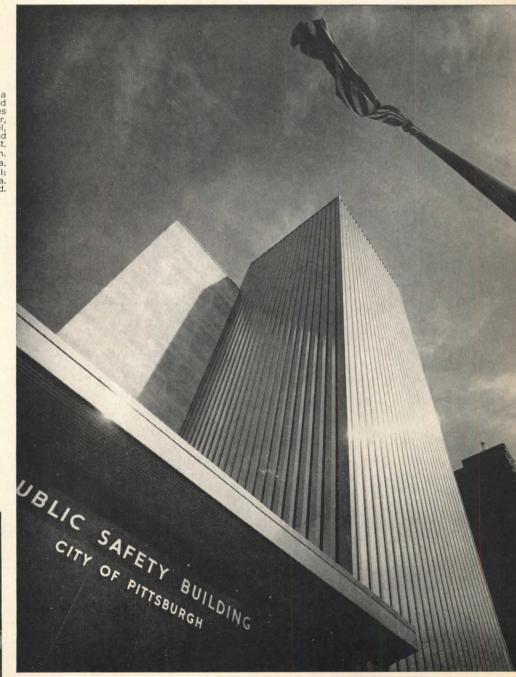
a de la constante	L. SUMPALL SUMPALL THATLASTURE
Timetarus	
U=.37 WITHOUT MASONRY FILL	U=.14 WITH MASONRY FILL

At 10° below zero, with the building heated at 70°, the interior surface of an outside wall without Zonolite would register an uncomfortable 50°.

register an uncomfortable 50°. By installing Zonolite Masonry Fill Insulation, the architect was able to increase inside wall temperature to a comfortable 62°.

DESIGN CONDITIONS Winter Heat Loss in BTU/HR. Assuming 70° F Indoor -10° F Outdoor					1. Operating costs are reduced by	
	Without Masonry Fill	With Masonry Fill	Without Masonry Fill	With Masonry Fill	over \$600 per year. 2. 34,000 sq. ft. of walls (include	
Walls	4" Face Brick 2½" Air Space 4" Face Brick	4" Face Brick 2½" Zonolite Fill 4" Face Brick	826,000	313,000	6,000 sq. ft. of Interior Walls) @ 10¢/ft.=\$3,400 installed. 3. Raised indoor wall surface	
Roof	Roofing, 4" Concrete 2" Insulation		155,000	155,000	temperature from 50° F to 62° F provides added comfort.	
Floor	4" Concrete on Grade		41,000	41,000	4. Increased wall attenuation	
Glass	1/4" Plate Glass 4000 CFM		780,000	780,000	characteristics reduces sound transmission between apartments	
Ventilation			504,000	504,000	by a considerable amount.	
Totals			2,306,000	1,793,000	Based on 5673 degree days \$.053	
% Savings wi	th Masonry Fill		2,306,000 — 1,793,00 2,306,000	$\frac{10}{2} \times 100 = 22\%$	per therm gas boiler.	

Now the excellence of stainless steel curtain walls can fit every budget



Stainless steel mullion covers, windows and pebble-textured panels combine to form a unit panel type of curtain wall of unusual flexibility for low-rise structures. Merritt Industrial Park Building No. 2, Fishkill, N. Y. Architect: Louis Battoglia, AIA, Fishkill, N. Y. Stainless steel "Series 100" curtain wall: American Bridge Div. of United States Steel Corp., Pittsburgh, Pa.

In this modernization effort, a 30-year-old structure was stripped to the columns and four stories added. A new utility tower, entirely sheathed in stainless steel, dominates the building and adds an important note of contrast. Public Safety Building, City of Pittsburgh, Architect: Alfred M. Marks, Pittsburgh, Pa. Stainless Steel "Versatile Wall" curtain wall: H. H. Robertson Co., Pittsburgh, Pa. and Connersville, Ind.



These versatile systems combine elegance with the economy of pre-engineered components.

low you can give your buildings the beauty and prestige of ickel stainless steel curtain walls and still stay within your udget. Modern production methods, such as high-speed roll prming of components, help keep costs competitive with other naterials. They enable you to use standard curtain wall omponents and assembly techniques by adapting them to your wn design variations.

tainless steel has many design advantages. There's no danger f corrosion products streaking or staining adjacent materials. tainless is corrosion resistant in virtually all atmospheres and limates. The high strength of stainless permits uses of lighter, nore economical gauges than usually needed with other rchitectural metals. Allows large glass areas where desired. he soft, permanent luster of stainless steel complements, eflects and highlights surrounding materials, too. Doesn't verwhelm or intrude on other design or color elements.

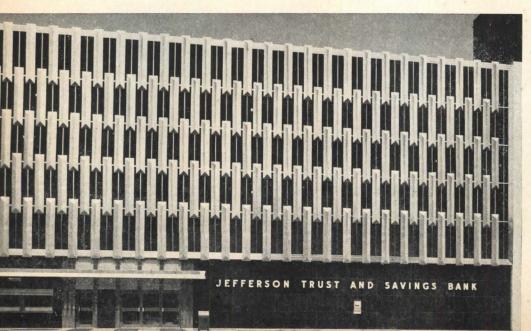
Curtain walls of nickel stainless steel cost less to maintain than ny other kind. Savings that accrue from the low cost of naintaining stainless can often make up any difference in cost etween components of stainless and other materials.

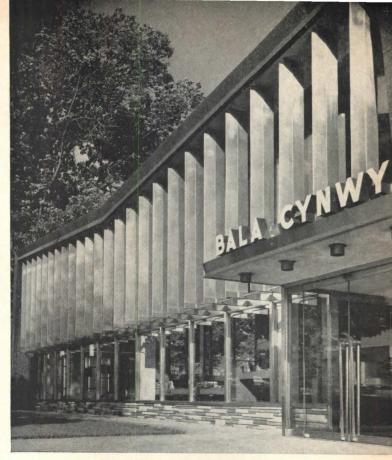
or your next design, consider the advantages of nickel stainless teel curtain walls—as well as doors, windows, hardware, fascia nd railings. And write for Inco's informative "Suggested Guide Specifications for Stainless Steel Curtain Walls." Their format ollows AIA Specification Worksheets.

INCO

The International Nickel Company, Inc. 67 Wall Street, New York, N. Y. 10005 Nickel ... its contribution is Quality

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Striking structural effects are components. Here, the addition of deep-louvered, stainless steel sunshades serve both function and appearance and become an integral part of the total exterior effect. Cayuga Federal Savings and Loan Association, Philadelphia, Pa. Architect: Philip Mastrin, AIA, Philadelphia, Pa. Plate Glass Co., Pittsburgh, Pa.

A light stainless steel clad facing grid supports a decorative pattern of stainless steel panels on this remodeled bank. A background screen of black porcelainized expanded metal hides the old surface and adds deep dimension. Jefferson Trust and Savings Bank Jefferson Trust and Savings Bank,

Peoria, III. Architect: Lankton, Ziegele & Terry, Peoria, III. Stainless steel "Fenmark" curtain wall: Fenestra Incorporated, Lima, Ohio.

Think thin with Barrett Urethane.

Twice as thin because it's twice as efficient as any other roof insulation.

Compare Barrett Urethane to any other roof insulation. You'll find others have to be at least twice as thick to equal Barrett Urethane in insulation efficiency. Trim, thin Urethane has a C factor of 0.15. That makes it ideal insulation for buildings with modern heating and air conditioning systems.



Here's the thickness needed in various materials to obtain this same low C factor:

Urethane	1.0"
Glass fiber	1.8"
Polystyrene	2.0"
Fiberboard	2.4"
Cellular glass	2.7"

Easy-to-handle Barrett Urethane saves on application costs, too. Compare what a roofer would handle on a 500square job: only 43,500 lbs. of Urethane against 210,000 lbs. of fiberboard insulation. At an average handling cost of \$5 per ton, this is a saving of over \$400 or nearly \$1 per square. Barrett Urethane comes in large, thin, lightweight panels. You get a tough walk-on, workon surface that won't bend, buckle or melt when mopped on with hot pitch or asphalt. There's only one way to get all the advantages of Barrett Urethane. Specify it by name. Merely to call for "1 inch of insulation" is inadequate with today's wide variations in insulating efficiency. For a detailed booklet, write to Barrett Division, Allied Chemical Corporation, Dept. 'PA-10, 40 Rector Street, New York, N.Y. 10006.





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tion of mcPhilben quality I fully vaportight, bug-tight, corrosion resistant all cast aluminum precision construction triple ground satin or black anodized finish for lasting beauty ■ 100W. or 200W. sizes with or without protective guard When it comes to the selection of lighting there is no "equal" for mcPhilben originality, quality, performance - You can take our word for it or write for specification data and convince yourself.

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