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EDITORIAL:

Does the current revolution in the arts represent a return to what is authentic in art? P/A's Editor assays the question.

COMMENTARY AND ANALYSIS

CUTTING THE SLAB DOWN TO SIZE: Two building complexes at the University of Colorado—Engineering Sciences Center and Marine Family Housing—underwent a design metamorphosis from monolithic slabs to multiunit complexes. ARCHITECTURAL ASSOCIATES OF COLORADO, WILLIAM C. MUCHOW, PARTNER IN CHARGE; MOORE & BUSH, ARCHITECTS; PIETRO BELLUSCHI AND SASAKI, DAWSON, DEMAY ASSOC., DESIGN CONSULTANTS.

A BOLD NEW APPROACH: THE COMMUNITY MENTAL HEALTH CENTER: Under the stimulus of funds provided by recent Federal legislation, a new building type is being born, intended to provide coordinated mental health care. Four design solutions are presented:

1. TERRACED GEOMETRY: A horizontal, two-level scheme set against a hilly site. ELLIS KAPLAN AND HERBERT MCLAUGHLIN, ARCHITECTS.

2. COURTYARD COMPLEX: A design solution in which courtyards are focal points for the treatment units. P. ARTHUR D’ORAZIO, ARCHITECT.

3. VERTICAL STACKING: Four-story treatment center in which space limitations prompted a simple organization of functions by floor. CAUDILL, ROWLETT, COTT, CONSULTING ARCHITECTS; KAHN & JACOBS, PROJECT ARCHITECTS.

4. PAVILION CLUSTER: Small pavilions clustered together to house the various functions retain the residential scale of the neighborhood. TYPE & MITCHELL, ARCHITECTS.

THE MORMON TABERNACLE: A description of the largest work of timber roof framing extant.

A PRIMER FOR CLIENTS: Robert Mutrux addresses himself to the question: Is it true that it takes a great client to make a great building?

INTERIOR DESIGN

WINDOW COVERINGS: The factors involved in choosing window treatments: economics, light, view, privacy, insulation, light diffusion, acoustical control, and aesthetic appearance.


SELECTED DETAIL

MATERIALS AND METHODS
162 SHADOWS, SCREENS, AND SIGHTLINES: The relative merits of front- and rear-projection systems.
164 UPDATING INDUSTRIAL WALLS: Improvements in joints, seals, and colors in industrial curtain walls.
167 BLOCK WALLS: ONE INCH PER STORY: An eight-story hotel supported on 8-inch-thick concrete block walls.

P/A NEWS REPORT

P/A OBSERVER
171 KENNEDY SHRINE IN JUDEAN HILLS: David Reznik's memorial to the late President, sited near Jerusalem, is an impressive sculptural statement that nevertheless falls short of greatness.
174 “FANTASY'S HOT FIRE”: An unusual complex of structures on a large site will serve as a firemen's training academy in Houston.
176 MORE THAN “BEAUTY” FOR WASHINGTON: Two projects for the ghetto area of southeast Washington, D.C., go far beyond most of the “beautifying-our-cities” pronouncements that come out of Washington.
180 ANOTHER CAPITAL SATELLITE: Plans for Montgomery Village, near the nation's capital, are another hopeful sign in the trend to designing total communities, in place of the commonplace dreariness of speculative housing.
182 SNAKES ALIVE: Fred Bassetti has designed a building unusual in the vocabulary of zoo architecture: one that houses reptiles and nocturnal mammals under the same roof.
184 OLD GRAD COMES THROUGH: A forceful proposal to redevelop the South Main-South Water area of Providence was sparked by the Providence Preservation Society.
188 MECHANICAL ENGINEERING CRITIQUE
William J. McGuinness describes a Swiss plumbing device that could greatly reduce the cost of piping for multistory buildings.

SPECIFICATIONS CLINIC
Harold J. Rosen discusses means of protecting concrete against deicing chemicals.

IT'S THE LAW
Bernard Tomson and Norman Coplan continue their discussion of a recent case in which architects were sued for injuries sustained by the contractor's workmen.

6 VIEWS
Our readers' comments on the architectural scene.

COVER
Student lazes in the sun in the courtyard of the Engineering Sciences Center, University of Colorado (p. 118). Photo: Rush J. McCoy.

FRONTISPIECE
Rawhide strips to bind split timbers survive a hundred years of use in roof structure of the Mormon Tabernacle (p. 158).

TITLE PAGE
From a recent address by Paul Rudolph at Colgate University.

JOBS AND MEN
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A monthly service to P/A readers who desire additional information on advertised products and those described in the News Report, who wish to order Reinhold books, or who want to enter their own subscriptions to P/A.
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Dear Editor: I was both amused and disappointed after reading the title page comments of Benjamin Thompson and Jan Rowan's Editorial in the August 1966 P/A. Their message seems to turn on the rather astounding notion that the "philosophy of the teenyboppers" and their "cool, with-it, way-out life" is somehow a cleansing tide that will wash over us, clearing away all dreary inhibitions, and leave us once again bare in the sunlight of innocence. I fear these gentlemen have fallen prey to the Cult of Youth, presently flowering in entertainment, fashion, and soda-pop ads. We have always had the frothy titillation of youthful antics: bobbed hair and bathtub gin; bobby-socks and big bands. Some kinds of fun are merely more fashionable and appealing than others.

Yet since when has the realm of "sensual wholeness" been confined to the young generation, and since when has the "new wave of ideas" flowed only from the "oppy, poppy... wiggling rock-and-roll joints"? No wonder that these joints seem incredibly vital and vivid when compared to the dull ritual of overblown conferences. However, is it not possible that one mistakes the foam of fashion for the stuff of creativity? It is awareness of all the senses in genuine self-consciousness, regardless of locale or generation, that is at the root of "wholeness." Neither conferences nor discothèques add one wit. And it has always been this wholeness, this attempt to divine one's roots in the earth, that has generated the creativity of saints and sages and sculptors alike.

Since I myself reside within the gilded halo of the "way-out" generation, I am only too well aware of the inhibitions passed on to us. I am equally aware of the legacy created by the "original avantgardists" who now are labeled The Establishment and dismissed. These men are perhaps old today; that is merely time touching them. Much of their work however, remains un kissed by age. And after the giving and the getting, my generation must choose between the fruit of creativity and the pap of Pop Kulch. Those gifts we choose and those we create ourselves shall then be the measure of our time.

Youth does not belong to us any more than it does to our fathers or to our sons. Wholeness, on the other hand, belongs to those who will cultivate it.

Under 25, way-out, and wiggling,

KEN RICCI
New York, N. Y.

Aspen Conference: An Elusive Success

Dear Editor: Concerning the International Design Conference in Aspen, Colorado (p. 72, August 1966 P/A):

Kaufmann: "There is no such thing as beauty without ugliness." Banham: "Let's put birds back into orbit." Moldonado: "Theory of reducing design to research is self-defying." Lionni: "We must refuse to act in situations that we do not fully understand." Dreyfuss: "A good designer reveals the subject and conceals the artist." Henry Wolfe: "Dentists don't have such conventions as this... They don't try to fix the world; they fix the upper teeth." John Cage: "City planning is obsolete... There is need for global planning." Gyorgy Kepes: "Confess and profess... but do not claim a universal validity." Thompson: "Our functionalism only

Continued on page 11
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Friedrich Schiller
Stirs in His Grave

Dear Editor: In your concluding comment on the work of "playscapist" M. P. Friedberg (p. 72, AUGUST 1966 P/A), you note that "Friedberg's philosophy of designing for play has an antecedent in that turn-of-the-century British 'humanist' Friedrich Schiller, who once propounded: 'Man only plays when he is human in the full sense of the word, and he is only completely human when he is playing.'

May I deliver the source of one of my favorite quotations from the perils of dry wit, the British, and/or unwarranted quotation marks? It was German humanist (no quotes) playwright Friedrich

Continued from page 6

proves that we are properly toilet trained." Farson: "The quality of life is for the first time within our control." Yaacov Agam: "In art you see everything, but in reality your vision is limited." Ben Shahn: "Chaos is the poetic element in a dull and ordered world."

These were just a few thought-provoking statements from each of the speakers at the Aspen Conference. Certainly there were dull moments. Man just does not bristle with new ideas continuously. Yet to say that the avant-garde is the old guard completely out of touch with a new wave of ideas, as Jan Rowan did in his Editorial, is the admission that architecture is fashion design, which changes with each new hit song and each new Dior dress.

"The Sources and Resources of 20th-Century Design... were very much alive in the jazzy, oppy, poppy, relaxed and free atmosphere of the wiggling rock-and-roll joints," writes Rowan.

He confuses source (the original and ultimate cause) with the effect (the outward expression—oppy and poppy). He would be right if we were talking about the sources of 1966, but a span of 100 years should have a broader base for design than a teen-age craze that is admittedly refreshing but also very much of a passing thing.

The conference represented a conglomeration of thoughts, a search for artistic identity, with some of the swing design apparent; the modern native genius of the primitive Africans was just as vital as a pop film. The very reason (or the difficulty in summing up what was actually said) is proof of its elusive success.

GEORGE A. HARTMAN

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Continued from page 11

Schiller who made the observation (in *Letters on the Aesthetic Education of Man*). And while he might have flourished at the turn-of-the-century, it wasn't at the turn of the last one.

RALPH WILCOXEN
University of California
Berkeley, Calif.

**Landscape Architects**

**Look at Buildings for Recreation**

Dear Editor: We who are directly associated with recreation, and the subsequent changes its presence can exert on the landscape, remain impressed, as designers, by the concern P/A has shown this obvious architectural dilemma through its article on "Buildings for Recreation" (JULY 1966 P/A). Even though the feature's scope is limited to major architectural elements and does not include the minor—only in size and function relative to the feature's content—and more utilitarian recreational architecture, the subject deserves applause. The amounts of land necessary for a viable recreational facility fluctuate, depending upon population pressure and land availability. However, this variance in size should in no way limit the quality of architecture in the development plan. Regardless of a project's scale, these man-made elements are by their nature obvious intruders and have therefore the same potential of imposition on the landscape. Visitors readily identify themselves with these objects in the landscape, chiefly because these elements usually serve extremely necessary (utilitarian) roles in the function of the recreational development plan (i.e., entrance and comfort stations, snack shops, dressing rooms). The structures used are often minute compared to the total use areas involved (camping, swimming, parking, picnicking, boating, etc.) but are, in fact, because of their obvious presence, gigantic in terms of visual effect.

We continue to be impressed with some architectural design solutions, as those shown by P/A, which would be, by their presence, an addition to the visual continuity generated by any recreational facility. Yet we are chiefly concerned with architectural solutions seen in large state and Federal projects (including highways). Projects whose daily use amounts are gigantic. Projects in which structures are few in number and generally utilitarian in concept. Projects that seem directed by architectural administrators rather than...
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Continued from page 14

progressive, contemporary professionals. Projects that, with disturbing regularity, produce design solutions conspicuous in their mediocrity and obviously failing to respect the landscape in which they are placed. These types are not onlynoxiously conspicuous, but inappropriate as well.

We are well aware of factors limiting architectural success—for example, the ever-present, aesthetically suppressing bureaucracy of state and Federal agencies and the budgets they present. Yet these factors should not be used asscapegoats for mediocrity in architectural problem-solving. Unfortunately, these limiting factors do not also limit the visual effects created. Considerations such as siting, color, and graphics are in themselves worthy of more extensive investigation. So-called “temporary comfort stations,” or other structures of programmed impermanence, are often positioned as intermediaries in view corridors; these, too, are “Buildings for Recreation.” Signs are curiously confusing through a lack of forethought, and furthermore, cannot be omitted from the realm of recreational architecture. Noxiously ugly and inappropriate colors regularly loom before us from the forest glade or roadside rest area, as if the structures were of such design significance (hardly the case) that it should be displayed for the world to behold. Unfortunately, the world, in many cases, beholds. Again, desired architectural success should not be controlled (or supplanted) by the scale of the project. We should like to see increased sensitivity to buildings in the landscape and less dichotomy of the design disciplines that seem to produce buildings on the landscape. The importance of such considerations deserve accelerated exposure—something P/A has started; if only it could continue it.

THOMAS E. NELSON; JAMES GILBERTON; RONALD CHRISTMAN; ALBERT F. PRATT
Sacramento, Calif.

A Note from Abroad

Dear Editor: We have not renewed our subscription with your magazine because we cannot associate ourselves in any way with your Government’s Vietnam policy.

MICHAEL O’SULLIVAN
Dublin, Ireland

CORRECTION: In the article, “In-Use Evaluation of Psychiatric Facility,” which appeared in the AUGUST 1966 P/A, the name of one of the authors, Thomas Peel, was omitted, and the order of the other two authors, Edith Zeller and Lawrence Good, was reversed.

NOVEMBER 1966 P/A
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Mr. Bill Byron, Industrial Products Division, Dept. L-11
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Erickson and Stevens enhance a modern day "cave" in a sophisticated country home with ceramic tile.

The focus of this home located in a wooded area of Winnetka, Illinois is the "cave"—a room within a room. It was designed to meet the owner's requirement of an intimate yet not isolated conversation area. The cave, as well as the surrounding entry, dining and living areas have ceramic tile floors.

The philosophy behind the design of this home is the use of a prismatic plan offering maximum opportunity to capitalize on spectacular views in all directions. At the same time, privacy is accommodated by the adaptation of individual, adjoining living "cells," each with its own roof.

Throughout the home, architects Erickson and Stevens have made extensive use of ceramic tile for decorative as well as functional values. Bathroom vanity tops, tub enclosures and walls are finished in random blend ceramic mosaic tile with quarry tile floors. In the kitchen, counter tops and backsplashes are tiled for color harmony and durability.

If you're looking for a material with limitless possibilities in combined decorative and functional use, look for ceramic tile made in the U.S.A. and Quality Certified by the Tile Council of America. The triangular seal at the right is your assurance of glazed wall tile, ceramic mosaic tile and quarry tile that is tested to meet the most rigid government specifications. For more information about Certified Quality tile, a material that can be used with confidence indoors and out, write: Tile Council of America, Inc., 800 Second Avenue, New York, N.Y. 10017.

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yet it's the most versatile linear diffuser you can specify

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It’s manufactured of attractively finished extruded aluminum, with natural-anodized face.

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DYNAMICS CORPORATION OF AMERICA
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New Improved Fesco Board roof insulation exceeds the Factory Mutual velocity pressure minimum of 60 pounds per square foot by 100%. That's equivalent to resisting uplift from winds blowing at 160 miles per hour.

Other wind stresses? Improved Fesco Board has twice its previous shear resistance to the tearing force of wind across a roof. Three times as much tensile strength to overcome internal stresses generated by wind or structural movement. And a tough new Top Coating that bonds the insulation tightly to the built-up roofing.
double hurricane force winds

That's not all. Improved Fesco Board has 100% greater resistance to punishing foot and wheel pressure. It handles better, with minimum breakage... mops easier, installs faster. As always, it bears the Underwriters' Laboratories "incombustible" rating. As always, it's essentially waterproof, even under prolonged soaking.

Wind-safe, fire-safe, water-safe, Improved Fesco Board outperforms other roof insulations on practically every count.

Write for complete information to Johns-Manville, Dept. (PA), Box 111, 22 East 40th Street, New York, N. Y. 10016.

Johns-Manville

Results shown above are obtained under controlled laboratory conditions without consideration of the possible effect of air hail or other wind forces.

On Readers' Service Card, Circle No. 361
Clear, lustrous
Starlux plate glass relieves a powerful facade of concrete
Its upper windows aglow like firing slits of a fortress, Shapero Hall of Pharmacy at Detroit's Wayne State University makes a bold silhouette against the dusk. The building's upward-and-outward configuration is completely functional. It places those activities most in need of space and isolation (such as animal quarters and large laboratories) in the top levels. Heavy traffic activities are centered in the two-story base which includes a lobby and 160-seat lecture hall.

Shapero Hall is glazed with ASG's Starlux® twin-ground, polished plate glass. Floor-to-ceiling lights of Starlux ring the lower floors, making them open, light-filled and inviting. After dark, these extensive walls of superbly clear glass form a pedestal of light for the building's powerful superstructure. Here, slim Starlux windows help relieve the weight of the massive concrete tiers.

Starlux contributes to this unusual building the unique qualities of the finest polished plate glass—superior clarity, visual fidelity and lustrous transparency. Starlux is the premier product in the full line of architectural glasses manufactured by ASG. For complete information about Starlux, write: Dept. E-3 American Saint Gobain Corporation, P. O. Box 929, Kingsport, Tennessee 37662.

Starlux twin-ground plate glass by...
How to get tenants into your new building earlier.

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There is one answer to both problems: steel.

Steel goes up fast. It goes up in any season. There is no waiting for the weather. A steel frame usually means lighter, less expensive foundations, so you save time there, too. Simply put, when you build with steel, you collect rents sooner.

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The crystal chandelier was the symbol of old-time opulence. It was elegant, cumbersome, fragile and hard to clean. Celestial®, by I.C.I., is the ultimate in modern munificence. It recaptures the elegance of crystal chandeliers. Yet it's infinitely versatile, practically eternal, and maintenance is nearly non-existent. For your next extraordinary structure, seriously consider Celestial®. It transcends anything else under the stars.

Celestial® is one of a new series of lighted ceilings we produce for the purist. May we send you our Catalog? Write to Integrated Ceilings, Inc. 11766 West Pico Blvd., Los Angeles, California 90064, GR 8-0043

INTEGRATED CEILINGS, INC.
Casting a new light on architecture

On Readers' Service Card, circle No. 311
This handsome building had a severe glare problem.

Nothing has ever replaced the natural light. Yet, too much of it can easily turn into a very annoying glare problem, as the Illinois Bell Telephone Company recognized. What was needed here, as in many other fine buildings, is a fabric that gets rid of the glare, yet remains a see-through fabric to let just enough of the natural light get in. This is one of the reasons why Ben Rose, supplier of the fabric, together with S. A. Maggio, A.I.D., and K. Ragos, interior designers, decided to select Fiberglas Beta draperies. They are not the only ones. Every day more architects and interior decorators are expecting Fiberglas to be a problem solver. It is. Fiberglas is:

- Sturdy: Fiberglas is flame-resistant, unaffected by humidity, resistant to sun. Won't stretch or shrink.
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**Fiberglas** Beta

drapery fabric solved it.

Illinois Bell Telephone Building: Architect: Holabird & Root. *Fiberglas and Beta are Owens-Corning trademarks. Owens-Corning Fiberglas makes the Beta yarn, not the fabrics.*
You see Stanley in all the best places.


Consider elegance, then decide Stanley. Stanley Hardware, Division of The Stanley Works, New Britain, Connecticut.

On Readers' Service Card, Circle No. 402
In fact, Myrtle Desk’s designers have planned it so you have a choice of more than 53,261 best seats. Some designed especially for the mod movement. Some for classical drama. And some to work well with just about any staging you might choose.

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How can Myrtle Desk offer you the best seat in the house?

We work at it.
They go to great lengths in Tulsa to house expositions

World's largest cable-supported roof — 404' x 1200' — is Inland Acoustideck®

Talk about thinking big — there are 10½ acres of clear-span space under the Inland Acoustideck roof of the new Exposition Center Building on the Tulsa State Fairgrounds!

 Structural framing of the building consists of two symmetrical cantilevered halves supported by steel cables. Principal structural members are shop-welded steel box columns and girders. Lightweight beams span between the girders.

Inland type N Acoustideck spans the 13'-10" between these beams. The inherent diaphragm action of the deck provides lateral bracing for wind loads, thus eliminating the need for extraneous X-bracing.

Acoustideck was a logical choice for this suspended roof system, because it weighs less than half of equivalent poured-in-place or precast construction — and carries normal loads over greater spans. The roof on the Tulsa Exposition Center is designed for a snow load of 20 psf. Because Acoustideck absorbs sound, it dampens the high noise level rampant in exhibit areas.

Acoustideck — with a protective two-coat baked enamel primer — is part of a complete line of Inland roof systems. See Sweet's, section 211. Or write for catalog 248 to Inland Steel Products Company, 4069 W. Burnham St., Milwaukee, Wis. 53201.

Inland Steel Products

Excessive noise in the Tulsa Exposition Center is entrapped in fiber batts through perforations in the vertical webs of the Acoustideck panels. Insulation over the deck is topped with asphalt-impregnated felt and then a layer of white marble chips. This is coated with a highly reflective white paint.

On Readers' Service Card, Circle No. 357
The Patented Adjustable Butt Hinge

is just one of six solid reasons why Natcor says "install it...forget it".

(Significant in design, flexibility and a lifetime of trouble-free operation.)

Natcor offers a complete line of 5 door types and 4 basic framing systems in Clear, Anodized, Kalcolor and Duranodic finishes — with a custom styled look for greater visibility and handsome appearance. Quality materials and advanced engineering principles add six solid reasons why a Natcor entrance is a lasting entrance. Install it...Forget it!

1. Patented, adjustable Butt Hinge — Ball Bearing with frame reinforcement for extra endurance.

2. Snap-In Vinyl Glazing Bead — Just one member to snap in during glazing of door — saves labor.

3. Quality Extrusions — Door Stiles and Rails of fully extruded aluminum, ¼" thickness throughout, as specified by architects.


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This is Profile light®
Looks good, lights better...
This is the rectangular revolution in good light and good looks. Profile light, above, illuminates the new Iverson Mall in Washington, D.C., and below, a neighborhood center in Timonium, Md.
Profile light provides the bright, even illumination you see here for shopping centers large, medium and small. Customers see and come in. Traffic moves. Vandals and thieves can be seen before they do their dirty work.

Each Profile light fixture directs more than 85% of its beam onto the parking lot surface, something conventional lights can’t come close to. And it does this uniformly, in a large rectangular pattern. In place of the usual hot spots and dingy corners, you’ll get even light with fewer poles, fewer fixtures.

And from the outside looking in, there’s enough light to advertise, but without glare. Your neighbors will thank you.

All this is the revolution in good light and good looks that Profile light has created. Check the additional information and cost comparisons on the next page. Then check Crouse-Hinds for a specific proposal for your shopping center.

CROUSE-HINDS®
THE RECTANGULAR REVOLUTION IN GOOD LIGHT AND GOOD LOOKS

**Quick Cost Comparator**

**AVERAGE COMMERCIAL PARKING AREAS**

<table>
<thead>
<tr>
<th>Luminaires</th>
<th>Pole Height</th>
<th>Footcandles</th>
<th>Minimum Footcandles</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-400W, 120V</td>
<td>30 ft.</td>
<td>2</td>
<td>1 fc</td>
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<tr>
<td>4-1000W, 480V</td>
<td>40 ft.</td>
<td>3</td>
<td>1.5 fc</td>
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**PARKING AREA LIGHTING SYSTEMS**

<table>
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<tr>
<th>Luminaires</th>
<th>Pole Height</th>
<th>Footcandles</th>
<th>Minimum Footcandles</th>
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<td>Decorative</td>
<td>Large A Lumina</td>
<td>4000W S Unit</td>
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<table>
<thead>
<tr>
<th>Lamps</th>
<th>Metallic</th>
<th>Lucalox</th>
<th>Mercury</th>
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<td>$6410</td>
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<td>Mercury Lamps</td>
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<td>$4000</td>
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<td>$416</td>
<td>$527</td>
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<tr>
<td>Streetlight</td>
<td>$257</td>
<td>$258</td>
<td>$273</td>
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<td>Streetlight</td>
<td>$273</td>
<td>$273</td>
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</tr>
<tr>
<td>Streetlight</td>
<td>$882</td>
<td>$1107</td>
<td>$1140</td>
</tr>
</tbody>
</table>

**Cost Factors**

- Figures given are dollars/100,000 sq. ft. of parking area at equal illumination levels shown.

<table>
<thead>
<tr>
<th>INITIAL COST</th>
<th>OPERATING COST/YEAR</th>
<th>ANNUAL OWNING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCLUDES fixtures, lamps, poles, materials, labor, etc.</td>
<td>Power, maintenance, relamping</td>
<td>Amortization of initial cost plus annual operating cost</td>
</tr>
<tr>
<td>$4850</td>
<td>$257</td>
<td>$952</td>
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<tr>
<td>$5040</td>
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<td>$1009</td>
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<td>$6410</td>
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<td>$1140</td>
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<td>$366</td>
<td>$527</td>
<td>$1217</td>
</tr>
</tbody>
</table>

More than 85% of the beam from Profile light goes right here. On the ground in large, bright rectangles of light. You’ll need fewer poles, yet gain a higher level of illumination.

The maximum to minimum ratio of light can be held to any level.

Profile light comes in 400 and 1000 watt sizes. Choice of economical mercury vapor, color-true metallic vapor or the new Lucalox® light sources. One, two, three or four fixture arrangements.

The chart gives you a quick comparison of cost. Our home office computers will detail out layout and specific costs. We’ll include recommendations on other Crouse-Hinds fixtures for facade lighting, open malls, signs, security entrances, walkways, driveways.

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This architectural dormitory furniture shrugs off hard knocks like an all-American. Features steel framework welded where necessary for maximum strength... steel side panels... tops and doors of virtually indestructible fused laminates... smooth sliding steel drawers with integral reinforced sides... nothing to warp or chip. Built-in System '70 units meet federal standards for long-term loans. And how versatile they are. Custom tailor them to your needs... combine them to meet large and small requirements as well as dimensional and design specifications. Available in glowing wood grains and solid colors. Write us. Let us quote your next job. The Troy Sunshade Company, Division of The Hobart Manufacturing Company, Troy, Ohio 45373.
A free-form expression of its function

Northland Theatre  At Northland—Detroit, Michigan

Overlooking the world's largest shopping center, the Northland Theatre is designed to show its function with exterior lines. Hence, the slope up to the high screen (which accommodates both Cinerama and Cinemascope) as well as the curved end wall. There is not a straight wall in the plan of the 24,050 sq ft column-free interior.

Resembling an outstretched hand placed on a table, this unique building was most economically framed with steel because of (1) the great variation in the plan dimensions, (2) the building slope, and (3) the long spans. Fabricated in two sections, trusses were shop-welded. They range in length from 88 to 101 ft.

Whatever shape you have in mind, remember that structural steel can be “tailored” to every architectural form. And it offers a set of practical advantages no other material can match.

Exterior of the Northland Theatre is of grey-brown brick, with a limestone canopy fascia and a copper roof (copper was etched to assure even weathering).
Owner: Northland Theatre.
Developer: E. Sloan & Co.
Structural Engineer: Ray W. Covey & Associates, Inc.
Fabricator: Arrow Steel Company.
Erector: Argo Steel Construction Co.
General Contractor: Cronk and Tocco, Inc.
JOHNS-MANVILLE

Temper-Tone 360

Fissuring Shown Actual Size

New: 360-degree fissuring for overall ceiling elegance

Here—in response to architects' requests—is a sound control ceiling with fissures that look natural, yet have no tendency to line up in parallel ranks. The first truly omni-directional acoustical tile of its type. Temper-Tone 360 by Johns-Manville has a 360-degree fissure design that is an improvement upon nature...puts an end to unsightly checker-board or parallel optical patterns...produces elegant, even-textured suspended ceilings with the same visual effects from all viewing angles. And the 12" x 12" tiles can be placed as they come to hand—without concern for orientation.

You'll want all the data on new Temper-Tone 360. On its other advanced design features. On its fire resistance, high attenuation value and light reflectance. On its excellent sound absorption. Write for Bulletin AC 101A. Johns-Manville, 22 E. 40th Street, New York, New York 10016.

Johns-Manville
Each floor is attached to the trunk like limbs of a tree.
The trunk is a central "slip-formed" concrete core.
This cantilevered design concept is suitable for apartments,
office buildings and motels. The design permits use of
small downtown plots of land. Due to their tapering shape, the
floors will not block daylight from neighboring buildings.

Floor units are precast, then
hoisted into position.
Post-tension cables support
the floors. Sill-to-ceiling
window walls are added,
and sliding glass doors
lead to balconies
at wing ends.
The type of glass used
depends upon building
location and orientation.
Parallel-O-Grey® and

New design freedom
in the Open World
of L·O·F glass

14-story apartment designed to
fit on a 25-foot urban lot.
Caisson-type foundation for mechanical core goes down to bedrock. Precast floor units are hoisted into position.

Parallel-O-Bronze® Plate Glass are recommended for sun heat and glare control. Thermopane® insulating glass will reduce heating and air-conditioning costs.

A two-wing version of the “tree house” apartment can be constructed on a 25-foot-frontage lot at a cost, the architect estimates, of $20 per square foot. Additional units would reduce this cost. Ideal for urban renewal. Floor plan and variations of “tree house” buildings are shown. They were conceived by Architect Haigh Jamgochian of Richmond, Virginia.
672-room motel with double towers that can rotate so that all views of an area can be seen from each room every hour.
L·O·F makes a particular kind of glass for every purpose in Open World design. Refer to Sweet’s Architectural File or call your L·O·F Glass Distributor or Dealer listed under “Glass” in the Yellow Pages. Or write to Libbey-Owens-Ford Glass Company, 811 Madison Avenue, Toledo, Ohio 43624.

115,000 sq. ft. office building.

Architect’s original sketch of the “tree house”.

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POLISHED PLATE GLASS
Parallel-O-Plate®, 1/4", 3/8"
Heavy-Duty Parallel-O-Plate, 3/8" to 1"
Parallel-O-Grey®, 3/8", 3/4"
Parallel-O-Bronze®, 3/8", 3/4"
Heat Absorbing, 3/8"
(grey, bronze and heat absorbing plate are available in heavy-duty thicknesses.)

Rough Plate
INSULATING GLASS—Thermopane®
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Vitreous colors fused to back of heat-strengthened glass
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Toledo, Ohio
BUILDING MATERIALS
INDUSTRY PLANS RESIDENTIAL MORTGAGE LOANS

NEW YORK, N.Y. Building materials suppliers are probably more upset than anyone about the current slump in residential building, and characteristically they plan to do something about it. Speaking to the Producers’ Council, Gene C. Brewer, president of U.S. Plywood, suggested a “joint mortgage lending program.” He pointed out that “companies and individuals with a stake in the prosperity of the construction industry could form a lending corporation which would provide supplemental funds to primary mortgage financiers, permitting them to make loans up to 90% of a building’s value.

This type of supplemental financing, known as “piggyback” financing, has been offered by individual suppliers, such as the General Electric Company, since last year. Brewer’s proposal would mark the first time that the resources of manufacturers were pooled to offer wider financing. What the building suppliers would do is provide financing covering a gap not filled by primary lenders. “If the primary lender were restricted to loans of not more than 75%, the new corporation would provide funds for the additional 15%,” Brewer explained.

“EMMONS RESIGNS FROM BART

SAN FRANCISCO, CALIF. Surrounded by much ballyhoo, the Bay Area Rapid Transit District has been following a downhill course through political and economic quicksand. Its much touted concern for design is, at the same time, proving to be little but so much talk. The most recent note of disillusion was struck in late September when Donn Emmons, principal of the firm of Wurster, Bernardi & Emmons, resigned from his position as consultant to the engineers retained by BART. Lawrence Halprin, who had been serving as consulting landscape architect, also resigned. Emmons and Halprin found they were not being consulted, that the design and planning of the system was being done entirely by the engineers, and that, as a result, no thought or effort was being expended to make the system fit the area it will serve. They stated, for example, that work on elevated structures has gone on with “virtually no planning or architectural guidance for the past year and a half, and that they are being designed, with small regard for appearance or effect on adjacent environment.”

In his resignation, Emmons advised that a consulting architect be retained, reporting directly to BART, with responsibility equal to the engineers. In a subsequent telegram to the board, Emmons stressed that his resignation was a step toward clearing the way for such an appointment and stated that “all the professional experience and resources of my firm will be available to BART and the new architectural consultant to accomplish this end.”

MILWAUKEE, WIS. Milwaukee’s lakefront has always been one of its greatest assets. It stretches for miles beneath a high, sloping bluff, and because of the foresight of some early city fathers, much of the lakefront land was turned into spacious, well-maintained parks. To the north, there is Doctors’ Park; to the south, Grant Park; and, in between, Lake Michigan in all its moods, from which boys in convertible cars whistled at girls on the beach, and along which Sunday motorists could park and wash their cars. In short, the Drive, instead of cutting the city off from the lakefront, made it even more accessible. It is not unusual even today to see a line of traffic come to a halt while a mother duck leads her family from the lagoon and across the road on some unexplainable mission.

Now, for reasons almost too well known to mention, the roadbuilders want to change that. Milwaukee’s plight, while far from unique, is nonetheless pathetic. Proposed plans call for an eight-lane expressway that would knife along a portion of the
A perimeter of structural Mo-Sai.

Mo-Sai panels with a glacial surface of white quartz aggregates support the roof perimeter on the base portion of the new Arts Library at the University of Waterloo, Waterloo, Canada. Prestressed concrete "T's" reach from a concrete structural core to the Mo-Sai load-bearing units. Mo-Sai curtain walls in a matching design form the facade on the elevated tower.

Situated on the crest of a rise, the Arts Library is the commanding building on the Mo-Sai-coordinated campus.
downtown lakefront, decisively cutting it off from the city behind it. Those hardy souls who manage to penetrate the barrier to be thrown up by the Lake Freeway, as it is to be called, will be able to eat their bratwurst sandwiches to the accompaniment of the roar of freeway traffic. A day on the Milwaukee lakefront will become like a day spent next to any other interstate highway.

Interstate highway funds are involved. The lakefront extension of the Milwaukee Freeway system is estimated by the County Expressway Commission to cost about $26 million. Half this amount would be put up by Milwaukee County, and half by the Federal Government. Proponents of the roadway argue that the county would lose Federal funds if the Lake Freeway is not built. This all-too-familiar argument is not unlike the logic of a Nazi prison camp commandant arguing that he would lose government funds if he failed to build a gas oven.

Milwaukee is in great need of a well-planned transit system. There is no rapid transit. The vastly curtailed railroads offer no commuter service to suburbs, and the automobile remains the only efficient means of getting to and from downtown. Belatedly, Milwaukee started a freeway system, with arteries running into the center of town from the west, south, and north. But, according to most Milwaukees, an extension running along the lakefront is needed about as badly as Atlanta needs a baseball team—in other words, not at all. There is adequate automobile access to the downtown area from the wealthy residential area to the northeast along existing city streets, especially with the north-south freeway carrying traffic into town from outlying areas. The reason the loop along the lakefront was added seems to be that parkland, already owned by the county, is cheap. But is it? The ultimate cost to Milwaukee residents can hardly be measured. Where will people go on summer evenings and weekends if the lakefront becomes undesirable? How will downtown residents like opening their windows on summer nights to get the lake breezes and find instead that they are inhaling exhaust fumes from cars and trucks? Residents of Philadelphia, New Orleans, and San Francisco, all victims of the pernicious planning of the Bureau of Public Roads, can tell them. Downtown merchants, so anxious for these roads, fail to understand that, far from bringing more people into the city, these rivers of concrete, if mishandled, only make it more desirable and easier to leave town.

Fortunately for Milwaukee, there is still hope. An informal group of concerned citizens gathered 48,000 signatures (they needed only 45,000) for a petition calling for a referendum on the issue to be put to the City of Milwaukee residents. On April 4, 1967, they will be asked to vote on whether they think the freeway extension through the park and along the lake is consistent with Milwaukee policy. If the vote is no, the city can recommend to the county that the route be studied. It is an involved procedure. But in the time gained perhaps the Bureau of Public Roads can be made to see that you do not have to pave it just because it is green.

THE BREUER PAPERS

SYRACUSE, N.Y. On the eve of the opening of Marcel Breuer's Whitney Museum in New York, Syracuse University announced the acquisition of many of Breuer's drawings and manuscripts. The papers, which cover his work from 1934 (three years before he came to the U.S.) to 1953, include correspondence, preliminary sketches, memoranda, billing data, contracts, and blueprints. In all, there are more than 20,000 items. They will become part of the Syracuse University Manuscript Collection and will be available to historians and students.

THANKS FOR THE MEMORY

NEW YORK, N.Y. When the Ziegfeld Theater opened on February 2, 1927, with the bubbling, easily forgettable production of Rio Rita, it was the beginning of an era. In a way it was the end of one, too. The house, which seated 1638 and gave everyone an uninterrupted view of the stage, was ellipsoidal in shape, interrupted at the stage by an opposing curve of a small stage apron. At the time, both the curved walls and the curved stage apron were in opposition to the more classical shapes of theaters, with their flat walls and consequent fan-shaped auditoriums. The uninterrupted sight-lines were also unusual for a legitimate theater. Perhaps the most significant innovation, however, was the console lighting.

Between 1927 and 1931—during which time Show Boat opened there, Jimmy Durante made his first Broadway appearance there, and Ruby Keeler and her husband Al Jolson sang from a runway extending out into the orchestra—the performances were lighted automatically from a switchboard console set to operate without human intervention. It was a system that became a forerunner for systems that have their optimization in the new Met at Lincoln Center. But by 1931, the economics of show business had suffered a reversal, and the Ziegfeld became a movie house.

Designed by Joseph Urban and Thomas W. Lamb, the Ziegfeld set—or at least solidified—a design style that has been much copied. The façade carried simple, large-scale decoration; and the exterior expressed the shape of the auditorium. On the false prosenium façade, curving between two gigantic pilasters, were two huge masks.

In the early 40's, showman Billy Rose bought the theater for a price reportedly near $500,000. (It had cost $2 million to build in 1927.) After about 10 years, Rose refurbished it, restoring it to its original opulence right down to the gold carpeting. The ceiling mural was still the largest oil painting in the world. (Michelangelo's Sistine Chapel ceiling was the second largest.) Unlike Michelangelo, who lived in a less complicated age, architect Urban had to join the paperhangers' union to end a two-month dispute about who would put the mural in place. The paperhangers put it up.

To raise money for the restoration, Rose entered a contract with NBC, and to do so he passed up a chance to produce My Fair Lady. If he hadn't, the Ziegfeld might still be standing. It isn't. This fall it came down, to make way for an Emery Roth & Sons-designed office building.
1967 ARCHITECTURAL WORK MAY REACH RECORD LEVEL

Although most architects across the country grumble about the possible effects of tight money, the average architectural office has more work on the boards than at any time since Progressive Architecture first forecast coming architectural business 11 years ago. According to the 1966 P/A annual business survey (the only one of its kind in the architecturally designed building field), the average office has $6,160,000 of work on the boards for 1967. This is an 11 per cent increase from an average of $5,518,584 projected in last year's P/A business survey, and represents potential business. Architects architecturally served construction industry at a time when many economists and pundits are widely pessimistic.

There is some pessimism among architects, too. They are afraid that the money situation will worsen, leaving many designs on the drawing boards. One California firm, with about $2,500,000 of work in preparation for 1967, notes: "Every project in this office is held up from bid by lack of financing. If this is not corrected, there will be no architectural practice in 1967." Not all, of course, paint this black a picture, and indeed most offices continue the optimism born of influence and evident in last year's survey. They point to a healthy economy, increased public spending for urban renewal projects, and the simple need for more buildings as the population grows. What pockets of doubt exist seem to represent the effects—or expected effects—of a shifting architectural practice.

Most severely affected by current tight money, a factor almost every architect believes will influence business for the coming year, will be small firms, working on small projects for which financial institutions are not so willing to put up funds. Depending on how tight money actually becomes, many young architects and principals of small firms may be going back to work for larger firms that maintain a broader scope of business.

Shift in Housing and Industrial Work
Part of the shift in architectural practice is seen in the dips taken by housing and industrial work. According to the survey, industrial work will be down a significant 23 per cent from 1966. Housing continues to drop, and total housing starts, multiple (low and high rise) and single residential will be off a total of 7.3 per cent. Still, it is interesting to note that private residential work will almost double that of the 1966 total, partially offsetting an 18 per cent decline in multiple residential work. Apartment vacancies throughout the country are still running close to 7 per cent, and multiple residential building will probably not turn around until this overbuilding has been absorbed. Private housing, however, at least that which is architecturally designed, may make a strong turn. The availability of financing and the height of the interest rates will probably determine whether this turn can be made in 1967.

Public Use, Health, Urban Design, and Defense Show Significant Increases
In addition, public use construction should increase about 90 per cent, and work in health construction by 20 per cent. Some of this work in health shows the incipient impact of Medicare. But most of it undoubtedly stems from the overcrowding of facilities brought on by an increase in population and a gradual proportional increase in persons over 60 years old. Both the increase in these areas and those in urban design (up 20 per cent) and defense (up 12 per cent) show the increasing effect of Government spending for construction. According to the survey, 33.5 per cent of all architectural work will be for government, local or Federal.

Eight of the 10 geographical areas of the country report gains in business. And, in 1967, California, Nevada, Hawaii (where business in the average office has almost doubled) will replace the Great Lakes region as the most active area. In seven regions, education work is the most prevalent type (as it was before). Exceptions are California, Nevada, Hawaii, where public use tops the list; Texas, where commerce is the biggest category; and the North Central states, where health work predominates.

Most Work in Preliminary Stage
It is perhaps significant that at this time only 39 per cent of work for 1967 is in the working-drawings stage. Depending on the difficulty of gaining financing, the outcome of that portion still in the preliminary stage could be questionable. On this outcome, of course, depends whether or not the architectural profession in the U.S. will have a record year.

One Type of Work
Specialization is down slightly from 1966, with 9.3 per cent of all firms reporting specialization in one architectural category (Table 5). The most popular category for specialization is, of course, education, as it was in last year's survey. Defense is missing from this year's specialization list and no firms reporting specialization in urban design.

Commercial Work Most Widespread
The categories of activity found in the responding firms is indicated by percentage in Table 4, contrasting with Table 3, which shows category by dollar volume. More firms (58.1 per cent) work in commercial structures, although education represents the greatest dollar volume. Only slightly more than half the firms reporting do education work. Approximately one-third have work in health and public use, and slightly more than a third (36.4 per cent) have private residential work on the boards.

Size of Firms
In the past 11 years, the P/A business survey has shown that by far the greatest percentage of firms throughout the U.S. have up to nine employees. This year is no exception, with 79.6 per cent (Table 6) fitting this category. But firms with fewer than 4 employees have increased almost 10 percentage points, and those with more than 20 employees have increased 1.5 percentage points, now representing slightly more than 10 per cent of all firms. Largest decreases are in firms with from 5 to 9 and 10 to 19 employees, which have declined jointly 23 percentage points from last year.

The three most active building categories are plotted for last 11 years, showing average dollar volume in each category in average firm. Education continues its steady growth.

The percentage of firms with $10 to $50 million on the boards has increased from 10.4 per cent last year to 13.9 per cent this year. But, of course, the majority of offices (84.7 per cent) have less than $10 million of work in progress.

Reasons for Past Performance
Questioned about the increase in architectural business during the past 15 years, most architects attribute the rise to the needs of an expanding population coupled with a spreading understanding of the contribution an architect can make. To say, as one respondent did, that expanding architectural work stems from "more need for buildings" is to oversimplify. Perhaps closer to the truth is the reply of one architect, who wrote that "buyers want more luxurious space to shop in, live in, work in and lounge in. The architect, because of his training, is best qualified to create

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this. Also given credit for the increase are the growing complexity of architectural work, the desire of some public and civic leaders to create a better environment, and advertising, aimed at architects, which shows continued improvements in materials and design.

Setting the Pace
What will be the factors affecting design trends and architectural practice in 1967? Many architects feel that today's high interest rates, coupled with increasing costs of labor, will lead to a vigorously renewed search for less costly building solutions. A Kansas City firm whose work for 1967 is up 15 per cent over this year states: "Economic slowdown will be followed by a return to conservatism in design. Flights into structural fantasy and nonfunctional block stacking will be replaced by a more useful and more mature rationale." Some architects see the cost squeeze leading to more prefabrication and an increased use of plastics. Also, the labor situation, where more money is paid less skilled workers for less work, will lead, according to a Maryland firm with 20 years' experience, to architects spending more time in the field. They must "accept much longer construction periods for their projects," they believe.

And the Vietnam war will, many feel, strongly influence developments in 1967. Allocation of materials to the war effort is seen as leading to shortages affecting construction. Some respondents believe that the architect will

U.S. MAP SHOWS DOLLAR VOLUME AND NUMBER OF EMPLOYEES IN AVERAGE ARCHITECTURAL OFFICE BY REGION.

Bar graph shows what percentage of work, in the average office throughout U.S., is in which category. Percentages add up to 100.

TABLE I
Number of Firms Reporting and Regional Distribution

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of Firms</th>
<th>% of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>403</td>
<td>30.2</td>
</tr>
<tr>
<td>California-Nevada</td>
<td>176</td>
<td>13.2</td>
</tr>
<tr>
<td>Great Lakes</td>
<td>127</td>
<td>9.5</td>
</tr>
<tr>
<td>Southeast</td>
<td>124</td>
<td>9.3</td>
</tr>
<tr>
<td>North Central</td>
<td>114</td>
<td>8.6</td>
</tr>
<tr>
<td>Texas</td>
<td>81</td>
<td>6.1</td>
</tr>
<tr>
<td>Western Mountain</td>
<td>81</td>
<td>6.1</td>
</tr>
<tr>
<td>Central States</td>
<td>80</td>
<td>6.0</td>
</tr>
<tr>
<td>Gulf States</td>
<td>74</td>
<td>5.6</td>
</tr>
<tr>
<td>Northwest</td>
<td>72</td>
<td>5.4</td>
</tr>
<tr>
<td>Total Response</td>
<td>1332</td>
<td>100</td>
</tr>
</tbody>
</table>

Percentage of replies from the Northeast are up slightly this year and down slightly from the Southeast and the North Central regions. Otherwise, the distribution remains much the same as in the past, with replies coming in from every state in the Union.

TABLE II
Average Dollar Volume By Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Average $ Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>California-Nevada</td>
<td>8,550,000</td>
</tr>
<tr>
<td>Hawaii</td>
<td>8,310,000</td>
</tr>
<tr>
<td>Great Lakes</td>
<td>7,020,000</td>
</tr>
<tr>
<td>Southeast</td>
<td>6,480,000</td>
</tr>
<tr>
<td>Northeast</td>
<td>6,190,000</td>
</tr>
<tr>
<td>Gulf States</td>
<td>4,670,000</td>
</tr>
<tr>
<td>Central States</td>
<td>4,620,000</td>
</tr>
<tr>
<td>Texas</td>
<td>4,180,000</td>
</tr>
<tr>
<td>Northwest</td>
<td>3,687,000</td>
</tr>
<tr>
<td>Western Mountain</td>
<td>2,202,000</td>
</tr>
<tr>
<td>National Average</td>
<td>6,160,000</td>
</tr>
</tbody>
</table>

Average dollar volume lead moves from Great Lakes States to California, Nevada, Hawaii, where the amount of work for the coming year almost doubles. National average is highest since P/A survey started 11 years ago. It is up more than $500,000 from last year, and almost $200,000 higher than 1962, the previous record year.
become increasingly a member of a team that includes planners, contractors, engineers, and construction companies. An Illinois architect who reports a 25 per cent increase in business for next year states: "Of major concern to most architects in our area is shortage of trained people. We note that fewer young people are attracted to architecture because of the five to six years it takes to get a degree. Therefore, I fear that industry will take a stronger position in the construction business."

Despite the cost squeeze, many architects see a greater freedom of expression emerging, led by the styles of a new wave of architects. But the work of the established older practitioners, such as Louis Kahn, will continue to have an impact on design. And, as usual, many respondents feel that the design trends in the next year will be strongly influenced by projects published by the architectural press.

**TABLE III**

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>% of All Firms' Work</th>
<th>$ Volume of Work</th>
<th>% of All $ Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>25.2</td>
<td>1,562,000</td>
<td>22.00</td>
</tr>
<tr>
<td>Commerce</td>
<td>14.9</td>
<td>952,500</td>
<td>11.94</td>
</tr>
<tr>
<td>Low Rise</td>
<td>(8.3)</td>
<td>(328,500)</td>
<td>(4.03)</td>
</tr>
<tr>
<td>High Rise</td>
<td>(6.6)</td>
<td>(424,000)</td>
<td>(5.17)</td>
</tr>
<tr>
<td>Residential (Multiple)</td>
<td>13.2</td>
<td>833,800</td>
<td>10.44</td>
</tr>
<tr>
<td>Low Rise</td>
<td>(6.0)</td>
<td>(372,300)</td>
<td>(4.73)</td>
</tr>
<tr>
<td>High Rise</td>
<td>(7.2)</td>
<td>(461,500)</td>
<td>(5.83)</td>
</tr>
<tr>
<td>Health</td>
<td>11.2</td>
<td>700,000</td>
<td>8.70</td>
</tr>
<tr>
<td>Public Use</td>
<td>10.5</td>
<td>662,000</td>
<td>8.36</td>
</tr>
<tr>
<td>Religion</td>
<td>6.0</td>
<td>372,000</td>
<td>4.73</td>
</tr>
<tr>
<td>Industry</td>
<td>6.0</td>
<td>369,500</td>
<td>4.69</td>
</tr>
<tr>
<td>Other</td>
<td>3.2</td>
<td>210,200</td>
<td>2.67</td>
</tr>
<tr>
<td>Defense</td>
<td>3.0</td>
<td>192,200</td>
<td>2.41</td>
</tr>
<tr>
<td>Residential (Private)</td>
<td>2.6</td>
<td>173,000</td>
<td>2.17</td>
</tr>
<tr>
<td>Urban Design</td>
<td>2.5</td>
<td>154,500</td>
<td>1.95</td>
</tr>
<tr>
<td>Recreation</td>
<td>1.7</td>
<td>121,700</td>
<td>1.51</td>
</tr>
<tr>
<td>Total Work, All Respondents</td>
<td>100.0</td>
<td>$8,222,985,208</td>
<td></td>
</tr>
</tbody>
</table>

Work in Religion is more than double that of last year. Residential (Private) and Public Use show increases almost as large. Largest decline is in Industry, and although Commerce moves into second place behind Education — replacing Residential (Multiple) — it is actually down slightly from last year.

**TABLE IV**

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>% of Firms Reporting Current Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commerce</td>
<td>58.1</td>
</tr>
<tr>
<td>Education</td>
<td>53.7</td>
</tr>
<tr>
<td>Residential (Multiple)</td>
<td>39.3</td>
</tr>
<tr>
<td>Residential (Private)</td>
<td>36.4</td>
</tr>
<tr>
<td>Religion</td>
<td>34.7</td>
</tr>
<tr>
<td>Public Use</td>
<td>32.8</td>
</tr>
<tr>
<td>Health</td>
<td>32.3</td>
</tr>
<tr>
<td>Industry</td>
<td>25.0</td>
</tr>
<tr>
<td>Other</td>
<td>14.7</td>
</tr>
<tr>
<td>Urban Design</td>
<td>5.1</td>
</tr>
<tr>
<td>Defense</td>
<td>4.7</td>
</tr>
<tr>
<td>Recreation</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Most U.S. firms have work in more than one category, so percentages add up to more than 100. Activity of Architectural Firms in Types of Buildings

**TABLE V**

<table>
<thead>
<tr>
<th>Specialization of Architectural Firms</th>
<th>% of Firms Doing Only This Type of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>2.1</td>
</tr>
<tr>
<td>Residential (Private)</td>
<td>1.6</td>
</tr>
<tr>
<td>Residential (Multiple)</td>
<td>1.5</td>
</tr>
<tr>
<td>Commercial</td>
<td>1.3</td>
</tr>
<tr>
<td>Religion</td>
<td>0.9</td>
</tr>
<tr>
<td>Industry</td>
<td>0.7</td>
</tr>
<tr>
<td>Health</td>
<td>0.5</td>
</tr>
<tr>
<td>Other</td>
<td>0.3</td>
</tr>
<tr>
<td>Public Use</td>
<td>0.2</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Total specialization has declined slightly since last year. This year, no firms report specialization in either Defense or Urban Design.

**TABLE VI**

<table>
<thead>
<tr>
<th>Sizes of Architectural Firms</th>
<th>% of National Size by Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of Firm</td>
<td>Total</td>
</tr>
<tr>
<td>Up to 4 Employees</td>
<td>57.60</td>
</tr>
<tr>
<td>5-9 Employees</td>
<td>22.00</td>
</tr>
<tr>
<td>10-19 Employees</td>
<td>10.35</td>
</tr>
<tr>
<td>20-39 Employees</td>
<td>6.50</td>
</tr>
<tr>
<td>40-100 Employees</td>
<td>2.48</td>
</tr>
<tr>
<td>Over 100 Employees</td>
<td>0.97</td>
</tr>
<tr>
<td>Total (1332 Replies)</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size of Firm as Reported</th>
<th>% of National Size of Work on Boards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $1 Million</td>
<td>29.7</td>
</tr>
<tr>
<td>$1-10 Million</td>
<td>55.0</td>
</tr>
<tr>
<td>$10-50 Million</td>
<td>13.9</td>
</tr>
<tr>
<td>Over $50 Million</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Percentage of firms with more than 10 employees has increased slightly, while number with up to 4 employees has increased almost 12 percentage points. At the same time, percentage of firms with more than $10 million of work on the boards is up.

**THERE'S AN ELECTRIC CAR IN YOUR FUTURE**

DETOIT, MICH. The Ford Motor Company announced last month that it was working on a battery that will, when perfected in a couple of years, drive a small car—a sub compact, they call it—at 40 mph for distances from 150 to 200 miles. In crowded New York City, where the average car speed on traffic-clogged streets is estimated to be 13 mph, and average daily driving distances about 26 miles, the Ford electric car would be a boon indeed. To recharge the battery, a user would plug it into his household circuit once a week. According to Ford, the operating cost per mile would be something like $0.65, as compared to more than 2¢ for present cars. Moreover, the battery-operated car would be silent and fume-free, two sterling attributes that should make every noise-rattled, fume-choked city dweller stop and prick up his ears. Unfortunately, any shift to small electric cars will undoubtedly be a slow, painful one, as drivers tend to resist giving up their speedy, powerful status symbols. If Ford does bring forth its electric car, at least there will be an available alternative.

Up to now, experiments with electric cars have been less than promising. To protect even a small car, so many conventional lead acid batteries are needed that both motor compartment and trunk must be filled with them. One experimental model of this type weighed about 6200 lbs and cost more than $4000; in addition, it could travel only about 40 miles before needing 12 hours of recharging. Ford's sodium-sulphur cell battery would power two starter-sized motors, and the whole unit could fit under the front seat of the small, four-passenger car.

Such small city cars have long been a dream of designers. In an interview with P/A, industrial designer Raymond Lowey, who designed the postwar 1947 Studebaker, which gave the automotive world the coming-of-age look so fashionable in automobiles since then, pointed out: "If you take a conventional car, cut off the motor compartment in front, cut off the trunk in back, cut off the space taken on each side by the wheels and fenders, you have a car that will carry four people comfortably and take up about half the space. The motor would go under the driver's seat." This is precisely the car Ford now envisions. General Motors is said to be working on something similar to that Ford battery-powered cars, but is not yet ready to make an announcement. "Ford always likes to talk about their research projects," said one GM official. The automotive companies obviously see the demand for noiseless, fumeless, efficient transportation. It is up to the rest of us to see that the demand is met.
Beautifully functional. Functionally beautiful.

That's Steelcraft's new "J" sliding labeled fire door. Clean, flush design. Looks like it belongs—not just something to be tolerated. No crazy-quilt patchwork. No ugly weights, or counter-balances.

Normal operation is independent of self-closing mechanism. And if there's a fire, it will close automatically, regardless of position.

Other nice things about "the neat door": UL and FM 3-hour rated. Level track.

Eighteen-gage steel bonded to honeycomb core means rugged construction, light weight, and easy operation. Quickly installed without special tools. Write for "The neat door" folder. It's neat, too.

STEELCRAFT MFG. CO., 9017 BLUE ASH ROAD, CINCINNATI, OHIO 45242, U. S. A.
AWARDS

"Citations for Excellence in Community Architecture" have been awarded by the AIA to the cities of San Diego, Calif., and Albuquerque, N.M. San Diego was the recipient of an award for its Mission Bay Park (see below), a project that involved dredging the channel of the San Diego River and conserving 27 miles of tidal shoreline. Albuquerque's citation was the reward for an extensive remodeling of public space in the city's downtown area. At the annual convention of the American Institute of Building Design, Glendon P. Bowman and Carl Cristiano received the first annual Louis Siegler, Inc., Holly Division "Environmental Control Award." The two building designers were commended for their improvements in heating and air-conditioning applications and design in their Madrid cooperative apartment in Arcadia, Calif.

PERSONALITIES

Hugo Erickson, member of the St. Paul (Minn.) firm of Tolitz, King, Duvall, Anderson & Associates, has taken office as President of the American Public Works Association. He is a former city coordinator and director of public works for Minneapolis . . . H. R. H. Prince Philip, Duke of Edinburgh, is the first honorary member of the Concrete Society, founded last month in London. The new organization comprises the Reinforced Concrete Association and three other groups, which have merged in an effort to organize and publicize the British concrete industry.

THAT GREAT ARCHITECTURAL PASTIME - BASEBALL

SAN DIEGO BUILD A WINNER

SAN DIEGO, CALIF. Noted in the "awards" column this month is the AIA's "Excellence in Community Architecture" award to the city of San Diego. The city received the citation for its Mission Bay park — 4600 acres (approximately half land and half water) of tidal flats with 27 miles of shoreline that have been developed for public recreation.

Early in the project's history, 20 years ago, it was stipulated that 75% of the area be retained for public parks and beaches; the remaining 25% was to be leased to private concerns for supporting facilities. Today, Mission Bay offers boating, fishing, and swimming hotels (Vacation Village Hotel, 1), restaurants pools, and lagoons. The water is bordered by boardwalks, crossed by bridges, and pierced by piers and pilings. Certain buildings have emphatic vertical designs, providing points of orientation for park visitors.

Cost of the entire project is expected to be $106 million ($50 million private and $56 million public funds, including a $2 million bond issue approved by the city in 1945).

NEW YORK, N.Y. Caught in a deceptively relaxed pose, the tough, aggressive baseball team fielded by the office of Edward Larrabee Barnes shows that style is a matter of inner spirit, not external trappings. Although some of the 10 teams in the league composed of New York architectural offices had jerseys and names (sample: The Rocks, Edward Stone's team), the Barnes group relied on understatement. It won them first place in the league, which staged its games evenings during the summer and fall in Central Park. Architect Michael Lawn, of Kelly & Gruzen, kept track of the schedules and standings, and was supposed to present the winners with a post-season trophy. Although Edward Barnes was not present when the photo (above) was taken, he was a frequent competitor in center field. Edward Stone and Wallace Harrison caught occasionally for their teams.

These were the final standings:

<table>
<thead>
<tr>
<th>Team</th>
<th>Won</th>
<th>Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edward Barnes</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Clarke &amp; Rapuano</td>
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<td>Harrison &amp; Abramovitz</td>
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<td>Edward Stone</td>
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<td>Philip Johnson</td>
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<td>Marcel Breuer</td>
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<td>Max Urbahn</td>
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NEW YORK, N.Y. In a luncheon speech to the women's auxiliary of the New York Chapter, AIA, Commissioner of Parks Thomas P. F. Hoving announced plans to create recreational facilities in Flushing Meadows, site of the 1964 - 65 New York World's Fair. Exactly what will be done will be left up to Marcel Breuer, Kenzo Tange, and Lawrence Halprin, whom the Parks Department has commissioned to submit designs for a sports park there. In his

BREUER, TANGE TO DESIGN FOR FLUSHING MEADOWS

November 1966
At the ripe old age of two this building was recaulked with G-E Silicone Sealant.

(The original caulk couldn't stand the weather.)

Was it the Florida heat or a hurricane named Dora?

Chances are, both caused the polysulfide caulk in this Florida hospital to break down in just two years. (And it was guaranteed for five!)

Now, General Electric's Silicone Construction Sealant is doing the job. It's providing superior protection day in and day out. And it'll survive Hurricanes Dorothy, Dolores, Donna and Dinah!

In fact, tests show that G-E Silicone Construction Sealant will take punishment of high winds and rain, intense heat and sunlight for years without loss of bond or elastomeric properties.

Because it's permanently flexible silicone rubber, it withstands severe expansion and contraction cycles. It won't crack, crumble or leak with age. And it's also permanently waterproof.

So recaulk with G-E Silicone Construction Sealant. Or use it from scratch and forget about recaulking. It comes in standard caulking cartridges and a range of permanent colors.

For more information and color swatches, contact your G-E distributor or write: Section Q1239R, Silicone Products Department, General Electric Co., Waterford, New York 12188.
speech, Hoving suggested facilities for both indoor and outdoor sports that could be used either formally or informally. He mentioned a touch football field and a drag strip. But both the design and the specific nature of the facilities will be left up to the architects.

Getting such top-notch talent to prepare designs is a welcomed change for New York City, and would indeed be welcome anywhere. Hoving's announcement came less than a week after Mayor John Lindsay had announced an invited architectural competition for a $5,700,000 combined police station house, stable, and riding ring in Central Park. Invited to submit designs in the $100,000 competition were Edward L. Barnes, Marcel Breuer & Associates, Kelly & Gruzen, Philip Johnson, and Whittlesey, Conklin & Rossant. All are New York City firms.

SIGNATURES SOUGHT TO PROTEST VIETNAM WAR

NEW YORK, N. Y. A group of New York architects concerned with the effect of the Vietnam war on the construction industry (see business survey, p. 60) and on human values, formed last month the Committee of the Planning Professions to End the War in Vietnam. In a plea for petition signatures to send to the White House, they note that "leading representatives of all fields of thought, of the arts and sciences, and of the professions, except notably our own, have called for an end to the killing." They hope to add the voice of the planning profession to those already raised in protest. What they want is a sensible negotiation at the conference table and a cessation of fighting. All professionals are invited to send signatures, followed by identifying professional initials (AIA, ASCE, AIP, etc.) to Maxfield F. Vogel, Committee of the Planning Professions to End the War in Vietnam, Room 331, 101 Park Avenue, New York, N.Y. 10016. Contributions of $5 or more are also invited to cover the costs of the campaign, including advertising in professional magazines.

THE CHICAGO PICASSO

CHICAGO, I11. Within eight months, the plaza in front of Chicago's soaring Civic Center will have a specially commissioned 50' sculpture by Picasso. To be constructed of the same corrosion-resistant steel as the building it will decorate, the sculpture will rest on a 20' x 30' granite base and will weigh 125 tons, almost as much as "The Mayflower," which brought the pilgrims to Plymouth, Mass. An idea of what the sculpture will look like when it takes its place in the plaza can be seen in the photo of the model superimposed on a photo of the Civic Center (above).

Back in 1963, before construction work started on the Center, the architects (C. F. Murphy Associates, Supervising Architects; Skidmore, Owings & Merril, and Loeb), Schlossman, Bennett & Dart, Associate Architects) decided that a monumental sculpture was needed as a focal point in the plaza. According to William Hartmann, partner in SOM's Chicago office, the architects "decided to ask the foremost artist in the world if he was interested in designing such a monumental sculpture. . . . We wanted the sculpture to be the work of the greatest master alive."

Armed with their vision, Hartmann and his colleagues — C. F. Murphy and Norman Schlossman, together with Sir Roy S. Penrose, Picasso's biographer — went to the artist's home in Mougins, France, in 1963. They took with them a model of the Civic Center site and a fat album of photographs of Chicago in all her moods and guises. "We included photographs of famous men and women from the Chicago area," Hartmann recalls. "Picasso appreciated this human element in our presentation and even became excited when he recognized an old acquaintance."

"My friend!" exclaimed Picasso, looking at the photo of author Ernest Hemingway. "I taught him everything he knew about bullfighting. Is he from Chicago?"

Hartmann believes that what finally persuaded Picasso to accept the commission, something he has rarely done, was "the bigness, vitality, and dramatic beauty of a still young city."

In May 1965, the artist completed the 42' steel model, which is on display at the Art Institute of Chicago's Gallery of 20th-Century European Art, one of 145 works by Picasso the Institute now has in its permanent collection.

Sir Roland, Picasso's biographer, says this about the sculpture: "Serene and evocative of many interpretations, the great head is more than a head. At first sight, it is the height of a woman with flowing hair. The simplicity of the outline and the economy with which each component part is used to build up the whole prompts the imagination to fill in the empty spaces and also encourages other associations, just as words in a poem can convey more than one meaning. The two winglike shapes that are her hair suggest with equal truth the fragile wings of a butterfly or the powerful flight of the eagle, while at the same time the rods that connect them with the profile seem to contain the music of a guitar. . . . The materials of which it is made are primarily air and light, held together decisively by the rigid metal. This is noticeable in the span shaped like a head, which is framed by the air and connected by a veil of rods with the profile. With admirable precision, the profile rises through mouth and nose to eyes and forehead. Subtlety, simplicity, and strength combine throughout to make this splendid evocation of that concentration of wonder — a woman's head."

COMPETITIONS

The New York Chapter, AIA, has announced the 1967 competition for its $6000 Brunner Award. The award is made for advanced study in the architectural field. Applications are available at Chapter Headquarters, 115 E. 40th St., New York, N.Y., until January 1, 1967. Projects must have been submitted by January 15 . . . The AIA has announced its nineteenth annual program of National Honor Awards for work by American architects on projects completed since January 1, 1962. All building types are eligible. Preliminary application must be submitted with entry fee before November 25, 1966. Write for program and entry forms to 1967 Honor Awards Program, The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

CALENDAR

Monday and Tuesday, December 12 and 13, the American Society for Engineering Education will sponsor a meeting of its Continuing Engineering Studies Division at the Sheraton-Chicago Hotel in Chicago. Various ways of meeting the need for continuing the education of engineers will be discussed. For further information, contact J. W. Hostetter, Assistant Dean of Students, Polytechnic Institute of Brooklyn, Brooklyn, N.Y. . . . The sixteenth session of Commission Internationale de l'éclairage (International Commission on Illumination) will be held June 19-28, 1967, at the Shoreham Hotel in Washington, D.C. For application, write to U.S. National Committee of CIE, Secretary, L. E. Barbrow, c/o National Bureau of Standards, Washington, D.C. 20234 . . .
Specifications and Load Tables for High Strength Open Web and Longspan Steel Joists

It's the Steel Joist Institute's practical working handbook of everything you need to specify joists to carry uniform loads on spans up to 96 feet.

The 1967 Edition covers the following joists: J-SERIES, joists made from 36,000 PSI minimum yield strength steel; LJ-SERIES, longspan joists compatible with the J-SERIES; H-SERIES high-strength joists with chord sections made from 50,000 PSI minimum yield strength steel; LH-SERIES high-strength joists with chord and web sections designed on the basis of 36,000 PSI to 50,000 PSI yield strength steel. Send coupon for your free copy of this valuable handbook.

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ADDRESS __________________________________________
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STEEL JOIST INSTITUTE
Room 715 DuPont Circle Bldg., Washington, D. C. 20036

November 1966

On Readers' Service Card, Circle No. 404
Verrazano Bridge; and to the east is the skyline of New York City.

When the Kurt Orban Company, importers of steel and machine tools, decided to build a Jersey City office building, they wisely decided to capitalize on this asset. To do this, they bought up 14 acres of shore and river bottom with riparian rights for slightly less than $200,000. On their property, which lies some 200' offshore, they plan to erect a 12-story building. It will be connected to the shore by a covered walkway and a roadway that circles beneath the water's surface. The first-floor level of the building will be about five stories above the river, high enough so that tenants there can see over surrounding structures.

Designed by architect Bernard Rothzeid, with Schupack & Zollman as structural engineers, the building will be set on pilings sunk to bedrock, about 75' beneath the water's surface. The exterior utility tower will serve as support for precast T-girders, 122' long and weighing close to 60 tons, which will, in turn, support each floor level. The girders can be floated to the building on barges, then lifted directly into place. Construction cost is expected to be about $3,500,000.

**PRODUCT LITERATURE: AN ARCHITECTURAL AID?**

**WASHINGTON, D.C.** Some of the gripe's architects and consulting engineers have with product literature and advertising were pinpointed recently by the Committee for Construction Industry Product to erect a 12-story office building sponsored by five organizations: the AIA, Consulting Engineers Council, National Association of Home Builders, Producers' Council, Inc., and Sweet's Construction Catalog Services. In September, the committee held a competition — its first — to select outstanding examples of product literature and advertising aimed at four groups: architects, consulting engineers, home builders, and lumber and building material dealers. Of 62 entries, almost half, 299, were for architects' 101 for consulting engineers. Winners will be named at a dinner in New York City on November 10.

R. Lloyd Snedaker, (above) a partner in the Salt Lake City architectural firm of Snedaker & Budd, was chairman of a panel of five architects, selected by the AIA, which judged the architectural entries. In an interview conducted especially for P/A, Snedaker had these comments:

"There's been a steady improvement over the past few years in most categories of manufacturers' literature. Notice I say 'most' categories. I'm very disappointed, as I think most architects are, about the lack of comparative cost data in literature we receive . . . . These are of extreme importance to architects. We've been preaching to manufacturers for years about the need for such data. The manufacturer wants, among other things, to feel free to change his prices any time he wants to. Now, the architect underestands the manufacturer's point of view. Listing comparative cost data can be a tricky thing, but it can be done because a few enlightened producers are doing it.

"I'm also concerned — and again, I think most other architects would agree with me on this point — about the quality of maintenance literature we receive. Or, perhaps I shouldn't say quality; I think lack would be a better word. Most manufacturers don't give us what we need . . . . The very practice of architecture relies heavily on the maintenance factor. Take a hospital, for example. Obviously, its initial cost is important, but it is minor over the years compared to the maintenance cost."

Since maintenance information is so important to the practice of architecture, why is there such a dearth of literature?

"That's a question you've had to ask a manufacturer. It could be there is the feeling that, 'Making the initial sale is important. What's in it for us after that?' Well, anybody who indulges in this sort of thinking is guilty of a fallacy. Say an architect has a choice of two or more competing products of similar quality and cost in making his specifications. In most cases, of course, he does. Now, if one producer provides accurate, complete, well-organized maintenance literature and the others don't, whose product is the architect going to specify? The question answers itself. Now, maybe its simply a lack of communication between producer and user. Perhaps a great many manufacturers are not fully aware of the importance of maintenance material."

What about trade advertising? Do you think it has any value and does it influence you in any way?"
Norton Uni-Trol controls prove particularly valuable to the satellite Automotive Center. Items purchased at this store are more likely to be bulky. Customers appreciate the convenience of an open door when they leave with their purchases.

FOR CONTROL and SAFETY
Montgomery Ward specifies
NORTON ® UNI-TROL DOOR CONTROLS

To control doors under all circumstances and to protect both customers and doors, Montgomery Ward has specified Norton Uni-Trol door controls. The tremendous traffic experienced by these stores at their public entrances demands that the doors be under perfect control at all times and all situations. In addition, safety to both customers and the door is an utmost concern.

All of these important considerations were met very successfully with the Norton Uni-Trol, a combination door closer and door holder. For normal to medium heavy traffic, the unit functions as a normal door closer. When traffic is heavy, the door holder is engaged to keep the doors open. The spring in the holding mechanism serves as a cushion as the door is opened. Strong winds or energetic customers cannot harm the door or frame when the unit is opened too quickly.
that creating a good trade ad directed to architects involves exactly the same factors as creating trade advertising for any other profession? Is that correct?

"I think I gave that impression, didn't I? Well, I should have gone further. No, I think that advertising people should take into account the way an architect thinks. The architect has — or ought to have — a highly defined aesthetic sense. A four-color ad that appeals to this aesthetic sense will be read where the same ad in black and white wouldn't be. Because the average architect is far busier than he used to be, the total impact is becoming increasingly important.

Not only that: We're getting more and more literature every year, which means that there is greater competition for our attention."

Frank W. Riederer, head of the Chicago consulting engineering firm of Frank W. Riederer & Associates and head judge in the consulting engineering category, echoed Snedaker's opinions: He pointed out, for instance, that only one piece of maintenance literature was entered in the competition. And he felt that ads should be eye-catching.

He went on to say, "In an ad, the information should be brief but accurate. An ad doesn't satisfy your appetite; it whets it. A good trade ad should be presented in such a way to make you say to yourself, 'This is something I want to look into.' I think — and I feel sure that most engineers would agree with me on this — that one of the best ways to stir up interest is a case-history ad. Also, more information is needed on product limitations; we need to know what a product can do, and what it can't do."

In trade advertising, is the consulting engineer receiving the credit he deserves?

"I'm glad you brought that up, because the answer is a resounding no. This is one of the engineer's biggest complaints. . . . Just to give you an example: I've seen ads from the manufacturer of the structural steel that was used in a building. Who was the person most concerned with this aspect of the building? The structural engineer, of course, but his name is conspicuous by its absence. I would think that advertisers would realize that engineers look at ads with engineers' names in them."

A TOUCH OF ACRYLIC-POLYMER

NEW YORK, N.Y. Artist Frederick Terna has lived in the United States since 1952. Before that, he studied art in Paris, and still earlier he lived in Austria, his birthplace. Most of his work is in etchings and lithographs, although he also works in oils, and, most recently, in tondo-acrylic polymer. These latter efforts consist of pebbles and sand embedded in plastic, and they can be applied to canvas and framed. Shown above is Terna's "The World." Its rough surface is meant to be touched, which adds another dimension to the viewer's experience. Terna's work is on display at Etchings International, a firm that specializes in art work for offices, homes, and hotels in New York City.

WASHINGTON/FINANCIAL NEWS

By E. E. HALMOS, JR.

The real battle over the President's much-desired "Demonstration Cities" program (S. 3708) centered on two matters that weren't present in the original proposals at all:

(1) Aid the land-developers (by insuring mortgages) for acquisition of suitable plots for large-scale community development. This was inserted in the bill in the Senate.

(2) A fear that certain provisions in Title II favored area by regional groups, rather than local governments individually — regional groups that would, in the end, said opponents, be answerable only to the Secretary of Housing and Urban Development, who would approve their formation, actions, and funds.

The aid to land developers has always seemed questionable to many legislators, who see it as use of public funds to aid private industry, regardless of any eventual advantages. (Idea is to aid developers in obtaining funds for such "new towns" as Reston, Va.) Many local government officials opposed such a move, on ground that such aid might permit the formation of developments that could kill existing political subdivisions.

The second objection — to the local "supergovernment" idea — was by far more important, and involved fears of further forced integration of schools. (A very poorly timed "leak" of some Office of Education plans for school integration, including busing of children from one neighborhood to another, didn't help, either.)

What bothered Congressmen and many local officials was the requirement under Title II that "all applications for Federal loans or grants to assist in carrying out (almost any project) must, after June 30, 1967, be submitted for review by a metropolitan-wide, comprehensive planning agency."

A vocal minority of the House Banking and Currency Committee declared: "The proposed . . . title would divide the country into new Federal community development districts — a new administrative or political unit that would look to the Federal Government, rather than the states, cities, and other localities for guidance. Title II would place the shadow of HUD over every metropolitan area. . . . Virtually every local governmental decision . . . would be subject to review. . . . To whom would the people turn to exert their proper voice in local and even metropolitan government?"

In all, it was another lesson in how not to get legislation through a harassed Congress; and it pointed as well to a widespread tendency in Washington today to overload basically laudable bills with too many hastily conceived and often controversial measures.

There was not nearly as much opposition to other portions of the bill (which offers great challenges to architects and planners): a two-year authorization totaling $900 million for planning and program assistance for urban renewal projects; changes in FHA programs to make more low-interest financing available to nonprofit housing groups; and a number of technical changes in existing legislation.

(An important companion bill to the Demonstration Cities program — the Urban Mass Transit Act amendments [S. 3700] — sailed easily through Congress. It provides, among other things, grants to public bodies for technical transit studies; research and development and demonstration projects; grants for training of technical and managerial personnel.)

Portable Pension Plan — A bill proposing a "portable pension" that specifically covers technical and professional employees had no chance for passage this year, but proponents will certainly revive the measure next year.

It would have a profound effect on the operations of architects, structural or engineering firm in the U.S.

Idea of the bill (HR 16832, introduced by Representative John Dingell, Michigan Democrat) is embodied in two provisions:

(1) Pension plans would qualify for favorable Federal tax treatment only if they provide that an employee's right to fund in his pension account became nonforfeitable after 10 years of employment or less.

(2) A "clearing house" would be set up (in the Department of Health-Education-Welfare) to facilitate transfer of employees' vested pension credits upon separation from their jobs.

Thus, when an architect lets some of his staff go because of change in work load or for any other reason, he could keep the employees' "vested" pension credits and pay the
FOR A RHAPSODY IN STYLING AND COLOR

LINE MATERIAL SOFT ILLUMINATION OUTDOOR LIGHTING

TO 175 WATTS MERCURY • 189 WATTS INCANDESCENT
8000 LUMENS • 0.8 MAINTAINED FOOTCANDLE

STYLED FOR THE MOOD
Choose just the right tone to set the mood with the styling of Line Material outdoor lighting. An array of contemporary and traditional fixtures allows you to underscore your job in the key you choose. All L-M fixtures have been styled by the noted industrial designer, Jean Reinecke. Styling ranges from a crisp, sharp modern design to an authentic reproduction of a whale oil lamp. And when you add a variety of 9 dramatic decorator colors, you have a design freedom available in no other outdoor lighting line.

EFFICIENCY, ECONOMY
You enjoy engineered, optimum useable lighting when you choose Line Material luminaires. Aluminum construction assures long, corrosion-free life. Low-cost maintenance is realized with the accessible interior that is easy to clean or relamp.

COMPLETE SYSTEMS
Minimize the efforts in coordinating your lighting job by obtaining all the equipment from Line Material. In addition to luminaires—poles, ballasts, lamps, brackets, wiring and power supplies, including transformers, are available from your L-M Authorized Distributor, backed-up by an L-M Lighting Engineer and an L-M Field Engineer. They'll be happy to work with you.

CONTEMPORARY LAWN-GLO
The smart, modern styling complements any contemporary architectural motif. Provides a flair to soft functional lighting; 9 decorator colors, and 3 styles.

SPECIFICATION
Utilizes incandescent lamps through 150-watts; has plastic, non-glare globe; standard 2-inch or 3-inch OD yard light post mounting; supplied with or without photocontrol.

LINE MATERIAL'S COMPLETE OUTDOOR LIGHTING LINE
ALSO INCLUDES HIGH, MEDIUM AND MEDIUM-SOFT ILLUMINATION

TURN PAGE
STYLING AND COLOR FOR YOUR JOB
FROM L-M's SOFT ILLUMINATION LINE . . .

FOR ENTRANCES • WALKS • DRIVEWAYS • LAWS • GARDENS • PATIOS • CHURCHES • SCHOOLS • MOTELS
OFFICES • INDUSTRIAL AND COMMERCIAL BUILDINGS

To 175 watts mercury • 189 watts incandescent • 8000 lumens • 0.8 maintained footcandle

STYLEKING

Diversified, graceful styling plus a choice of 9 dynamic colors. Cover interchangeability gives added versatility. Will match any architectural decor. Pole top mounting for installation economy in new and conversion installations.

SPECIFICATION
For lamps rated to 175 watts mercury or 189 watts incandescent; constant-wattage, high-reactance or reactor ballasts; IES Types I, I-1 way, II, II-4 way, III, IV and V distributions; 3-inch and 7-inch mounting fitters; photocontrol accommodation for Styles A, B, C, and F units.

STYLETTE

Complete choice with 7 designs and 9 colors, to match every architectural design and mood. In addition, the distinctive covers are interchangeable. Pole top mounting for 3-inch diameter poles adds installation economy.

SPECIFICATION
Designed to operate incandescent lamps rated up to 189 watts. IES Types I, I-1 way, II, II-4 way, III, IV and V distributions; 3-inch mounting fitter; includes built-in photocontrol.

LAWNAIRE

Contemporary styling combined with application flexibility. Available in a choice of 9 decorative colors. For mounting on 3" OD pipe.

SPECIFICATION
Available for use with 75-, 100- and 175-watt mercury lamps; internally mounted high-reactance ballast; IES Types II, IV and V distributions; built-in photocontrol.

TRADITIONAL LAWN-GLO

Efficient, controlled illumination combined with charm and styling of Early American whale oil lantern. Long lasting beauty and minimum maintenance achieved with cast aluminum base and cover plus shatterproof, acrylic plastic retractor. Available in black or white with gold finial, roof, and retractor clips.

SPECIFICATION
Available for incandescent lamps through 150-watts as well as a 100-watt mercury lamp with high-reactance ballast; mounts on standard 3-inch OD yard light post; supplied with or without photocontrol.

STYLED SUBURBANAIRE


SPECIFICATION
Available for use with 189-watt incandescent, 100- and 175-watt mercury lamps; high-reactance or reactor ballasts; IES Types I, I-1 way, II, II-4 way, III, IV and V distributions; 3-inch mounting fitter; includes built-in photocontrol receptacle.

DUSK-TO-DAWNER

Fresh, modern lines and styling plus excellent lighting. Aluminum finish blends with all types of architecture. Mounts easily on poles or flat surfaces; also available for mounting on 1 ¼-inch pipe supports.

SPECIFICATION
Available for use with 100- and 175-watt mercury lamps; internally mounted constant-wattage, high-reactance, reactor or constant-current ballasts; IES Types II, III, IV and V distributions; built-in photocontrol receptacle; completely pre-wired, including power supply leads.

FOR COMPLETE INFORMATION on Line Material's line of outdoor lighting contact your L-M Distributor or write Line Material Industries, Milwaukee, Wisc. 53201.
November 1966

PIA News Report

73
This steel window won't rust.

It's finished in polyvinyl chloride.

Polyvinyl chloride is impervious to moisture. We put it on our window four times as thick as paint, using a Ceco-researched method, an exclusive process. This is a resilient finish. It doesn’t crack or chip. It gives. We call it Cecoclad. There is no other finish like it.

The Cecoclad window is in the price range of a galvanized-and-painted steel window and a hard-coat-anodized aluminum window. The Cecoclad window needs practically no maintenance. Your client can keep it looking brand new by washing it down with water when the glass is washed. That’s all.

We’ll be glad to sell you whatever window you want. We make them all. But if you’ll take our unbiased advice, you’ll specify the Cecoclad window. It’s incomparable.

Send for colors, test data, specifications, samples and comprehensive list of projects built with Cecoclad windows throughout the country. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Illinois 60650. Sales offices and plants in principal cities from coast to coast.

CECOCLAD/STEEL WINDOWS

encased in colored polyvinyl chloride four times thicker than paint.
LENSCREEN
IN-WALL REAR PROJECTION SCREENS BY POLACOAT

LENSCREEN utilizes the modern concept of rear screen projection which conceals projection equipment, eliminates distractions and provides full image sharpness in regular room light. Every detail of a motion picture, slide film or other projected motion display is reproduced in full color and contrast.

Glass LENSSCREEN is soundproof and fireproof when mounted in a permanent In-Wall installation. Available in heavy plate to 10 feet by 22 feet, other materials and sizes also available.

In-Wall Glass LENSSCREEN is ideal for Board Rooms, Briefing Rooms, Class Rooms and Auditoriums.

We offer helpful designers' information portfolio. Request LENSCREEN Designers Kit for In-Wall Display.

POLACOAT, INC.
9748 CONKLIN ROAD • BLUE ASH, OHIO, 45242

On Readers' Service Card, Circle No. 439

FINK DOME

A unique structure for architectural and industrial uses — designed to exacting tolerances, accommodating large vertical loads. Highly versatile as convention hall, arena, theatre, etc. Proposed dome shown is 900-ft. dia. at base and used as covering for existing ball park. For more information, forward to us the approximate size, required interior loads, together with details of application and surrounding terrain characteristics to: General Conveyor Inc. of N. Calif., General Domes Div. 1821 Mt. Diablo Blvd., Walnut Creek, Calif. or Phone (415) 934-9121.

On Readers' Service Card, Circle No. 418

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TRAZOPOXY

retains OLD WORLD CLASSIC BEAUTY AND MEETS 20TH CENTURY DEMANDS of HIGH STRENGTH and DURABILITY

OF SPECIAL INTEREST

If floor loads and levels are critical.

Weighs only 3 lbs. s.f. 3/8" thick.

Compared to 30 lbs. s.f. 3" thick required for terrazzo.

No underbed required, apply directly to concrete, brick, steel or wood.

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 Creates a impenetrable surface to most materials, with more than twice the impact resistance of terrazzo.

FLEXIBILITY

TRAZOPOXY'S resiliency eliminates floor crack problems. Can be applied to flexible long spans and bridgings.

Unlimited range of design and color

STA-CRETE, INC.
115 New Montgomery St., San Francisco, Calif.

On Readers' Service Card, Circle No. 401

NEW TRAFFIC DOOR IMPACT PANELS

• Positive "Straight Edge" Closure • Greatest Resistance to Impact • Attractive Appearance • Exclusive on KELLEY "CAMATIC" TRAFFIC DOORS

New plastic-alloy laminate bottom panels will stand up to the heaviest impacts of non-stop traffic. Even after hundreds of thousands of openings they "hang straight" for positive environmental control. Get the Traffic Doors you know will stand up.

For the full story, write . . .

KELLEY COMPANY, INC.
6740 N. Teutonia Ave., Milwaukee, Wis. 53209

Area Code 414-352-1000

On Readers' Service Card, Circle No. 432

November 1966
**PRODUCTS**

**AIR/TEMPERATURE**

Infrared gas heaters for ceiling installation in large spaces such as hangars, warehouses, and gymnasiums are said to cut annual fuel costs. "Re-Verber-Ray" radiant sources are ceramic tiles and stainless-steel rods capable of withstanding temperatures up to 1800-2000°F. The three new models cover from 85 to 255 sq in. each. Detroit Radiant Products Co., 1297 Terminal Ave., Detroit, Mich. 48214.

---

**CONSTRUCTION**

Slotted blocks absorb low frequencies and give patterned relief to large wall areas, says manufacturer. "Soundblox" cavity-slot designs, closed on three sides with precisely dimensioned slots on the exposed side, act as damped resonators. Auditoriums, noisy factories, gymnasiums, and other spaces where noise absorption and sound control are important, benefit from absorption in the low frequencies that penetrate many other building materials. Sound Transmission Class (STC) for 6" Type A blocks is 49; Type B blocks, with a fibrous filler, are STC 47 and have a .65 noise reduction coefficient. Nominal dimensions are 8" x 16", in 8", 6", and 4" widths. The Proudfoot Co., P.O. Box 9, Greenwich, Conn. 06830.

---

**DOORS/WINDOWS**

This weatherstripping (silicone-treated woven pile) will support a drop of distilled water for 15 minutes—five times longer than required to meet the Architectural Aluminum Manufacturers Association Specification 701.1, reports manufacturer. Results for this and other tests (wear, crush, etc.) are available. The Schlegel Mfg. Co., 1555 Jefferson Rd., Rochester 23, N.Y.

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**ELECTRICAL EQUIPMENT**

**EQUIPMENT**

Baby spot, the "Mini-Ball," accommodates 100-w, R-20 applications; .012", .015", and .018" or available in other gages by specification. Washington Steel Corp., Washington, Pa.

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Eight new colors in the Porcelain Enamel Institute's "NatureTone" series are matte-finish earth shades plus off-white and gray. They are keyed to the PEI code system used as a guide by specifications writers. Color sample card available. Porcelain Enamel Institute, 1900 L St. NW, Washington, D. C. 20036.

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Soft stainless-steel flashing costs 40% to 50% less than copper and has a higher strength-to-weight ratio, states manufacturer. AISI Type 304 stainless has a dull matte finish and will not discolor or streak adjoining metals. Soft-temper, no-springback "MicroFlex" is available in coil or sheet widths up to 48" or cut-to-order for roofing and flashing applications; .012", .015", and .018" or available in other gages by specification. Washington Steel Corp., Washington, Pa.

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Blackboard is a wall and no longer black. School walls, either fixed (but demountable) or sliding, offer entire sections of chalk panel in 11 colors. Magnetic accessories for steel-faced, gypsum-core panels include chalk trays, tack boards, and magnetic "thumbtacks." Another panel designed for the classroom acts as a projection screen. Special service panel consolidates location of clock, intercom, thermostat, switches, and outlets. E. F. Hauserman Co., 5416 Grant Ave., Cleveland, Ohio.

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Sound wall with "Sound Attenuation Spacer" has been added to manufacturer's line of movable wall systems. Metal, roll-formed clips inhibit passage of sound waves with a "tuning fork" action. The 3/4"-thick wall panels comprise 5/8" gypsumboard faces; two 5/8"-thick gypsumboard spacers at each end of panel with sound attenuator between; and 2" glass-fiber insulation blanket in core space. Sound Transmission Class is 44. Vaughan Walls, Inc., 11681 San Vicente Blvd., Los Angeles, Calif. 90049.

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Furnishings

Forest grain paneling is a prefinished hardboard featuring an extra-tough surface. The clear, catalyzed, durable top coat is said to protect the wood print grains permanently. A variety of wood shades is offered, from dark Nestucca walnut to light Tulatin birch. Panels are available in 1/8", 3/16", and 1/4" thicknesses and 4" x 8" and 4" x 16" units (cut to other sizes on order). They also are available without grooves and in punched board patterns. Panels meet the requirements of Commercial Standard CS 251-63, and have a Class 111 Flame spread classification. Forest Fiber Products Co., P.O. Box 68, Forest Grove, Ore. 97116.

Circle 111, Readers’ Service Card

Conference table, designed by Robert Becker, has a sculptured appearance, achieved in part by radius corners and edges. Its frame comes in either walnut or oak and the top is of rift oak. Three sizes are available: 84" x 40", 96" x 42", and 120" x 42". Helikon Furniture Company, Inc., 315 E. 62nd St., New York, N.Y.

Circle 112, Readers’ Service Card

Double built-in oven cleans itself electrically, automatically. The sliding of a locking lever and turn of a dial starts the process, during which safely controlled high heat transforms grease and oven spatters into harmless vapors. Shelves may be cleaned as well as walls. The 24"-wide unit comes in turquoise, yellow, single or two-toned copper, and a two-toned Tahitian green as well as white. Manufacturer notes that only two screws are necessary for installation. Frigidaire Division, General Motors Corp., Dayton, Ohio 45401.

Circle 113, Readers’ Service Card

The Matador Line of chairs has a steel frame covered with polished chrome. Its form-fitting, contoured back stands free of the arms (which are cantilevered, with solid oil finish overheads) and the back attaches to a flexible backstrap. The seat is of molded latex rubber. One may choose between fixed, revolving, and self-return base. Companion desks, filing cabinets, and other units are also available. McDowell/Craig, 13146 Firestone Blvd., Norwalk, Calif. 90650.

Circle 114, Readers’ Service Card

Glass-top tables, geometric in design, stand 16" high on sliegh bases of polished chrome bar stock. Tops are of 3/4" plate glass with polished edges; they are available in 36" or 40" squares, a 24" x 48" rectangle, or a 36" circle. Robert John Company, 821 North Second Street, Philadelphia, Pa. 19123.

Circle 115, Readers’ Service Card

The 3000 Line of metal office furniture by Yawman-Erbe includes a desk with a drawer suspension system which, according to the manufacturer, is the strongest in existence. The drawer, riding on steel ball carriers rather than the now conventional nylon rollers, hangs from the desk top. Tops come in wood or wood-patterned textolites. Frames are available in 14 standard colors or any other specified. Design allows the desk to be shipped disassembled, then reassembled on delivery. Companion files, chairs, and public seating are also available. Sterling Precision Corporation, 103 Park Avenue, New York, N.Y. 10017.

Circle 116, Readers’ Service Card

Yoke-mounted spotlight allows 358° vertical rotation and 180° horizontal rotation. Comes in 5" and 6"-dia. extruded aluminum housing with choice of exterior and interior finishes; removable grooved baffle. Pendant mountings also available. Prescolite Mfg. Corp., 1251 Doolittle Dr., San Leandro, Calif.

Circle 110, Readers’ Service Card

Two new furniture groups by C.I. Designs offer sturdy, comely seating in rugged grains of solid oak or ash. The Ash group, created for “contract” use in collaboration with Hugh Stubbins, includes

November 1966
How do you measure comfort?

In inches of Styrofoam.

Compared to other insulations, a little Styrofoam® brand insulation board goes a long way. Little is needed for the comfort level you want; the economy you expect. Styrofoam not only gives superior insulation efficiency, but it is moisture-resistant and requires no vapor barrier. Specify Styrofoam in one of your buildings now and its comfort is available for years. It won't rot, mold or deteriorate. It's light as well as easy to install.

And Styrofoam insulation is versatile. Use it over masonry construction, in perimeters or forms. Then give it any finish you like—gypsum wallboard, wood paneling or plaster.

There's a good way to learn more about Styrofoam. Check Sweet's Architectural File 10a/Du. Or write The Dow Chemical Company, Plastics Sales Department, Midland, Michigan 48640.

Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes...look for this trademark on all Styrofoam brand insulation board.
all-wood pieces, and pieces upholstered in C.I. (or other) fabrics. Part replacements are possible. The Oak group, conceived by Borge Mogensen, features chairs with solid oak frames and adjustable saddle leather seats and backs. Companion tables of solid oak are also available. Wood comes in its natural state, or in standard finishes. C.I. Designs, 230 Clarendon Street, Boston, Mass. 02116. Circle 117, Readers' Service Card

**Economical carrel** offers compact study corner for $65 (volume price). Solid-core units, locked into aluminum frame, will be sent "on approval" to school administrators and architects in the U.S. or Canada to prove that the low price tag does not mean an inferior product. Uniline, 420 Alabama Ave. NW, Grand Rapids, Mich. Circle 118, Readers' Service Card

**Library component system** known as The Libra Series has bookshelves, magazine shelving, storage cabinets, wardrobes, and bulletin boards that lock in place and thus eliminate need for built-ins. Recessed tracks (adjustable on 1/2" centers) allow for an infinite variety of component combinations. Companion book trucks, lecterns, dictionary stands, tables, and study carrels are also available. All pieces are made from select walnut veneers with solid lumber cores. Hardwood House, Inc., 10 Saint James St., Rochester, N.Y. Circle 119, Readers' Service Card

![Planter benches of molded glass-fiber construction provide concentrated seating space, yet leave walls free for shelving in areas such as department stores.](image)

Planter benches of molded glass-fiber construction provide concentrated seating space, yet leave walls free for shelving in areas such as department stores. They are available in smooth matte finish, three-dimensional finishes in earth tones, and a coarse surface suggesting masonry. Seat is pitched to permit runoff into the body of the planter. Drainage holes can be supplied, casters can be mounted inside bases, and bases can be scribed to a given degree of slope. Custom sizes and designs will be executed upon request. Architectural Fiberglass Division of Architectural Pottery, 2020 South Robertson Blvd., Los Angeles, Calif. 90034. Circle 120, Readers' Service Card

**OFFICE EQUIPMENT**

**Desk-side phone table** helps keep working surfaces free. Available with top drawer for dictating machine or open shelf (shown) with file drawer below. Unit may be built-in or free-standing. Corry James-town Corp., Corry, Pa. Circle 121, Readers' Service Card

**SERVICES**

Two-faced precast wall panels have thermosetting copolymer resin base and urethane or honeycomb insulating core. Made to architect's specifications, panels may be faced with such materials as aggregate, tile, limestone, marble, etc. Panel shown is aggregate one side and man-made slate on the other side. "Wall-Tite" unit is half the weight of concrete and twice as strong, claims the manufacturer, with a "U" factor as low as .09. A considerable cut in installation time is said to be possible using the panels. Mortite Corp., Passaic, N.J. Circle 122, Readers' Service Card

![Twisted curlicues, jelly-roll curves, conical tubings and curved, tapered forms in molded plywood can be mass-produced by a new molding technique on high-speed presses at low cost, claims manufacturer. Suitable for furniture and decorative paneling, for example, the fabricating presses will mold many types of wood in layers from 3 to 46 plies. Manufactured under license from Livermore Corp., Florida.](image)

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**SPECIAL EQUIPMENT**

![Antipollution unit cleans flue gases from apartment house incinerators. Scrubber, installed either in basement or on roof, enables owners to comply with clean-air laws being passed by many cities, states manufacturer. Fumes are cooled and put through water chamber where high-velocity centrifugal action precipitates solids, making gases clean enough to exhaust into atmosphere. The 3000 cfm "Hydro-Volute" incinerator scrubbers require 15 gpm of recirculating water. Johnson-March Corp., 3018 Market St., Philadelphia, Pa. 19104. Circle 124, Readers' Service Card](image)

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![Turbine dishwasher has only two moving parts and requires only two connections — hot water and drain; since it operates on water pressure, there is no electrical connection.](image)

Turbine dishwasher has only two moving parts and requires only two connections — hot water and drain; since it operates on water pressure, there is no electrical connection. Manufacturer claims it can be installed for "50% of the cost of an electrical washer." Vulcan Mfg. Co., Inc., P.O. Box 3460, Maplewood Sta., St. Louis, Mo. 63143. Circle 125, Readers' Service Card

November 1966
Mr. Architect:

you can't specify

the contractor,
so be sure the windows in the building reflect the high standards of
your design. Windows are opened, closed, slid, pushed, pulled, raised,
lowered, locked, unlocked, bumped into, jumped into and out of, cleaned,
covered, uncovered, scorched by sun, frozen by cold and wind,
drenched by rain, sleet, snow, and hail outside, and pampered with
temperature and humidity inside. Windows account for the most visible
used and abused space in a building. So, when you can't specify the
contractor, make sure the windows are the highest quality on-time
windows available. Specify unsubstitutable Bayley steel, aluminum,
or stainless steel

windows.

Write for new 1967 window catalog

THE WILLIAM BAYLEY COMPANY, Springfield, Ohio

On Readers' Service Card, Circle No. 429
MFRS' DATA

ACOUSTICS

Thin-strip acoustical ceiling system is designed for quick and low-cost installation. Narrow, perforated strips of aluminum are backed by a fiber barrier and a glass-fiber pad for sound absorption. Brochure describes five types of "Mirawal-Dampa" strips and gives sound absorption and sound transmission graphs. Photos, accessories, edge molding details, specifications, color sample card. 8 pages. Mirawal Co., P.O. Box 38, Port Carbon, Pa. 17965.
Circle 200, Readers' Service Card

CONSTRUCTION

Ground slab design and construction manual is divided into two sections—slabs on grade and slabs supported on walls or piers. Booklet covers theory and practice for residential and commercial projects. Tables, photos, design data. 20 pages. Wire Reinforcement Institute, Dept. SG-90, 5034 Wisconsin Ave. NW, Washington, D.C. 20016.
Circle 201, Readers' Service Card

Curtain wall panel faced with "Brickplate," a high fired ceramic material, provides an exposed masonry surface in a metal curtain walls (sandwich and window panels available) and four metal roof systems can be combined in many ways to enclose space. Three color systems, Butler Mfg. Co., 7400 E. 13 St., Kansas City, Mo. 64126.
Circle 204, Readers' Service Card

Design booklet on fire-resistant gypsum assemblies contains six sections: general information, floor-ceiling assemblies, partitions, columns, beams/girders/trusses, and roof decks. Hourly rating charts tabulate construction details, fire test reference numbers, and Sound Transmission Classes. The expanded edition also includes a number of cutaway views and cross-sections of construction details. 42 pages. Gypsum Assn., 201 N. Wells St., Chicago, Ill. 60606.
Circle 203, Readers' Service Card

Picture story of prefabricated components used in a variety of buildings, from a country club to a factory. Structural steel skeleton with Venetian blinds sandwiched between double glazing is feature of brochure/catalog on windows and curtain walls.

DOORS/WINDOWS

"The Growing Case for the Daylighted School" takes issue with the windowless-school trend. Comparative cost tables show the daylighted school to be less expensive in over-all construction, operating, and maintenance costs. The case is also stated in terms of student well-being, along with the claim that windows provide more effective classroom illumination. Architectural Aluminum Manufacturers Assn., 35 E. Wacker Dr., Chicago, Ill. 60601.
Circle 206, Readers' Service Card

Results of exposure tests on porcelain-enamel-coated steel and aluminum are reported in "Weather Resistance of Porcelain Enamels." The seven-year study (by the National Bureau of Standards and the Porcelain Enamel Institute) at seven test sites around the country show that, on the average, the higher the acid-resistance rating, the better the enamel samples weathered. Both matte-finish and glossy samples were used. Oddly enough, the least severe changes were observed in samples at a site in smog-ridden Los Angeles; they gathered an adherent film which, the report states, "may have partially protected the enamels from weathering action." Test results are tabulated in six pages of charts showing color and gloss retention, acid test ratings, etc., for different types and colors of enamel; manufacturers are not named. Explanatory text and technical graphs supplement this data.
Two-component sash on venetian-blind unit may be unlocked and opened for cleaning interior faces of glass. Blinds are raised, lowered, and tilted by a single crank handle. Window (over-all thickness 3/8") opens on vertical or horizontal pivot. Other aluminum windows shown are projected, casement, reversible, and monumental series. Low-and high-rise curtain-wall systems are briefly detailed. Cross-sections, photos. 16 pages. Samson Window Corp., 62-35 30th Ave., Woodside, N.Y. 11377. Circle 208, Readers' Service Card

Guide standards for fire doors and windows cover the use, installation, and maintenance of fire-door assemblies, windows, glass blocks and shutters. This 1966 revised edition of NFPA No. 80, containing material that has been incorporated into numerous building codes, has been developed as a guide to good practice. 80 pages. Price: $1. National Fire Protection Assn., 60 Battery March St., Boston, Mass. 02110.

This photograph was taken right through a mirror

To prove how clearly you can see through Mirropane®, the "see-thru" mirror, we put a piece right over the lens of a camera. Mirropane makes an ideal observation window in a classroom (to the children, it looks like any ordinary mirror). Therapists use it to observe patients' reactions, and storekeepers for detecting shoplifters. You can probably think of a dozen uses for Mirropane for the buildings you're planning. For more facts, phone your L·O·F Distributor or Dealer listed under "Glass" in the Yellow Pages or write:

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A DIVISION OF LIBBEY-OWENS-FORD GLASS COMPANY
82116 L·O·F Building, Toledo, Ohio 43624

On Readers' Service Card, Circle No. 368
tions of finishes, wattages, lenses, etc. 24 pages. Emerson Electric Co., 8100 Florissant Ave., St. Louis, Mo., 63136. Circle 209, Readers' Service Card

FURNISHINGS

Antique ceramic tile for exterior and interior use is described in a color-illustrated four-page brochure. The tiles have smooth or rough surfaces (rough one resembles the pockmarked skin of a baked potato) and a double glaze impervious to weather. Colors seem time-tested (stone wall gray, burgundy red, rust). Sizes listed. Hoganas Ceramic Co., Riverton, N.J. 08077. Circle 210, Readers' Service Card

NuTone's Idea Booklet for kitchen and bathroom planning contains floor plans, sketches, and illustrations. Installations are shown in contemporary and traditional styles for kitchens (equipped with range ovens, dishwashers, disposers, range-hood and exhaust fans, electric heaters, built-in food centers, music-intercoms, etc.) and bathrooms (with "vanitories," gardens etc.). Architects could usefully give this 62-page booklet to clients interested in bathroom and kitchen planning. NuTone, Inc., Cincinnati, Ohio 45227. Circle 211, Readers' Service Card


The Independent Suspension Series of furniture includes various seating units (settee, sofa, armchair) designed by Dave Woods for lounging areas (especially business and public spaces). Pieces with mirror stainless steel frames and up-tilted seats and arched-forward backs suggest a steam-shovel scoop. Six-page brochure includes specifications and photographs showing seating units, armed and armless, in various arrangements. It also presents a companion table. J. G. Furniture Co., Inc., 160 E. 56th St., New York, N.Y. Circle 213, Readers' Service Card

The Service Module System comprises various units (for example, a storage compartment providing outlets for razor, toothbrush, etc.; a dressing area with mirror and light). Designed by George Nelson, they may be surface or door-mounted, as well as built-in. They come in epoxy colors (blue, gray, yellow) or specially treated, moisture-resistant, natural-wood finishes (cherry, walnut, or birch). Interiors are of sheet-
Even at high speed, fork trucks don’t scare the Clark Shock Absorber Door. That’s because they never touch the door itself. URETHANE cushioned steel bumper plates soak up hundreds of thousands of impact openings. Unique, full-length hinges equalize the stress; never tear; never wear out. Neoprene seals on all edges keep out cold drafts and noise. Door comes in complete, easy to install, easy to specify package. FREE 12 page Catalog shows the door you need.

Dept. P-11
69 Myrtle Street,
Cranford, N. J.
Tel. (201) 272-5100

On Readers' Service Card, Circle No. 420

GET YOUR PERSONAL REPRINT OF P/A's OCTOBER "CONCRETE" STORY

A limited number of reprints of the editorial section of the October issue of PROGRESSIVE ARCHITECTURE have been set aside for our readers.

This was the issue that explored the subject of Concrete from top to bottom. It looked in depth at the uses and mis-uses of concrete in office buildings, houses, hospitals, saloons and state capitols. It gave cogent answers to the question: "What is the future for this most promising yet controversial of building materials?"

Comments and critiques on concrete were supplied by experts from all sides of the building industry — architects, designers, engineers and builders.

Get your own personal copy (or copies) at $1.00 each of the October Concrete reprint by checking #450 on the Readers' Service Card at the back of this issue. We'll bill you later.

On Readers' Service Card, Circle No. 450
QUARTZ BEAMS
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More lamp life
More compact fixtures

Are you working on an outdoor lighting job where fixtures should be "heard from," but hardly seen? Where space is at a premium? Where more wallop per pole is a must?

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STONCO
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On Readers' Service Card, Circle No. 405

500W 1000W


Circle 214, Readers' Service Card

Draw-Matic automation allows one to open traverse draperies and similar sliding objects (for instance, plywood doors, maps, and charts) with a flick of a switch. It can be coupled with a time device, incorporated with lights, and geared to radio or solar control. A fold-up brochure discusses and illustrates the unit's various applications and gives specifications. Draw-Matic Engineering Company, 13052 W. McNichols Rd., Detroit, Mich. 48235.

Circle 215, Readers' Service Card

SPECIAL EQUIPMENT

The cross form has had a complex history since the beginnings of Christianity. A detailed brochure illustrates a great number of them, giving the names and a brief comment on the symbolism and history of each. The illustrations may be used as guides for designing, choosing, and ordering a cross from the manufacturer. Traditional Latin, Greek, and French designs are included. There are also contemporary examples.


Circle 216, Readers' Service Card

PROGRESSIVE ARCHITECTURE

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November 1966

50 Filters -- or removable parts
Automatic Water Cleaning -- Daily
Centrifugal Grease Extraction
Requires less air
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Underwriters' Laboratories Inc. Listed National
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On Readers' Service Card, Circle No. 349

86 Manufacturers' Data
Prepare to Meet Thy Future!

By the end of this century, every element involved in shaping our lives and society will have undergone phenomenal changes. Philosophy, religion, science, technology, aesthetics, social sciences—all the factors influencing man and his surroundings are even now in a state of revolution that will completely change the face of the world in the future.

The December issue of PROGRESSIVE ARCHITECTURE will examine all the aspects of the many disciplines that are in this state of flux, and what they might come to mean decades from now. Special attention will be given, of course, to the coming role of the architect—if that is what he will be called—in the altered scheme of things.

If you are not planning to retire into a deep cave and let the rest of the world go hang, the December issue of P/A will be of great significance to you, both as a practitioner and as a member of society. We are excited enough about it to believe that it will be required reading for any thinking architect for some time to come.

To get the December P/A and 11 more far-reaching issues, fill in the subscription order form (see Contents Page for location) and send it in to our circulation department. We hope to continue to make things more exciting, more understandable, and more immediate.
SCHOOLS
POST-TENSIONING ENCOURAGES
DESIGN FLEXIBILITY WITH ECONOMY

School design problems have been solved by many architects and engineers with the Prescon System of post-tensioning for prestressed concrete. Examples near you can be pointed out by a Prescon representative.

The multiple-award winning Estancia High School, Costa Mesa, California, features a “Great Court” surrounded by academic areas all under one roof. The 200,000 square foot roof was a post-tensioned prestressed waffle slab on a 5-foot square module. The waffle slab is 23 3/4” deep using 8” joist stems and 20” deep pans. Spans varied from 25’ to 35’. The roof system was designed for zero deflection under dead load.

Design criteria called for (1) 2,000 student capacity (2) departmentalization (3) flexibility in number, size and organization of departments and teaching stations. All exterior and interior walls are non-bearing demountable throughout the academic areas. Building costs were $1,586.00 per student.


At Bishop College (Dallas, Texas) where all buildings are permanent type, post-tensioning was widely employed. The Prescon System was used in classroom, dormitory and library structures. It contributed to economy in materials, forms and construction speed. (The men’s dormitory was occupied in 8 mos.) The flat campus has slab areas non-bearing demountable throughout the academic areas.

Prescon coated, as well as grouted tendons were used. The library is a 65’x 90’ clear span area; the auditorium has 90’ maximum spans with the balcony framed of post-tensioned cast-in-place concrete to eliminate the need for columns. Architect—Wheeler & Lewis; Structural Engineer—Russ Kostroski; Contractor—Hensel Phelps Construction Co.

The Student Union Building, Southwest Missouri State College, Springfield, is a four-level structure with 55’ clear spans. The second and third floors, and roof have 4” slabs with 61/2” ribs on 3’4” centers. Floor construction depth is 2’7” and 2’11” for the roof.

Field measurement of camber indicated a variance of 1/4”—from a minimum of 3/16” to a maximum of 3/8”. In addition to being more economical than the original design, post-tensioning provided the benefit of creep and shrinkage control. Post-tensioning sealed the slabs so well that water standing on the upper portions showed no moisture evidence on the undersides.

E. D. Mayes, structural engineer, pointed out that among advantages of post-tensioning were: (1) elimination of deflection in the slab to reduce partition placement problems; (2) use of thinner slabs for reduced floor-to-floor height resulting in lower material costs. Flat plates allow easier mechanical distribution, and ceiling finish can be applied directly to under side of slab.

Architect—Donald B. Kleinschmidt; Consulting Engineers—Mayes & Brockett.

A Ft. Morgan, Colorado, school utilized four structural systems, all post-tensioned: (1) two-way waffle slab; (2) one-way joists and one-way zee type sections; (3) folded plates; (4) haunched slabs.

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The arrangement of the subject matter is distinguished by the fact that where materials in a certain construction system have been shown in detail, the methods of estimating quantities of these materials have been included. Questions and answers pertaining to mechanical and electrical equipment of buildings have been added for the benefit of those preparing for the Registered Architect’s examination.

The practical applications of this book within the building construction, cement, building materials, and equipment manufacturing industries are exceptionally broad. Architects, engineers, and builders will find it especially useful as an up-to-date source of ready reference, and for the contractor it can prove a most efficient aid to becoming better acquainted with new methods of construction. In addition, it is highly adaptable for reference use by students of architectural design and mechanical drawing in technical schools and colleges.

September 1965 256 pages 8½" x 10½" $15.00

DEPT. M-327

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On Readers’ Service Card, Circle No. 452

NOVEMBER 1966 P/A
DEVELOPER OF RELOCATABLE BUILDINGS SHOWS SCHOOL BOARDS HOW TO SAVE UP TO ONE-THIRD ON SCHOOL CONSTRUCTION COSTS

One of the big problems school planners face stems from the population explosion itself and is measured by numbers of kids. But size of enrollment is often a simple problem compared to the one of population movement. One family in five moves each year and the resulting enrollment shifts, complicated by consolidation and shifting of school districts for other reasons, have school planners looking more and more seriously at relocatable structures as the most practical answer to the problem.

One leading builder of conventional type schools, the Vinnell Steel Co., of Oakland, Calif. 94623, has developed a modular school concept which successfully combines the mobility of a relocatable unit with the aesthetics, economics and permanence features of a conventional structure built on site.

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“Contrary to popular opinion, the creative process is ultimately highly impersonal. The urban designer-architect, painter, and sculptor must direct his inner vision toward those problems and opportunities of an age, and drive toward those essences which differentiate one epoch from another in order to render it simultaneously timeless and of its time. Any artist is merely an instrument who senses the drive of an age, and helps translate them into an environment which serves everyone.”

PAUL RUDOLPH
Fine art, one often forgets, is a recent invention. Throughout most of the history of mankind, art for art's sake was a nonexistent concept. Then, a breed of people was born who started producing useless objects called "works of art," which were usually destined to be hidden in a new and questionable building type called "museums."

This rather inane system is supported today by a powerful coterie of fine art worshippers consisting of: gallery owners and museum directors who do not wish to kill the goose while she keeps on laying such big eggs; wealthy collectors whose dignified hobby makes them even wealthier; artists themselves, whose egos hanker for quick fame and riches; and much of the public at large, which has been brainwashed into accepting the idea that art is culture and does not realize that when culture is dissociated from everyday life it becomes merely a fetish and not culture at all.

Before fine art was born, all art served a utilitarian purpose and an artist was merely a talented craftsman—a scribe who illuminated manuscripts, a mason who carved ornaments for buildings, a metal worker who decided to give an iron hinge a more fancy shape. Even painting and sculpture were not for art's sake but a means of communication and enlightenment. The purpose of statuary, murals, and similar "artistic" endeavors was to tell a story, usually of the past for the edification of the living, or of the present for the education of future generations. Those craftsmen who managed to evoke sensory response from the making of everyday objects, or from the telling of stories, we nowadays call artists.

Artists, then, were traditionally a part of a civilization, never apart from it. Through aesthetic means, using available technology, they interpreted the life around them. Because of highly developed sensitivities, they were able, by appealing to sensory perceptions, to make others aware of the aesthetic possibilities of an age: They told their generation what is, and, sometimes, what could be.

Recent developments in art indicate that perhaps we are at the beginning of the end of the whole perverse fine art idea, because two important trends are evident: an interest in present-day technology such as plastic paints, electronic components, neon lighting, even discarded industrial junk; and a preoccupation with contemporary environment loudly proclaimed in Pop art, typified by the now famous painting of a Campbell's soup can. These trends suggest that the new generation of artists is attempting to re-enter the mainstream of life. Instead of escaping reality, they seem to be saying: "This is what we have. Let's make something of it!" Which is really the traditional call of artists.

Unfortunately, the results of their efforts are still considered "objects of art." Yet my hope is that the next stage of this development will lead to a situation where a man who now assembles a few neon tubes, calls it sculpture, exhibits it in an art gallery, and sells it to a museum for its collection or to a millionaire to serve as a status symbol for his living room, will someday simply work for a neon-sign manufacturer and design neon signs. This is what he should be doing. Perhaps there is less glory and less money in designing commercial signs rather than concocting something called "sculpture," but it is the only way that art can return to where it belongs—on the streets, part of everyday life.

Viewed in this light, the strange goings-on in the art world today might lead eventually to a most desirable end: the death of fine art and the rebirth of art.

And how about architecture, since, in spite of its nearly always utilitarian purpose, architecture is also classified as one of the fine arts? Surely, with the death of fine art, architects, when they play the part of artists, will no longer be allowed to escape the artists' role of interpreting the present and setting the stage for the future. To be capable of doing this, architects must understand the forces of our time and the direction into which these forces are taking us—a subject to which the next issue of P/A will be devoted.
“Many projects today are so large and complex they cannot be solved with a simple box set down on a site. At this scale a building must become a city, articulate, with an inner excitement of its own; and the traditional division between structure and site disappears: The building is the site, as at Mont-Saint-Michel or Carcassonne.”
KENNETH DEMAY

CUTTING THE SLAB DOWN TO SIZE
Two recent projects—Marine Family Housing and the Engineering Sciences Center at the University of Colorado—developed from simple cerebral slabs to multiunit, multisensory complexes.

The final designs make a shameless play for the senses. They beguile the visitor, draw him in, and guide him—Dante-like—through a whole series of experiences: hot-cold, dark-light, high-low, outside-inside spaces. The façades and masses change constantly and stage shifting plays of light, shadow, and texture. They intrigue on all levels to captivate attention.

Both projects started out (in the preliminary design stages) as simple slabs and ended up as complex compounds. The metamorphosis is an interesting example of the current tug of war between two architectural philosophies. For want of better labels, one side could be called the "monumentalists," the other, the "environmentalists." The first, following in the footsteps of Mies, finds its inspiration in a preconception, in the supreme prototype, the ideal container—usually a rectangle, a slab. The latter group (still in the process of establishing its leaders), looks for its creative sources in a wide range of specific data: gleamed from the site, the program, the senses, the emotions, as well as the intellect. The Miesians are inclined to look at architecture as a monument in open space, as an exercise in façade design, graphic refinement, and in skillfully fitting all the problems into a single serene container. The style has had a great following: It is neat, cheap, and easy to construct. It has almost become habit. The environmentalists, on the other hand, favor letting functions express themselves; they prefer to knit together tightly the building and the site, and play on a whole range of human perceptions with a wide array of architectural tools—not simply façade design, but massing, assemblage, interweaving of space and mass. The environment, climate, and surrounding architecture influence the design. The finished product is somewhat unpredictable in its effect. Unlike in Miesian or post-Miesian boxes, the other three sides are not mirror-images of the first. The architect cannot completely foresee how all the masses will play against one another, how patterns will change in the sunlight. It is not an immutable perfection, but designed for change and for growth.

The development of the two projects at the University grew out of an architectural team heavily oriented toward the environmental concept of design. Five years ago, the University retained Sasaki, Walker & Associates, Inc. (now Sasaki, Dawson, DeMay Associates, Inc.) to do a site plan for the expanding campus. The older area had been largely designed by Charles Klauder, who initiated it in 1918 with his own ingenious version of Italian Rural architecture, which he thought more appropriate to the site than the then-current rage for Collegiate Gothic. His solid, simple masses with slanting tile roofs were arranged around courtyards. They formed a bold counterpoint to the backdrop of the Rockies, and the foreground of the plains. His style was later continued—and exhausted—by one architectural film. Both the new site planners and the administration agreed that, in order to infuse new vitality into the campus, it would be wise to hire different architects for each new project. However, they wished to continue the spirit, if not the precise style, of the old campus. Unlike some universities that can tolerate a wide variety of styles within a variegated urban campus, the University of Colorado has a distinct character, in a fairly open setting. So, in order to maintain control over the new additions, two design consultants were named to review all projects: the Sasaki office and Pietro Belluschi.

The resulting schemes evolved out of a dialogue between the two protagonists: architects and design consultants. It is quite clear from the results which side came out the winner. But perhaps more important are the arguments, the statements that clarify the position of a new architectural philosophy that has emerged in the last five years. It is an architecture that is sensuous, expressive, that favors surprise as against the expected, that is rooted in the specifics of its environment rather than in idealized preconceptions.
Marine Family Housing

Architects: Moore & Bush, Pietro Belluschi and Sasaki, Dawson, DeMay Associates, Inc., Design Consultants. Program: 80 two-bedroom, 50 one-bedroom apartments for married students. Site: Restricted area adjacent to playfield and existing married student housing. Design Solution: See text at right. Cost: Original budget was set at $10,000 per apartment; final costs came in at roughly $11,492, including site work. This was well within the total budget, which included the contingency funds. Consultants: Sasaki, Dawson, DeMay Associates, Inc., Site Planners, Landscape Architects; Edward R. Bierback, Structural Engineer; Francis E. Stark, Mechanical Engineer; Swanson, Rink & Associates, Electrical Engineers. Photography: Maude Dorr.

Engineering Sciences Center

Architects: Architectural Associates Colorado: William C. Muchow Associates; Hobart D. Wagener & Associates; Fisher and Davis; William C. Muchow, Partner in Charge. Pietro Belluschi and Sasaki, Dawson, DeMay Associates, Inc., Design Consultants. Program: Provide laboratories, classrooms, and faculty offices for five engineering departments of the University: Chemical, Civil, Electrical, Mechanical, and Aero-Engineering. Total square footage—263,000. Site: A 500 x 600 sq ft lot at the edge of the University campus. Building had to tie into classroom area to the west, and be able to expand to the east. Entrance should continue mall from older campus. Size of the new complex was to be balanced by open playing field to the west. Architects were to design the site to fit in with the scale of the existing campus, even though densities were far greater. Design Solution: See text at right. Cost: $13.03 per sq ft, without equipment. Final design came in at $1 million under original estimate, so that the University got an extra lab—the chemistry one—for “free.” Consultants: Sasaki, Dawson, DeMay Associates, Inc., Site Planners, Landscape Architects; Ketchum & Konkel, Structural Engineers; Swanson, Rink & Associates, Electrical Engineers. Photography, except as noted: Morley Baer.

Preliminary Proposals:
The Slab

Preliminary designs draw the comment from DeMay that “they look like Hilton Hotels; they could have been anywhere.” Sasaki’s suggestion: “In such a large program, one should probably not try to contain such diverse parts in one or two envelopes. Let diversity be articulated, in response not only to the program but also to the region and the environment. The resultant buildings should be expressive and distinctive in character but also harmonize with the rest of the campus.” At this point, the rectangular containers were a wrapping around programs that had not begun to be explored.
Alternative Solution: Fragmentation

A complex interweaving of mass and open space is sketched out by DeKay for both Engineering Center and housing. In each case, individual functions are freed from monolithic container. Labs, offices, etc., take on their proper dimensions, then are assembled into a composition. Housing is split up into two-, four-, five-, and six-story buildings. Unlike the original campus plan by Klauder, buildings are not separate units, but continuous masses that wrap around the open spaces. The additive assemble qualities of the complexes will permit them to grow without harming the original composition.

The general massing of the Engineering complex rises to a climax in the center, reflecting the form of the mountains behind. Classrooms and labs are on outside; offices are stacked in towers at center.
In the Marine Family Housing, space flows between buildings, widening, narrowing, varying in surfacing, size, and activity.

Precast concrete floors between units are for sound containment. Concrete block walls filled with sand separate adjacent apartments. Exposed 4 x 10 wood beams 3 ft. O.C. support 2-in. tongue and groove decking covered with 3/8-in. plywood and resilient tile on intermediate floors of all duplexes.

Entrance to the complex is between taller units that cut off parking lot from court area. In one court, fathers roll out the barbecue pits onto the pavement, kids circle on tricycles, mothers keep track of their infants from the doorway. In another space, two boys dig themselves into a sandpit; on the periphery, small laundry sheds and pebbled drying lots wait for washing day.
"This is not what you expect a science complex to be. You expect a clean, cold world, and all of a sudden there is green inside."
A fountain, in the southern court acts as a magnet. "People are naturally drawn toward water, walls, and light," DeMay continues; "these are strong but almost instinctive ingredients in the architect's vocabulary."
...The north court (left) is secondary to the southern one, and visited later; it has no fountain and from the main entry staircase to the west, it is concealed by a bank of elevators. From either court, a student is led to a low, dark space surrounding a second fountain, with rough, turbulent waters. From here, he exits to the east, into sunshine, brilliance—and parking.
"The hundreds of laboratories take on a fantastic variety of shapes. If we could somehow express this in a wall construction, some of this vitality might come through to the exterior."

The unity and excitement of the complex comes from an ordered but expressive functionalism. The basic structure is a core-in-place concrete frame with masonry infilling; stone on the exterior, concrete block on the interior. The regular rhythm of the buildings is established by the exposed concrete frame and the predominant 20' x 20' bays. Variety comes with the exceptions:

- 20' x 20' bays for labs requiring long spans,
- 20' x 10' bays for corridors,
- Stone infilling and concrete bands add textural interest.

The functional order is also expressed by assigning different window shapes to various areas. Square windows in halls and stairways; long horizontal slits, bathrooms; narrow vertical ones, offices; large apertures, laboratories or corridors.
Mechanical system in the laboratories is independent of that for the entire structure, and left exposed so that it can be readily changed should the necessity arise. Connectors in the corridors (right) form balustrade along windows.
"The laboratories are introverted; it is the equipment that's important and dictates the character of the interior. Sometimes it's fragile, delicate as in the chemistry lab, sometimes it's rough, tough."

The final building is tough and sensual. As one passing architectural critic commented, "It's a building born to have a love affair with Yamazaki." One criticism with both complexes is that DeMay possibly did not push their strength far enough. His clear-cut, rather bold style is apparent in the forthright volumetric character of the complexes, the careful proportions and scaling of the façades, and the obvious delight in playing upon a whole range of tactile and spatial senses. He has caught the spirit of the campus without the need for such literary references as the tile roofs, which seem inadequate in scale to complete such a complex. Local critics and college alumni who have written letters are divided in their reactions to the Engineering Center. Some, on the one hand, object to its brutality and state that it resembles a granary, a factory. At the same time, they acknowledge that it is profoundly human. "It is a campus within a campus," says the alumni journal editor, Russ Olin. "One fountain is a gushing geyser type that permits one to sit beside it and lose oneself in the noise of the water and the hypnotic dance of the spouting columns of water. The other provides the best opportunity for quiet contemplation as the water gurgles over the center and flows out evenly over a spout on all four sides of the perfectly level table that forms the pedestal for the fountain." DeMay has apparently been successful in making the building and spaces provocative, in making them alive.

"I am particularly intrigued," writes a visiting alumna, Nancy Hawkins, "with the play of shadow on shadow. It would be interesting to make a study of the east and west faces as they are affected by early morning, late morning, early and late afternoon light conditions. I feel it is a building which would breathe in a study of this kind, but, unfortunately, I was not in Boulder long enough to study it." There is no plainer tribute to a building than that the visitor does not want to leave.
A new building type, not yet visible in the townscape, has been in the developmental stage for many years. Precedents for the Community Mental Health Center go back several decades, but it was not until President John F. Kennedy’s Administration that these facilities received nationwide attention, specific definition, and substantial Federal funds. Under Public Law 88-164, passed by Congress in October 1963, $150 million was authorized for use by the states in the period from 1965-1967, the total broken down into annual appropriations of $35 million, $50 million, and $65 million.

John Kennedy was the first President to address himself with conviction to the problems of the mentally ill. In the historic message of February 5, 1963, he called for “a bold new approach” to the twin problems of mental illness and mental retardation. “Central to a new mental health program,” Kennedy stated, “is comprehensive community care. Merely pouring Federal funds into a continuation of the outmoded type of institutional care which now prevails would make little difference. We need a new type of health facility, one which will return mental health care to the mainstream of American medicine, and at the same time upgrade mental health services.” In describing the new kind of facility, President Kennedy noted, “While the essential concept of the comprehensive community mental health center is new, the separate elements which would be combined in it are presently found in many communities.” (Although first authoritatively commended to Congress in 1963, the Kennedy proposals derived from a report presented to Congress in early 1961, a report that in turn grew out of the Mental Health Study Act of 1955.)

What is a community mental health center? As defined by Public Law 88-164 (Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963), it is not necessarily a new or a separate building. It may be a wing added to a general hospital or a clinic, or to another mental health facility in the community. Essentially, the center comprises a varied program of mental health services in the community, housed in one or more facilities, under a coordinated system of care. Through the center’s varied range of services, a patient will find the type of care he needs when he needs it, as close to his home as possible. He can transfer easily from one method of treatment to another as his needs change, and the clinical data obtained in one phase of treatment can similarly be transferred. Also, whenever practicable, those responsible for his care in one element can continue responsibility in the succeeding. This “continuity of care” makes possible the best care, according to current psychiatric thinking.

To qualify for Federal funds, a center must provide at least five essential services: (1) in-patient, or 24-hour, care; (2) out-patient care; (3) partial hospitalization, i.e., day-care for patients able to return home overnight, and night care for patients able to go to work; (4) emergency care, on a 24-hour basis; and (5) consultation and education for community agencies and professional people. To be fully comprehensive, five additional services should be included: (6) diagnostic; (7) rehabilitative, both social and vocational; (8) pre-care and after-care; (9) training of personnel; and (10) research into mental illness, and evaluation of treatment.

This definition of the community mental health center, as spelled out in the 1963 legislation, is only a formalization of concepts that have been developing over the years. (The term has indeed been used before, particularly by out-patient clinics; but, with the new Federal regulations, the term is likely to apply to those facilities having at least the five essential services.) According to Bertram S. Brown, M.D., Chief of the Community Mental Health Facilities Branch of the National Institute of Mental Health, the concept is “a clear and direct result of most of the recent developmental trends within the mental health field, both in this country and abroad.” He cites the vast increase, since the late 1940’s, in community-based out-patient clinics, the similar increase of psychiatric units in general hospitals, and the growth of a variety of new local services that provide less than a full 24 hours of in-patient treatment—the day-care or night-care programs, for instance, that are only feasible if located close to the patient’s home. Two additional developments in treatment have had an effect: the use of tranquilizers and similar drugs has made the center concept more attainable, and the close involvement of the patient’s family in the program of treatment has made local treatment more desirable.

If this new approach breaks down the isolation under which a patient was for-
merly treated by preventing his dislocation from familiar surroundings, it also decreases isolation in another sense, too. Even when communities have had highly developed mental health services, individual agencies have tended to operate in isolation, and there have consequently been serious gaps in service. "It cannot be overemphasized that the community mental health center movement seeks to accomplish comprehensive services not by duplicating or replacing existing services, but rather by coordinating and improving what now exists and filling in the gaps." 1

To insure that new facilities fit into a coordinated plan, the act requires that each state make an inventory of its existing facilities and needs. These state plans delineate areas for purpose of priority, and indicate probate sites for centers. Once the state plan is approved by the U.S. Public Health Service, any public or private nonprofit organization in the state may apply for Federal assistance in meeting construction costs of a community mental health center. (The word "community" applies to areas of not less than 75,000 and not more than 200,000 persons. Smaller localities can join together to form a "community.") Federal participation varies from one-third to two-thirds of the cost of construction. Funds available to each state are based on population and financial need. The act further requires the designation of a single state agency to administer the state plan. Each local project is submitted through this state agency, for approval by the Community Mental Health Facilities Branch of NIMH in Bethesda, Md. Actually, Congress delegated two agencies to share in administering the CMHC program. NIMH is concerned with programming (the type and arrangement of spaces); the Hill-Burton Agency is concerned with actual construction (safety codes, materials, etc.).

Architectural consultant to the NIMH is Clyde H. Dorsett, the first architect to be hired by this agency in its 20-year history. Dorsett has a master's degree in architecture from Columbia University, where he specialized in the planning and design of hospital and public health facilities. His job involves the evaluation and approval of all mental health centers submitted for Federal funding under Public Law 88-164. As one of the writers of the law's regulations, Dorsett has made it obligatory that architectural design be submitted in three stages, the earliest of which includes schematic drawings. This has never been done before in Federal procedures. The programming of the facility, based on the specific needs of the community, is an all-important step in the design process, Dorsett feels, and every effort must be made to see that the facility is the best one from everyone's point of view. Communication between architects and mental health people is crucial to successful programming; early communication and a vigorous dialog will help to dispel the misconceptions and preconceptions with which each group views the work and goals of the other.

To spur such communication between architects and psychiatrists, NIMH sponsored the third Rice Fete, held last year at Rice Institute. Over a two-week period, six collaborating teams of architects and psychiatrists gave more than their usual energies to the formulation and solution of six mental health centers. These solutions, and the thinking behind them, will be published by NIMH as Volume II of an exceptionally handsome series. Volume I, recently published, is Planning, Programming and Design for the Community Mental Health Center, a case study of a center at San Francisco General Hospital. (Drawing on previous page is from this publication.) Volume III will provide guidelines for the design of a community mental health center, using data developed at the University of Utah.2

Dorsett hopes to expand the architectural consulting and research aspects of NIMH along many lines. Among the most interesting proposals are these:

- coordination of a national committee comprised of architects and mental health specialists who will serve in an advisory capacity to NIMH and to community representatives in their own locales;
- endorsement and/or sponsorship of a graduate training program in interdisciplinary studies on any aspect of psychiatric programming and architectural programming and design, including environmental design considerations for other building types with reference to perceptual and psychological environment;
- promotion of architectural concepts to mental health specialists (the nature and value of architectural services);
- an evaluative clearing house for mental health and architectural research reports;
- maintenance of interprofessional bibliography;
- establishment of a student program (architectural and mental health) in which students assist in liaison for reporting purposes between institutional and academic projects, thus involving them in research techniques, documentation, and communication;
- continuation of support of architectural research: definition of problem areas, impact of technology, use of electronics, etc.;
- development of "mental health atlas" conceptual systems, utilizing graphic concepts for portraying information input and retrieval in terms of real time, real distance, and services available.

One of the biggest concerns of this agency, however, is to see that the money already authorized is spent for services that are most needed and for facilities that will best provide them. Four of the projects already approved are presented on the following pages.—EPB

1 The Community Mental Health Center: An Analysis of Existing Models, 1964, a publication of The Joint Information Service of the American Psychiatric Association for Mental Health, available at $3 from The Joint Information Service, 1700 16th St., N.W., Washington, D.C., 20009.

2 Volume I is $8; Volume II, to be published next month, will be $12; Volume III, forthcoming in early '67, will be $5. Volumes may be purchased singly, or as a $20 package, from Mental Health Materials Center, 104 E. 25 St., New York, N. Y., 10010.
The architects for this project, Kaplan & McLaughlin, have perhaps the most extensive experience in creating this new building type; to date, they have designed five mental health centers. Their first, at San Francisco General Hospital, is the subject of the recent report, *The Planning, Programming and Design for the Community Mental Health Center* (see p. 132).

In this comprehensive study, they outline design considerations, based on mental health therapy, which seem to be commonly agreed upon by architects: the first is order, "the proper separation of parts and the differing visual expression to the various parts of the building"; the second, clarity of form and space—since the patient is easily confused, "he should be able to sense where he is and be able to go from one part of the CMHC to another without difficulty"; next, scale, flexibility—"a change in program may occur and new and different space demands will accompany it"; and lastly, integration with the community, and security—visual security of staff over patients, plus a feeling of security on the part of patients.

These standards are in evidence in the community mental health center at Marin General Hospital. It will offer all elements of a comprehensive unit (concentrating on the five essentials); it will have 28 adult in-patient beds and accommodations for 52 day-care patients, but no in-patient and partial hospitalization facilities for children.

Because of the hilly site, the mental health center will be a self-contained wing.
added to the existing general hospital; it is positioned in a natural depression between two 90-ft-high hills to minimize cut and fill, retain existing oak trees, and provide maximum usable outdoor areas and maximum views.

The resulting scheme is a horizontal, two-level one, which seems to sprout out of the terraced terrain surrounding it, and is connected to the hospital by a bridge (from the upper level of the center to the lower level of the hospital). While this is an unusual ordering of spaces, the design is very much in keeping with a logical division of functions. Out-patient, consultation, planning, and administrative services are housed on the lower level, while in-patient and partial-hospitalization facilities are housed on the upper level.

To insure patient-staff continuity, the in-patient and partial-hospitalization rooms are combined. Thus, when patients move from one stage of mental health care to the other, they remain in the same treatment group. There are to be two treatment groups, each with their own patient nucleus, and each occupying one of the upper-level projections (see floor plan). The plan connects the two projections, providing an area where some facilities may be shared, and also providing easy access for nighttime staff members to supervise patients in both treatment groups. Shared facilities include the secretarial pool, the clinical director's office, and the staff library.

Each projection is designed so that the living and dining area is at the very center of the treatment unit, thus becoming the focal point of corridor activity. As Ellis Kaplan, one of the architects, explains, this placement "mirrors the importance given to treating the patient as part of a group in a clearly defined environment."

The plan also enables the staff to have easy physical and visual control over the area, and eliminates the long closed corridor of many mental institutions. (The architects feel that CMHC's should not resemble hospitals, but, then, they feel that hospitals in general should not look like hospitals.)

Maximum flexibility in the center was sought for reasons of accommodating possible changes in program and allowing moderate expansion. Thus, there are multipurpose rooms, suited to many different activities, which can also be converted into bedrooms, offices, or conference rooms. Physical expansion is possible but is limited by the need to maintain the logic of the scheme and to avoid cutting too deeply into the terrain. Realizing that the population of Marin County is growing, there is a master plan to build another CMHC in the northern part of the county, and a children's community mental health center in the central part. This facility should therefore eventually be serving only the southern section of Marin County, with a predicted possible population of only 125,000, as compared to the present catchment area population of 185,000.

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Terrace on upper level.

Lounge area for patients.
COURTYARD COMPLEX

CHILD AND ADULT MENTAL HEALTH CENTER, Youngstown, Ohio. Architect: P. Arthur D'Orazio; Anthony Joy, Project Designer. Site: Some 5½ acres of a 30-acre urban renewal tract adjacent to the downtown area. Tract will contain the Health Center Complex, a community service complex including St. Elizabeth's Hospital, the center under construction, and related facilities. Cost: Approximately $782,825; $19.57 per sq ft. Structural System: Precast concrete frame, slab floors and roofs. Materials: Foundation walls of cast-in-place concrete; interior walls, vinyl-covered gypsumboard panels on movable partition system. Floors are vinyl-asbestos tile or carpet; ceilings are exposed concrete slab. Construction Schedule: To be completed by fall of 1968.

Architect P. Arthur D'Orazio worked almost two years with the Child Guidance Clinic, the Adult Mental Health Clinic, and the Mental Health Association in Youngstown to evolve a coordinated program for the mental health center in which all three agencies are to be housed. Although the services of each are to be expanded, the Child and Adult Mental Health Center will have no in-patient program; instead, an in-patient program coordinated with the center is to be provided at a nearby hospital.

The resulting design solution allows each of the three main units to occupy separately defined portions of the building.

The courtyards—there will be at least one per section—are integrated into the scheme; in fact, the main entrance to the center itself is through a courtyard. The adult wing has two courtyards, one of which is an area for waiting and informal therapy, the other, for adult day-care and therapy. On the other side of the building, the children also have their own courtyard, as well as their own enclosed two-story playroom. (Adults will be able to use a multipurpose two-story room for indoor group activity, situated directly behind the admissions area.)

The design is a clear, well-ordered, and simple arrangement of spaces corresponding well to the functions they will perform. The courtyards are focal points for the treatment units so that interaction among patients themselves, as well as between patients and staff is encouraged, and visual surveillance on the part of the staff is facilitated. The patient will be able to orient himself easily, and the scale is in keeping with the goal of creating a therapeutic environment devoid of institutional overtones, where a patient may be treated on a personal, intimate basis, whether individually or as part of a group.

Early rendering of children's playroom.
The Maimonides Hospital of Brooklyn Community Mental Health Center will offer the full range of services of a comprehensive center to a catchment area of approximately 180,000. The population for the most part consists of working-class and middle-class people, few of whom can afford extensive psychiatric care on a self-paying basis. Although no extensive study has been made of the prevalence of mental illness in this area, response to Maimonides Hospital’s present limited program of out-patient care and community consultation service shows a need for expanded facilities. Furthermore, in the local area, there is almost no other mental health or psychiatric facility to serve the population.

The consulting architects, led by James F. Farrow, an associate at Caudill, Rowlett, Scott, and the staff of the center worked closely throughout the planning stages. They were concerned with the image the building would present to the outside world, as well as the feeling it would convey to the patients and staff inside. From the exterior, architects and staff wanted the building to be a departure from anything resembling a hospital; they wanted the center to blend in with the scale and character of the neighborhood. Since the surrounding buildings are five- or six-story structures of dark red brick or wood, with arched entrances, Caudill, Rowlett, Scott suggested picking up these characteristics and breaking up the massing to continue a residential scale.

For the interior, they wanted a physical environment to foster a therapeutic atmosphere; physical dimensions were not to impose harsh demands on the patients’ distorted perceptions. The architects and
staff would have preferred a horizontal plan for the center: first, for the spatial flow necessary in promoting the socialization and interaction that is an important goal of modern "milieu" therapy; second, for a more intimate human scale and freer accessibility. However, site limitation (100' x 160') and zoning regulations (ground floor could only be a maximum of 10,000 sq ft) necessitated a vertical stacking arrangement.

In the four-story center, space limitations prompted a simple organization of functions by floor. Thus, in-patient (25 beds) and night-patient (16 beds) are located on the top floor, with activity and some office/treatment rooms on the third floor; the rest of the office/treatment rooms on the second floor, and administrative offices on the ground floor. The outpatient and day-care child psychiatry unit will also be located on the ground floor, so that children will have immediate access to their own play area. Some services occupy basement space (psychiatric rehabilitation, psychiatric research, and audio-visual control).

Regulations require that corridors be uninterrupted from one end of the building to the other, and clearly defined. In an effort to break up the resulting tunnel-like space, as well as insure spatial flow and flexibility wherever possible, the architects decided to widen the corridor at intervals into open lounge, secretarial, and waiting areas (diagram left). Bedrooms
and offices are grouped around these spaces, forming small enclaves for gatherings of people. Offices are arranged according to treatment group—that is, rather than grouping all the social workers together, all psychiatrists together, etc., offices are grouped on an interdisciplinary basis. Thus, a cohesive unit is formed, furthering interaction between staff members themselves, as well as between staff and patients.
THE GUIDANCE CENTER, Daytona Beach, Fla.
Architects: Tye & Mitchell. Site: Lot in residential neighborhood, adjacent to elementary school, and four blocks from hospital.
Cost: Approximately $310,550; $13 per sq ft (average cost for local office space). Structural System: Masonry and wood frame support for one-story units; formed and cast-in-place concrete frame for two-story unit. Materials: Exterior walls are textured stucco on treated masonry; roof, asphalt shingles on timber frame; interior walls are plaster and wood paneling in one-story units, exposed masonry (frame walls plastered) in two-story unit. Floors are terrazzo on concrete slab; ceilings, plaster, and acoustical tile. Construction Schedule: Completion by January 1967.

Speaking of the Guidance Center at Daytona Beach, one of its architects, James Mitchell, commented, "It is hoped and anticipated that the Guidance Center will be accepted in the community just as is the neighborhood drugstore, grammar school, or post office." In order to depart from the "mental asylum" stereotype (thereby encouraging its use by the catchment population of 142,000), the architects and staff thought it best to do away with any traces of a hospital setting. Thus, the Guidance Center will have no sleeping accommodations. It will provide an outpatient program, daytime partial hospi-
talization, plus diagnostic, consultation, education, and pre-care and after-care services. (A training program will be added at a later date.)

Consequently, four blocks away at Halifax General Hospital, a one-story, 50-bed in-patient and 24-hour emergency unit is being constructed to supplement the services of the Guidance Center (design is by W. R. Gomon & Associates). The two sections will be closely integrated to insure continuous care for their patients, with a coordinating committee from the hospital and mental health center overseeing proper flow of staff, patients, and records. Together, these two sections comprise the community mental health center at Daytona Beach.

The design of the Guidance Center is in line with the thinking behind the program: remembering the monolithic structures meshed with tiny cubicles and long narrow corridors of the usual mental institution, the architects decided to cluster small pavilions together to house the various functions. While recalling those clusters of bungalows found along U.S. highways in the pre-motel era, these units nevertheless retain the residential scale of the neighborhood, with each pavilion enjoying its own exterior spaces.

The smaller modular pavilions are ordinarily divided into four large rooms, each of which may be used as a staff office and therapy/consultation area. Wood paneling, carpeting, and furnishings further the "living-room" look.

All the units are single-story, except the day-care center, where space requirements and the lack of over-all site space necessitated two floors. The first floor of this pavilion is a large multipurpose room, which can be converted into four small rooms partitioned by movable walls. On the second level are patient and staff facilities: an auditorium, with professional library, photo lab, music listening rooms, craft and other activity rooms at the perimeter. A swimming pool for patients and staff is located beyond the single-story kitchen/dining wing of the day-care center.

This scheme would probably not work well for in-patients: The assortment of bungalows might confuse and disorient the patient; interaction might be impaired, since spatial flow occurs only on the exterior, from one pavilion to the next. Nevertheless, the plan would seem to work well with day- and out-patients who are able to proceed from their homes in the outside world to the bungalows in the treatment center without feeling a profound change in milieu.
Since the time P/A published "Domesticating Glass Walls"—a review of basic criteria for designing methods of covering windows (p. 148, October 1961 P/A)—traverse draperies and venetian blinds have remained the most common type of window treatment: the former, in residential installations; the latter, in "contract" work. However, the most imaginative of our architects continue to invent new methods to meet the specific requirements of their buildings. From Philip Johnson's ingenious tinsel techniques (p. 196, March 1965 P/A), to Paul Rudolph's controversial, brutal cargo nets (p. 127, February 1964 P/A), innovational window coverings do show themselves as a serious architectural problem for the thorough architect. The sober, if less spectacular, examples on the following pages make that clear. Furthermore, in the past few years, several commercial developments have broadened the possibilities of window treatments; among them are the narrow-slatted venetian blind, which is more transparent, and the venetian blind that lowers its entire header mechanism to provide a view at the top of the window, while providing privacy at the lower portion. In this same period, the still available metal mesh drapery seems to have been unexplainedly slighted.

A new question about choice of window covering now is: Where should it be—inside or outside? Exterior elements such as an exposed structural frame, structural louvers, or other screening materials are permanent architectural window treatments. Inside, the choices also include shades and vertical blinds, all with several methods of closure—vertical, horizontal, or both. Now, a third area has opened as a possibility for covering the window—that middle ground between inside and outside—the window itself, which can have integral "coverings."

Basically, the critical decision in the choice of window treatment is to find the factor that is most important to the particular installation: economics, light, view, privacy, insulation, light diffusion, acoustical control, or aesthetic appearance. Next, the designer should distinguish between two approaches toward achieving the delicate balance between openness and view, on the one hand, and insulation and privacy, on the other. One approach depends on emphasizing the method of closure; the other is based on the density of the fabric employed.

The following article, based on research provided by John F. Ferger of Owens-Corning Fiberglas Corporation, provides a checklist of factors and criteria for choosing window treatments, and serves as a point of departure toward the invention of new methods of covering windows.

The increasing use of large expanses of glass in modern construction has brought one architectural and interior design problem into more prominent focus: how to cover the glass wall. For buildings as unique as Saarinen's TWA terminal, and for those as classic as the variations on the Miesian theme, selection of uniform window coverings is a primary requirement of the architect and his client.

The most obvious reason for uniform selection—obvious to the professional and layman alike—is appearance. The view from both inside and outside a building may be seriously damaged by haphazard selection on the part of individual occupants: venetian blinds (some up, some down) next to draperies (of all colors and types; some open, some closed) and adjacent to shades (up or down)—in short, a war of vertical and horizontal elements that is disastrous to a uniform architectural envelope.

Yet each type of window covering must be weighed against functional and economic requirements as well as against aesthetic characteristics. Detailed factors of economics are: initial costs, installation costs, maintenance costs, air-conditioning and sound-control costs, the price of heat and light control. Physical requirements for controlling the newly available, wide viewing walls include: working or living conditions; atmosphere; ease of handling coverings in relation to window opening; mechanical equipment in the window area; natural and artificial light requirements; privacy requirements; glare con-

Probber Chain-Mail drapery, the latest of the indestructible metal window covering materials, is a mesh of "spiders" interlinked with loops—like that used for ladies' evening bags but in lightweight aluminum and therefore larger scale. This satin-finished aluminum mesh, from Harvey Probber Showrooms, Inc., is used by Paul Rudolph in the first of his buildings for Southern Massachusetts Technical Institute (facing page), exposing the different and equally handsome reverse to the outside. The potential seems great: in the future, will metal draperies be hooked up as radiators to heating systems?
interior function.

interior function
In the process of specifying window coverings, the first consideration must be the function of the building itself, for the factors and criteria are different for each type of building and often for each different interior. In an office building, for example, factors such as working conditions, light control, maintenance, air-conditioning and heating costs are of more immediate interest than those of privacy or decorative quality, which would appeal to an apartment-house tenant. Labor costs—in installation and maintenance—are working information to corporate tenants, but of lesser concern to residential tenants. Schools and hospitals have more specific, and more acute, criteria, which make enormous demands on the versatility of a uniform window treatment. Some structures, naturally, by peculiarities in function or construction, would obviate any choice of window treatment whatsoever.

economics
The first area of direct comparison is economics. (The accompanying charts document the basic cost considerations.) In a speculative building by an irresponsible builder, the choice would predictably fall to a window covering with the lowest initial cost, since replacement costs would not be considered.

Long-term financial factors, otherwise, are revealing. The window covering with the most expensive initial cost is open to debate: The decision is between the vertical blind and the traverse drapery. The latter, it is widely admitted, can involve almost twice the installation cost of venetian blinds. Conversely, due to higher maintenance costs of venetian blinds, it is thought by some that traverse draperies will be less expensive as a long-term investment. Frequent dusting and washing of venetian blinds is said to offset initial costs. With maintenance service supplied on contract, as in many office buildings with multiple tenants, this factor, of course, becomes dependent upon draperies made of a durable fabric.

insulation
A more complex (and more variable) economic condition is the cost of air-conditioning and heating, since there are enormous differences in the insulatory properties of different window coverings.

For example, in one office-building installation containing 57,600 sq ft of glass (77 per cent of the wall area), the initial costs of cooling equipment were found to be 25 per cent higher with venetian blinds than with draperies of a very dense glassfiber casement cloth. This fact was laid to the great insulating efficiency of the glass fiber.

Practical, in-use factors also affect the insulating efficiency of window coverings, Shades, for example, still widely used in residential installations and often specified for schools because of budget, ease of operation, and flexibility, generally are up during daylight hours and therefore provide no insulation advantages.

Solar heat gain, as opposed to climatic heat conditions, also affect heating and air-conditioning costs. Solar heat gain can account for as much as 60 per cent of the total air-conditioning load in a building that has an exterior wall that is 75 per cent glass. A forceful example of this problem is the experience of the Gateway West building in Century City, Los Angeles: On a specific summer morning, the sun was hot enough at 8 A.M., and again at 4 P.M., to develop a solar heat gain of 202 Btu's per-hour-per-foot. Subsequently, the builders installed a relatively close-woven glass-fiber drapery fabric that has a shading coefficient of .37 with the heat-absorbing plate glass of the building. As a result, 119.16 Btu's were reflected, radiated, and convected to the outside atmosphere, cutting the solar heat gain from 202 Btu's to 82.84.

Recent studies by ASHRAE (the American Society of Heating, Refrigerating, and Air-Conditioning Engineers) and independent laboratories have made interesting discoveries about the shading coefficients of specific weaves and specific fibers that may prove valuable to specifiers of traverse drapery materials working in conjunction with mechanical engineers.

light
Light control, another important factor, must always be considered in relation to privacy. During daytime, both translucent draperies and shades can provide either uniform light transmission or total privacy; if direct sun is desirable, however, the shades or draperies must be drawn and privacy is thereby totally negated. Venetian blinds and vertical blinds offer more control of light direction while still affording complete privacy both in day-time and at night; however, they do not allow the kind of uniform, diffused light transmission provided by draperies and shades.

Whereas natural light is sometimes a welcome and economical supplement to artificial light, special working conditions demand versatile window coverings for light control. Where only artificial light can be used, room darkening can be effectively achieved with venetian blinds, opaque draperies, or window shades—the three most obvious choices besides permanently blocking off the window. Such a choice will depend on factors other than opacity: operational methods, mechanical equipment, window closing, or accessibility of control.

acoustics
Interior and exterior sound transmission is another problem affecting choice. Ceiling tiles, wall coverings, and floor coverings have traditionally borne the major burden of acoustical control in buildings. Window coverings also can make appreciable contributions to acoustical control. The types of treatments vary greatly in their sound-absorption properties. Exterior as well as interior noises can be more effectively reduced by heavily textured fabrics—and by great quantities of them in deep folds—than by flat coverings, which are sometimes sound-reflective.

final choice
When specifying window coverings uniformly throughout a building, the choice can no longer be made after the building is completed. At that late time, structural peculiarities—such as reveals, protruding equipment, vents, air-conditioning, heating units, controls, and partitions—can severely limit a satisfactory selection. The type of window itself, including the type of glass, will obviously influence its covering, yet this might be unsuitable for the particular requirements or tastes of the tenant. Finally, the architect must make a choice of window covering as an inherent architectural element that is vital to both the performance and to the appearance of his building.

148 interior design
To avoid the traditional French pleat that is much overworked on traverse draperies today, Knoll Planning Unit developed "a pleatless pleat" for the vice-presidential offices in Saarinen's CBS building (right). Designer Peter Andes says, "It was devised to minimize the appearance of the pleat and to integrate the softness of the fabrics into the appearance of the pleating technique." Basically, this method is a refinement of the first "tabled" phase of the workroom's procedure, but, Andes warns, "the specifier should beware: It takes excellent tailoring to achieve so casual an effect without sloppiness."

The Knoll Planning Unit also designed a pleat for the corporate presidential suites at CBS (right). It uses continuous box pleats, therefore yards of fabric, and is grandly luxurious. Here are two thoughtful variations on the common traverse drapery that prove how imagination can expand and rejuvenate tradition.
To provide a window covering that would not invariably obstruct the relatively narrow windows of Minoru Yamasaki’s Northwestern National Life Insurance Company building in Minneapolis (left), Carl Benkert of Ford & Earl Design Associates designed a treatment that combines features of the traverse drapery with those of the vertical blind. A permanent pleat system of alternating accordion folds makes a wool fabric hang in straight, controlled, 4-in. panels. The effect is that of a vertical blind made of a soft fabric, or of a traverse drapery that stacks in a small area like a vertical blind. Developed by Isabel Scott Fabrics Corporation with The Wool Bureau, the “Permaneat” system has been commercially available for nearly two years. Recently, Ford & Earl redesigned a gallery-like office where they used the Permaneat drapery to return into an 8-in.-deep pocket, thereby consuming less wall hanging space from the art collection (details at bottom).
Beginning in 1953, when Louis Kahn hung full widths of fabric flat as an interior window treatment for his art gallery at Yale, architects and designers have been giving more and more attention to this technique, which had probably not been used since tapestries were hung this way as window coverings in the Middle Ages. Then, several years ago, Skidmore, Owings & Merrill, New York, developed a multiple track with Kirsch Company that allowed narrow panels of elegant fabrics to be slid across a window wall at will and to stack at the sides—a sophisticated version of the shoji screen. Now, SOM has refined that system even further for Armstrong Cork Company’s Engineering Building (right), in Lancaster, Pennsylvania. There, sliding panels of 20-gage steel transparent sunshade are hung from tracks in the return-air grille and run in tracks above the radiant-heating system. The panels stack as one 2-ft-wide panel against the mullions. The question remaining to be answered concerns the amount of cleaning the indestructible panels will require because of their location in the heating system.

In the very middle area of possible window coverings—within the window itself—is the horizontally pivoted Amelco window, which is double-glazed and has an operable venetian blind in the 2-in. space between the panes. Used by Kelly & Gruzen at New York’s Chatham Towers apartments (February 1966 PIA), the window insulates against heat and sound and provides great variations of light and view (right). It has been found that the higher initial costs are offset by savings in maintenance and air conditioning. No additional window covering should be felt necessary, but if more softness is desired, probably some sort of window shade that pulls up from the floor would be the most facile to install. A future development in this middle area will be the much discussed tinted glass that changes its color to compensate for changes of natural light.
Another window treatment in the “middle ground” is a development that has never been completely explored: a decorative silk-screening between two laminated sheets of glass. Dolores Engle of George Nelson & Company used such a sandwich of Monsanto glass as a partition at the Georgia Center for Continuing Education several years ago (left). The technique might be adapted for window use in areas where privacy and shading are not necessary, but its seemingly permanent and immutable character would make some additional development desirable. “In a closer design,” Dolores Engle says, “and with more color than the blue we used, it might diffuse the light as any kind of sheer material could—and it would eliminate that maintenance cost.”

Barring the final refinement of photochromic, variable transparency glass, the window treatment by Skidmore, Owings & Merrill/Chicago for the classrooms of the University of Illinois’ Chicago Circle Campus (facing page) is the most economical solution so far devised. The parameters Walter Netsch outlined were, first, to eliminate installation and maintenance costs of blinds and other coverings and, second, to provide only so much glass opening as would make air conditioning economical. In order to permit audio-visual projection in classrooms without blinds, the glass had to be dark, yet the windows also had to admit sufficient daylight so that occupants could see without artificial light. The resulting walls have 24 per cent glass in relation to solid. Since, for projection, the darkest band is needed at a height between 28 in. and 6 ft., the glass is tinted differently: The middle vertical slot of glass has a 2 per cent tint of brown-gray, whereas the top and bottom triangular pans have an 11 per cent tint. The configuration of the concrete wall panels, besides allowing for more light across the ceiling and floor, also helps to bounce reflected light into the classrooms. In addition, the lower triangles serve occasionally as intakes for the A.C. units. Here is minimal design at its most multiple performance.
Historically, it has proven socially axiomatic that the importance society accords a profession is gauged by the monetary remuneration accorded its practitioners. Judged in the light of this truism, the extreme flexibility of the fee structure in the contemporary interior design profession would seem to indicate a deep-seated social uncertainty.

Today’s interior designer finds himself unsure of his worth or the value of his professional accomplishments, since he is compelled to market intangibles—truth and beauty, taste and fashion—in competition with mundane commodities whose values can be determined by weight and measure, price and profit.
The interior designer has not always existed in such equivocation; in fact, the opposite is true. In past ages, the practice of his profession has been marked by an aggressive assurance, undreamed of in our contemporary society. Perhaps a short historical synopsis of the interior designer’s past role may help shed some light on the development of his present equivocal status.

We begin with the earliest known interior designer, Jonah, the Judean who undertook a novel interior design project. He decorated the interior of a whale. One might say that fee was not in question; He was thrown into the job. The whale, however, proved to be one of the first revolting clients. He found that Jonah’s design of truth and beauty was out of fashion, and he distinctly disagreed with Jonah’s taste. Before Jonah could blubber, the whale threw up the entire business.

For our next historic example of the social status of the interior designer, we proceed to Pompeii. The greatest propounders of the virtues of truth and beauty, taste and fashion in the ancient world were those prosperous and superb house designers of that ancient city. Their wall decorations represented superbly the merging of client differences, although at times displaying certain excesses in conception. Although the house designer of Pompeii managed to keep his end up, innate modesty prevented him from signing his work. However, here in the ancient world, where the interior designer first succeeded in making ends meet, the fate of his work was to be covered up with ash.
The next great era of interior design to emerge has its paradigm in one magnificent building—St. Sophia, the proud glory of Constantinople. This building represents the ultimate achievement of interior design of the period, and motivated the destruction of the Byzantine Empire. For centuries, Greek fire had preserved the Greek cross, instilling in the heathen a burning desire to leave Christianity alone. However, this bulwark of Christianity was sacked by European Christians on their way to fight the infidel. This tragedy can be traced solely to the work of the interior designers of St. Sophia. Its rich interior motivated one of the most elevated sentiments of medieval Europe—avarice. A brief description of the interior of St. Sophia will illustrate the richness that tempted the Crusaders to pillage this magnificent building.

The designers wrought their rich tiled decoration on St. Sophia's great hemicycles; some, of course, worked on foot. They placed an apse at the eastern end, which is the first historic mention of keeping a monkey in a cathedral. The designers employed a narthex, which, one assumes, was a primitive form of Vinatex and provided the interior with four great piers, undoubtedly for the purpose of docking boats from the Bosphorus. In the face of this opulence, there is little wonder that the barbarian Europeans were incited to confiscate the splendor. The end was tragedy, as the Crusaders carted away the ideals of Byzantine truth and beauty, taste and fashion, in a gunny sack.

Following the Byzantine debacle, the noble knight of the Middle Ages evolved a do-it-yourself interior design technique, wherein he vented his talents on himself by encasing his body in an assortment of ductwork. Although he was occasionally cut to the quick, he was in reality dedicatedly wrapped up in his work. However, the impact of gunpowder deadened his ardor. The explosive situation frequently reduced knightly décor to a feeless frazzle. While in many instances the interior designer's search for truth and beauty, taste and fashion was cut short, on the whole, the age of chivalry went out with a bang.
The fortune of interior design that followed the Renaissance can be summed up in two words: bad mannerism. The turning point was due almost single-handedly to the protean effort of one man, a man whose complete negation of architectural principles necessitated that his genius be confined to interiors, where the fruits of his talent would be exposed to as few admirers as possible, thus formulating the principles of contemporary interior design. By placing the columns on brackets in the Biblioteca Laurenziana, he engendered a structural uneasiness and deep-rooted psychic doubt within the architectural profession from which it has never recovered.

Michelangelo's designs undoubtedly reflected the contradiction inherent in the profession of his clients, the Medici. They were merchant princes, an obvious contradiction in terms.

Our foregoing capsulation of history has shown that each era of interior design contained within itself the seeds of its own destruction. So it is today, for the contemporary fee structure of the interior designer signals the end of that age of design so nobly inaugurated by Michelangelo.

With the passing of the Medici, merchant princes forsook nobility and concentrated on merchandising. Interior design became priceless within the extremes that adjective implies—the implication being, value beyond price or worthless. It is at this juncture that we find the present state of the profession.

We are left then with the only possible solution of the contemporary dilemma bequeathed us. If the interior designer, shackled as he is to history, is to alter the course of his inexorable fate, he must fix contemporary values to the cornerstones of the designer's art. Truth must be sold by the pound, beauty by the look, taste by the ounce, and fashion by the minute. In the contemporary idiom, the profession would survive, for its value would be a matter of common cents.
A study discloses surprising structural singularities of one of America's most unusual examples of religious architecture.

BY CARL W. CONDIT

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Although Salt Lake City's Mormon Tabernacle, with its enormous turtleback roof, is a celebrated tourist attraction, surprisingly little is known about the structure. Built a century ago (1863-1868), it is the largest work of timber roof framing surviving, and the only one in which lattice trusses were built as arch ribs.

Despite its mammoth size, the structure was built completely by hand in an area isolated from centers of building activity and railroad lines. Not only was it hand built, but all its materials were hand-fashioned: Salt Lake City had no shops, foundries, or mills.

Early Mormon Architecture

When the Mormons first settled in what was to be Salt Lake City, Utah, in 1847, they constructed "boweries," primitive structures of worship that were actually crude frameworks of trunks supporting interlaced dirt-covered boughs. The boweries were soon superseded by one "Old Tabernacle," a barnlike enclosure with a gable roof supported by elliptical arched trusses. The architect, Truman O. Angell, was actually a local carpenter who nevertheless demonstrated rare engineering skill in building each truss strong enough to carry a load of 8 to 10 tons beyond the dead load of the roof. However, by 1860, this building proved to be too small, and Brigham Young, organizer and leader of the Mormon settlement in Salt Lake City, urged construction of a larger church.

Architects of the Tabernacle

The plans of the new Tabernacle were prepared in 1862-1863; construction was completed by 1868. The idea of a domed and vaulted roof enclosing the whole interior area without intermediate supports is attributed to Brigham Young himself, but it required a team of three designers to translate the concept into working plans. William H. Folsom was the architect in charge of the total project; Truman O. Angell, official architect of the Latter-Day Saints Church, planned the interior, and Henry Grow designed the roof structure and supervised its construction.

Grow had previously built bridges in eastern Pennsylvania and had secured the rights to the Remington patent for lattice-truss bridges (the original form had been patented by Ithiel Town in 1820). After joining the Mormon Church of the Latter­Day Saints, he migrated to Utah where his lattice-truss highway bridges over the Weber and Jordan Rivers so impressed Brigham Young that he requested Grow to build the Tabernacle roof. Nevertheless, the finished Tabernacle roof far excelled in its imaginative quality Grow's earlier efforts.

Masonry Columns Support Timber Arches

In plan, the 250' x 150' building comprises a rectangle with two semicircular ends (1). Forty-four masonry columns, each 3-ft wide by 8'-9" deep, support the dome-type roof. These 8'-9" perimeter columns reduce the floor plan to 232' x 132'.

Nine lattice arch ribs, spaced 12 ft apart, span 132 ft between columns at the center section of the hall. Each arch rib rises 44 ft. Small ribs springing from columns spaced around the semicircular ends, span to the midpoint of the first and ninth main arch.

Each arch rib consists of X-braced web members connected on each side to four parallel stringers bent to the profile of the arch ribs (2). The pairs of stringers tie the top and bottom
The roof, described by The Salt Lake City Telegraph in 1867 as resembling the shell of "a common eastern ground turtle of huge proportions," has in recent years acquired a shiny carapace of aluminum. Photograph above shows the tabernacle as it looks today; inverted photograph, as it appeared shortly after completion.
ends of the web diagonals, and the other two pairs brace the
9-ft-deep ribs at third points. For mammoth spans, the designer
called for equally massive members. The stringers are all 21/2" x
12" timbers.

One of a Kind

None of the Town-patented trusses have these intermediate
stringers, so it seems likely that they were added either by
Remington or Grow. The truss depth is 9 ft throughout, 3 in.
more than the pier depth because the web members extend
beyond the inner and outer surfaces of the edge ribs, fixing the
corresponding surfaces of the pier.

The trusses spring from a three-layered grid of timbers set on
top of the pier. This grid is protected on the exposed side by
fascia that covers the gap between the soffit of the roof overhang
and the top of the masonry. The web members are connected
to the rib stringers with wooden dowels. Four holes were drilled
through the timbers at each joint, and dowels driven in until
2 in. were left exposed. The dowel ends were then split, and
wedges driven into seat the dowel tightly.

The lapped joints in the ribs are staggered and made fast by
hand-wrought bolts. When the timber split, the carpenters
wrapped the splits in green rawhide that pulled tight as it dried
(original rawhide is still in place; 3). The rib timbers
appear to have been bent to conform to the curve of the arch
before the truss was fabricated, because the grain of the wood
does not “run out” but follows the curve of the timber.

Bracing System

The most complex part of the Tabernacle structure is its bracing
system. The primary elements are cross-braced timbers between
the nine main trusses (4). A secondary system includes purlins
between the top chords of adjacent trusses. Additional bracing
is provided by cross braces between the half arches at each end
of the building. Finally, struts were laid as chords over the rib
stringers of the main arches. Supplementary bracing at joints
is made up of odds and ends of scrap lumber.

The Arching System

The major problem that confronted Grow was bringing the
massive semi-arches of the domed ends to a common joint at the
crown of the end transverse arches. Because of the great depth
and breadth of the arches, it was obviously impossible to bring
the radial system to a true common joint. Grow’s solution was
an effective piece of homely ingenuity (5).

The center half-arch at each end abuts along its full depth
and width against the crown of the last transverse arch, the
two half-arches thus forming two quarter-ellipses. Three alternate
half-arches in each quarter are wedge-shaped at the ends
to abut against this joint. The remaining three arches in the
quarter are brought up as close to the joint as possible without
reducing the width of the truss, and the free ends supported on
supplementary beams disposed roughly in a triangular and a
semicircular pattern. This radial system, bathed in pools of light
surrounded by shadows and black depths, renders a rather bizarre
architectural effect.

Structure of the Interior Shell

The plank roof was nailed to purlins spanning between the
trusses. The planking was covered with a protective coating of
lime, lamp black, tallow, and salt, the proportions being 5 lb of
the solid materials to 40 gal of liquid lime. The shingles and the
aluminum sheathing that later replaced them were laid directly
on the planking.

The ceiling is plaster embedded with cattle hair, which was
laid on lath nailed to rafters fixed in turn to little wooden hangers
suspended below the lowermost struts, braces, and ribs of the
framing system. The underside of the rafters was cut to conform
to the profile of the vault curve.

There has been very little cracking of the plaster, and since
the double shell of the roof and ceiling provides ideal protection
for the structural system, there has been no deterioration of the
framing members.

Structure of the Floor

The floor structure of the Tabernacle is a relatively simple
column-and-girder system. The butted-plank floor is nailed
directly to joists spanning between log beams, the upper and
lower surfaces of which are cut flat to provide adequate bearing
for the flooring and posts. Since the latter are carried to separate
sandstone footings, the floor frame is independent of the primary structure. The rise of the floor, calculated mainly for unobstructed sight-lines, is 16 ft. The balcony is an elongated horseshoe in shape. Sloping balcony girders are carried on columns set on independent granite footings. Beams span between the girders to support the tiered floor of the balcony. All wood in the balcony, flooring, roofing, and structural frame is local pine.

**Stational Action**

An interesting problem concerning the Tabernacle is the difficulty in assessing the stational action of this huge awkward assemblage of ribs, planking, and piers. The whole system is radically indeterminate, so that it is impossible to calculate exactly the arch thrust and its stresses. Nor is it possible to determine the distribution of forces among the four stringers of the arched ribs. Perhaps, as with bridges, the lower chord carries the full compressive load, with the truss proper acting as a stiffening element. The other three pairs of stringers serve only to brace the web members.

Structural details suggest that the designers held a primitive grasp of stational action, though at the same time they had a thorough knowledge of timber building techniques. The piers, which are of rough-cut sandstone blocks laid to course in limemortar joints and founded on heavy glacial gravel about 3 ft below basement grade, are horizontal on top rather than inclined normal to the arch thrust, and seem small in proportion to the size of the roof.

The suspicion that Grow may have miscalculated the shape and size of the piers is suggested by diagonal cracks following the joints near the base of several piers. Although the structural integrity of the Tabernacle is not jeopardized, the cracks do indicate that some adjustment in the masonry has occurred as a result of the bending moment of the arch thrust. A new equilibrium was established, and no further displacement appears likely.

Two factors have probably offset the defects in the pier design: The load is distributed over a large number of piers; and the horizontal component of the arch thrust may be absorbed through internal stresses arising from the membrane action of the roof and ceiling. If the compression is confined entirely to the bottom rib of the arch, this theory is unlikely; if part of the compression is distributed through other ribs, however, shell or membrane action may occur.

Since they had no hardware, carpenters connected stringers to diagonal webs with wooden dowels.

**The Construction Process**

The masonry of the footings and piers was built up conventionally from low platforms. The huge trusses were fabricated on the ground and erected into position on falsework, like a bridge truss, before being fixed into place at the springing points. Workmen raised the trusses onto the falsework with block-and-tackle operated by teams of horses.

The full transverse arches were erected first, followed by the semi-arches of the domed ends. With the primary structural members in place, the remaining operations followed in order—installation of purlins, planking, and shingles on the outside, lath and plaster on the interior. The maximum number of men on the job at any one time was 205; 70 were engaged in plastering alone during the final weeks of construction.

**How It Sounds**

The celebrated acoustical properties of the Tabernacle are a result of both shape and material. The concave ellipsoidal surfaces above the organ and choir blend and hold instrumental and vocal sounds, projecting the reflected waves cleanly throughout the auditorium. The possibility of annoying echoes is further reduced owing to the sound absorbency of the cattle hair embedded in the plaster.

How much of this acoustical excellence is a matter of luck and how much of experience and intuition is difficult to judge today. The structural system is for the most part perfectly functional, revealing an imaginative adaptation of the bridge-builder's art to the requirements of a large public building. The overall shape, however, seems to have been dictated by the idea of the most convenient form to include the volume, rather than by the search for good acoustical properties. Thus the solution to one problem brought with it the means to solve another—a coincidence that often characterizes the old craft tradition in building.
SHADOWS, SCREENS, AND SIGHTLINES

ISOIDEFORMATION LINES FOR MAXIMUM VIEWING ANGLES

CONE OF VIEWING ANGLE

PLAN OF VIEWER'S EYES

TRACE OF INTERSECTION ON FLOOR

SCREEN

ISODEFORMATION LINE = INTERSECTION OF PLANE AND CONE PROJECTED ONTO FLOOR

FLOOR LINE

ELEVATION

OUTLINE OF CONE

SCREEN

PLAN

ISODEFORMATION LINE = GEOMETRIC DISTORTION

NOTE: d EQUALS BACK-TO-BACK DISTANCE FOR SINGLE ROW VISION AND 2x BACK-TO-BACK DISTANCES FOR DOUBLE-ROW VISION

SEATING AND SIGHTLINES STUDY - VISIBILITY

SELECTION OF VIEWING ANGLE

n = INDEX OF VIEWING ANGLE DISTORTION = c-\n
n = 0° NOT ACCEPTABLE

n = 1.15 DESIRABLE

1.15 <= n <= 1.41 ACCEPTABLE

n > 1.41 NOT ACCEPTABLE

C = 5° NOMINAL

Y = 3°-6° NOMINAL

RISER HEIGHT = h + y0 - y

Y = VIEWING ANGLE

n = INDEX OF VIEWING ANGLE DISTORTION = c-\n
n = 0° 1.00

10° 1.06

20° 1.15

30° 1.30

45° MAX 1.41
A guide to designing rooms for screening films and slide presentations.

By William Szabo, an audio-visual engineering consultant of New Rochelle, N. Y.

Although projection and sound equipment varies widely in performance and cost, the basic steps for designing rooms for audio-visual presentations remain constant.

The designer must decide on front or rear projection, determine the size and shape of the screen, establish the brightness relationship between room and screen, assure that the whole audience will see comfortably, and oversee the acoustics, lighting, communications, and traffic.

Front vs. Rear Projection

Image brightness is the major determinant for selecting front or rear projection systems. Three factors have to be considered: the contrast ratio between picture highlights and shadows, the stray ambient light in the room, and the available illumination from the projector.

With these, the designer must also consider the reflection characteristics of a screen for front projection, and the reflections and transmission characteristics of a rear projection screen. The parameters for these conditions are illustrated (5, 6).

By rule of thumb, rear-projection systems are best suited to small rooms with an audience of 25 or less. Front projection is more suited to larger rooms.

When high ambient light levels are unavoidable, rear projection is usually indicated, since the low reflectance of these screens reduces the nonimage brightness. Also, rear projection is suitable for screens located near the floor.

Rear projection is suitable for a space-saving central projection core serving a number of rooms. In this situation, light from the viewing side transilluminates the core and increases the nonimage brightness of adjoining screens. To remedy this requires complicated light baffles that may cancel out the economy of a central core.

Back-to-back equipment rooms for front projection can be used to save space or share equipment. Indeed, wherever possible, front projection should be preferred unless the special requirements of the system dictate rear projection.

Sizing the Screen

The screen size and acceptable viewing area are based on the criteria for legibility, visibility, and geometric distortion of the screened image.

ASA standards recommend the width of a screen should be one-sixth the distance to the most distant viewer, to insure that the person furthest from the screen will see a legible image. If this ratio is raised to one-fifth, the designer retains flexibility to fill out the corners of a room without exceeding the recommendation.

To limit the maximum viewing distance, the viewer should not be required to discern details smaller than 1 in. for every 32 ft of viewing distance.

Selecting the Sightlines

With screen size and maximum viewing distance fixed, the next step is to locate the seats at the ends of the rows close enough to the center to prevent the occupants seeing a distorted screen image.

A plan and elevation of a room seating 163 people is shown (1). Sightlines are designed for viewing two adjacent screens and table in front of them. For the screen image, a viewer can look over the person in front. This is called single-row vision. For the table, two-row vision is allowable; this enables a viewer to see between the persons immediately in front, and then look over the heads in the next row (2).

The maximum allowable apparent distortion of a projected image occurs when

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the vertical viewing angle is 45°. The amount of distortion relative to the viewing angle is illustrated (4).

The ocular subtense \( \theta_v \) and \( \theta_v \) should not exceed 90° and 60° respectively. And, for comfortable viewing, the sightline from the front row to the center of the screen should not be more than 15° above the horizontal.

The influence of these criteria on the sightlines and iso-deformation lines (3) usually requires refining the analysis, and often will suggest that a slightly cylindrical screen will yield a larger acceptable viewing area.

Controlling Light

The projector's light source is usually selected to suit the largest image to be projected. This light cannot be varied except within very narrow limits; thus, to control the image contrast ratio, the designer must vary the ambient light, or the nonimage brightness.

With screens that are not completely diffuse—i.e., matte white—the screen brightness, or luminance, will vary as a function of the viewing angle for front projection, or bend angle for rear projection (8).

This variation in picture brightness should not exceed 3:1. A minimum luminance of 5-ft-Lambert must be provided for clear color perception in the type of installations discussed in this article.

Teaming the Specialists

In addition to designing the physical requirements for a presentation room, the audio-visual engineer also collaborates with other specialists. The audio-visual designer can handle projects that require simple programmed controls such as two slide projectors operated from a single console at a lecture desk, but he will work with others on the more sophisticated systems that may require punched tape readers to control image, sound, and lighting, or even be connected to a computer to show data on the screen.

Visual presentation systems are often installed in rooms doubling in purpose as conference rooms or general lecture halls. But some systems are incorporated in specialized facilities for presenting information. To help decide on the best facilities, an architect should call in a visual presentation systems engineer during early discussion stages of a project so that the best advantage can be taken of space, light, and acoustics.

A what, where, and how account of aluminum industrial curtain walls.

Aluminum industrial walls, due to their attractive appearance and functional efficiency, are often applied to nonindustrial buildings. They are a natural for such structures as hangars and service buildings; and in the case of windowless wall areas, as at movie theaters, shopping centers, department stores, and airline terminals, they provided, in addition, attractive color and texture.

Some of the most interesting and architecturally successful uses have been made in cases where the wall panels were combined with masonry materials, as on a Chrysler plant in Detroit, and the Pepsi-Cola bottling plant at Quincy, Ill.

These industrial panels are often combined with glazed curtain wall systems, as at the Alcoa Process Development Laboratory Building near New Kensington, Pa.

What They Are

The term industrial wall is a technical description, applying to the wall system itself rather than a designation of the type of building on which it is used. In the
terminology of the metal wall industry, there are three types of metal curtain wall: custom, commercial, and industrial.

The first two are generally built with preassembled framed units and provide substantial amounts of glazing. Industrial walls are defined as those that "consist essentially of preformed metal sheets in stock patterns and sizes."

Industrial metal walls are of two basic types: the single-sheet uninsulated type and the double-faced insulated, or sandwich type. The latter is of most interest architecturally, and it is in this type that the most important design improvements and refinements have been made.

These insulated panels may be either field assembled or preassembled at a factory. With preassembled panels, a contractor installs plank or panel units that form a completed wall, but with field assembly, workmen separately install the interior surface sheets, insulation, and exterior sheets.

Gaskets Seal Panels Faster

In recent years, the metal wall industry developed some interesting new types and configurations of panels. Manufacturers improved the design of preassembled insulated units to both increase thermal insulating values and simplify installation.

One of these newer designs features tongue-and-groove edge joints, which are self-sealing by means of a built-in vinyl gasket that eliminates the need for caulking. This is a structural panel, which is normally supported only at its ends. It is capable of carrying a 30-psf wind load on spans of 12 ft or more, with a maximum deflection of less than 1/180 of the span.

Manufacturers also are developing structural sandwich panels. One panel, Alcoa's Alply, consists of aluminum sheets bonded to a urethane foam core. It is available in 60-in. widths, which compares well with the usual 12-in.-wide mechanically assembled panels.

The flat facing sheet of aluminum, either smooth or patterned, may be bonded directly to the foam core, or, to improve dent resistance, may be backed up with an intermediate, rigid, nonmetallic sheet material. These panels are available in thickness ranging from 1 in. to 8 in., with corresponding U values from .22 to as low as .03. The thicker panels are particularly suitable for building cold storage plants, where a high insulating value is mandatory.

Several jointing systems are offered, the
most ingenious being the Alcoa-developed "Snug Seam" system, which uses a neoprene "zipper" insert gasket installed with a special tool. If accented joints are preferred to inconspicuous vertical joints, several types of filler-strip panels with projecting fins are available as millions.

**Spring Panels Into Mullions**

To improve the appearance of industrial walls, manufacturers offer facing sheets of new designs for field-assembled insulated walls. Many of them have bolder profiles, larger in scale than the older, standard patterns. Such innovations have undoubtedly been prompted by aesthetic rather than functional reasons, and serve to increase the design versatility of industrial wall systems.

One of the newer facing systems, the H. H. Robertson Company's "Curv-Line" system, uses flat facing sheets with a variety of optional finishes. When installed, these sheets are sprung into a shallow fluted configuration, and secured between roll-formed mullions spaced 18 in. apart.

Joints at the mullions are concealed with snap-on extruded aluminum cover strips, which dispense with sealants and exposed fasteners. Expansion and contraction due to thermal effects offer no problems, and the curved sheets eliminate "oil-canning." Standard liner panels, insulation, and subgirts are used with these facing sheets.

**Three Ways to Color**

Industrial metal walls need no longer be a monotonous, natural metal color; a wide range of colors is now available.

Three color processes are used: organic (baked enamel) coatings, laminated plastic film, and porcelain enamel. The organic coatings, being the least expensive yet remarkably durable, are by far the most commonly used. Film coatings and porcelain enamel both have their advantages, and are extensively used where the properties they offer are essential.

The organic coatings include some of the newest paint developments, some of which are said to exceed even automobile finishes in quality and durability. Many of the formulations are proprietary, but in general they include vinyls, alkyds, acrylics, and fluoropolymers.

These coatings may be applied either before or after the sheets are formed. Many manufacturers use precoated coil stock; others prefer to apply the coating themselves after forming the sheets. In either case, the metal receives careful surface preparation in advance, and after coating, is briefly cured in ovens.

The better coatings have a nominal dry-film thickness of at least 0.8 mil. They are rigorously tested for compliance with exacting standards to insure excellent adhesion, weathering, flexibility, and chemical resistance, and are generally predicted (though not guaranteed) to give 10 years or more of maintenance-free service.

Most laminated film coatings are either polyvinyl-chloride or polyvinyl-fluoride plastics, both of which are supplied in a wide range of colors. They are pre-applied to coil stock, in thickness of from 1 to 10 mils, by licensed pre-coaters.

Although such prefinished stock is generally available, not all wall manufacturers offer film coatings as a standard finish. These films are extremely tough, durable, and weather-resistant, and are easily cleaned with any soap or detergent. Because porcelain enamel is inorganic, it undoubtedly is the most durable of the three coatings, and also the most expensive. It is always applied to the sheets after forming. Since the process involves extensive facilities of a special nature, porcelain enamel is offered by only a few wall manufacturers as a standard finish.

Recently developed special alloys, as well as improved frits, make porcelain-on-aluminum a superior finish at reasonable cost. The coating consists of an oxide treatment, followed by a single coat of enamel 3 to 7 mils thick, on one side of the sheet only, fired at about 975 F.

**New Ways to Fasten**

Fastening methods for the single-sheet wall systems are pretty well standardized. Sheet metal screws, either aluminum or stainless steel, with neoprene washers, are used for lap fastenings. Self-tapping screws, or special weldable or tapping studs, secure the sheets to framing members.

Sheets are impaled on either type of stud by use of a rubber hammer, and are secured by a drive-on weathertight aluminum cap.

Various fastening methods, some old, some new, are used on the field-assembled insulated walls. Where sub-girts are used, the common practice is to attach the liner panels to the building frame by plug welds or self-tapping screws. The sub-girts are screwed to the ribs of these panels with sheet metal screws, and then the facing panels are clipped to the sub-girts and die-clinched to the mating panel edges. This provides secure attachment without any exterior exposed fasteners.

At least one manufacturer, however, has improved on this method, eliminating the die-clinching by using a side-mating face panel joint and a special clip that locks both joining panels to the sub-girt.

Field calking has been largely, if not wholly, eliminated in most of the preassembled walls. Joints are sealed by the use of shop-installed vinyl or neoprene gaskets, which also serve to provide a thermal break between inside and outside sheets, thus improving insulation properties.

Many of the facing sheets for field-assembled systems also have gasketed or pre-calked joints, and at least one liner sheet system features a mating joint containing shop-applied calking. This system is claimed to provide a highly efficient vapor barrier and an essentially airtight seal.

**Two applications of Curv-Line panels that add shadow texture to walls: Chas. Pfizer & Co., Coraville, Ga. (top); St. John Technical Institute, St. John, N.B., Canada (bottom).**
A revised building code permitted 8-in. concrete block walls to support eight stories.

By eliminating a structural frame and carrying floors on loadbearing block walls, a San Diego architect built the eight-story Hanalei Hotel for $11.44 per sq ft. This price includes air conditioning and elevators, but excludes site work and finish hardware.

The 8-in.-wide loadbearing system provided another bonus: fast construction. The contractor completed the $1,253,000 job in four months, which enabled the owner to open the hotel for the summer season.

The project became possible because of a major change in building codes. The 1964 Uniform Building Code, to which the hotel was built, permits higher design stresses in masonry than were previously allowed. However, the strength must be established by preliminary tests of masonry assemblies, and the work supervised by an inspector licensed by the city and retained for the project by the owner.

Doubling the Compression

The ’64 code allows an engineer to design masonry with an ultimate compressive stress up to 3500 psi. This far exceeds the previous allowable stress of 1600 psi.

With this higher stress, the code requires that five preliminary tests on 16-in.-high by 16-in.-long prisms must justify the design strength. Tests are conducted 28 days after making the prisms; but after establishing a relationship between 7-day and 28-day strengths, the code accepts 7-day tests alone.

This provision aids site work because, in addition to the preliminary tests, the code requires three more sample prisms be tested for each 5000 sq ft of wall.

At the Hanalei Hotel, the structural engineer used a 3000-psi design stress on the net section of the blocks in a wall. Tests showed that the lightweight, 8" x 8" x 16" expanded shale blocks average 3825 psi on the net section.

The Structural System

The walls supporting the eight-story building rise off a 22-in.-thick concrete mat foundation. There is no basement. Transverse walls, spaced 14 ft apart, extend to within 5 ft of the rear of the L-shaped building. Beyond the ends of the walls, cantilevered floor slabs support an open access corridor for the hotel rooms.

Stub walls to brace the transverse bearing walls are located 5 ft from the front of the building. The designer concealed these stub walls in the exterior wall of the bedrooms which open onto a balcony. The transverse walls separate the balconies.

Each room is decked with two 6-in.-thick concrete floor slabs that were precast at the site. One slab extends 25 ft from a balcony to a wall separating bathroom from bedroom; the other 13½-ft slab carries the bathroom and the cantilevered corridor.

To increase the bearing capacity of the lower two stories, the engineer reinforced the walls with steel and filled all the block cavities with concrete. Above the third floor, only the cavities containing reinforcing bars were grouted. Additionally, the walls were reinforced with wire fabric every second course in these first two stories, and every third course above.
BY ROBERT H. MUTRUX

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It is a universal trait of human nature that everyone who has contributed a part of himself to any venture whatsoever wants his effort to be recognized. Gisbertus' unashed "Hoc fecit" over the portals of the cathedral in Autun, the anonymous "Kilroy" peering over the parapet from Berlin to Tokyo, the Bakers' window at Chartres (and that of the prostitutes as well), the donors' plaques at Lincoln Center, and the recent trend toward self-immolation in public places are witness, at varying levels, to man's persistent longing to be acknowledged by posterity. In this respect, architecture has been especially rewarding. Throughout history, the field of physical structures has provided a bottomless reservoir for the vagaries of the human ego. From the time man first felt impelled to decorate his cave with wall-to-wall murals to the personality-saturated present, architecture has been the most pervasive status symbol yet devised.

The mortal desire for self-perpetuation and the candid self-appraisal that often accompanies it unwittingly enjoy the umbrage of divine precedent. In history's first recorded architectural criticism, God (so far as we know, His own and only judge) looked at each day's work and "Saw that it was good." And at the end of the sixth day He "... saw that it was very good. And he rested from his labors."

The true creator today has no greater aim than to do his chosen work and see that it is good, but the nature of his ensuing repose more often than not depends upon its evaluation by his peers and the changing standards of the times. Every work starts out to be good and yet, for reasons more or less specific, most of them miss the mark, and the untutored man in the street as well as the lettered aesthetic can immediately list the reasons why.

There is no shortage of Monday-morning-quarterbacks to explain, usually with no lack of enthusiasm, why this structure is out of proportion, why that plan does not work, why this solution is inadequate, or that one downright dishonest.

I have often wondered whether it would not be possible to put all this intellectual energy into reverse, and list, beforehand, all the elements needed to make a great building and to catalog the rules governing their combination. I am sure that Socrates, had he been more keenly interested in buildings for their own sake and less in politics, polemics, and wine-bibbing, could have pyramided this hypothesis to the point of anticipating an entire world free of ugliness, rid of mediocrity, and populated only with things of beauty and eternal joy. Aristotle, Goethe, Freud, Berenson, and a host of others have indeed dealt in varying depth with the subject, but their conclusions, by and large, are too abstract for the average practitioner to analyze, much less put to practical use.

Recently, however, one of the profession's phrasemakers made what may be a significant contribution. The bland statement, "It takes a great client to make a great building," may be the ray of light to herald a new age of design. This Gordian approach is based on the ingenuous assumption that the architect himself is inherently great, and that all that is needed is a marriage with his cultural equal to insure issue of lasting value. Perhaps this serene oversimplification contains a grain of truth. If, in the last analysis, the burden of greatness rests with the client, it behooves someone to indoctrinate him in the delicacy of his position and the magnitude of his responsibility. To put it more simply, he needs to be informed of the special amalgam of factors, concrete and abstract, which will result in an edifice to do justice to him and to his time, and of the special part he has to play in its realization.

It is a little like the medieval search for the philosopher's stone, but much better documented. Something akin to a formula does indeed exist, even though (like Will Rogers' scheme to dam up the Gulf Stream to defeat the Germans) certain details remain to be worked out. The basic requirements of a great creation can be enumerated and even calibrated, and it is actually possible, given a modicum of generosity on the part of the reader, to propose a comprehensive answer to the question of how to create beauty for eternity.

To begin with, it has been established, after exhaustive research and careful tabulation, that great work is the result of a combination of a maximum of six major components, and a minimum of two. Their permutations thus are not unlimited, and the challenge is shared equally by creator and patron. The first two are within the province of the architect.

The primary impact of any architectural project is usually its mass, its visual exterior. To the architect, this is the party, to the philosopher it is the concept. This is responsible to a great extent for the first and most lasting impression, whether it be breathtaking, inspiring, overpowering, bewildering, depressing, or dull, and goes a long way toward carrying a work into history.

Those who have seen the spires of Chartres across 20 intervening kilometers of countryside, the stark remains at Paestum, or the eloquent geometry of the pyramids of Egypt and Mexico, have sensed the feeling of intimacy with timelessness long before they have parked the car or the camel. The painter Georges Braque used an expression referring to sculpture that applies to architecture as well: "... it gives form to empty space, as music gives form to silence." If the form, in its essence, provides something in the nature of a lift, if it "sends you," or, to Picasso, if "it gives you a feeling of pleasure," then it contains the seeds of greatness.

The second vital element is the detail. The cathedral, seen first in miniature, is now seen face to face, and the relation of the major to the minor masses, the exterior to the interior, and all the individual parts down to the finest moulding and the most remote carving, resemble that blend of separate yet superbly integrated motifs and notes that form a symphony. Here is the Greek temple even after the carvings (sometimes irrelevant) have been removed and after time has eroded the (probably intrusive) surface painting, leaving only the pure music of the fluted columns and the majesty of the pediment against Homer's sky. Here the pyramids,
at close range, and the citadel of Carcassonne, and the Palais de la Défense in Paris, fall short, reminding one of Gertrude Stein's piquant statement, "When you get there, there isn't any there there." On the other hand, the Baroque church and the palace, the Alhambra, Angkor Wat, and the Town Hall in Copenhagen, all somewhat less than notable in their over-all effect, are outstanding in the realm of detailed development.

A sense of fine workmanship is a sense of history. The artist, architect, and artisan who strive for perfection are subconsciously aware of unborn generations looking over their shoulders, and their work may achieve immortality on that ground alone.

After the detail comes the legend. This is an attributed dimension, popularly referred to as the "mystique," but no less significant than the first two. Here again the temples and cathedrals score heavily, in particular Notre Dame and Beauvais. The Mayan ruins fall into this group, as do most of the English castles, the Colosseum in Rome, and the Palace of the Popes in Avignon. Stonehenge, the sculptures on Easter Island, the caves of Altamira and Lascaux, thrive on this element alone, as do the mythical city of Atlantis, Tintagel on the coast of Cornwall, and Frank Lloyd Wright's mile-high skyscraper. The best example, of course, is the court of love at Les Baux; a close second are the ruins of Machu Picchu in Peru. All express the relation of a work to its historical or mythical context, and the ghostlike echo of that relation resounding over the footsteps of the tourist is often far stronger than the mere imprint of the physical structure on a photographic negative.

Great architecture was never created in a void. It exists by, through, and for the sake of function per se, hence of function as an actual physical commodity, rather than in the sense of usefulness, crass realist or the fabled chump in the back row. What is needed is an idea from conception to realization. Time, not as a metaphysical concept or a conversational abstraction, but as an actual physical commodity, seems to be dying out, like the whooping crane and the passenger pigeon, but its presence in quantity was a contributing factor in all other epochs.

Rome was not built according to a timetable, nor was Constantinople, or Florence, or Toledo. Who knows what a masterpiece of marine design Noah might have contributed had he not been faced with an irrevocable deadline.

The fifth requirement, also within the realm of the client, is money. Dull, lackluster, malign, but always sought after, it is the single ingredient whose proportion most clearly stamps any work. Though its deletion may not visibly affect the broad spatial balance of void and solid, its absence will unalterably be reflected in the detail. Its presence and influence is noticeable throughout history from the time when all art was oriented toward royalty and the priesthood to the economy-minded, budget-ridden present. The democratic mentality that was brought up on the challenging dictum "Money doesn't care who owns it," matures to philosophical resignation with, "Oh well, you can't buy happiness with it." But I defy anyone, king or commoner, to say that you cannot buy architecture with it.

Last of all is the element of pride. This is the sin for which, it is said, man was driven from the Garden of Eden; this is the trap over whose entrance was written, "Ye shall be as Gods." And yet pride, which in our Puritan environment has always been considered a fault than a virtue, is responsible for most of the world's great architecture. Pride, in the person of Pericles, rebuilt the Acropolis we see today, and pride also built the copy of the Parthenon in Nashville, Tennessee. It was pride in the person of the local bishop, and not the faith of the nameless peasant, that populated France with 80 magnificent cathedrals in a single century. Pride built the colonnade leading to St. Peter's, the fountains in Mexico City, and that phenomenon of all time, the quasi-living Seine. Pride — call it civic if you like — built every cultural center from New York and Hartford to Dallas and San Francisco.

And that's it. What every young, well-endowed client-cum-creator should know. Six major components, frequently less, seldom more. Now, at this point, some crass realist is bound to interrupt (like the fabled chump in the back row, who, when Gabriel blew the last trumpet, yelled "Louder") and say, "But how about function?" I will say that function exists only for the form that is its sequel. Function is the homely cocoon that gives birth to the butterfly. Beauty, by our poets' admission its own justification, often outlives raison d'etre, and, again, the medieval cathedral is an irrefutable example.

Today, in a questionable search for "purity," we attempt to make a self-sustaining virtue of function per se; this has resulted not only in a trend of unprecedented sterility, but it reveals for posterity our poverty of imagination and our paucity of (Continued on page 250)
Several miles outside Jerusalem, in the hills of Judea, is the site of Betar, Simon Bar Kochba's last stronghold in his fight for liberation from the Roman legions in 132–135 AD. On the highest point of this area, refulgent with the past and present search for liberty, was recently erected Israel's memorial to John Fitzgerald Kennedy. The memorial commands far-reaching views all round, and, as if to underline the late President's hope for a world untroubled by nationalistic strife, also overlooks the nearby village of Bittir, on the other side of the Israel-Jordan border.

The scheme, which was the winner of a closed competition in Israel, is
commendable for its simplicity. A road, circling the hill, leads up to a broad plaza, from which rises the truncated crown of the shrine. David Reznik, the architect, states that the form of the building “attempts to convey the deep tragedy of a young, vibrant, and growing life being cut off before maturity. The monument is a direct outgrowth of the plaza, with each line growing continuously from the beginning of the plaza to the highest point of the monument. The form reaches upward and is cut off before it reaches its natural peak, as in the sawn-off trunk of a tree. There are 51 roots growing into the monument, each one containing one of the ‘required symbols’ (of the 50 states and the District of Columbia). Within the structure, there is an eternal flame at the center of the floor, and a sculptural concrete ring at the perimeter bearing documents, photographs, and a relief of President Kennedy.

As a totality, with its hill, the Kennedy Memorial appears an impressive sculptural composition; its massive stone retaining walls and concrete structure evoke the strength of the hills. Parking for 10 cars and 10 buses has been neatly tucked into the west side of the slope, where it is least obnoxious. One wonders, however, about the scale of the monument up close. After such a series of imposing prospects from far away and from the turns in the roadway below while approaching the plaza, the experience of the building would seem—from these views, at any rate—to be somewhat anticlimactic, the building having become almost diminutive in scale in comparison to the grandeur of its aspirations and its setting. The little medallion for each state, placed in each interstice, does not help, either. The total effect is that of a very good concept, and certainly laudable intentions, which just did not get that last added impetus that transforms a good and respectful memorial into a heart-stirring architectural and emotional experience.
A landscape that may look straight out of the TV series "Star Trek" or "Voyage to the Bottom of the Sea" is proposed as the setting for a firemen's training academy in Houston, Texas. The eerie quality of the project is not willful on the part of the architects, Jenkins, Hoff, Oberg & Saxe of Houston, but results from measures dictated by the program requiring widely separated buildings, experimental fire pits, and vast spaces for practice driving of fire engines.

Facilities will include a main building housing classrooms, offices, lounge and kitchen, reception area, apparatus rooms, and an all-purpose
auditorium; a six-story-high drill tower; a fire problem building for simulating various conditions encountered in conflagrations; an equipment testing area; open fire-simulation pits; outdoor classrooms and fire-control buildings; a spill fire-simulation building for tests with liquid fires; and a drivers’ training course.

The structures have been designed as exceptionally rugged forms, since, in the view of the architects, the “drama of service performed by this branch of the city government should be expressed in a vibrant and highly functional manner.” Cast-in-place concrete slabs and columns will be used throughout, and exterior walls will be face brick and fire brick.

The visual star of the complex undoubtedly will be the drill tower. It will be used for hose-and-ladder practice, high-rise training, and will contain a fire escape, stairs, and ground-floor control offices. All these activities will be expressed as exterior forms, resulting in a forcefully brutal building. An Eastern architect, looking at the sketch of the tower, said recently, “If somebody came to me and said, do a drill tower, I’d probably do it just like that.”
The definition of slum has changed somewhat over the past few years, since people have learned that a slum could be an enforced state of mind, and that rats, garbage, and junkies on every corner are mainly the desperate visual suppurations of the disease in some places. Watts is actually an area of not unpleasant modest single-family houses, but the intolerable, if invisible, conditions of municipal indifference, social unconcern, and economic blight finally erupted there in troubles that had until then seldom taken on such proportions in more obviously “ugly” areas.

The southeast area of Washington, D.C., similarly, is not as hideous as Harlem or the ghetto sections of Chicago, but there still exists the shattering hopelessness of the unspoken ghetto condition itself, one enforced by the picture of Washington prettying itself up in all other areas with middle-income developments, elaborate Federal buildings, and grand schemes for Pennsylvania Avenue and the Mall, while Congress grimly continues to refuse home rule to the District because it is more than 60 per cent Negro.

There seems to be so little that individuals can do to relieve these dispiriting conditions that many just give up and take care of their consciences by expressions of pity and regret and sending a donation to...
relief organizations. Mrs. Vincent Astor is not one of these, as she proved by underwriting Carver House Plaza and Riis Plaza in the midst of two New York low-cost housing projects (p. 97, October 1964 P/A, and pp. 170–172, July 1966 P/A). Now, she has taken the Washington Southeast district by the horns, and proposes the construction of two amenities that will symbolize tremendous charges of hope and confidence for the area.

With the same design confederates she used in the Carver and Riis experiences—architects Pomerance & Breines and landscape architect M. Paul Friedberg & Associates—Mrs. Astor plans the creation of an exciting school playground with after-school adult use, and a large neighborhood center and athletic field in the midst of a typically drab, low-cost housing complex. The latter project was announced last month at a reception given by Mrs. Walter C. Loucheim, Jr., Deputy Assistant Secretary of State for Com-
munity Advisory Services, and attended by Mrs. Lyndon Johnson.

The two projects far exceed most of the "beautify-our-cities" pronouncements that have come out of Washington in the last few years. There is structure, form, and depth to both of them, as though the designers wish actually to weave them right into the fabric of the community. The Buchanan School Playground right now is a bleak chain-link-fenced corner of the most dismal board-of-education-budget sort. It stands among small dwellings and marginal businesses across the street from a playing field attached to another school. In time, it is hoped, the street between can be closed and the two areas combined into a real community center. The new playground will have no coercive fencing. Its forms will be defined by earth levels and surfacing materials. A section will be lowered and paved for active games such as basketball, and the removed earth will be used to create mounds and pyramids for children to play on, around, and in. The open play space can also serve as a kind of amphitheater for local events and teen-age dances. In the play yard will be facilities for the children to be adventurous on: bridges, slides, stepping blocks, ladders, and a tree house. Strong, simple materials such as timbers, paving blocks, and brick will have their surfaces smoothed and edges rounded for safety. Adults will be able to sit under trees and sunbreaks, and there will be a raised adult peninsula jutting into the yard. On the E Street end of the site, structures housing restrooms, a snack stand, and maintenance offices will help maintain the continuity of the street and bound the playground from the traffic.

The Capper Plaza project is of far greater scale than the school playground—it is about 5 acres—and offers the opportunity of creating a true community center in the midst of a drab, 15-year old, 1500-family public housing project bounded on the north by a freeway and on the south by the Navy Yard. The space at the center of the project, which somehow stayed providentially open, has been used
intensively by the housing tenants for baseball, football, and track. There are interneighborhood games that draw huge crowds to the field, but there are no facilities whatsoever save for a tiny "community building."

The designers and planners set about making the area the true focal point of the larger neighborhood, making the sports field a real facility for games, terracing its sides for spectators, and creating a complex of structures around a sunken amphitheater to act as the social node of the place. It soon became evident that, even on paper, the center was acting as a magnet to draw life into the Capper area. People who had been privately thinking about buildings of various sorts in the neighborhood became interested in having them in Capper Plaza. Consequently, the center will probably have to be redesigned, much to the delight of Breines and Friedberg, to allow more activity. Right now, plans include a grocery, laundromat, café, a new games building, and structures related to the playing field (locker rooms, equipment storage, director's office). Two streets will be closed off and incorporated into the playing area. Around the enlarged field, and relating more closely to separate housing units, will be smaller play areas for children with seating for parents. An adjacent school yard will become part of the larger plan, and will gain a swimming pool, and, using portable equipment, structures for roller-skating and ice-skating. Areas formed by sunshades and trees can be used as outdoor classrooms. Next to a building containing elderly housing is a more sedentary area sheltered beneath sunbreaks. Throughout the site will be pedestrian paths for residents to stroll from one experience to another in the neighborhood. These will also be used by kids on bikes and skates.

The designers say that they hope to achieve a center that will be a gathering place for residents to shop, socialize, and watch over their children, that will serve as a recreation and sports center for all ages, and that will, most importantly, become "an identifiable 'place' which will give the immediate and surrounding community a sense of satisfaction and pride because it is useful and wholly accessible to all." The success of these laudable aims will have to be judged after completion, of course. It is emphatically the case, however, that design such as this, aimed directly at the relief of human despair, is to be more highly commended than a lot of the more monumental architecture and planning going on in the Federal center of the capital.—JTB
The success of Reston and the impending new town of Columbia do not mark the end of the new-town boom around Washington, D.C.; quite the contrary. One of the latest plans is for Montgomery Village, a community for 30,000 people on 2000 acres near Gaithersburg, Md., 20 miles north of the capital.

In the vein of a commendable recent trend on the part of developers to try and create communities rather than simply lay the land waste with scruffy little speculative houses on naked two-by-four lots, Kettler Brothers of Bethesda, Md., have asked their architects—Rogers, Taliaferro, Kostitsky & Lamb of Baltimore—to give Montgomery Village a center that will be more than just a shopping area set in a sea of parking lots. The architects have designed the Village Center as the pedestrian crossroads on a ridge at the geographical center of the new community. Pedestrian circulation is separated from vehicles and will enter the center via underpasses. In
the over-all site plan, the pedestrian way will run through a recreation valley to the south, past some apartments, through the Village Center, then more apartments, and finally arrive at a golf course in a valley to the north.

The Village Center will eventually feature two main courts linked by a galleria containing shops and businesses. The first portion to be built will be the south court, to be surrounded by residential and commercial buildings, offices, an information center and observation tower, an ice-skating rink, and a swimming pool. The low buildings will be essentially frame construction; brick and concrete will be paving materials. Major exterior materials will be brick masonry and slate roofing. Apartment houses to be built in the future will be of reinforced concrete.

Of commendable note in the plan is the placing of residential quarters over commercial spaces. This is a technique that has been regarded with a shudder in recent years, but one that actually has a lot to offer in creating compact, urban spaces with 24-hour lives. One can imagine that there are many people who would prefer this kind of living: single people, newlyweds, retired people who dread the idea of living in an old-age home.

When both elements of Montgomery Village Center are completed and connected with the galleria, it will probably really be like a village, with the added advantage of some open land within walking distance. Whether the brick-and-slate, slanted roof style will prove to be a little cute will have to be decided when the first units have gone up.
It might seem odd, at first glance, to place reptiles and nocturnal mammals under the same roof in a zoo building, but that is what Fred Bassetti plans to do in Seattle's Woodland Park Zoo. After looking at the sections, such a program becomes logical, for these will actually be two separate buildings joined under the roof for economy of servicing and sharing of ventilation equipment space.

The needs of the buildings are otherwise quite different: The reptile house needs to have tropical temperature, humidity, and ultraviolet radiation maintained, and the space for nocturnal mammals needs care on keeping night light levels during the day, so that the animals can be seen in action.

Bassetti says that the buildings will be “introverted, focused upon their exhibits; continuous, flowing concrete walls will form a muted background for the finely scaled creatures.” The radial circulation pattern will guide viewers in the reptile house between cages for snakes and larger pens for tortoises, iguanas, crocodiles, and alligators. A clerestory roof will admit daylight into the larger cages. In the nocturnal mammal house, illumination will be artificial, of course. Main cages will be in the center of the building, with three additional cages at the periphery. Structure will have concrete walls plus banked earth-retaining walls that act as a thermal insulator and moisture conductor. Roofs will be heavy timber construction with wood shingles, in the Northwest idiom.

The two “habitats,” side by side, should provide interestingly contrasting experiences, and the act of moving in and out amongst the crocs, gators, moccasins, 'possums, and 'coons in the radial circulation pattern should prove enjoyable.
In 1959, a demonstration grant study was made of College Hill, the oldest and most historic section of Providence, Rhode Island. One of the major aims of the study was to find ways of preserving the older buildings of the community while also creating new commercial and residential structures to revitalize the area. Since that time, the Providence Preservation Society, a more influential force in Providence than similar institutions in other cities, has managed to rehabilitate 85 historical buildings, and parts of the over-all plan have been nibbled at.

One of the important parts of the plan was the area on the east bank of the Providence River generally known as the South Main-South Water area, after the two major streets there. In the city’s great days as a shipping and whaling port, this section vibrated to the bustle of maritime trade. Today, however, it is a generally run-down residential slum whose largest commercial tenant is a wholesale plumbing supply organization.

When the Preservation Society pressed its proposal to rehabilitate the good old buildings of the area and create a forceful new business and residential neighborhood there, it found a sympathetic ear at the Providence Redevelopment Agency, which asked the Society to submit detailed plans for the project. Here entered Edward Sulzberger, a New York real estate man who is a loyal old grad (1929) of Providence’s Brown University, and has always held his alma mater’s home in fond regard. He liked the opportunity to discard the Robert Moses bulldozer technique for urban redevelopment, and commissioned New York architects Horace Ginsbern & Associates to come up with a viable plan for resuscitation and rebuilding. Millman & Sturges of Providence were named associate architects. Richard Coats of the Ginsbern firm saw a parallel—topographically and in the elegantly simple old buildings—be-
View from the river—before (above) and after (below).

Site Plan

(A) home furnishings center; (B) neighborhood shopping; (C) offices; (D) alumni club; offices, studio, and restaurant; (E) housing.
tween the slanting site and closely
knight nature of Mediterranean towns.

About 20 buildings on the site will be preserved; new structures will house about 300 residential units and a commercial center for the home furnishings trade. The commercial buildings will be on the water side of South Main and will include, in addition to the home furnishings center, neighborhood shopping facilities, offices with studios above for art students from Rhode Island School of Design, and a fine old warehouse building transformed into an alumni club with offices, studios, and a restaurant. Atop a rise at the west boundary of the section will be a high-rise apartment tower of 100 apartments containing a posh restaurant.

Low-rent housing units of two and three stories will be interspersed with some older buildings on the west side of South Main. Topography will be used to permit entrance into these from varying levels. Units will range from duplexes to efficiency flats. The structures will generally be directly on the street, with spaces at the rear for courts, playgrounds, and parking. Alleyways at various points will connect with these areas. There will be several parks in the redevelopment, plus a landscaped shopping mall. Parking in the commercial section will be underground, with landscaped decks above. Coats proposes that new houses be of brick with white trim, to fit easily with their Federal neighbors. The tower, as a sort of separate exclamation point at the end of the site overlooking a new expressway, will be more outspokenly contemporary, vaguely in the Chatham Towers idiom (pp. 132–39, February 1966 P/A).

Sponsor Sulzberger considers that this kind of sympathetic rehabilitation-development has sounded the death knell for the tear-it-all-down approaches of the past. "The days of the speculative urban renewal developer are over," he says. "Most firms today work on set fees and make their profits on the long-range investment and the success of the project rather than on overnight rises in land values. . . . The criticism that urban renewal is simply replacing old slums with new is no longer valid. In most instances, urban renewal has become urban preservation and the best of the old is blended with the best of the new into a harmonious and practical package that helps revitalize not only the immediate area but the entire city." Looking around most cities, an observer might conclude that this last statement is overoptimistic, but it is good to hear a real estate developer talking that way, and if more of his colleagues take a lesson from the responsible project in Providence, we may see some improvement in the redevelopment scene in the next few years.
What's behind the 17 separate climate control units at Geigy?

Gas and Carrier air conditioning

Temperature-humidity control for the new Geigy Pharmaceuticals plant in Suffern, N.Y. was a complex problem. Variance in the production areas couldn't be more than ± 1°F of temperature or ±5% humidity. What's more, comfort in the office areas also had to be considered.

The solution was a Gas-powered Carrier air conditioning system. One that employs no less than 17 separate air handling units for the 180,000 sq. ft. of plant. Each is tailored to the special needs of an area. Three reasons for the choice: First, Gas gives the lowest long-term operating cost. Second, Gas boiler capacity can be utilized year-round. Finally, Carrier absorption cooling equipment has no major moving parts, needs little upkeep.

Learn more about Carrier and Gas, its precision and economy. Call your local Gas Company Sales Engineer. Or write: Carrier Air Conditioning Company, Syracuse, N.Y. 13201.

For cooling and heating... Gas makes the big difference

On Readers' Service Card, Circle No. 322
A European plumbing device greatly reduces the cost of piping for multistory buildings.

BY WM. J. McGUIEES

A Swiss plumbing device under study in the U.S. could greatly reduce the cost of piping for multi-story buildings.

A European plumbing device that eliminates separate vent stacks and much of the branch vent piping for fixtures, can save about 40 per cent of the soil, vent, and waste piping of a fully-vented system in a multi-story building.

The device, called Sovent, aerates effluent in a plumbing stack. This enables air to pass through descending effluent, which means that the same pipe can be used to vent the system. This also means that branch vents can be eliminated, except where there are long lateral drainage runs.

Sovent was developed in Switzerland, and has been installed in numerous Swiss high-rise buildings. The first major application on this continent is underway in Montreal, where the fittings are being installed in the 12-story Habitat '67 project (see October 1966 P/A). In the United States, the Research Department of the School of Architecture at Pratt Institute installed Sovent in its test building in Carteret, N.J. Pratt, with a grant from the United States Department of Housing and Urban Development, is developing economical design and construction techniques for multi-story apartment buildings.

Venting Effluent

In any multi-story building, only a fragile barrier exists between occupied space and the polluted interior surfaces of sewage drains. This barrier is the fixture trap that retains a few inches of water in a "seal" that separates us from disease and unpleasant odors.

Air pressure within these soil pipes can force disease-laden air through the trap seal and into a room. Conversely, pressures less than atmospheric in the pipes can create a reverse pressure-difference that would allow air at room pressure to push the water from the trap seal into the piping. This siphoning action would destroy the water seal and allow polluted air to pass freely through the open trap and into the room.

The air pressures referred to are often greater than 5-in. water gage, and are caused by liquid sewage descending from upper stories. The liquid nearly fills the pipe, pressurizing the air below it and creating a subatmospheric pressure following it. This condition is compounded in multi-story buildings,

The conventional method of coping with this problem has been to create air reservoirs into which gases can be pushed instead of allowing them to escape through traps. An adjacent function of this air system is to supply air to low-pressure regions in order to fill the vacuum and prevent siphonage. The reservoir comprises a series of vent pipes usually located parallel to drainage pipes.

Aerating Effluent

Sovent, by aerating the effluent and permitting air to pass through it, modulates pressure differences, both positive and negative, to less than 1-in. water gage. Because the trap seal always exceeds 1-in. of water pressure, the small pressure differences in the pipe cannot siphon a trap.

The aeration is accomplished in a long mixer fitting located on each floor at the junction of a branch drain and a stack. The Sovent fitting aerates the effluent from the branch line by allowing the effluent to discharge from the pipe into a larger chamber. Branch effluent can enter the Sovent at the top of the mixer (see illustration) or it can enter at the side. When this side connection is used, the manufacturer installs a baffle inside the mixer to break up the horizontal discharge.

As effluent descends, it passes through the mixing chamber at each floor. To further aerate the material, the vertical pipe is offset just above the mixer to break up the tendency for effluent to compact itself.

Ultimately, however, the effluent has to be de-aerated before entering the building drain. Therefore, at the junction of stack and drain, another type of Sovent fitting is installed that will break the fall of effluent and separate the air. The separated air enters the top of the building drain. At this point, effluent and air flow separately in the horizontal drain.

Because copper DWV (Drainage-Waste-Vent) tubing and wrought or cast fittings are suitable for this system, the Copper Development Association is promoting its use. The association is sponsoring tests in Switzerland so that it can develop capacity data suitable for presentation to U.S. code authorities.
Don't specify Gargoyles to do a RIGID-TEX® job

For fascia, reflection-flattening Rigid-tex flashing, stainless gives you protection against the elements that you can depend on... and its textured patterns provide decorative advantages as well. Many otherwise beautiful buildings are being capped with materials that are as effective against wear and corrosion as a stone bird, and just about as handsome. Rigid-tex stainless is resistant to corrosion and far less susceptible to vandalism than unrigidized stainless. We'll send you a 50-50 comparison sample. Take a nail and scratch its surface. Hold it in the sunlight. You'll see how much more mar-resistance and how much less glare Rigid-tex provides.

Lighter gauges are possible because Rigidizing strengthens the metal. Rigid-tex is easier to work with, therefore—fewer rejects in fabrication and installation. It can be color-coated, highlighted, and polished.

Consider Rigid-tex when specifying flashing and fascia... we'll be glad to do all your gargoyle work.
PROTECTING CONCRETE AGAINST DEICING CHEMICALS

BY HAROLD J. ROSEN

How to protect concrete against deicing chemicals by coating it with linseed oil and mineral spirits. Rosen is Chief Specifications Writer for Skidmore, Owings & Merrill, New York City.

Concrete walks and concrete roads will deteriorate due to pitting and scaling when deicing agents are used to remove snow and ice. Although air-entrained concrete provides a reasonable degree of resistance to deicing chemicals, this result is not always obtained in practice.

The use of sodium chloride and calcium chloride for deicing roads and walks are standard procedures with public agencies and with homeowners. The resultant deterioration in concrete through the use of these deicing agents prompted almost simultaneous independent investigation of the problem by several agencies. Surprisingly enough, each of the investigators arrived at the same relatively simple and economical solution to the problem: A coating of boiled linseed oil in a mineral spirit solution was found to reduce and minimize the scaling of concrete that occurs as a result of the attack by deicing chemicals.

Among the agencies involved in this research were the New York State Thoroughway Authority, Kansas State University, and Battelle Memorial Institute, which worked under contract for the Thoroughway Research Board of the National Research Council.

The Battelle researchers evaluated a total of 110 coatings, representing a diverse spectrum of organic and inorganic materials, and conducted laboratory freeze-thaw experiments to determine their resistance to a 3 per cent solution of sodium chloride. The degree of scaling was determined visually by comparing coated and uncoated specimens.

Of the 110 coatings evaluated by Battelle, those based on linseed oil or other vegetable oils and sand-filled, coal-tar epoxy coatings performed best.

Considering both economics and performance, the best results by far were obtained with vegetable oils and particularly linseed oil solutions. In addition, this type of coating least affects the appearance of concrete. Some discoloration may appear initially. However, most discoloration will bleach out within a matter of weeks, although some may require an entire season.

For new concrete, the coating may be applied any time after the concrete has cured for a period of 14 days. If the coating is applied prior to this time, the finish may be marred and appear unsightly. For concrete that has been exposed to deicing salts, it is recommended that loose scale be brushed away and the surface of the concrete be scrubbed and flushed with clean water to remove as much of the absorbed salts as possible. The washed concrete should then be allowed to dry for a day, prior to application of the coating. An additional application should further be provided every three to four years to assure protection.

The following specifications may be used for the materials and application procedures in specifying linseed oil protective coatings for concrete.

Materials:
(a) Protective Coating: 50 per cent boiled linseed oil and 50 per cent mineral spirits furnished as a blended mixture.
(b) Boiled Linseed Oil: A.S.T.M. Spec. D-260, Type I, modified as follows:

<table>
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<tr>
<th>Property</th>
<th>Min.</th>
<th>Max.</th>
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<tr>
<td>Viscosity (Gardner Holdt)</td>
<td>A</td>
<td></td>
<td>A.S.T.M. D 1545</td>
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<tr>
<td>Color (Gardner)</td>
<td>13</td>
<td></td>
<td>A.S.T.M. D 1544</td>
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<tr>
<td>Acid Value</td>
<td>4</td>
<td>6</td>
<td>A.S.T.M. D 555</td>
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(c) Mineral Spirits: A.S.T.M. Spec. D 235, modified as follows:

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<tbody>
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<td>Aniline Point</td>
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<td>138F</td>
<td>A.S.T.M. D 611</td>
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<tr>
<td>End Point</td>
<td>410F</td>
<td></td>
<td>A.S.T.M. D 86</td>
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Application:
(a) Weather Conditions: Do not apply in temperatures below 50F or above 100F, or when relative humidity exceeds 85 per cent, or when rain is predicted within 24 hours.
(b) Safety Precautions: Protect traffic and workmen against fire hazards in the presence of flammable, volatile mineral spirits. Protect adjacent lawns and plantings by use of plastic sheeting.
(c) Surface Conditions: Concrete surfaces shall be dry and cleaned of dirt, debris, oil, and grease, or other foreign matter that would inhibit penetration. Do not apply to surfaces less than 14 days old.
(d) Equipment: Apply by approved mechanical pressure spray equipment, by portable hand-spray equipment, by brushing or rolling, or by a combination of these methods to insure complete, even coverage. Spray equipment nozzles shall be not more than 18 in. from surface being treated.
(e) Rate of Application:
(1) First Coat: 40 sq yds per gal or 0.025 gal per sq yd.
(2) Second Coat: 67 sq yds per gal or 0.015 gal per sq yd.
(f) First Coat: Permit first coat to dry until penetration is complete and tackiness has disappeared, but not less than 24 hours.
(g) Second Coat: Apply second coat immediately after first coat has dried, as specified above.
(h) Protection: Do not permit traffic on coatings until tackiness has disappeared, and not sooner than 24 hours after application of second coat.

Concrete "al
specifications

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Among the countless luxuries of the Mansion House Apartments is the gift of quiet living. Engineered sound control throughout insures that neither a neighbor's Hi-Fi, nor the strains of a concert on the promenade deck below will disturb the tranquility of any apartment. Selected to complement this “hear a pin drop” atmosphere are 1400 Sloan Quiet-Flush II Flush Valves.

Mansion House Center
—a New 52 million dollar Apartment Community on historic St. Louis riverfront site

In the shadow of the Gateway Arch, St. Louis’ newest landmark—and on the site of the historic Mansion House, one of the city’s oldest landmarks—stands the elegant new Mansion House Center representing a truly spectacular and unique venture in urban living. Rarely have modern design, materials and technology combined to produce an apartment community with such impressive services, planned conveniences and interesting facilities. The three 28-story apartment buildings, sheathed in bronzed aluminum, are the tallest of their kind in the city. In addition, three adjacent commercial buildings provide Mansion House Center with offices, retail stores, restaurants and social clubs. On the beautiful six-acre promenade are an interdenominational chapel, lushly landscaped lawns and gardens, reflection pools, illuminated fountains, and statuary by internationally known sculptors.

The flush valves selected for Mansion House Center are Sloan’s new Quiet-Flush II Flush Valves. With Quiet-Flush II, Sloan has once again raised the standards of flush valve quality and performance, incorporating a new dimension in quiet operation, new dependability, new ease of installation and new smart appearance. Sloan is indeed the Flush Valve of Tomorrow—Today. Be sure to specify and insist on Sloan Quiet-Flush II Valves for your new building.
provide the perfect lighting and design tool. A high level of uniform, glare controlled, shadow free illumination is achieved in the new dining hall of Colorado State University, Fort Collins, Colo., through the use of the first commercially available egg-crate louver panels molded out of 100% pure virgin Acrylic. Acrylic louvers were specified because of their complete resistance to yellowing in long-term exposure to fluorescent light, and also because of their minimal maintenance requirements; 70% of the panels are open allowing no area for dust accumulation. Economical, efficient and attractive, American louvers are now available in Acrylic for both fluorescent fixtures & luminous ceilings.

**Samples and Literature on Request**
By Bernard Tomson and Norman Coplan

In the second of several articles, P/A's legal team discusses the findings of the Appellate Court of Illinois in a recent case in which architects were sued for injuries sustained by the contractor's workmen.

In last month's column, we discussed the Illinois case of Miller v. DeWitt, in which a contractor's employees had been injured on a project because of inadequate shoring, and who as a result instituted action against the architects, contending that the latter had a duty in the exercise of their professional function to take reasonable steps to insure the safety of workmen on the project. It was the contention of the plaintiffs that it was the duty of the architects to "inspect, supervise, and to stop the work if it endangered life or property," and that the architects should be liable, even though the injuries in question were sustained in the first instance because of the manner in which the contractor performed his work.

The architects, on the other hand, contended that they were not responsible for the methods utilized by the contractor in executing the work, nor for the safety of his employees; and that the architects' primary responsibility in respect to supervision is to insure that the completed project conforms to the plans and specifications. They further contended that, if liability were charged to them, they were entitled to reimbursement from the contractor who performed the work, since the latter would be the primary or active responsible party and the architects' role was only passive.

The contractor, who could not be sued directly by the plaintiffs since such suit was barred by the Workmen's Compensation Law of Illinois, contended that the cross-suit by the architects should be dismissed, since the claim of the plaintiffs against the architects of inadequate supervision constituted an act of active and not passive negligence. The contractor further contended that the Workmen's Compensation Law, which barred direct suits by employees against their employer, also barred the cross-complaint of the architects, since a recovery by them against the contractor would accomplish by indirection what is barred directly under such law.

The Appellate Court of Illinois described the potential liability of an architect as follows:

"The architects may be liable for negligence in failing to exercise the ordinary skill of their profession, which results in the erection of an unsafe structure whereby anyone lawfully on the premises is injured. Their possible liability for negligence resulting in personal injuries may be based upon their supervisory activities or upon defects in the plans or both."

The Court ruled that an architect can be liable to persons with whom he has no contractual relationship, including employees of a contractor, stating:

"Their possible liability is not limited to the owner who employed them. Privity of contract is not a prerequisite to liability. They were under a duty to exercise ordinary, reasonable care, technical skill, and ability and diligence, as are ordinarily required of architects, in the course of their plans, inspections, and supervision during construction for the protection of any person who foreseeably and with reasonable certainty might be injured by their failure to do so, and whether or not they so exercised such is a question to be determined by the jury."

In rejecting the position of the architects that the duty of supervision was limited to assuring that the completed project conformed to plans and specifications, the Court ruled:

"The defendant's architects urge that under a contract to 'supervise the work' of construction, an architect undertakes only a duty to see that a building is constructed, which, when completed, meets the plans and specifications and is the building for which the owner contracted, and that he has no rights or duties with regard to the manner or means or techniques of construction adopted by the contractor to produce that end result. One of the defendant's architects' duties here undoubtedly was as they say, but that was by no means their only duty. Under these contracts and associated documents they had many other powers, authorities, responsibilities, and duties. Some of their rights and correlative duties did relate to some of what the defendant's architects possibly refer to as manners or means or techniques of construction of the contractor. But it would be a useless exercise in semantics and speculation to endeavor to examine or define or classify (which the architects here do not) what is meant by manners or means or techniques of construction of the contractor and as to which ones the architects had duties and as to which ones they had no duties. Under these contracts and documents and under these facts and circumstances they had substantial relevant and applicable duties to persons in the position of these plaintiffs as we've set forth, whether those be considered to relate, in part, to what are possibly denominated to be manners or means or techniques of construction, or to something else."

The Appellate Court of Illinois concluded that the architects had the duty to stop the work if the contractor's performance jeopardized the safety of his workmen, and that the jury was justified in concluding that the architects in the proper exercise of their professional functions should have known that the contractor's employees were subject to jeopardy. The Court further ruled that the dismissal of the architects' cross-complaint against the contractor was proper, and that the jury could find that the failure of the architects to stop the work was active negligence, precluding recovery against a negligent contractor.

In next month's column, we will discuss the decision of the Supreme Court of Illinois, which affirmed in part and reversed in part the determination of the Appellate Court.
Here's a grandstand built with an air spoil to hold down the roof. And J&L Junior Beams to hold down the cost.
Build a large roof in Florida and a hurricane may lift it off. At Pompano Park, Florida's newest Harness Course, the architect and consulting engineers attacked these uplift problems with J&L lightweight structurals and a unique design idea. They built the curving grandstand roof with an air spoil that runs down the center, from one end to another. The air spoil creates turbulence to break up wind uplift forces. J&L Junior Beams, according to the engineer, were the best choice of roof member because of their rigidity and lightness. The beams act equally well in two directions, help resist the unusual uplift forces of low-sloping roof surfaces. But lightweight structurals help hold down more than the roof. They held down costs, too. Because the 12-inch beams (placed on 5-foot centers) weigh only 11.8 pounds per lineal foot.

If you could use more strength with less weight, look into J&L lightweight structurals. Write for our booklet containing all the specs. It's free.

To help hold down cost.

- Architect: Robert E. Hansen, A.I.A.
- Consulting Engineers: Walter C. Harry Associates
- Steel Fabricators: Peden Steel Company
- General Contractor: Porcher Construction Company
- Completed: 1965
- Owners: South Florida Harness Raceways, Inc.
- Wm. A. Weir, Construction Coordinator, Pompano Beach, Fla.

Jones & Laughlin Steel Corporation
3 Gateway Center, Pittsburgh, Pennsylvania 15230

On Readers' Service Card, Circle No. 362
This is a comprehensive, well-illustrated book, dealing with the entire scope of this style, which reached its high point at the turn of the century. Robert Schmutzler uncovers its origins in William Blake, and traces early art nouveau through Rossetti and the Japanese influence to its zenith in Europe and America.

The active hostility shown to art nouveau in the last 50 years, and its small repute, is reflected in part in the minimal attention it receives in most architectural texts. This reticence on the part of architectural historians is perhaps understandable. They doubtlessly find it difficult to take seriously a movement spawned by poets, painters, and illustrators whose beginnings were decidedly not architectural. Yet the insistence of the art nouveaux on total design, their concern with interior planning, and their search for decoration uncontaminated by the regurgitations of revivalism is surprisingly consistent with the concern of those contemporary designers who see design as integral to architecture. This is what makes this book important, rather than the commercial exploitation by art dealers and galleries of art nouveau as a collection of prettified objects isolated from their setting.

Art nouveau has been characterized as essentially an anti-movement. Schmutzler's book strongly contradicts this. He proves that the roots of art nouveau go back to the 18th Century. His work documents with a profusion of fact and illustration the validity of the author's premise that this was not a hybrid offshoot grafted to the mainstream of artistic development.

Within an art form that includes Jan Toorop's poster for salad oil, Berlang's Amsterdam Stock Exchange, Tiffany vases, Gaudi buildings, and structural decoration by Viollet-le-Duc, it is understandable that an occasional generalization by the author may be found questionable by this reader. But these infrequent flaws do not prevent Schmutzler from attaining a synthesis of the tendencies that made the phenomenon of art nouveau less a phenomenon and more the logical outgrowth of a design search spanning considerable time.

The beauties of art nouveau's surrealist contradictions offer boundless fascination. The meanings of a hand-blown, organically formed glass vase decorated with peacock feathers; or soulful, spiritual, erotic Victorian nudes; or tigers and a damsel bursting out of a clump of lilies have the logic found only in dreams. Within the complete environment of architecture, however, the surrealistic climate is the more remarkable. Here, the art...
THE I/S SEATING GROUP DESIGNED BY DAVE WOODS

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Continued from page 196

nouvel architect’s insistence on total design gave overpowering consistency to his fantasy.

It is therefore useless to seek logic in art nouveau. The flowing, sinuous organic line was most successfully realized in inorganic form. Gaudi, in his striving for architectural form, created form for form’s sake, which, by definition, is sculpture rather than architecture. Yet, in his creation of forms unassociated with architecture, he often employed the soundest structural reasoning; there can be little argument with the logic of moving columns from the vertical to take the side thrust of an arch, or the creation of a serpentine cave by simply successively tilting the rafters over the ridge. Victor Horta, who was given credit for designing the first art nouveau building with the most sensible of ground plans (according to Siegfried Giedion) was not above creating an insect-shaped inkwell. From the vantage point of over half a century, some of these concepts seem incongruous, but then logic has seldom been the controlling

vice of artists. I need but mention today’s Campbell Soup cans and Brillo boxes.

Of course, the incongruities of the style are only too obvious, and the author has not dwelt upon them. In retrospect, however, they seem no more outlandish than the modernism that followed in the 30’s. Unquestionably, in unimaginative hands art nouveau could be unequivocally bizarre, but the possibility of its awfulness approaches virtue when contrasted with much of contemporary building—designed by codes, calculated by machines, aesthetically gaged to the arbitrary convenience of machine extrusions—which, in their mediocrity, lack even the possibility of being bad. Now that we have seen what the uncontrolled machine is capable of, it is possible to appreciate once again the nostalgia for nature that was the mainspring of men like Sullivan in their creation of ornament.

The reaction of most observers to art nouveau is unequivocal, for it is not a style that can be taken or left alone. It would seem, therefore, that this style, which at times attains surrealistic madness and at others fine architecture, is a valid record of our architectural past and is at least important enough to examine for our architectural future. In this reviewer’s opinion, this fact alone would give sufficient importance to Schmutzler’s book.

Scrupulously Documented Survey
BY PETER COLLINS

The Search for Environment: The Garden City Before and After. By Walter L. Creese. Yale University Press, New Haven, Conn., 1966, 360 pp., illus., $15. The reviewer is Professor of Architecture at McGill University, Montreal, Canada.

When Walter Creese first began his research on the antecedents and influences of planned English urban environments since 1850, orthodox town planners still based their theories on a doctrine equating “slums” with housing densities greater than 12 families to the acre. This was so whether the panacea visualized was conceived as scattered villas or widely spaced, tall apartment blocks. But the delayed publication of the results of Dean Creese’s research has coincided with a revulsion against this doctrine among the most influential academic theorists and practitioners. Thus, his scrupulously documented survey allows us to study and assess his critical appraisals with far greater objectivity than

Continued on page 204
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would have been possible a decade ago.

Whether or not the present eclipse of the "Garden City" ideal (in favor, for example, of prototypes based on Greek fishing villages) is merely a fashionable reaction or based on more solid causes, the reader can best decide when he has read Dean Creese's final chapter. But it seems worth noting that, whereas today's authoritative town planners usually have a deep and extensive scholarly background commensurate with the complexity of the problems they face, the most salient quality of the leading figures in this book is their patent lack of formal education. Ebenezer Howard (according to Lloyd Rodwin) "quit his studies at the age of fifteen, and during the next six years drifted through a series of odd jobs, taught himself shorthand, and served as secretary to a noted evangelist" before he emigrated to the United States and unsuccessfully took up farming in Nebraska. Raymond Unwin (the principal hero of Dean Creese's book) began work as an apprentice engineer and drifted into architecture in a manner the author leaves largely unexplained. Barry Parker (Unwin's partner, cousin, and brother-in-law) admittedly began his career as an article pupil to a country architect; but Dean Creese refers specifically to "his humble start as an apprentice decorator" (p. 255), and remarks that both Unwin and Parker were "self-educated in the literal sense, and partially lacked the inner restraint upon which more formally trained minds can often draw" (p. 243). In fact, all they seem to have had in common was, at best, a fervent faith in the romantic mediaevalism of Ruskinian sociology, and, at worst, the subconscious belief that the best environmental patterns inevitably bear a generic resemblance to William Morris's wall-paper designs.

In general, then, Dean Creese's basic interpretation of English developments in domestic architecture seems to corroborate the main thesis outlined in Professor Pevsner's Pioneers of the Modern Movement. Similarly, its detailed organization displays the same inherent inconsequence, which may of course accurately reflect one of the fundamental defects of British mentality, but may also indicate a Hegelian flaw in the author's organization of his text. For example, Chapters 2 and 5 deal with the model villages built by industrial philanthropists to house laborers who worked in their new factories. Chapters 4, 10, and 11 deal with garden suburbs either built for, or eventually occupied exclusively by, middle-class "commuters." Both may well have exerted a powerful influence on Howard's concept of the "Garden City"; but there is in fact little fundamental connection between the three concepts, and Dean Creese might have been more consistent if he had either elaborated trenchantly upon the nature of the discrepancy, or included detailed comparative analyses of, say, continental garden suburbs such as Le Vésinet, begun near Paris in the 1860's (which he entirely omits).

However, the sympathetic reader will not regard this inconsequence as a blemish, but rather as an additional stimulus toward pondering the significance of Dean Creese's immensely rewarding study. For the author's unassuming scholarship has brought to light a wealth of hitherto obscure literary and photographic information on a topic often treated too superficially on our overweighted shelves of Mumfordiana, whilst his shrewd and humane commentary has transformed what, in less able and distinguished hands, might have been little more than a catalogue raisonné of apt quotations and esoteric facts.
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Continued from page 204

**A Hit and a Miss**

**BY ROBERT B. RILEY**

CLASSICAL GREECE, GREAT AGES OF MAN series, BY C. M. BOURNE and the EDITORS of TIME-LIFE BOOKS, TIME, INC., TIME-LIFE BLDG., ROCKEFELLER CENTER, NEW YORK, N.Y., 1963, 192 pp., ILLUS., $19.50.

THE HORIZON BOOK OF ANCIENT GREECE, BY the EDITORS of HORIZON MAGAZINE, WILLIAM H. HALE, EDITOR in CHARGE, AMERICAN HERITAGE PUBLISHING CO., INC., 551 FIFTH AVE., NEW YORK, N.Y., 1965, 415 pp., ILLUS., $19.95. The reviewer is an architect practicing in ALBUQUERQUE, NEW MEXICO.

Judging from current book lists, the publication of scientific and cultural popularizations must be a profitable undertaking. A good many of the efforts, of course, are poorly written, condescending, and without purpose. But in a time of expanding knowledge and increasing specialization, carefully done popularizations are badly needed. At their best, they not only increase one’s knowledge of the world as it has been, is, and may someday be, but sometimes good one into thinking a little more about his own relation to those worlds. Ideally, a popularization should do two things: It should present not only a catalogue of well-accepted facts and theories, but a full measure of scholarship; not just truisms but controversies and unsolved problems; not just what is known, but what is being searched for. Secondly, it should try to communicate a sense of drama and excitement—in short, to use an un-fashioned Victorian word, the romance of the subject.

On these counts, the Time-Life book is a sorry effort. It is a cleaned-up, tidily-wrapped, written-down classroom history. If it is written for the schoolboy or for the parent with little education or curiosity, it lacks the element most needed to reach such readers—a sense of adventure or excitement. It is an ugly book, the format cluttered and muddy, the pictures poor. (Is it just nostalgia, or were the Life pictures of my teens really that wonderful?) It is a boring, overly elementary textbook, hardly what one would expect from Bourn.

The Horizon volume is a much better book, even a good one—almost everything a popularization should be. It not only shows a high level of scholarship, but continuously tries to relate the history of ancient Greece to the eternal dark and light sides of human life. It is neither cleaned up nor watered down.
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The follies of the Greek experience are here, together with the triumphs, the pettiness, the viciousness—and the heroism. The author, not content to merely catalogue events, tries to convey a sense of the power and emotional content of Greek life and thought; he succeeds remarkably well. Both books scatter brief excerpts from Greek writing through the text, but the Horizon volume includes 45 pages of representative poetry, drama, and philosophy, including the same passage from Homer rendered by six different translators, from Chapman through Robert Graves. It is a bonus if a book is not only mentally satisfying but also handsome; the Horizon book is. The layout is clean and spacious and the photography is exceptional. It has that quality of both isolating and exaggerating the emotional essence of landscapes, vases, and statues. One finishes it not only knowing more about classical Greece but feeling something as well.

Doxiadis Revisited

BY EDWARD K. CARPENTER


URBAN RENEWAL AND THE FUTURE OF THE AMERICAN CITY. By Constantinos A. Doxiadis. Public Administration Service, 1313 East 60th St., Chicago, Ill., 1966. 174 pp. The reviewer is an Associate Editor of P/A.

In two books published this year, Constantinos A. Doxiadis, the Greek city planner, issues basically the same warning: Man must not plan cities for a world whose population is 2 billion; he must plan for a world 10 to 15 times that size. “In a century from now,” he writes, “the total population will be of the order of 20 to 30 billion, the urban population about 20 times larger than at present, the economic forces, the machines, and the area of human settlements almost terrifying.” Indeed, Doxiadis thinks man is, in a way, already terrified, for his response to this evident boom in both population and urbanization has been to do nothing. Doxiadis’ books are by way of a plea—almost an order—to apply sense to chaos. As he points out:

“It is interesting for us to see how man has reacted to these dangers and warnings in building his cities during the early 20th Century when the crisis became, to some at least, apparent. The first remark that we can make is that during this period of the greatest population increase in human history man has lost the ability to build new cities. His only and really world-wide response is to create garden-cities, which are only very small cells in relation to the actual dimension of his settlements. Confronted with a new task, man shrinks into the dimensions of the past.”

Between Dystopia and Utopia is a series of three lectures, illustrated with diagrams, that Doxiadis gave in March 1966 at Trinity College in Hartford, Connecticut, when he was Lecturer-in-Residence there. For a college audience, the lectures provide exactly the right blend of scholarship and intellectual gymnastics that will excite and instruct. It is probably true, as Trinity President Albert C. Jacobs points out in his introduction, that “No one who heard him relate his doctrine of Ekistics to the

Continued on page 236

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Associate Architects: Minoru Yamasaki — Smith, Hinchman and Grylls

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NOVEMBER 1966 P/A
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Continued from page 222

urban problems existing today will ever again view the city with complacency.”

The other book is a report written for a more professional audience, and, although it carries much the same message, it raises more questions than it answers. In September 1960, the National Association of Housing and Redevelopment Officials asked Doxiadis to review urban renewal in the United States and to develop a set of principles and criteria “by which renewal agencies can appraise their progress and formulate programs for the future.” The report was submitted in 1961; Urban Renewal and the Future of the American City is an abridged version of that report.

In reviewing, or even in reading, anything prepared by Doxiadis, it is necessary to cut through the neat stack of freshly minted words with which he attacks any subject. This is really not very difficult, and he eases the task by providing short glossaries. But it is disconcerting, and the initial effect is to becloud rather than clarify an issue. His urge to coin words seems to stem partly from the realization that he is pointing the way across uncharted ground and that, as the first guide, he has license to identify the landmarks. Also, it seems to stem from his Greek heritage, for all his words—ekistics, entopia, Ecumenopolis, for example—have Greek roots. It is as if an Egyptian, coming from a land of ancient architectural heritage, were to feel obliged to establish the architectural styles of the future.

What Doxiadis sees in the U.S.’s urban renewal program, as it was four years ago, is not encouraging. He likens it to heart surgery in a case where the best cure might be a carefully planned diet, and notes that it has “resulted in disappointment for most people.”

He is concerned, for one thing, with the disappearance of park land. “Recent estimates are that because of the interstate highway program alone, 2 million acres of parks will be covered by concrete.” And he points to other factors leading to the extinction of parks—such as public buildings, schools, and post offices that are being erected on park land. “We can ask ourselves what we mean by urban renewal when we deprive a city of such elements as parks and gardens, and the beautiful buildings of the past, all of which made it worth living in.”

This is not to say that Doxiadis explores all urban renewal, for he does not. He thinks, rather, that it is a misguided—or non-guided approach. With the vast
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population expansion, the need is not so much for renewal of existing urban centers, he argues, as for planning new centers to relieve the pressure straining the existing ones. He believes that regional and metropolitan planning should come first. In a constantly expanding society—one of dynamic growth, as he calls it—he would anticipate results, and conceive, plan, and build accordingly. But, together with this plan, he would include areas of “static value that do not need to be and cannot be influenced by growth.”

Doxiadis would create urban backwaters, areas that would be passed by time and the interurban transit system whose only escape from stagnation would be eventual urban renewal. All mankind, he believes, should live in such static cells. As he has written:

“It is within such static cells that we can save man from the city that will crush him; it is within them that the community can have complete freedom for its expressions and man for his life. Someday, if people should bring their ears into the human part of such a community, we will laugh at them, as we do now at people who have entered a drawing room wearing their muddy boots.”

Eventually, within 100 years, Doxiadis believes that the expansion of urban settlements will decrease. He suggests there will then be no more movement from rural settlements to urban ones, and the population growth, for reasons he does not make clear, will level off. We will be left with a landscape composed mostly of urban areas with pockets of rural countryside. At this point, the world population will be about 30 to 50 billion, and the U.S. population will exceed 1 billion. All communities will be static, and then urban renewal will become the only means of amelioration. One can hardly quarrel with Doxiadis’ concern with long-range planning, although the premises on which it is based are not at all certain. Doxiadis is quick to point out that his data may not be entirely correct, but that we cannot wait around to have it all conclusively proved.

Unfortunately, the type of planning Doxiadis suggests may make it easier for mankind to overrun the countryside—a process many are fighting even today, as in the way highway planning has made it easier for cars to overrun cities. Any implementation of Doxiadis’ dreams should be undertaken with very great care indeed.
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