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THE ARCHITECTURAL FORUM / MARCH 1971

- 5 FOCUS
- 22 LETTERS
- 27 FORUM A monthly review of events and ideas.
- 29 THEATER BUILDINGS A 22-page portfolio of new theater buildings in the U. S. and Germany.
- 30 OKLAHOMA CITY, OKLA.: The Mummers Theater, John Johansen's latest production, is explosive in form and challenging in content.
- 38 DUSSELDORF, WEST GERMANY: A civic playhouse in the Rhineland is a sinuous counterpoint to its hard-edged neighbors.
- 44 BIRMINGHAM, ALA.: The proposed Civic Center will have four widely different halls around a lively public square.
- 48 NEW YORK, N. Y.: Two more theaters are completed in a century-old landmark, and the Public Theater faces its greatest crisis.
- 52 THE SCANDAL OF RURAL HOUSING A hard-hitting indictment and some major recommendations concerning two-thirds of the nation's substandard housing. By Clay L. Cochran.
- 56 CHAPEL IN THE DELL A worship-drama-music building for a small college in Washington, D. C., respects its Neo-Georgian neighbors.
- 60 STRUCTURE FOR CHANGE AND GROWTH A proposed system for residential construction, using adaptability to overcome obsolescence. By Helmut C. Schulitz.
- 64 TECHNOLOGY Outdoor/indoor music pavilions and permanent and mobile orchestra shells are approaching concert hall acoustics, prolonging symphony seasons and attracting new, informal audiences in the process.
- 68 SOMETHING NEW IN BARRACKS The Coast Guard barracks designed by Marquis & Stoller demonstrate that even a military base can be colorful, flexible and, almost, pleasant.
- 76 BOOKS
- 81 PRODUCT REVIEW
- 89 READER'S SERVICE FILE



Cover Design: A photograph by Balthazar Korad of the Mummers Theater in Oklahoma City, Okla. (p. 30).

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Here's how it helped Harwood K. Smith & Partners design an 18-story building that saves its owners thousands of dollars every year.

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FOCUS



SKY-HOOK TOWER

Rising 430 ft. above the financial district of Johannesburg, South Africa, is the world's largest suspended-floor structure to date, the Standard Bank Center. Architects were Hentrich-Petschnigg, well-known for their work in Germany (next page, top). The tower's structural core -composed of four slip-formed shafts — supports cantilevered concrete "arms" at the 11th, 21st, and 31st floors (which are used as mechanical floors). Precast concrete framing for individual office floors was hung -working from the top down -from each set of arms. At the base of the tower, a curtain of clear glass-with mullions stopping short of the plaza-allows a full view of the two-story banking hall, which extends out under the plaza. Also beneath the plaza are a small shopping arcade, computers, and parking.







QUADRUPLE SLAB

Hentrich-Petschnigg, the Dusseldorf architects whose triple-slab Thyssen House is shown as the backdrop to the Playhouse in that city (p. 39), have just completed this quadruple-slab headquarters in Cologne, for the West German Radio. The configuration of the plan fits the building neatly onto a long, narrow, and irregular site. The four connected slabs vary from six to nine stories, and are supported on single rows of columns. Directly to the south of the main building is a 2-story dining hall for employees, and there are three levels of parking for 580 cars below grade. Additional, smaller facilities are located behind the main building and not visible in this aerial.



COPPER ON COPPER

Designed by architect M. Arthur Kotch, this house was intended to demonstrate products sponsored by the Copper Development Association and cooperating manufacturers. Somehow, it does just that without looking like a hodgepodge. Among its features: a copper roofing system with Roman or Greek clay tile; bronze floors with patterned marble; a copperplywood laminated roofing and sidewall system; a film-coated copper panel system; bronzesurfaced copper floors; rollformed bronze sliding glass doors and windows; and copperclad walls, ceilings and countertops. Plumbing, electrical and mechanical systems in the house use copper metals and the pool even has a copper sculpture in it. Designed for "stately" yet "informal" living, the five-bedroom house found a buyer while still on exhibition.





GALLERIA TEXAS-STYLE

A version of the 110-year-old Galleria in Milan is Houston's new 600,000-sq.-ft. Galleria, with space for 100 stores. Designed by Hellmuth, Obata & Kassabaum (of St. Louis) and Neuhaus & Taylor (of Houston), the new Galleria, which opened last year, is part of a hotel/office/ retail complex set to open later in spring, with parking for 4,200 cars. The Galleria's ground floor contains a skating rink; the second floor cantilevers over the rink; and the third floor is set back under a glass skylight, 550 ft. long and 40 ft. wide.



PROGRESSIVE GOVERNMENT

The new City Administration and Council Chambers for Kettering, Ohio, is just what its officials wanted: a landmark symbol. Designed by architect Eugene W. Betz, the building is the first in a new government center to be located on the suburban wooded site. The structure is of reinforced concrete, with perimeter walls of glass. The roof, which overhangs 9 ft., is supported by steel trusses, primarily, and concrete piers.







IBM FOR THE MOTORIST

Located on a site adjacent to a San Diego freeway, this new IBM office building is designed with "an exterior of a scale that can be quickly grasped by a passing high-speed motorist," according to architects Leroy Miller Associates. The structure is of cast-in-place concrete, with exposed surfaces sandblasted for contrast between columns and spandrels. Windows are of gray glass, with dark, anodized aluminum frames.

PHOTOGRAPHS: Page 6, lower left, Harper Leiper Studios. Page 7, middle left, Bill Engdahl of Hedrich-Blessing; lower left, Julius Shulman; upper right, C. W. Ackerman.



OP WING FOR ART MUSEUM

In the \$10-million addition to the Cleveland Museum of Art, Architects Marcel Breuer and Hamilton Smith have complemented the 1916 Classical style building, while creating a landmark of the 1970's. Striped stone walls, wrapped around its cubic volumes, were made by setting split blocks of light and dark gray granite into precast panels. The new wing, primarily for art education (lecture halls, class rooms, etc.), also includes 11,000 sq. ft. of special exhibition space and a new main entrance for the whole museum.







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THE DECADE 70 HOUSE: SHOWCASE OF THE SEVENTIES

A house full of exciting ideas for those seeking the trends of the seventies has been built among the towering trees of a Houston suburb: the Decade 70 House of New Concepts.

Conceived and built by the Copper Development Association, advanced market development arm of the copper and brass industry, the Decade 70 House is a breathtakingly beautiful and spacious showcase of product innovations for the emerging lifestyle of the seventies. Participating sponsors include leading building product companies, a major national retailer and the electric heating industry.

A House of Innovations

As one might expect in a home of high quality, vital electrical wiring and mechanical systems including tubing for plumbing, water heating, and air conditioning are made of copper to assure long, reliable service. And, of course, brass hardware is used.

But it is the unexpected and unconventional uses for copper and copper alloys that characterize the

ENLERATE

Decade 70 House—visionary yet practical ideas that can be readily adapted in new and existing homes.

The Decade 70 House is aglow with the warmth and beauty of copper, brass and bronze. These traditional metals find new expression in dozens of intriguing and inventive ways—rich wall coverings, glittering floors, bright sculptured screens, elegant door and window frames, vaulted roofs and ceilings, hardware, furniture and decorative sculptures. Even the longlife nails for the redwood siding have been fashioned of a weather-proof silicon bronze alloy.

Outdoor Rooms, Too

The architect's imaginative plan enlarges and brightens each room by linking it with an exterior "room." A first-floor master bedroom suite opens on a private walled garden. Both living and family rooms adjoin a spacious pool patio through sliding glass doors framed in bronze.

Among the exterior innovations are: • Thin gauge copper/plywood laminated roofing and fascia systems

that mellow with age.

• Standard weight copper roofing that will stay bright (protected by a thin film factory-laminated to copper).

• Roll-formed bronze sliding glass doors and windows with bronze-tinted glass that reduces solar glare and increases privacy.

• Entrance doors and walls of sculptured copper panels that weather to a soft green patina.

• Conventional copper tubing, both rectangular and round, used for unconventional architectural highlights such as window stops and stair railings.

Interior appointments have been coordinated by Montgomery Ward with its new emphasis on modern decor, expressed in the theme, "Wards the Unexpected." Wards designers have brilliantly coordinated the color and texture of fabrics, furniture, carpets and wall coverings with the wide range of warm tone colors and finishes available in copper, brass and bronze.

Participating sponsors of the Decade 70 House along with the Copper Development Association include:



Preview of New Products

Artfully out of sight but on duty wenty-four hours a day are the nechanical systems that make the House of New Concepts virtually maintenance-free.

The Electric Heating Association, in cooperation with the Westinghouse Electric Corporation, has designed a total-electric heating/cooling system to make living and breathing delightful and comfortable in any season.

The total-electric system in the Decade 70 House releases no soot or collution-producing gases into the atmosphere. Based on the heat pump orinciple, the Westinghouse Hi/Re/Li apparatus warms the home in cold weather by drawing heat from the outside air. In warm weather it reverses itself and, much like a refrigerator, absorbs inside heat and lisperses it into the outside air.

Air in the house is continually leansed by Westinghouse's smoke, collen and dust removing Precipitron.

Many additional product innovations nave been introduced in the Decade 70 House to help create a new and leisurely ifestyle, freeing the homeowner of the seventies from bothersome chores and vorries, and creating a sense of nformal elegance in the home.

To house all these new adventures in iving, noted Houston architect, M. Arthur Kotch, AIA, has designed a lazzling structure surmounted by opper roofs that vault, peak, slant and lide as they define the changing nterior spaces.

MASTER BR

STER

DRESSING RM.

Architect M. Arthur Kotch's plan for the House of New Concepts is a tour de force of distinctive home design.

Guests entering through the copperclad front doors find themselves in a warm, skylit reception gallery. Ahead, beyond a glass-walled atrium open to the sky, stretches the 50-foot vista through the living room. To the right are spaces flowing into the dining room, family room, and kitchen, and stairs to second-story sleeping chambers. At the left, carefully isolated from activity areas, are the study and master bedroom suite, a sumptuousand practical-sanctuary for parents.

Throughout the house there is totalelectric heating and cooling engineered by Westinghouse in cooperation with the Electric Heating Association. Like growing numbers of consumers, Decade 70 designers see electric heat as a solution to many pollution problems.



STURAGE

SECOND FLOOR

DRESS

BAT

KITCHEN



*

ENTER

STORAGE

BAR

GARAGE

FAMILY DA



FIRST FLOOR

As You Enter

The doors of a gracious home should be inviting...beckon you in...and these doors do just that. Paneled with copper bas relief squares in a dogwood blossom pattern, the front doors of the Decade 70 House are accented on the exterior with a simple but massive "Domo" design and on the interior by "Flyte," both striking new solid brass door handles by the Schlage Lock Company.

Throughout the House, Schlage locksets are of solid bronze in a rich, satin finish design called "Luna."

Schlage also installed a new-concept security measure. A modular system adaptable to any standard-size closet or storage space, the Schlage "security closet" can accommodate vital papers, furs, liquors and other possessions, keeping them safe from fire and theft. On display in the driveway of the Decade 70 House are two new-concept cars for the seventies developed as prototypes by the copper industry.

At left is Exemplar I, a fully roadable car demonstrating many new functional, safety and decorative concepts utilizing copper and brass.

At right is the Copper Electric Car. Utilizing quiet, pollution-free electric propulsion, this car is ideal for shopping and for commuting. Its batteries can be charged overnight on regular house current.

The garage of the Decade 70 House faces the side, rather than the front, and is hidden from the street. Its solid metal door is by Stanley-Berry Division of the Stanley Works, and is operated by a Stanley-Berry electric door opener electronically controlled by a radio transmitter in the car.

Inviting entrance way and double doors are framed with massed medallions of copper. Reception gallery beyond is separated from dining room by a floor-toceiling decorative screen of bronze. New-concept flooring is made of non-skid, sixteen-inch textured squares of bronze.







Bronze-framed Parallel-O-Bronze Tuf-flex Tempered Safety Glass by Libbey-Owens-Ford stretches from floor to ceiling on two sides of the living room, assuring comfort by reducing glare on the inside and blocking a high percentage of the sun heat from the outside.

The exciting triple-vaulted ceiling is faced with etched brass sheets whose random oxidation patterns reflect the endless variation of nature.

endless variation of nature. Coffee table and etagere demonstrate the beauty and versatility of copper and its alloys, brass and bronze.



This beautiful all-electric kitchen is a dream-come-true for any homemaker. Designed in a step-saving L-shape, it features the latest in timesaving, copper-clad and copper-toned appliances by Westinghouse.

A part of the lifestyle of the seventies available right now is the Westinghouse microwave oven and its amazingly fast, smokeless cooking. Completely portable, it can be moved outdoors for heating and serving poolside meals or snacks. All that's needed is a 115-volt outlet.

Other up-to-tomorrow Westinghouse

appliances are the copper-faced refrigerator/freezer, built-in oven, and dishwasher, upright freezer, and the stacked washer/no-vent dryer unit that requires a mere 27 inches of wall space.

Also engineered by Westinghouse is a highly sophisticated "total security" system protecting the Decade 70 family from hazards such as fire, burglary, freeze-up, and even power failure. Called "Home Guard 24," this remarkable Westinghouse system employs a network of sensors that is ćonstantly on duty to warn of trouble in and around the house. Even the pool area is monitored, an extra measure of safety for pool owners with children.

Not only does Westinghouse's "Home Guard 24" alert family members of danger, it also sends a coded message to an outside communications center. It can be programmed to alert the center to freezing water pipes or an air conditioning failure when the Decade 70 family is away from home, and, if regular power is interrupted, can even switch on a standby power plant that may be installed.



Counter tops and cabinets throughout the kitchen are finished with Formica laminates for maximum beauty and durability. Cabinets are faced with a honey-toned teakwood pattern. Counter tops are Formica's natural slate pattern. Door pulls and hinges are solid brass.

Throughout the Decade 70 House, in baths and in other rooms where special wood-grain effects are desired, the architect has specified Formica paneling because of its low-maintenance durability and the wide range of patterns and colors available.

Also featured in the kitchen are new concepts from the NuTone Division of Scovill, a leading manufacturer of home built-ins and electronics, inter-com systems and lighting fixtures. Above the brick-faced cooking peninsula, with its range unit and charcoal broiler, is a custom-designed NuTone range hood, fabricated of statuary-finish copper. In the counter, a flush-mounted NuTone 221 food preparation center features a combination power blender, food mixer, meat grinder, vegetable slicer, juicer, ice crusher, and knife sharpener.

Thoughtful extra : throughout the kitchen, supplementary lighting has been provided under overhead storage cabinets to banish counter-top shadows.

At the right on entering the Decade 70 House, separated from the gallery by a decorative bronze screen, is the spacious dining room. A high, coffered ceiling adds to the sense of openness and grandeur.

This is truly a "prototype room." The bronze floor tiles, which distinguish the entrance gallery, also form the perimeter of the dining room floor. The custom-made dining table features massive copper legs. Against the far wall is a sideboard, which combines the warmth and beauty of solid copper and rosewood.

Over the dining table hangs a bronze chandelier, a new-as-tomorrow demonstration of the new relevance of copper and copper alloys in contemporary design.

As in the living room, Parallel-O-Bronze Tuf-flex Tempered Safety Glass by Libbey-Owens-Ford reduces glare from the sun to increase visual comfort.



A spacious study adjoins the master bedroom and provides a quiet retreat when privacy is important. A new exterior insulation sheathing developed by the Philip Carey Company, a division of the Panacon Corporation, insures interior temperature control for maximum year-round comfort.

Philip Carey's built-up roofing products, Thermo-Bord and Asbestoseal, waterproof the sun-deck and insulate the deck topping the second floor. Bookshelves along the wall are accented with vertical brass standards. Behind the sleeping sofa and to the left of the bronze-framed sliding doors, the wall covering is "liquid gold" etched copper, similar to that enhancing the vaulted ceiling of the living room. Contrasting with the dark richness of this wall is the bold look of twin barrel chairs, fashioned of satin-finish brass.

The result is a warm chiaroscuro of light and shade.

Lavatory fittings and towel bars by the Miami-Carey Division of the Panacon Corporation complement the bathrooms of the Decade 70 House.

Although windowless, the downstairs powder room is remarkably bright, its feeling of spaciousness enhanced by wall-to-wall sliding mirrors over the lavatory which reflect and multiply the light from the ceiling fixture. Some of the mirrors are brass hinged and open to reveal convenient storage shelves.





In keeping with the architect's concept of integrating interior rooms with the outdoors, the master bath shown below commands a sweeping view of a private enclosed garden.

Luxury is the keynote here. "His" and "Her" lavatories by Borg-Warner are set in a ten-foot-long vanity top. Wallto-wall mirrors draw the freshness of the garden into the room.

Other Borg-Warner furnishings include the sunken, non-skid Versatub and a newly developed one-piece water closet, both in soft tones of tan to harmonize with the backwall and floor trim encircling the tub.

Borg-Warner also outfitted the other Decade 70 bathrooms, and supplied the enameled copper sink in the kitchen and the bronze sinks in the wet bars off the study and family room.



Center of informal entertaining is the spacious family room that separates the gallery/dining area from the kitchen.

The wall just beyond the staircase contains a NuTone solid-state inter-com unit, which serves as a two-way communications center throughout the Decade 70 House. To the right of the fireplace, doors conceal a home entertainment center which includes NuTone electronic equipment such as the record player seen here.

The far end of the family room opens into the kitchen, which features a copper range hood (seen beyond the circular dining/game table), with a NuTone vent. A flush-mounted NuTone 221 appliance performs seven basic food preparation functions, freeing counter space.

NuTone also installed a central cleaning system that makes short work of maintenance, plus built-in heaters and ventilators for the bathrooms.

Ceiling spots here in the family room, as well as all recessed lighting fixtures throughout the house, have been supplied by the Sterling Division of Scovill.



Adjoining the family room and facing the patio/pool area is one of two wet bars on the first floor of the Decade 70 House of New Concepts.

Sliding bronze windows allow access for service directly to the outside. Focal points: a bronze sink and an advanced-design brass faucet that provides water at any temperature at the touch of a finger.





Free and easy style distinguishes this upstairs "what not" room. It's a bedroom, game room, hideaway, guest room, art gallery—anything that suits the Decade 70 family's fancy. Main conversation piece is the

oversize bed, resting on a sculptured

copper platform. Another furniture prototype is the cylindrical night stand in bright brass with a woodchopper's notch to hold knickknacks.

Another feature: a sunken window seat overlooking the front entry way.



THE DECADE 70 HOUSE: EXCITING NEW CONCEPTS IN COPPER

New ideas, new concepts, new products will make the homes of the seventies adventures in living. Pictured here are some of the innovations which can be seen now in the Decade 70 House of New Concepts.



This completely new roofing system makes possible reliable copper roofing at an economical cost. Lightweight copper sheets laminated to plywood provide protection against weather, fast installation, and straight, crisp lines without an "oil canning" effect.



Many furniture prototypes are displayed in the Decade 70 House to dramatize the modern-as-tomorrow look of solid copper, solid brass and solid bronze.



Solid copper medallions, in bas relief design, were especially designed for the front doors and entryway of the Decade 70 House.



This is "Flyte," a new heavy-duty locking device marrying a cylindrical lock with a graceful handle of solid brass for rich appearance, safety, convenience, and durability.



Vaulted roof spanning living room is pure copper sheet, factory-treated with a special film to preserve the metal's natural satin finish and color.



This bronze-filigreed screen is a product innovation for the Decade 70 House. Individual sections are fastened together mechanically to form an artful space divider.



Copper scuppers, to carry away rainwater from the upper deck, prove anew that functional sheet metal work can also be beautiful...when it's fashioned of reliable copper.



A brand new bronze flooring system welcomes you to the Decade 70 House. Sixteen-inch-square bronze plates are laminated to plywood.



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ILETTERS

UNDERMINING THE ETHIC

Forum: The competition for the Mathematic's Building at Yale would seem to have undermined the Ethic of Architecture, which Mr. Moore's letter has done nothing to alleviate. The issue of importance concerns the matter of the participation of associates and employees of jury members and of the Professional Adviser, who are expressly excluded as a stated condition of the competition establishing, explicitly thereby, an unwritten time-honored professional law.

The matter is not open to personal interpretation as Mr. Moore would conveniently believe. Nor is subtlety in equivocation of principle lost upon a majority of architects merely on account of their silence, especially under the conditions of a competition which effectively precludes the free expression of those who competed. The growth of a double standard, in a variable law serving the whims of those who rule, and a law of rectitude for the disadvantaging of the rest, is an intolerable burden, and an anomaly in any society.

If the Professional Adviser of a competition may arbitrarily absolve a member of his own faculty from the expressed condition otherwise preventing his participation because of the close and intimate association existing with the Adjudicator as Chairman of the department he serves, and with three other close associates of the same faculty and school represented on the jury; and is then allowed unanimously to be the selected winner, the competition system, normally sustained by integrity and honor, is thereby invalidated and reduced to a farce.

An implication of the Yale competition is that the President of the AIA must either redress the violation of Ethic, and the injustice seen to be done in the case of all who participated, for the exemplary sake of what the oncoming younger generation of architects may be expected to follow as a precedent or, acquiesce ignobly in the undermining of the status of architecture as a decent profession. CHRISTOPHER CYAIONI Scottsdale, Ariz. Architect

MORE COMPETITIONS

Forum: The organizers of the Yale Mathematics Competition deserve every praise for the very fact that an open design competition was held at all.

That so many architects entered the competition, thus incurring a combined professional expense that undoubtedly exceeds the building's construction budget, together with the ensuing hue and cry, is due in part to the regrettably small number of architectural competitions offered in the U.S.

Every architect who is committed to design should use his influence as well as Charles Moore did at Yale, to establish more architectural competitions. Competitions are particularly appropriate for the large number of public building commissions that are now dealt out, not on the basis of design ability or even an architect's past experience with a certain building type, but instead as patronage

for political contributions. To look into the extent of this practice, simply compare the list of political contributors on file as public record at each Statehouse with the list of Public Works and other State influenced architectural commissions.

An open competition system would do much to raise the level of public architecture, as well as to offer to students and young practitioners the challenge to become serious designers. The interest, not to mention the fury, that always follows the few competitions held would be better directed at removing the influence of the greasy palm on the low quality of many public buildings. A better alternative is a healthy competition system. DONALD WATSON Architect

Guilford, Conn.

The Forum has received a lengthy reply to Charles Moore's comments, from Joshua D. Lowenfish. Because we do not have space to publish this letter, we refer interested readers to Mr. Lowenfish, 23 Lawrence Park Crescent, Bronxville, N. Y. 10708, for a copy.-ED.



Edison Plaza Building. Owners: Toledo Edison Company. Engineers • Architects • Planners • Samborn, Steketee, Otis and Evans, Toledo, Ohio.

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The engineering • architectural • planning firm of Samborn, Steketee, Otis and Evans made a computerized cost analysis of their glazing alternatives while the building was still on their boards. They compared various types of glass in terms of year-around heat loss and gain, initial glass costs, total building cost, effects on taxes and insurance, annual operating costs, etc. (See summary in box.)



What came out, loud and clear, was that Thermopane with Vari-Tran 108 coated glass as the outer pane would save the owners money. Less expensive to build. Less expensive to operate. This was not just because Vari-Tran's superior heat-reflecting qualities require less air conditioning tonnage. Since height of cavities between floors is less because smaller ducts are adequate, the same space is achieved in a shorter building at lower construction cost. And Vari-Tran permitted a simple radiation system 6" deep around the perimeter of the building. An average of 500 sq. ft. of usable space



was gained per floor. The other glasses considered would have required an expensive induction system 18" deep.

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ECONOMIC GLASS COST ANALYSIS by Samborn, Steketee, Otis and

Evans, Toledo, Ohio Uniform annual costs for the glass were based on an anticipated useful life of 40 years for the building, 20

years for the air conditioning equipment. Both costs are for borrowed money at 8% interest.

The initial cost of Thermopane with Vari-Tran and the air conditioning equipment it requires is less than for ¼" plate and the increased air conditioning it would require. And the total annual cost of owning and operating the building will be substantially less and will result in reductions as follows as compared with ¼" plate.

64.7% reduction in capacity of central refrigeration equipment 67.9% reduction in capacity of distribution system

53.2% reduction in capacity of central heating equipment

19.2% reduction in comparative initial costs

24.4% reduction in comparative uniform annual cost

33.7% in total annual operating costs 29.5% savings in comparative annual operating costs

There are also incalculable benefits from glazing with Vari-Tran/ Thermopane: greater humidity control in offices and the computer room located on an outside wall; sharp reduction of roomside condensation and down drafts near windows in winter, increasing comfort.



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Several years ago I asked Paul Rudolph, who was then Chairman of Yale's Department of Architecture, whether he had a student who might prefer writing about buildings to designing buildings. Rudolph suggested I talk to Warren Cox; and, in due course, Warren became the Technology Editor for the Architectural Forum.

I felt reasonably certain that Warren would remain with us for some time. For one thing, he seemed genuinely in-



terested in the subject; for another, he managed, almost at once, to get us into considerable trouble by writing a story that effectively deflated one manufacturer's claims regarding a widely advertised product (and we tend to like writers who get us into trouble, and keep them); for still another, Rudolph had told me that Warren really wasn't much interested in becoming an architect—that writing about architecture was really more his line.

Well, we were both wrong, and Warren quit after one year to move

to Washington where he went into partnership with George Hartman. He has written one or two stories for us since notably the cover story on the late Egon Eiermann's German Embassy building in Washington (May '65 issue), which, if I remember correctly, Warren was about to compare with a Nazi battleship before I exercised certain editorial prerogatives. But, more importantly, Warren has confounded both Paul Rudolph and me by becoming a first-rate architect; and the Mount Vernon College chapel designed by Hartman-Cox (pp. 56-59) is proof of that.

It is just as well. While Warren is an extraordinarily articulate and intelligent talker, I seem to recall that he was something of a stranger to the written word. It is good to know that he won't have to depend on it for his living.

-PETER BLAKE

REPORTS

PIPE LINE REPORT

The Interior Department has released a staff report-required of it by court order-on the environmental impact of the proposed 800-mile pipeline to transport oil from the North Slope of Alaska. The project would be the largest single private construction project in history. The report does, of course, concede that the pipe will do some irreversible damage to the environment but that we must have it "for the strength, growth and security of the United States." And the Department emphasized that "national security" was the primary consideration. The U. S., says the report, must not become "overly dependent" on oil from the politically unstable Middle East. (The U. S. derives about 3 per cent of its crude oil from the Mideast and North Africa.)

The report warns frequently of the dangers: "The response of the different species of fish and wildlife to the disturbances, possible pollution incidents and other alteration of their environment would depend on many factors, some of which are not completely understood"... "There is a probability that some oil spills will occur even under the most stringent enforcement of safeguards"... There would



St. Louis Post-Dispatch

be a "residue of unavoidable effects" . . . "For those to whom unbroken wilderness is most important, the entire project is adverse because the original character of this corridor in northern Alaska would be lost forever."

Since 95 per cent of Alaska still belongs to the Federal government, which has yet to settle native land claims, permission for the pipeline should perhaps come not from Interior with approval of the Council on Environmental Quality, but from the Congress, as Senator Case (Dem. N. J.) and others have urged.

"If they start building the pipeline", said Joe Upicksoun, president of the North Slope Native Association, "we'll wait another 103 years for Congress to settle land claims."

... AND WEST FRONT

The late Architect of the Capitol J. George Stewart's grandiose scheme to bury the West Front of the capitol behind an extension of gleaming white marble is very likely doomed. Stewart's successor, George White, is an officer of the AIA-Stewart's principal antagonist through the years; three of the seven-member Commission for the Extension of the Capitol are now dead or retired; and a report has just been released of a study commissioned by Congress from the New York engineering firm of Praeger-Kavanagh-Waterbury, which rejects Stewart's contention that the Capitol was in danger of collapse.

The Capitol, states the report, "survives in relatively good condition, attesting to the excellence of its builders . . ." And restoration, says PKW, will cost no more than \$15 million. Stewart's extension would have cost \$45 million.

Foundations, says the report, are subject to very little further settling, but they should be reinforced nevertheless. Voids in the foundation and upper bearing walls should be filled with cement grout or epoxy; and walls should be reinforced by anchoring steel rods in grout holes. Cracking of stones has resulted from expansion and contraction and they should be replaced.

COMPETITIONS

LOSER TAKES ALL

"It is certain that the intrigues and political rivalries which seem to be the specific affliction of European competitions, will give the winning team of the Vienna Conference Center a tough time." So said the late Sibyl Moholy-Nagy in Forum, March, 1970. The winning team was, of course, Gruen Associates of Los Angeles, with Cesar Pelli as Partner in Charge.

Pelli's team, first stage winner of what was to have been a single-stage competition according to the rules of the International Union of Architects, was

British entry below; Austrian, bottom

asked, along with three other teams, to develop their designs further. The second place winner had been the Building Design Partnership of London; third place, F. Novotny & A. Mahner of West Germany; and fourth, Johann Staber of Vienna.

On second go-round, the jury —by a vote of eight to one reversed itself in favor of the British entry, placing Pelli last. While the Germans stood fast on third base, the Viennese, Staber, advanced to second. Staber was then awarded the commission by a special committee of the Austrian government.

The Building Design Partnership, whose team had included two Viennese firms, issued a statement in which they said that their good faith "had not been justified" and that it was their intention "to say more in due course."

HOUSING

BLACK JACK CHALLENGED . . .

A case challenging the zoning in Black Jack, Mo., was brought in federal court in St. Louis, and the outcome is awaited with much interest. Here is the background.

A nonprofit religious group



announced plans last spring to build 214 townhouses (federally subsidized for low- and moderate-income residents) on a 12-acre site in suburban Black Jack. In August, the 3,000 inhabitants incorporated as a city (HUD had just approved the \$1.8 million project), and promptly zoned out the multifamily uses that were permitted when the land was under the jurisdiction of St. Louis County.

Romney called it "a blatant violation of the Constitution and the law," and in November asked the Attorney General to file suit. Mitchell was variously reported as "leaning toward legal action" and waiting for Administration policy before deciding the role of the Justice Department.

The President made one thing perfectly clear. In his press conference of December 10, he spoke out against "forced integration of the suburbs" (causing the National Committee against Discrimination in Housing to reply: "It is unconscionable for the President to speak of 'forced integration' when in fact the question is one of enforcement of the law. The President's statement demonstrates once more that he has a penchant for law and order except when civil rights laws are in question.").

In his January 4 discussion with four TV commentators, the President declared that "the law does not now require, or, in my opinion, allow the federal government to have forced integration of suburbs." In fact, he declared, to do so "would be counterproductive, and not in the interest of better race relations."

The case filed in federal court on January 7 was not brought by the Justice Department but by the American Civil Liberties Union. They charge that Black Jack's new zoning law violates the 13th and 14th Amendments, the Fair Housing Act of 1968, and the Civil Rights Acts of 1964 and 1968.

. . . AND MAHWAH, TOO

And, in a related attack on the same problem, the United Auto Workers and the National Committee against Discrimination in Housing have filed a complaint with the New Jersey Division on Civil Rights. It is the nation's first challenge by a major labor union of local zoning that excludes low-income residents.

Object of the joint complaint is the one-acre minimum zoning in Mahwah, N. J. Some 5,000 workers at Mahwah's Ford Motor Company plant drive long distances to work. The town's industries pay nearly half of Mahwah's \$3.7 million in annual property taxes. Local population is 11,000.

The procedure in this action is as follows: if the Civil Rights Division finds substance to the complaint, it can hold a public hearing. Eventually it can order Mahwah to provide equal opportunity in housing; Mahwah, however, can contest the order in state courts. Meanwhile, Region 9 of the UAW in New Jersey is ready with a housing corporation to build the units, once community approval is no obstacle.

INTERIORS

SENSE . . .

Artist Aleksandra Kasuba is erecting a "Live-in Environment" in a floor-through of a brownstone in New York City that will banish the 90-degree angle. The 750 sq. ft.-within an existing structural framework of "rooms"-will be transformed into seven stretchednylon "space shelters" with rising and sloping floor levels. These shelters will permit a generous flow of air, diffuse light evenly-while rendering the appearance of the shapes from solid to translucent-and muffle sounds. "It is privacy without alienation," says Miss Kasuba. "The presence of others is evident, communication possible, yet the individual, when sharing or occupying a clearly defined territory, feels invisible from other areas."

The seven defined shelters include a "sensory" for not more than two people, where light, color, odors (of earth, fire, water, and air, created by Danute Anonis), and sound densities (composed by Emanuel Ghent) can be experienced at will. And there is a "sleeping bower" of natural yak hair over a supporting construction by Silvia Heyden.

Miss Kasuba will invite people of different ages and professions to conduct "sensitivity sessions",



Stretch-fabric apartment

or just to spend time in her environment, then compile their impressions for publication.

. . . AND NONSENSE?

From Italy, by way of Domus magazine, come two other ideas that might help you loosen up for a sensitivity session.

The "soft bathroom" is not by Claes Oldenburg, but by the designer, Olivier Mourgue. Everything-the non-skid seating shelf which faces the soft sink (porcelain basin excepted), the floor, and the encased bathtub, curved in the profile of a reclining body-all are covered by a soft, expansive polyurethane, protected by a film of PVC. "Without sharp corners, and without loud noises," says Domus, "one Gulliver



Soft bathroom

can abandon oneself either to play or rest.'

• And if you can't be sensitive in a group without some very reassuring prop, you might try something like "Gulliver," a pop/father figure in papiermache that was scavenged from a carnival in Viareggio, Donato D'Urbino, Jonathan De Pas and Paolo Lomazzi built a proper chair for what was left of him.

ZONING

CARROT AND STICK

The power of persuasive zoning may soon be guiding private development in two strategic districts of Manhattan: the Fifth Avenue shopping district and a portion of Lower Manhattan along Greenwich Street. The use of zoning to promote specific goals-pioneered by the City Planning Commission's Urban Design Group-is already showing positive effects in the pedestrian arcades of the Lincoln Square area (May '69 issue, page 96) and the replacement of razed theaters in the Theater District (Apr. '68 issue, page 96).

Now the city's Office of Midtown Planning and Development (headed by Jaquelin Robertson, originally of the design group) has come up with a plan for saving Fifth Avenue-that is, the 25-block stretch (34th to 59th Sts.) that has long been the shopping Main Street of the U. S. A. For decades, the avenue's success has been undermining it; as rents have soared, banks and airline offices have replaced shops on the ground floors of the avenue's office buildings. But there was no real alarm until last year, when two retail landmarks, both occupying whole buildings, quit the avenue: Georg Jensen moved away, making room for an unspecified office building, and Best's closed down, selling its prime site to developers of a massive office building for Olympic Airways. Under present zoning, the result in both cases would be a lot of lobby and plaza at ground level, with perhaps some space left over for airline ticket offices. Fifth Avenue's effectiveness as

a prestige shopping area would be further impaired, and there is no comparable alternate location for this economically vital activity.

If adopted, the new special district rules would set a mandatory minimum area for retail use, insuring at least two lower floors of retail space in any new development. Banks and airline ticket offices would be limited to 15 per cent of ground floor space.

Additional retail space above the minimum would be rewarded with bonus floor area on the upper floors, but this additional area would have to be for residential use-a function that has been missing from this stretch of the avenue for decades.

Bonus apartment space would also be allowed for other amenities, such as through-block pedestrian passages-with shops along them-parallel to the avenue, public roof terraces at setback levels, and restaurants opening onto such terraces. Unorthodox setback requirements would allow no setbacks below three stores on one side of the street, none at all on the other; heights and setbacks for sites adjoining historic landmarks would be negotiable to allow the most harmonious massing.

New apartments on top of (continued on page 71)







THE MUMMERS THEATER

John Johansen's latest production is explosive in form and challenging in content

Opposite page: like all theaters, the Mummers is used primarily at night. This view of the central outdoor space, looking toward the entrance lobby (with the rehearsal hall on top), shows the reflecting pools that surround that outdoor space. Agitators stir up the water in those pools and create rippled light on the concrete walls. Below: the cooling tower supplies chilled water to the three structures that make up the theater.



Imagine for a moment, if you possibly can, that Peter Brook were to stage a production of Hamlet on a razed block in a run-down section of downtown Oklahoma City-what on earth would it look like? Answer: the set would look about like the new Mummers Theater just completed on just such a razed block in Oklahoma City, but probably not quite so wonderful. It would, undoubtedly, have battlements of raw concrete, and grain elevator tubes of painted steel, and water pipes and cooling towers and a few other accessories taken out of catalogues of 20th century American gadgetry. But it wouldn't, quite, have the wild nuttiness, the spectacular pizzazz that the architect John Johansen, and the stage designer David Hays, generated in this astonishing building.

Oklahoma City, like many former frontier towns now striving for a more genteel image, is architecturally schizoid. All of downtown is being ripped up and rebuilt in a somewhat grotesque, neo-Yamasaki style -marble arches, stately piazzas, and smashing vistas to nowhere. The locals, having been brainwashed into wanting their city gussied-up to look like downtown Tulsa (which looks like downtown Dallas, which looks like downtown Houston, which looks like Lincoln Center in Manhattan) are distinctly worried about what Johansen's Mummers Theater is going to do to their new midcult image. (Isn't it too reminiscent of the days when Oklahoma City was just a hole in the ground, with a great, big pump on top of that hole?) Well, yes, it is very reminiscent of all of thatand that is precisely why it is such an exciting building.

For if the theater in America, as an art form, is to survive the flicks and TV, it can do so only if it becomes a vital and vibrant expression of the American scene—the high-style as well as the low-style scene. Johansen's Mummers Theater, in its helter-skelter form, and in its ad hoc spaces within, is just the sort of theater that will survive.

It will survive not only because it is an expression of where and what the action is; it will survive, also, because it is the one theater I have seen, in several years, that will in-











spire more theater—that will inspire playwrights and actors and directors to extend themselves beyond their present limits, and to attain new heights. How many other theaters have been built, in recent years, that served as more than temporary shelters for some transitory productions? When was the last building built for the performing arts that inspired its occupants to expand their horizons? The Mummers Theater inside

The Mummers Theater, inside, is a bit of a dump, of course. I remember working with David Hays once, on an off-Broadway theater project, and having him tell me that my design wasn't really quite crummy enough it should have been more like some difficult, remodelled loft space, with awkward columns and crazy beams, and squeaky floors—and obstacles like these tended to challenge and inspire actors and stage designers.

Well, the Mummers Theater has plenty of junk inside to inspire: Johansen, who wanted to make a building that was simply assembled out of the catalogues of available American hardware, made no effort whatsoever to create well-proportioned and sleekly-finished showrooms. His workshops, rehearsal areas, dressing rooms and storage spaces are concrete parking garages lit with bare fluorescent tubes and decorated with wall-mounted conduit and graffiti; his lobbies and theaters are just sufficiently finished so the sound bounces around properly, and the light doesn't blind.

The only thing that has mattered to him, really, is the action on the stage; and because the framework is so crude and raw, the action, suddenly, acquires a splendid new dimension, simply by contrast.

The pictures on these pages suggest, but don't really quite explain, what the Mummers Theater is like, as an experience. When I saw it on a recent, sunlit winter morning, it was quite devoid of people. It was being circled by taxicabs whose drivers, one imagined, were muttering and probably cursing as they passed by what they considered to be the city's latest disaster area. A few kids walked by, and as soon as they saw the "people tubes" painted red, blue, mustard yellow and black, criss-crossing in the bright sunlight (opposite page),

PLAZA LEVEL








Opposite page: the thrust stage theater, with a capacity of 592 seats. The seating has been broken up into large loges, and the scale has thus been kept intimate. Actors enter from the slots between the loges. Above: the 240-seat arena theater which some visitors to Mummers prefer to its bigger neighbor. It is even more crudely finished than the bigger space—raw concrete, and wooden boards to absorb some sound. Below: view of the entrance lobby, with its exposed light bulbs.

their faces lit up in broad smiles. It is clearly a building one cannot ignore; it either infuriates, or it blows your mind.

It isn't only a stage set, of course. It is, primarily, a container of a number of very useful spaces. There is, to start with, the basement, which has in it all the administrative offices, the storage and dressing areas, and some of the mechanical stuff. All this is lit through skylights that stick out of the earth and supply dramatic and, at the same time, intimate lighting. Above that level there are three structures, vaguely connected: a cylindrical affair, which is the entrance lobby (with a rehearsal space on top): and two theaters-the arena theater, with a capacity of 240; and the thrust-stage theater (capacity: 592 seats). They are shown in these pictures. The cooling tower, clad in silverpainted steel, surmounts the central outdoor space. Three black tubes carry chilled water to the three separate structures, each of which has its own blower room. These blower rooms cool the three separate structures-and they heat them when hot water is piped up into them from the basement furnace. Keeping all the mechanical equipment outside the building envelope also kept a lot of noise out of the theaters.

Apart from the two conventional (or, rather, unconventional) theater operations, the Mummers Theater has, traditionally, had a very active children's theater, which performs on Saturdays and rehearses, during the week, in the lobbies that lead into the two major theaters, and in the rehearsal room over the main entrance lobby. Because all the spaces in the Mummers Theater are quite casually arranged, they all seem to work for any number of improvised functions. The little lobbies outside the two major theaters, for example, overlook the central outdoor space-and may someday become seating areas for a performance staged in that space below. Nothing seems impossible in this building, largely because there are no formal, no set conditions.

David Hays, who was most directly involved in the design of the two theaters, says that the larger theater came from an image suggested by an early

16th century Venetian painter. "The audience was divided into trays or sections," he said re-cently, "and they were united as a whole, but not homogenized into one group." The 592seat, thrust stage theater has about a dozen actors' "streets" leading into it-the stage becomes a sort of miniature Times Square-and you feel that David Hays' notion of a criss-crossed theater influenced John Johansen's larger concept for the whole building; a criss-crossed walk-through (right), in which the center is the place where the human connection is made -the stage itself.

About eight years ago, Mack Scism, the enthusiastic producer-director of the Mummers Theater, received a \$1,250,000 grant from the Ford Foundation to build and equip a new theater, a condition being that there would be matching local funds. McNeil Lowry, of the Ford Foundation, asked me to talk to Scism and to suggest names of architects and I did suggest several, including Johansen's. By May 1968, the Architectural Forum was able to present a detailed preview of Johansen's scheme. Finally, this past December 2nd, the Mummers Theater opened formally.

Since that day, theater people from all over the country and, indeed, the world have visited the Mummers Theater. They have been impressed, particularly by the relatively low cost (around \$2.3 million) for a well-equipped and stimulating facility. But they have felt that this was really an isolated event on the local scene.

Before very long, the Mummers Theater will cease to be an isolated event. A couple of city blocks to its east have been razed, and will soon be replaced by Tivoli-type gardens that will link the theater to the new convention center and downtown redevelopment under construction in the center of Oklahoma City. When this happens the Mummers Theater will become part and parcel of the city's intended new image.

Too bad for all those marble arches and paved piazzas; for there will then not be any doubt at all about where the action is in downtown Oklahoma City; and those arches and piazzas and vistas are going to look a little funny by comparison.

-PETER BLAKE



FACTS AND FIGURES

The New Mummers Theater, Oklahoma City. Owner: Mummers Theatre Incorporated. Architects: John Μ. Johansen (Charles A. Ahlstrom, associate in charge); Seminoff-Bowman-Bode (supervising architects). Engineers: Rudolph Besier (structural); John Alteiri (mechanical and electrical). Landscape Architect: Thomas Roberts. Stage Designer: David Hays. General Contractor: Harmon Construction Co. Building Area: 64,400 sq. ft. Costs: \$2,000,360 (construction); \$271,200 (furnishing and equipment). (For a listing of key products used in this building, see p. 89). PHOTOGRAPHS: Balthazar Korab

The central space of the Mummers Theater has been conceived, primarily, as a meeting place for the audience, before and after performances. But, as these pictures show, the potential of that space is much greater—it could become, and was indeed intended to become, an outdoor performance area, with audience seating in the lobbies that overlook the space. The ad hoc construction of the theater is very visible in these photographs—light steel framing and industrial tubing throughout.











THEATERS IN THE ROUND

This civic playhouse in the German Rhineland is a sinuous counterpoint to its hard-edged office-building neighbors

Left: view of the south (entrance) side of the Playhouse. Ramps leading to subterranean garage are seen in the foreground. Top of page: view from the northeast, against the backdrop of the Thyssen House. Below: aerial view showing existing buildings and park that shape the site.



The Schauspielhaus Dusseldorf —literally, the Dusseldorf Playhouse—is one of the most controversial theaters built in West Germany since World War II. It is also one of the very best.

It is controversial, primarily, because it turned out to be expensive to build, and because some of the sculptural and painterly embellishments suggested by the architect—Bernhard M. Pfau—ruffled some local feathers. (The feathers have remained ruffled, and some of the works of art have, consequently, been shelved).

And the Dusseldorf Playhouse is one of West Germany's very best not only because it is so well planned and so well equipped, but because it is, in plastic terms, such a really successful piece of urban design. More about this in a moment.

Some ten years ago, a competition was held by the City of Dusseldorf for the design of this Playhouse. Among the finalists were Pfau and the late Richard Neutra—but Pfau's proposal won out because the jury felt that it was superior in urbanistic terms. The resulting building was officially opened in January 1970— $4\frac{1}{2}$ years after the start of construction.

These are the vital statistics: the new Playhouse contains two theaters-a fairly conventional, proscenium - stage auditorium, seating about 1,000; and a roughly square, theater-in-the-round, seating anywhere from 219 to 307 on four bleacher-type facilities. In addition, the new Playhouse contains the usual dressing rooms, workshops, offices and studios. An underground parking garage for 600 cars, accessible by the ramps shown in the photo opposite, is located beneath the entrance plaza.

The site is shaped on three sides by a number of existing buildings, most prominently the triple-slab of the Thyssen House, designed by Hentrich - Petschnigg. The fourth side of the site opens to a handsome public park; and the architect's most significant urbanistic contribution was to relate the new Playhouse to that park, both functionally and visually: functionally, by bisecting the ground floor of the building with a pedestrian passage that connects the square and the park; visually, by giving the building an "organic" form relating to the landscape patterns of the park.





Opposite page: the larger of the two theaters, viewed from the stage and from the back row, respectively. All seats are reached from side aisles only. Above: the smaller, more experimental theater, showing movable bleacher seats on one side of the acting area. Plans and section are shown at right. The two most significant aspects of the Dusseldorf Playhouse, in urbanistic terms, are its "organic" form and its division, at ground floor level, into two separate buildings (see plan at bottom, right). The form, admittedly somewhat arbitrary, was developed to relate to the existing public park to the north, and to set the building apart, visually and symbolically, from the rectangular geometry of nearby office structures. And the pedestrian passage that bisects the Playhouse at ground floor level was developed to create a physical connection between the new plaza to the south-and the public park to the north.

The larger auditorium, which seats around 1,000, is shown on the facing page. Its prosceniumstage is fairly conventional in plan, with ample back- and sidestage facilities; the seating arrangement is somewhat less conventional - orchestra seating only, with the farthest row of seats about 90 feet from the stage. The elegant, overlapping wall-and-ceiling panelling helps to conceal some of the stage lighting; and the wide proscenium arch is effectively played down so that it disappears as a barrier between audience and performers. Acoustically, the larger auditorium is a huge success: one critic praised it as being so perfect as to make even the actors' breathing pauses audible! (The reverberation time is about 1.1 seconds). The wood panelling is grey in tone, the carpeting is red, and the seats are a greyish green. The iron curtain, designed by Gunter Grote, successfully continues the patterns of wall and ceiling.

The smaller auditorium, with a capacity of up to 307, is equally successful in terms of acoustics. The bleacher seats on the sides of the central acting area are movable—hence the variable capacity of this auditorium. Many different arrangements of seating and acting areas are possible: not only theater-in-the-round, but also a thrust-stage arrangement and even a proscenium-arch stage can be created here.

The two theaters have separate entrances and separate foyers with all the usual ancillary facilities. Some critics feel that the circulation from foyer to auditorium (especially in the case of the larger theater) is slightly confusing.





UPPER LEVEL





One of the more dramatic spaces in the Dusseldorf Playhouse is the foyer that serves the larger of the two theaters. It is located directly beneath the auditorium which is, in turn, supported on a single reinforced concrete column, with umbrellalike staves branching out from it to support the seating area above (see photo on facing page). It is a rather extravagant piece of structural gymnastics, but an effective one.

The structure of the Playhouse is reinforced concrete and steel. The form of the building, and the great variety of spaces required within, made any orderly structural system impossible to apply. The glistening, white and curvilinear facades were finished with a corrugated steel curtain wall. The steel was first sprayed with zinc, then coated with plastic and painted. It is mounted on a steel frame attached to the reinforced concrete structure of the building. Special clips permit the steel panels to expand and contract as temperatures change.

The building is, of course, a great success. Its architect, who knows the building better than anybody else, said this recently: "Both theaters form an architectural unity, a closed, curvaceous, plastic architecture. Without false modesty, I believe that I have found a form here that expresses theater — and nothing but theater." At a time when the theater itself is in a state of flux, a fluid form seems entirely appropriate as an architectural symbol.

FACTS AND FIGURES

Schauspielhaus, Dusseldorf. Owner: Landeshauptstadt Dusseldorf, Kulturamt. Architect: Bernhard M. Pfau. Engineers: Ingenieurburo Haesaerts; Ingenieurburo Kohlhaas. Consultants: Ingenieurburo H. Graner (acoustical); Dir. Willi Ehle (theater). Sculptor: Marianne Jovy-Nakatenus. Painter: Prof. Gunter Grote.

PHOTOGRAPHS: Manfred Hanisch



Above: entrance side of the Playhouse. The triple-slab of the Thyssen House is the backdrop. Right: foyer below the larger auditorium. A single reinforced concrete column, supporting a fan-like slab, carries the entire 1,000-seat spectator area above. The flooring in the foyer is pink Portuguese marble. The glass wall that rings the foyer overlooks the park.







THEATERS FRAMING A SQUARE

In Birmingham, Ala., everything from ice hockey to opera will be a few steps from a lively new plaza



View of Civic Center model with upper levels removed (top, opposite) shows public circulation areas and performing spaces. Same model, with roofs added (above), shows how bridges and terraces surround central plaza. The center's pedestrian link to the rest of downtown will be a tree-lined mall (plan, left) running under a proposed highway, then between the civic auditorium and the museum, to Wilson Park. The Birmingham-Jefferson Civic Center, now under construction, will not be merely a "cultural" center. Almost any event that will draw an indoor audience in a city such as Birmingham can be accommodated in its four major halls: a 10,900-seat coliseum, a 3,000-seat concert hall, an 800-seat drama theater, and a 100,000-sq.-ft. exhibition hall.

The indoor facilities were specified in the program of the 1966 design competition for the center. But the plaza in the middle is the creation of the competition-winning architects, Geddes Brecher Qualls Cunningham of Philadelphia.

The focus on a central plaza, one of the strongest features of the winning design, was the architects' response to the unpredictable future of surrounding blocks, now thinly covered with industrial buildings. More intensive development seems likely, but—despite prodding by the architects—the city has drawn up no guidelines for the area.

One of the few certainties in this planning vacuum is a noisy interstate highway, which will run—elevated—along one edge of the site. A pedestrian mall, lined with tree-planted mounds, will pass under the highway (plan, left) linking the new complex to the government center around Wilson Park.

The Civic Center plaza was conceived as "an enclosed urban garden," says George Qualls. All four halls in the center will face the plaza, but not with monumental porticos. Instead, offset entrances will fit the flow of circulation, and each hall will have a glass-walled lobby overlooking the plaza. Balconies opening off upper lobbies will overlap entrance canopies to form a continuous band of shelter around the space. Funnelshaped openings through the ring of buildings will provide inviting entrances on all sides.

Another outstanding feature of the competition design has since been abandoned because of its cost. This was the three-level garage beneath the complex, which opened directly—at each level—into the terraced plaza. Visitors would have walked from parking areas up to theaters through a lively public space. For the second stage of the competition (which involved eight finalists out of 278 entries), the architects showed



a hard, geometrical plaza (plan above), with a vast circular canopy—doubling as an observation deck—around it. Qualls now feels that the canopy (also abandoned as too costly) would have been too monumental.

Costs have had to be rigidly controlled—with the help of a construction manager-throughout the design and bidding phases. The competition program had been admirably clear about facilities needed, but overly optimistic about what could be obtained for \$25 million. More money was expected to be forthcoming, and its was (current budget: \$36.5 million). But inflation swallowed up most of the added funds. When test borings showed rock outcroppings and mud below the site, all major excavation was ruled out.

So parking was moved out to adjacent blocks where, consultants say, it will cause less congestion, anyway. (But provision for this parking will have to be made whenever these areas are developed.) The plaza took on a more casual form, with lots of water and some greenery. The sculpture at the edge of the central pool has not been designed yet, but Qualls has definite-and quite valid-criteria for it: he wants it to be about 30 ft. tall, and he wants it to move, perhaps in reaction to water falling over mobile parts.

The jury that selected the winning Civic Center design predicted that the plaza could "take its place among the well-known outdoor civic spaces of the world," Whether or not the revised plaza design meets their high expectations, the center will be an invaluable asset to Birmingham. The idea of a performing arts center-so pointlessly overblown in New York and Washington-may still have a valid function in cities the size of Birmingham. Without such concentrations of after-officehours activity to attract other development, their cores might simply fade away.



POOL LEVEL

The four components of the center (plans, left) form a hollow square, with a sunken plaza in the middle. At the lower level, a large restaurant will hang just above the plaza pool, and a covered outdoor cafe will overlook it from another angle. At street level, broad car and bus platforms will lead into funnel-like covered entrances. A complex of meeting rooms bridging the east entrance will link the exhibition hall and concert hall, which will be used jointly for conventions. The steel framing of the complex (section, top) includes a trussed roof girder spanning the length of the asymmetrical coliseum. The bulk of the coliseum's 10,900 seats (model, top right) will be on one side, near its main lobby and facing the stage location for theatrical events. The 3,000 seats of the concert hall (near right) will be divided into distinct groups at different angles and elevations. Balconies, reached by parallel curved stairs around a "rotunda," float free of the hall's back wall. The theater (far right) has 1,000 seats, only 800 of which are used for most events. A thrust stage displaces 200 down front; for proscenium productions or cinema, 100 are screened off at either side.

FACTS AND FIGURES

Birmingham-Jefferson Civic Center, Birmingham, Ala. Architects: Geddes Brecher Qualls Cunningham. Associated architects: Lawrence S. Whitten & Son. Engineers: Paul Weidlinger (structural); Leonard Weger Associates (mechanical and electrical). Associated engineers: Donald F. Nardy & Associates (electrical); Evans & Young (mechanical). Consultants: Jean Rosenthal & Associates (lighting and theater); Bolt, Beranek & Newman (acoustics); Restaurant Associates Industries (food service). Construction manager: Turner Con-struction Co. Estimated total construction cost: \$36.5 million.









THE PUBLIC THEATER

Papp's group continues rebuilding, and faces its biggest crisis



The 299-seat Newman theater (opposite, top) is one of two spaces newly refinished at the Public Theater (joining the Anspacher theater, above, now three years old). Entry corridors for the Newman (opposite, bottom) are simply treated. The theater itself has a sculptural catwalk against the side walls (the theater people subsequently obscured it by adding plywood acoustical baffles). Brick piers originally filled the space; these were removed and replaced by steel in the ceiling (covered with acoustic plaster). The ample stage is without proscenium. The set shown here was built out over the first of two removable rows of seats. Two more theaters at the dynamic Shakespeare Festival Public Theater are finished: the Newman theater (opposite) and an unusual cinema (following pages). Thus the New York landmark that began life as the elegant Astor Library, and grew older as the Hebrew Immigrant Aid Society, has returned to vibrant youth at the age of 117.

The offerings of the Public Theater are unorthodox-"Hair" began at the Anspacher theater (left, and April '68 issue)-and the audiences are young in age or at least in spirit. Joseph Papp's fervor for experiment attracts the directors, playwrights and performers who are the big names of tomorrow (and occasionally of today). The low prices and free admissions attract people who can't or won't pay heated-up Broadway prices for warmed-over theater. Aside from creating a new use for an old building, the Public Theater has created a new cultural institution.

All this is fine, but the roof is falling in-not structurally, of course, just financially. The entire Public Theater operation could collapse as a result of Papp's insistence on excellence (in architecture as well as theater), his determination to keep ticket prices low (one play, supported by other productions at the Public Theater, earned an \$85,000 loss and then a Pulitzer Prize), and his belief, amply supported by Mayor Lindsay's actions, that the city would buy the Public Theater and lease it back to Papp at a nominal sum.

Building on that "assurance" and using all its reserves, the Public Theater did these two new theaters. It now has debts of \$1 million: \$475,000 to the loyal and patient contractor, a mortgage of \$360,000, other bills from the new construction, and —last and probably least—the architect's fee. The architect is Giorgio Cavaglieri, whose rehabilitation work on this building and the Jefferson Market Courthouse has won him deserved acclaim.

"We would rather not sell the building," says Papp, but the situation is desperate. Thus in October a plan was presented to the city by its Department of Parks, Recreation and Cultural Affairs, for acquisition of the building with \$5.1 million in capital funds. (The city contributes from operating funds to Papp's summer programs in Central Park and mobile theater; but most of Papp's money is raised privately, and private money was sought, in vain, as this crisis developed.)

The \$5.1 figure covered expenditures to date (\$2.6 million) plus added money to finish the entry lobby, restore the chamber music room, finish the exhibition area, extend air conditioning, and comply with belated Fire Department demands for sprinklers throughout (the plans had received full Building Department approval without a total sprinkler system).

The Board of Estimate voted loud and clear—no—the result of an austerity mood, an untimely and unrelated fight with the Mayor (who backed the plan), and a general feeling—according to Papp—that the arts are expendable.

An emergency appeal then went to the Governor, who replied that he could do nothing "at this time." One avenue remains open and is being traveled as the Forum goes to press purchase of the building by the city, as is, for \$2.6 million. (When this possibility first came up, reporters conveyed the idea that the \$5.1 figure had been padded. The \$5.1 price was "fair and equitable," said an independent architect hired to make a careful estimate.)

"The city would be getting a bargain," says Bernard Gersten of the Public Theater; "there's no charge for the entrepreneurial leadership involved in what was done."

There is more than bricksand-mortar at stake, although it would be disaster enough to lose a building so lovingly preserved and improved in this latest rehabilitation. One theater producer calls the Public Theater the conscience of Broadway, and at very least it is a supplier to the commercial theater (e.g. "Hair"). Papp sees the struggle as one of conservation-conserving a cultural resource-which he says is not too different from conserving a tree. Whether all this will enter into the calculations of the Board of Estimate and City Council is unknown.

By every calculation, the loss of the Public Theater would be a disaster in ways too numerous to count.

-ELLEN PERRY BERKELEY









The 93-seat cinema (left) offers a new concept in viewing. Each seat is built up at the sides and back with plywood, and the viewer concentrates without distraction from other people. Except for the screen, the interior is totally black—black velvet walls, black upholstery, black carpeting. The intention is to suggest being inside the camera that is doing the filming. In the cinema lobby (opposite), one sees a curving wall of wood and cork; chandeliers have both a modern feeling and an old-world character that goes with the century-old moldings.

FACTS AND FIGURES

Estelle R. Newman Theater and Anthology Film Archives, New York Shakespeare Festival Public Theater, 425 Lafayette St., New York, N. Y. Architect: Giorgio Cavaglieri. Engineers: A. D. Ateshoglou (structural); Harold Hecht (mechanical and electrical). Consultants on Newman Theater: Ming Cho Lee (stage designer); Martin Aronstein (lighting). Cinema concept: Peter Kubelka. General contractor: Yorke Construction Corp. Construction cost: Newman, approx. \$950,000; cinema, approx. \$250,000.

(For a listing of key products used in this building, see p. 89.) PHOTOGRAPHS: George Cserna, except p. 48 top, Louis Reens.



THE SCANDAL OF RURAL HOUSING

BY CLAY L. COCHRAN

A hard-hitting indictment, and some major recommendations for the two-thirds of the nation's substandard housing that is in small towns and rural areas The interest of the National Rural Housing Coalition is not in "saving" small towns and rural areas or turning New York City into a public park, but in providing shelter for people wherever they are.

We are opposed to postponing meeting the needs of people until they move to the location where the planners think they ought to be—if the planners ever get around to agreeing where people ought to be.

We are not unfriendly to planning—quite the opposite. We are not anti-urban. We are not opposed to new towns. What we are opposed to is bad housing, bad water and sewer pollution, and to any attempt to justify the failure.

The need is immense. Twothirds of the substandard housing in this country is outside the Standard Metropolitan Areas. In addition, 34,000 communities lack modern water facilities and 44,000 communities lack modern sanitation facilities. The need over the next ten years has been estimated by the first National Rural Housing Conference, last year, to be 13.5 million housing units, new and rehabilitated, of which 7 million (or 700,000 a year) must be subsidized.

Primary blame for the neglect of rural housing rests with several Presidents, the Congress, and the U.S. Department of Agriculture (USDA). Except for the Farmers Home Administration, the USDA (especially its principal outreach agent, the Extension Service) has virtually abandoned the poor people of small towns and rural areas. The Extension Service is currently busy knocking on the doors of the ghettos for admission as consultants. It is a disquieting fact that the last agency in government likely to help low-income rural people on housing is the Extension Service, federal and state.

It is a curious tribute to the metropolitan orientation of our

Mr. Cochran is Chairman of the Board of Directors of the National Rural Housing Coalition, a nonprofit and nonpartisan organization that was launched in 1970. NRHC is concerned with housing (including water supply and sewage disposal) in small towns and rural areas. These remarks are an edited version of a statement made last fall before the U. S. Senate's Select Committee on Nutrition and Human Needs. society that these facts are not known even to informed people. One senatorial assistant said she didn't believe us. We told her to quarrel with the Bureau of the Census, not with us. (Until the Rural Housing Alliance began publishing figures, I would have guessed that rural areas accounted for 20 or 25 per cent of the total housing problem.)

Why is the problem so huge? In the first place, this nation is in trouble across the board on housing. The Secretary of HUD says that 80 per cent of our people, urban or rural, cannot afford to buy a decent home.

The explanation runs the whole gamut: the crunch from the war and ill-advised fiscal policy; skyrocketing land prices (no land policy, and a tax system that encourages land speculation); outmoded zoning; outmoded production practices.

But there is more. The Federal government has simply not acted responsibly on housing, particularly for low-income people. It spends \$9 billion a year subsidizing poor housing through social security and welfare payments, but, in dealing with housing production, it has not only been mighty parsimonious, but worse, has let housing fall victim to every little vested interest that could afford a ballpoint pen or an expensive lobbyist.

Until very recently, Congress did little to house low- and moderate-income people except (1) establish an insurance program for moderate-income people, designed to take the risk but not the profit out of private loans, and (2) set up a public housing program.

However, *indirectly*, as a result of Congressionally-blessed programs, we have ripped more housing out of cities than we have replaced, particularly for low-income groups; we have bulldozed housing from along our highways, with no concern for replacing it; we have rewarded land speculation through taxes. The present capital gains tax puts a premium on land speculation over many other forms of investment and is totally antisocial in its ramifications.

We urge this Committee to consider discouraging land speculation by levying a special tax on unearned increment. We are in agreement with the "Supplementary Views on the Taxation of Land Values" in the Douglas Report. (We suggest | that the proceeds from this special tax be put into a lowincome housing trust fund.)

Also indirectly, Congress has subsidized concentration of our "huddled masses" in our central cities through a most unwise welfare program that ties Federal benefits either to the capacity or the willingness of state and local governments to pay.

In a country that makes a fetish of the economic man, we know that higher wages will attract manpower; but we have happily assumed for almost 40 years that Federal welfare payments delivered on an uneven basis would not influence the location of people. Why should a poor woman with six kids, denied ADC in Arkansas or delivered a pittance, stay there and starve when her relatives tell her she can get \$300 a month in Chicago? Even though she lives miserably on \$300 a month in Chicago, she can at least live. Indeed it is surprising that the movement to the cities has not been even greater.

n the other hand, in rural areas we have dealt most generously with agri-business. We have handed out enormous subsidies to large-scale operators under the guise of aiding the family farmer; we have subsidized farm operators, packers, processors, and the whole agribusiness complex by exempting them, more or less totally, from wage and hour laws, unemployment compensation, part of social security, the right to organize and bargain collectively —you name it—and we have come belatedly if at all to making these benefits available to rural people.

Thus by deliberate Congressional policy we have facilitated the greatest enclosure movement in the history of the world, not excluding the drive to collectivize Russian agriculture.

This enclosure movement and the resulting out-migration have created a crisis in the cities without curing the rural housing problem; rural deficiencies are so severe that the out-migration did not make available decent housing even to those who remained.

The problems of the cities have received great attention.

But the problems of the small towns and rural areas are no less real and tragic.

In these areas there is very little public housing and it is too expensive for many of the poor. And no other agency is available to provide housing, or credit for housing, except in token amounts.

The public has finally become aware that the Federal Housing Administration has "redcircled" most of the central cities—they will not insure loans in those areas. This policy still exists *sub rosa* (where it always existed), but we are hopeful that despite his failure so far, Mr. Romney will be able to command his troops to abandon the policy; currently, they apparently wink as they salute.

But red-circling has not been restricted to the central cities. Red-circling has been almost ubiquitous in small towns and rural areas. FHA has never functioned in small towns and rural areas except under exceptions to the rule, and it is still not doing so. To impute blame is fruitless: Congress apparently never intended FHA to be anything except a scow on which lenders, realtors, developers, surveyors, title finance companies, and the rest of the camp followers of the housing industry could ride when they could not get aboard the yacht operated by banks, insurance companies, savings and loan and other lenders catering to the better-quality folk.

Whatever the various Congresses may have intended, FHA has in fact worked handin-glove with private groups, operating only where they would operate, and sharing their prejudices. FHA was in "business" to take the risk out of private credit for certain kinds of people, not to serve the public or housing consumers except insofar as the interests of the public and consumer happened to be equated with the interests of the housing business complex. Frequently, all of the housing ingredients are present in rural areas except credit, and this was to have been FHA's contribution. But FHA has seen fit to stay out of the towns and rural areas.

Public housing has also been largely an urban or metropolitan program. Congress created a system of local authorities. But unfortunately, the Federal subsidy was only available to the poor where the local power structure was sufficiently wise or enterprising or humane. Like welfare, the program puts a premium on socially-conscious state and local officials, and on the ability to pay.

The result is that public housing exists mostly in urban areas although there is a modest trend in the other direction in recent years—the result of an increasing fail-function role in the cities, as well as a new solicitude (mostly for the elderly population) in the rural areas.

or at least a hundred years our mythology has assumed that the growth of cities would redound to the benefit of all, that some technological imperative dictated that when we really became civilized, 90 per cent of our people would live on one per cent of the land, happy, prosperous, cultured, and secure. The place for people who were in trouble in rural areas and small towns was obviously in bigger towns. Electricity, inside plumbing, paved streets, medical facilities, neon lights, the more gilded pleasures of the flesh, and lately intolerable pollution, came first to the cities and (except for pollution) exercised a magnetic attraction on those from rural areas. Given the overwhelming acceptance of this mythology, it is small wonder that Congress moved easily with its constituency.

The powerful "farm bloc" which exercised power in Congress was a coalition of farmers and their suppliers and creditors (including a lot of "farmers" who were corporations, doctors, lawyers, and other absentee landlords) struggling to increase or protect their share of the American economic pie. They were much more concerned with increasing prices, decreasing the number of farmers, and holding wages down than they were in improving the quality of rural life by such exotic devices as subsidized housing programs.

The result was that neither in the New Deal days nor in the benchmark Housing Act of 1949 was any effort made for small towns and rural areas, except the modest farm housing program of the Farmers Home Administration (FmHA). The very promising farm labor housing program of the Farm Security Administration was destroyed by agri-business in a drive to prevent the unionization of hired farm workers and prevent the government from underpinning family farming by developing cooperatives and liberal credit.

Most people assumed that if housing was needed in rural areas and small towns, FHA and public housing could function there. Any examination of the facts would have revealed that a middle income housing program like FHA, created as the handmaiden of private lending institutions, could not function adequately in rural areas because of the paucity of private credit institutions there.

Be that as it may, it was another decade and more before Congress discovered that Federal programs were not serving rural areas and approved a modest home ownership program to be administered by FmHA. The program was to be financed out of direct appropriations, a tacit admission that the private credit institutions were not out there. This was amended later-after years of starvation by the appropriations committees - to enable FmHA to make insured loans.

(There was also a farm labor housing program instituted but it was designed to serve farm operators and processors and only incidentally the farm workers. It has failed miserably even for the growers.)

In one sense FmHA, that battered and anemic stepchild of the New Deal, was ideally designed to operate a more or less direct lending program in rural areas. It has about 1,700 field offices which are more or less accessible to rural people and therefore provides (given the money) the missing ingredient in rural housing, a source of credit at more or less reasonable rates. But, as indicated, using direct funds it was starved by a budget-conscious Congress worshipping at the feet of a balanced, more or less, budget and increasingly concerned with "budgetary impact," particularly since Vietnam.

Even after insured lending was approved, the agency had

to struggle with a Rube Goldberg apparatus for raising the money, among other devices begging labor unions and others to invest for the good of mankind, instead of being able to secure funds rationally through the sale of guaranteed securities. Eventually, FmHA has been enabled and compelled to move in the direction of a security marketing agency, but the current requirement that they peddle each mortgage, even in a package, is an oxcart system and so designed, under pressure from existing vested interests.

Congress has continued to starve Farmers Home for administrative funds, to hamper it in securing the essential credit funds, and to put its implicit blessing on the ceiling which the Bureau of the Budget imposes on it each year in the name of a fiscal policy designed to finance a major war without taxes.

For fiscal 1971, FmHA requested \$146 million in administrative funds; the President cut that back to \$85 million. Also, despite a backlog of some \$11 billion needed in community facilities in FmHA areas, the funds available for the last fiscal year in grants were only \$46 million and the ceiling on direct loans \$64 million. It will take a century before *present* need is met!

Aside from FmHA's inadequate resources, it is restricted to towns of 5,500 and below, while FHA does little in towns of 25,000 and below. This leaves millions of people caught between FmHA statutory limits on service and FHA's functional limits.

nother anomaly is FmHA's curious philosophy. FmHA is supposed to make loans only to families who cannot get money from any other source. Thus it is supposed to make risky loans. Yet, under the battering it has received from the vested interests in and out of Congress for several decades, the agency has been inordinately proud of a loan loss (less than one per cent) so low as to demonstrate that it was not carrying out its mandate.

The agency chiefs, through a series of administrations, have

leaned over backward to prove themselves sound bankers lest their agency be destroyed. That they have in fact eroded FmHA's social usefulness to save its bureaucratic life is obvious. Under more courageous leadership—in the White House and the USDA— the agency might have stuck to its guns.

In considering a housing loan, FmHA first constructs a budget for the family including everything except shelter, then ascertains the family income and subtracts the family budget from that income; what is left is considered the mortgage paying capacity of the family. Therefore, if a family has been paying \$50 a month for a slumlord's shack, and wants to buy or build a house costing half that amount per month, FmHA's curious logic would result in denial of a loan on the grounds that the family has no rent paying capacity after deducting its other needs from its income!

FmHA officials justify this policy on the highest moral grounds-they will not be a party to "boxing a family in" on a mortgage, at the expense of food, clothing and medical care. They admit that they deny loans when the mortgage payment would be less than the present rent; the slumlord may be willing to starve the kids but not old Farmers Home. As long as FmHA insists that shelter is at the bottom of the list. a drastic improvement in rural incomes will be needed before that agency can have its guidelines and the people can have housing.

For a long time, you will recall, nobody who was anybody admitted there was hunger in America. But when the facts were made clear, and the denials and obfuscations had had their day, something was done —maybe not enough, but a great deal compared to the recent past. So it must be with rural housing.

To some extent the programs already exist. Some need only to be expanded or reoriented. All need a tremendous increase in funds. But there must be more than this. (And simply raising incomes is no answer, even if that were miraculously to be done; it would only bid up the price of existing housing.)

When I was teaching a course on poverty at the University of Oklahoma half a moon-age ago, I advised my students that the remedy for poverty lay in "ameliorative pluralism" and "pragmatic opportunism." Two jawbreakers!

First, ameliorative pluralism. Since the causes of poverty were many, the attack upon it must be many-faceted. No one program would do. The solution must be pluralistic and evolutionary, changing as knowledge grew or new problems arose.

Next, pragmatic opportunism. At any given moment one knows, for example, that the Federal government should revise the public housing law, deepen the subsidy, restructure the authorities, encourage tenant organization and participation, and make the Federal government the builder of last resort. Pragmatic opportunism is playing all fronts simultaneously in a social crusade, knowing that you may solve a part of the problem in one way, when the door to a more rational and economical means is closed.

ere, then, are a whole series of suggestions. The first is for a one-stop agency to do away with the conflicting bureaucratic rules, gappy laws, and dodging of responsibility. Congress would create a single agency with the responsibility of handling the housing needs of everyone requiring public housing assistance in any form.

A second recommendation is for the enactment of a capital budget system for the Federal government, a "Truth in Accounting Law." There is a real economic difference between operating costs and capital formation costs. Every business in this country would be in bankruptcy court if it used the Federal accounting system. As it is, the present system is the most powerful ally of those opposed to increasing this country's equality of opportunity.

The present accounting system makes it possible to kill off essential programs because of their "budgetary impact." The distortions that arise from this are maddening. If FHA insures a loan by the Podunk Bank to John Doe and thereby obligates the Federal government to pay off that loan if necessary, that has no "budgetary impact." It is not an expenditure. But if the Federal government borrows that same money from the Podunk Bank and lends it to the same family, that is an expenditure. The first action is blameless and wealth-creating, and does not frighten the community or run into trouble with Congress, but the second action blows our collective minds because it jeopardizes the republic by increasing the national debt. This is pure mythology, economic voodooism.

Our third recommendation is that the authorization and appropriations of funds for housing and community facilities be placed in the hands of one committee in each house of Congress. At present, Banking and Currency dictate the structure and function of HUD, but FmHA is controlled in part by the Agricultural Committees, in part by Banking and Currency. More important, FmHA's housing program is inextricably tied to its other programs which are under the control of a committee whose principal interests are the agri-business programs of the USDA. The Rural Housing program is an orphan child.

Our fourth recommendation is that Congress create a Home Owners Loan Authority, a Federal housing bank, which would be financed out of public funds and authorized to issue securities. The need is for an institution to which low income people could go for housing credit on terms as low as are available from any other agency. The "budget impact" voodooists and the private credit groups have got to stand aside in the interests of preserving the republic.

Under present law, it appears that the most hopeful prospect for improving housing and facilities for the small town and rural poor is the public housing program.

We are convinced that it is neither right nor constitutional for Congress to permit state and local governments to deny their citizens Federal benefits. Congress must find some means of stipulating that Federal housing and community facilities and renewal and other funds cannot be used by a state or community unless that state or community is actively engaged in meeting the housing needs cf its low income citizens. Local governments should simply be shut off from access to Federal funds for any program, including highways, unless they are willing to take on the responsibility for meeting minimum housing needs.

And, as a last resort, Congress should insist that unless minimum needs are met on pollution, water, and housing, some agency should be given the authority, the mandate and the funds to move into a vacuum. We have been nourished on this idea by writings of Herbert Franklin of the Urban Coalition.

he National Rural Housing Coalition believes very strongly that people should have a choice of alternatives, including a choice between ownership and rental, between multi-family units and individual homes. We think the overwhelming bias in small towns and rural areas, as in most of megalopolis, is toward individual home ownership. Public housing can provide not just rental housing but ultimate home ownership. The function of FmHA should then be to carry out an adequate community facilities program and a program primarily of home ownership with whatever rental units are demanded by groups able to pay the rent.

If FmHA is to make the necessary contribution to solving the rural housing problem a number of changes are necessary.

1. Farmers Home's greatest need is for adequate administrative funds. Its appropriations should be increased severalfold.

With additional funds, 2 FmHA should be encouraged to: (a) Institute a program of research into housing needs in its area of service. This money should not be turned over to USDA's research service or to the land grant colleges. We need action-oriented research, related to people, not rural sociology or agri-business-minded research. (b) Establish a housing and community facilities staff in the field separate from the staff handling other programs. The total national housing staff of FmHA-Administration and Research-now consists of eight professionals and nine secretaries. Incredible! (c) Carry out programs of research in building itself. At present the USDA has research funds channeled everywhere but FmHA, which doesn't get a dime. (d) Develop a specialized staff to promote co-op housing, self-help housing and farm labor housing. 3. FmHA should be expanded

to include towns with a population of 25,000 and under.

4. FmHA should be amended to include the equivalent of the Norwegian plan, i.e., the authority to make second trust loans of up to 40 or 50 per cent of the value of a house with the balance payable at as low as one per cent, depending on family income. At the same time, FmHA regulations should not be less generous than public housing; if a family would be required to pay a given amount on public housing and a lesser amount paying off a loan, the family should be eligible without question. Major reform or not, FmHA has got to stop telling a family that if it cannot afford a house it should get off the earth.

Our specific recommendations are not exhaustive, but they indicate the direction. Given the obstacles, and the slowness of progress, and the slips 'twixt the intent of Congress and the administration of programs, we feel strongly, however, that more is required.

We propose an emergency Rural Home Development Administration (RHDA) with responsibility for meeting the needs of any family or individual who is not immediately eligible for housing from FmHA or public housing where it exists. The RHDA will provide minimum housing, sanitation, and clean water (as well as desirable community facilities for day care and other programs) in any town of 25,000 or below, including rural areas, and will do so within five years.

The RHDA will have direct appropriations for the following: (1) To do continuing research into the location and number of families not eligible for existing programs of housing; (2) To organize, recognize, supervise, and finance local housing development agencies which may operate in anything from a portion of a county to an entire state. These housing development agencies will be organized, cperated and controlled by those it serves, the old REA slogan, under appropriate regulations and with competent personnel.

The housing development

agencies will be provided with the funds necessary to build housing developments, finance individual homes, finance water and sewer systems and community buildings (in conjunction with cities and FmHA projects where feasible). They may utilize self-help, contractor-built or prefab housing in that combination most likely to meet the needs for minimum but attractive housing, modestly designed but not degrading or obnoxious to its occupants.

They may organize rental units or provide for home ownership or condominiums; they may extend a loan at one per cent or in the case of home ownership or condominiums, may extend a loan at one per cent and provide grants for as large a per cent as necessary to make the housing available. The grant funds shall be in the nature of non-amortizable, noninterest-bearing second trusts which come into effect only when the house is sold or the original interest-bearing note is repaid. No family shall be required to pay funds for rental if its budget can not cover adequate food, medical care, clothing, education, and the other essentials over and above the rental payment.

It is assumed that the operations of the housing development agencies will diminish as incomes improve, as FmHA's programs meet more of the need, as public housing improves in operation, and as means are found for spinning housing off into existing programs.

It is hoped that this legislation will be accompanied by a new orientation (and extra subsidies) for public housing operating on an area-wide basis in sparsely settled areas. It is assumed that Congress will increase FmHA's administrative and loan funds. But the new program is not to wait until these things are done, but to proceed as though it is the only agency functioning.

Ve can anticipate one quick response: to build housing in areas declining in population is wasteful. But if we can provide children with the necessities of life and self-respect for five or 10 years, we do not care whether the house is subsequently sold to a weekender or con-

verted into a silo. Our concern is with people.

It has been urged upon me that neither the country nor the Congress is in the mood for any drastic innovations, but that remains to be seen. Let me mention an earlier experience.

In 1958 I made a study of the food distribution program of the USDA. The program was bad. It was being used to feed the poor like mules through the winter, and was cut off to force them back into the fields at starvation wages in the spring. It often did not reach the most needy. Subsequently I aided in drafting a bill to improve the program which was introduced by young Sen. John Kennedy.

We got the same flack that I expect now: the proposal was not big enough; it was too big; it was wrong-headed; it threatened to invade state and local autonomy, ad nauseam. But the most cruel contention was advanced by the then Chief of the AFL-CIO Social Security Department, who would not support an improved food program because "that would postpone the day when we get an adequate cash assistance program." Well, the bill didn't pass, but the furor over it helped to pass Lenore Sullivan's food stamp bill; the Senator who sponsored the bill later improved the food program in his first executive order as President; and since then Congress has vastly improved the food program to the benefit of many millions of people. Yet today the chances for "adequate" cash benefits have never been so good. It is not true that we must starve millions before we leap forward to utopia. We muddle upward; we never soar to new heights.

And so it is with the recommended emergency housing program. The proposal is designed to meet a need which should long since have been met differently. But the only way I know to catalyze the various conflicting, greedy, and apathetic groups and bureaus into action is to say that we are going to draw a line near the bottom of the income pyramid and say: Below that line we are going to meet the need by new institutions. Let the existing institutions take stock and struggle to maintain their domains by doing more of the job they should long since have completed.



CHAPEL IN THE DELL

Worship-music-drama building on a Neo-Georgian campus fits into the landscape and respects its older neighbors



The chapel follows the side of a ravine, rising 78 ft. from base to peak (top left). The main entrance is recessed into the bell tower at the southeast corner (far left). From this corner, the land slopes off along the east side (near left) as well; at the low end is a second entrance, from a campus parking lot. On the west side (above), is a vast sloping grid of clerestories; terne metal baffles between the tilted panes are painted gray to match the roof slate.

Seen across the campus, from the uphill side, the Mount Vernon College chapel looks deceptively like the other red brick buildings on the park-like Washington, D. C., campus. But, disappearing down the slope into a wooded ravine, it is a spatially adventurous building quite different from its Neo-Georgian neighbors.

Architects Hartman-Cox have scrupulously used the same soft red, sand-molded brick and the gray slate of the older buildings; they have used only "punched" window openings, on the visible side, and broken the volume down into small-scaled blocks ("All of the existing buildings have lots of jogs," says Cox). But instead of just standing on the grass, their building makes the slope and the woods part of an unexpected-and refreshing-architectural experience.

The donors of the chapel left the school, and the architects, quite free to determine what a chapel for a nonsectarian, twoyear girls' college ought to be like. They raised no obstacles to the use of the chapel for music, drama, meetings — any functions compatible with its serious primary purpose. A program was drawn up calling for a main room seating 300, plus a choir room and robing room (adaptable for classes and seminars) and an office.

Ironically, the architects' first undertaking for the college-a master plan-had shown the chapel on high ground at the top of the 30-ft. ravine. But as soon as they saw the potential of the slope, they violated their own plan. "At one point, our concept was to have everyone sitting on the side of the ravine, with a glazed canopy overhead," Cox recalls. This simple scheme was soon modified by the need to control light and views, the need for a level, flexible floor area at the bottom, and the desire to offer variety of routes down to that level-not just one pell-mell slope. Obviously, the architects took some pleasure from the complexities that developed along the way from concept to finished chapel.

The sequence of spaces begins (if you come on foot from the campus side) at the entrance on the uphill corner. A few steps down is a landing





overlooking the chapel floor— 30 ft. below. At this level, near the entrance, are the choir room and the office. From here, you go down a large, skylighted stairwell to the level of the balcony and of the top row of banked seating on either side of the chapel; another stair leads directly down to the chapel floor.

Compared with the apparently small scale of the building at the upper entrance, the volume of the interior comes as a great surprise. Equally surprising are the views out, since the building looks so closed as you approach it. From the upper levels, there are views into the treetops through numerous clerestories. And at the lower level, broad openings face out into dogwood groves.

Chapel seating is arranged around three sides of flexible "performing" area, facing inward but not laid out strictly along sight-lines, as in a theater. Chairs—as well as platform and lectern—on the level floor at the center can be moved around to suit the ceremony or performance that is taking place.

Natural light pours in from many directions, much of it from unexpected sources at the tops of shafts or in remote corners. Virtually all of the light is reflected; even the vast array of clerestories in the main roof admits direct sunlight only a few minutes a day at the height of summer.

Acoustics "took care of itself," for the most part. Surfaces of sand-finished plaster and glass are hard enough to reinforce sound, but broken up into areas too small to cause disturbing reflections. Floors are carpeted throughout, except for the level area at the center, where hardwood is used to reinforce sound.

The use of red carpet with white plaster walls—deeply modeled and abundantly lighted —is reminiscent, Cox admits, of Georgian church interiors. Yet the flood of light from widely dispersed sources, the long sweep of the roof, and the use of light oak trim with white walls all suggest the influence of Aalto. "Of course," says Cox, "what better architects can you look to when you're designing religious interiors than Peter Harrison and Alvar Aalto?"

The route from the upper-level entrance to the chapel floor leads down a sequence of stairs (plans, left) with views down into the chapel and out through clerestories from many landings. A view of the main chapel space (top right) shows movable lectern and platform, movable chairs at lowest level, and organ pipes ("Holtkamp's first white ones") against far wall. From the balcony (near right) the view includes foliage seen through the clerestory grid. Framing of the gallery behind this balcony (far right) suggests a classical facade. Interior walls are white, sand-finished plaster, with light oak trim; carpet is vivid red.

FACTS AND FIGURES

Florence Hollis Hand Chapel, Mount Vernon College, Washington, D. C. Architects: Hartman-Cox. Engineers: James M. Cutts (structural), JEK Associates (mechanical and electrical). Landscape architect: Lester A. Collins. General contractor: Edwin Davis. Building area: 7,500 sq. ft. Cost not available. (For a listing of key products used

in this building, see page 89.) PHOTOGRAPHS: Robert Lautman.









STRUCTURE FOR CHANGE AND GROWTH

BY HELMUT C. SCHULITZ

A proposed system for residential construction that answers the need for adaptability in architecture As the functions of living become more complex and technological change accelerates, the construction of predetermined, unchangeable buildings becomes more and more questionable.

The search for the standardized dwelling unit is a useless effort. User requirements cannot be summarized in terms of averages, but can only reflect the needs of a given person at a given time and place. Needs not only differ for various users, but also change over time as a result of technological advances and economic potentials.

In the U.S., the average space in newly constructed FHA-financed housing has increased from about 900 to 1200 sq. ft. in the past 16 years. In certain European countries, dwelling space has increased even faster: in Denmark, the average size of new housing units increased 50 per cent in only six years. Changes in equipment occur even more rapidly: new housing units in West Germany with central heating systems increased from 6 per cent to 75 per cent in only 14 years.

But these time spans are short compared to the potential physical life span of buildings. How will buildings completed recently meet the user requirements of the year 2000?

Most of today's buildings have no built-in potential for change. so that change is often ruled out economically. And the limited changes that can be made are costly: in the U. S., money spent on repair and improvement of dwelling units amounts to almost 75 per cent of the amount spent for new housing. Inability to adapt to changes in space requirements and equipment speeds obsolescence and decreases the life span of buildings. In 1947, the average life of residential buildings in the U. S. was estimated at 50 to 60 years; by 1962, the estimate had dropped to 40 to 45 years.

But since new buildings today are conceptually no different from the older ones, their useful life will be even shorter. Rapid changes in demand in the future will make the cycle of demolition and replacement even

Helmut C. Schulitz is an assistant professor of urban design at the University of California at Los Angeles. His article "The Message as an Architectural Medium" appeared in the May 1970 issue. shorter and more wasteful, especially when the costs of demolition and the social cost of relocation are considered.

While physical deterioration is a predictable and continuous process (except in cases of disaster), obsolescence follows irregular and unpredictable patterns. Obsolescence is a relative decrease in value, which depends on many factors, often unforeseeable, such as:

Changes in life styles of users
Changes in family size and structure

- Technological changes
- Changes in taste

• Local changes in demand, land use, and real estate value.

The discrepancy between physical deterioration and functional obsolescence—i.e., between potential life span of structure and period of functional value —causes excessively high dwelling costs over an ever shorter product life—costs which constitute over-investment (Figure 1).

In previous centuries, obsolescence caused no problems for architects, since technological progress was slow and physical deterioration was almost the only cause of depreciation in buildings. But today functional obsolescence is the main factor in the decline of building value.

Fighting obsolescence

Over-investment can be avoided only by designing buildings so that the rate of obsolescence corresponds to the rate of deterioration. There are two general ways to solve this problem: 1. to design structures with a short life span, so that they will deteriorate as rapidly as they become obsolete. 2. to make buildings highly adaptable by allowing for the replacement of obsolete components, which determine the level of performance of the whole building.

The short-life structure solution can be applied only on a small scale, where the timing of demolition can be based on personal standards of habitability, without demanding a public consensus. Moreover, it is technically difficult to build largescale structures with an economically justifiable short life span, since the heavy structural parts required for stability, safety, etc. are inevitably longlasting.

The difference between the average life span of buildings



Figure 1. Redundancy in traditional buildings: discrepancy between functional obsolescence and physical deterioration as factors in depreciation



Figure 2. Depreciation of houses, appreciation of land (Source: Jean Gottman, Megalopolis, New York, 1961)



(40-60 years) and the life cycles of building components (4-100 years) shows how uneconomical it has become to construct buildings as fixed entities, where obsolescence of the whole package depends on the most short-lived components. Since the useful life of various components is subject to widely different influences, their replacement cycles should be allowed to differ accordingly.

Besides a potential for replacement of components, structures should also have the capacity to change in spatial configuration,



Indeterminate assemblage

as by expansion or contraction. This need arises not only because the space requirements of users may vary, but also because changes in land value can render a building obsolete. While the value of the building normally drops, the value of the land it occupies tends to rise (Figure 2), generating pressure to utilize the site more intensively (Figure 3).

Indeterminate vs. determinate

To date, concepts of "growth" in architecture have focused on the quantitative part of the problem only-the process of adding repetitive units. But any change in one part of the structure generates changes in the rest of the system; existing units must adapt to functions for which they were not initially designed. The alternative provision for growth - scaling service and structural support systems to a predetermined maximum sizeincreases initial costs and causes fixed parts to be overdimensioned, at least initially.

The method of assemblage is the key to making adaptability economically feasible. Homogeneous flexibility throughout a structure has proved to be very expensive, since it does not take into account differing degrees of adaptability required in different areas. Such a uniform level of adaptability might not be adequate to allow for rapid changes of some components (in daily or weekly cycles); conversely, it might be wasted where the need for change might not occur in the whole useful life of the components.

The SCAG proposal (Structure for Change and Growth) is designed to provide the greatest possible overall adaptability at the lowest possible investment. SCAG is a building system, mainly for residential use and related activities, developed in 1968 for a site in Los Angeles. It allows for response to changing user requirements by combining two divergent concepts of assemblage that are often looked upon as "either-or" choices: indeterminate and determinate assemblage.

Indeterminate assemblage implies a non-hierarchical system of components, which are not determined for specific locations. Components can form an indefinite number of configurations and can be replaced independently; disassembly and re-use do not require alteration or destruction of any element.

Determinate assemblage is a way of combining elements so that they form a rigid, more or less unchangeable, object for a special location.

These two opposing concepts of assemblage coincide with two important trends of today—on the one hand towards increased choice and potential for change (indeterminate assembly), on the other hand, towards tightly controlled production of inflexible packages—for instance, by applying automobile assembly techniques to produce mobile homes (determinate assembly), with choice reduced to a few "optional extras."

Indeterminate assemblage slows down the rate of obsolescence, but implies built-in redundancy and high initial investment. Determinate assemblage, on the other hand, yields a high *initial* performance for the investment, but only at the risk of fast obsolescence.

The determinate assemblage is used to offset the high initial cost of the indeterminate portions; it can be used to provide equipment and enclosures for complex functions that can be expected to remain stable for a



First stage. Wall elements and private containers assembled to form two units: A, single; B, single.



Horizontal expansion; additional space, interior and exterior. A, single; B, couple.



Horizontal and vertical expansion. A, couple with child; B, couple with two children, second floor and stair added.



Obsolete kitchens replaced with new equipment; additional bathrooms. No change in occupancy.



Wall panels replaced by membranes and inflated privacy enclosures; new entertainment-service-control units.

certain period of time. Such determinate assemblages a r e planned, however, for a life span as short as the effective life of the well-defined function they perform; when needs change, these units are replaced like any consumer product. These determinate assemblages—used for kitchens, bathrooms, sleeping rooms, stairs—will have many characteristics of contemporary mobile homes.

SCAG incorporates a number of determinately assembled subsystems, but the system as a whole is conceived as an indeterminate one—allowing for easy replacement and change of shortcycle units. Implementation of such a determinate-indeterminate system requires autonomous components with as little physical dependence on other components as possible.

Assemblage structure

As soon as components are assembled in multistory buildings, a means of supporting them (an assemblage structure) is absolutely necessary, for the following reasons:

• Components should be independently exchangeable, and therefore cannot be stacked on top of each other.

• Without an assemblage structure, the lower components would have to be built differently to carry the cumulative weight of the upper ones, so would not be freely interchangeable.

• The assemblage structure can only be disassembled after all infill components are removed; it must, therefore, have the longest life span of all components. And a long useful life span requires that the structure be general enough to accommodate the whole range of activities that could be expected to go on inside it during its predicted physical life span.

Specified vs. unspecified space

Generally, two groups of functions can be identified in terms of different space requirements: • Unspecified space. For certain activities, the form of the enclosure is irrelevant; they can be performed in unspecified space, which is given identity only by its equipment and enclosure components. These spaces can be confined by two horizontal planes, and they allow for changes in function. • Specified spaces. There are functions for which the form of the enclosure must be closely tailored (stairways, auditoriums, etc.). These spaces do not admit easy change of functions.

SCAG illustrates, using existing technologies, possible ways of combining elements to allow for an unlimited number of arrangements. The structural increments of the system are bays 24 ft. by 24 ft., a module large enough to accommodate many different functions. But since 24-ft.-square increments (576 sq. ft.) are fairly large for expansion of housing units, the structure is designed to allow for smaller adjustments along the perimeter of the basic module; a two-module floor area, for example, can expand from 940 to 1140 to 1340 sq. ft., without altering the structural system.

The floor trusses provide a space for free horizontal distribution of services. Vertical distribution can be accommodated as needed in the interstices between the bays. But, as far as technologically and economically feasible, self-contained and portable systems will be used.

The components of the floor trusses are either brought to the site in pre-assembled sections or as single parts for a do-it-yourself type of assemblage. Columns are built up out of several components, so that their strength can be adjusted to changing loads; additional parts are inserted if additional floors are added. The permanent separation of structural and infill grids ensures that both can change independently over time.

Site configuration

The assemblage equipment, a moving crane (a determinate assemblage with limited life span), enables the system to be changed rapidly as required. The linear path of the crane has a strong impact on the shape of the project (plan, right). The configuration would be entirely different if, for instance, a crane in a fixed position were used.

Aside from its general configuration—linear, central, etc. the form of a SCAG project would change constantly as parts were added and replaced. At any point in time, the form would be an expression of the users and their activities, and would be predetermined only to a limited extent by architects.



TECHNOLOGY

New acoustical spaces allow orchestras to leave the formal concert hall and reach informal mass audiences The symphony orchestra today is on the brink, either of financial disaster or of a popular renaissance. Crucial to the outcome is the development of new kinds of performing spaces that are informal, flexible, suitable for large audiences and acoustically adequate.

The priorities for orchestral performing spaces have perpetuated the forms and esthetics of the seventeenth century salon or opera house for today's concert halls. Most orchestras remain enshrined in marble palaces furnished with ruby velvet and gold, formal and private in their attitude. Clients have assumed a different environment is second best and often communities sacrifice any concert space at all until (if ever) they raise the money for a "proper" space. Architects have happily complied to the rich requests.

Few orchestras can continue to survive in this fashion. Their social roles and responsibilities have widened; many now feel the need to go out to new audiences, knowing that many of these persons will not or cannot come into the formal concert hall. Witness 70,000 persons, who flocked to New York's Central Park to hear the Philharmonic.

The exclusively Lincoln-Center-type approach not only ignores such audience potential, but often such monuments sacrifice acoustics for appearance.

The last five years have witnessed the growing awareness that the first priority of a concert environment must be the quality of its acoustical performance. The happy effect of this is that ideas of what constitutes a performing space have thus loosened, opening up new opportunities for communities to have concert presentations of high quality, without the capital investment and formality of the traditional concert hall.

The kinds of spaces that can be made acoustically hospitable to orchestra performances are myriad, once the old formulas are abandoned. They may be existing or new spaces, intended for concerts or not, but requiring sound acoustical planning or redesign. The spaces may be indoors, outdoors or a combination and they may be permanent or movable. Orchestras may even develop portable acoustical accoutrements they can set up for special performances. The New York Philharmonic, for example, is developing equipment it can use for union hall performances.

The materials used in these new spaces may depart from the traditional wood and marble. Plastic, cardboard and many other newer materials are now seeing acoustical use. And electronic distribution aids are becoming increasingly sophisticated and, therefore, acceptable. Such instruments are not used to amplify the sounds of the orchestra itself, but to transmit the natural sound. As an example, speakers can have a time delay system, so that people sitting far away from the stage can hear the sound at the same time that they would naturally hear it without artificial aid.

The acoustical criteria for the new spaces are basically the same as those for an indoor concert hall. And, surprisingly for many, the two can approach each other in quality.

A pioneer in developing concepts and acoustical techniques for the new performing spaces is Christopher Jaffe, an acoustician practicing in Norwalk, Conn., and San Francisco. He is responsible for designing the acoustics of many of the summer pavilions used by major U. S. orchestras and for the acoustical redesign of such structures as the Hollywood Bowl.

Jaffe spells out the criteria for acoustical quality as the combined listening experiences of the world musical community, tempered by local experiences over a period of time. The role of the acoustician is to interpret the physical acoustic requirements for the architect.

The criteria are achieved through manipulation and balance between the source of sound (the orchestra), the path of the sound (the hall: volume, shape, materials of boundary surfaces, materials of suspension objects, etc.), and the receiver, or audience.

To achieve quality at the source, or orchestra, a space must help achieve sectional balance among the instrumental sounds, a blending of the sounds, articulation and optimum distribution of the sound. The musicians should be able to hear themselves in the stage area and the space should develop a ratio of direct to reverberant sound that complements similar criteria in the audience area. (The time of reverberation is the number of seconds it takes a note of a given pressure level to decay 60 decibels.)

There are not any fixed optimums or any single criteria for what is "good" in these areas. Acousticians used to think that a fixed figure ratio of direct to reflected sound would assure a good acoustical environment, but this has proven untrue. At one time a reverberation time of 2 seconds was considered optimum, but Philharmonic Hall originally had this and was poor, while Meadow Brook achieved superior acoustics with a 1.3second reverberation.

The goal of the architect and acoustician in the path area is to eliminate all possible acoustic disturbances and correct any distribution faults, echos, focusing of sound in one direction and flutter. Frequency selectivity among high, low and middle ranges, beyond that normal in an enclosed concert hall, must also be eliminated.

In the receiver or audience areas, the architect must plan seating in places where people can enjoy the familiar concert hall sound. This means they must be located within the acoustic sightlines of the source, within 20 milliseconds of the initial secondary reflections. The space must also develop a sufficient reverberant sound through a frequency spectrum within the first 500 milliseconds. The acoustician must also develop a structure-borne coupling (such as a wooden floor) of sound energy in the low frequencies, which are easily lost.

These goals are most difficult in multipurpose areas where compromise must often occur. Jaffe notes that many musicians are resistant to electronic assists as a means to recreate physical parameters. This is not only a problem in the corrective sense, but also eliminates the new kinds of sounds that can be produced with electronic aids and which are more and more a part of new repertories. Jaffe also scores the academicians and scientists who perpetuate out-of-date information in their curriculum for architects, engineers and musicians.

The problems, however, are solvable. Jaffe has done many kinds of spaces and the kinds of solutions he applied and continues to apply may help lead to fundamental changes in symphony presentations to come.







Sound pressure level in decibels 60stamiliar listening experience concert hall average Old Kavinia goal of renovation 0 Time in sec.

CIRCULAR PAVILION

The Forum, a part of the new Ontario Place (Oct. '70 issue), will feature seating in a 360-deg. pattern around a raised orchestra platform.

Scheduled to open this summer, the Forum was originally planned as an outdoor amphitheater. It has now been named the summer home for the Toronto Symphony, with Craig, Zeidler & Strong as architects and Chris Jaffe, acoustical designer.

The area, which includes indoor seating for 2,000 persons and lawn seating for 6,000 more, is treated as a single acoustical space, with acoustical panels close to the musicians for short-term reflections and clarity.

The acoustical system has acrylic, saucer-shaped diffusers, 10 ft. in dia. and suspended on a winch system, that hang over the orchestra (asymmetrically to avoid an echo). The low end of the reverberating field requires electronic energizers.

The roof structure, costing \$500,000, is part of the acoustical design. It is translucent vinyl over a steel space frame.

Jaffe's precedent for the circular design was the West Palm Beach Coliseum, where the New York Philharmonic was invited to play two years ago. The auditorium featured wedge-shaped seating for 2,000 persons and a curtained platform stage.

Jaffe redesigned the space with a \$10,000 system that added 3,000 seats to the original plan, some of them behind the orchestra. He removed the draperies and installed plexiglass panels to diffuse the sound in 360 deg., yet allow clear views.

PAVILION REDESIGNED

Ravinia, summer home of the Chicago Symphony, is one of the earliest of the outdoor/indoor music pavilions and has recently undergone a 1-million renovation by Architects Holabird & Root, with Jaffe.

Before the redesign, Ravinia was a makeshift structure that produced a blurred and feeble facsimile of orchestral sound. The original pavilion had burned down in 1949 and a temporary stage was erected that served for the next 20 years.

Ravinia presented many design problems and one of the most troublesome resulted from its location at the rear edge of the property line, making it impossible to build a reverberant chamber in back of the stage, which is the usual solution for collecting and blending orchestra sound. Instead, Jaffe eliminated the proscenium arch and side curtains, as well as some cloud diffusers put up in an earlier acoustical rescue attempt. Then he extended the new concrete stage walls creating a stage almost twice the size of the former. He then installed sophisticated acoustical accoutrements.

The acoustical articulators include freestanding, movable towers, located on the stage, with transparent, plexiglass bubbles. Opaque glass bubbles hang in a fixed position over the first seats of the pavilion. Similarly flexible, but translucent bubbles hang over the stage on automated rigging and double as light diffusers for the orchestra lighting. An electronic, time-delayed, sound reinforcement system backs up the structures.

SHELL RENOVATION

Despite its fame, the Hollywood Bowl was, until last season, among the poorest acoustical environments for an orchestra. An old parabolic shell that produced severe sound focusing, the structure had even been lined with an absorptive material as the only solution to the sound distortions it caused. The result was that the audience heard sound almost exclusively from electronic amplifiers.

Last year, Frank Gehry & Associates (architects) and Jaffe were chosen to redesign the Bowl (over the protests of preservationists who insisted the Bowl was a landmark that should not be touched). Their assignment included finding a temporary solution to the Bowl's poor acoustics and formulating a fiveyear renovation plan: redesigning the stage area, making necessary structural changes, reorganizing traffic and parking patterns, designing a lively graphics system and exploring ways to convert the shell to year-round use.

The temporary solution was used last season and cost about \$20,000 for the temporary diffusion system and \$125,000 for a permanent electronic sound reinforcement system.

The temporary sound system is comprised of cardboard concrete forms (normally used for pouring concrete columns). Forty-eight of these, up to 36 ft. high and 3 ft. in dia., line the sides of the bowl structure and extend to the front and sides of it. They are threaded with a light wood beam for stability and are stopped with plywood in much the same way as an organ pipe, at 1-in. intervals. The same tubes are placed horizontally under the ceiling, suspended from a light steel structure.

The cardboard tubes are a joint concept of Gehry and Jaffe, who had both used the material before. Gehry had experimented with structural and decorative uses of cardboard and Jaffe had used it in the Dinkelspiel Auditorium (see photo below) of Stanford University in the form of cut fiberboard panels.



Using the cardboard as resonating tubes is a first, but has given impressive results—so impressive that the "temporary" solution (intended for one season) will probably be kept for several seasons. The tubes are coated with waterproof white paint and work because they convert direct sound energy to reverberant energy, helping to increase the reverberant time in the low frequencies.

The next stage of renovation will probably include an acoustical canopy for the rear of the shell and a secondary infusion sound system for special effects, such as fireworks.



0 63 125 250 500 1000 Frequency H₂

Resonating diffusers

(cardboard tubes)

(Source

Absorptive plaster removed

to provide reverberation

Air resonates in tubes - Stopped at distance equal to one-half wave length of desired frequency

Plywood stops

Reverberant Field

V

PHOTOGRAPHS: Page 65, Orlando Cabanban; page 66 (top) Marvin Rand Associates; (left) Ron Turner; page 67, Christian Steiner.

Reverberation







MOBILE SHELL

First used in 1965, the New York Philharmonic's Minnie Guggenheim shell is the orchestra's summer home in the city's five borough parks. A fold-up structure that can be set up in only five hours. Minnie was designed by Jaffe's firm.

The requirements for the shell, which cost about \$300,000 to build and develop, were that it be able to fold over and travel (meeting all road requirements) and that it meet all city codes.

The final design is a steel-reinforced, 2,500-sq.-ft. stage with molded fiberglass sidewalls and ceiling, all contained on four large truck trailers. The ceiling includes a lighting system and is erected hydraulically in sections. For transportation purposes, the stage floor folds up in sections to form the trailer sides.

Hydraulic jacks create a level platform area that then serves as the foundation for four collapsible towers and two steel beams that connect the towers across the stage. The acoustical ceiling is then hung in three sections from the beams.

The shell's acoustical system includes poly-cylindrical wall and ceiling surfaces for diffusion and to achieve a natural blending of orchestral sound. Equipment includes audio power amplifiers with tape delay systems. A generator provides power.

Jaffe had to choose between quality sound for a few and noise for all; the result is a compromise. Those in the front of the audience are not blasted and those in the rear receive mostly reinforced sound.

PORTABLE STAGING

In new efforts to develop and reach new audiences, many orchestras and societies have asked for help from the National Endowment for the Arts. which can give grants on a matching fund basis for projects such as developing new planning, architectural and program concepts. The New York Philharmonic has been awarded such a grant to develop union membership interest in the orchestra by bringing the music into the union hall itself.

The Philharmonic asked Jaffe to design acoustical physical and electronic accoutrements to improve the halls for performances.

Union halls are usually acoustically dead spaces, with low, often sound-absorptive ceilings. Such cigarbox-shaped spaces force sound to bounce quickly back and forth from absorptive surfaces so that it dissipates before it reaches the back.

Jaffe's system includes fiberglass panels for the rear of the stage, which can serve as an opaque mask to the backstage areas. Plexiglass panels will be erected on the sides of the stage, where their transparency will allow people to sit on the side and have a view of the orchestra.

The system also includes a reverberant field energizer to pick up the low ranges of the orchestra and filter out the mid and high ranges, raising the balance of the orchestral sound. A loud speaker system with delay features will be used to transmit sound to the rear of the hall. Where possible, the speakers will be aimed toward a hard portion of the wall to create reflective sound.





SOMETHING NEW IN BARRACKS

Here's strong evidence that military barracks can be colorful, flexible and, almost, pleasant





The barracks are built in three clusters around a central assembly area. Each cluster has eight barracks units (four per floor level) and every unit has facilities for 64 men. Sited on a man-made island, the barracks are part of a master plan that also includes a drill field and landscaping.

The U. S. Coast Guard barracks, in Alameda, Calif., are a decided departure from the conventional. Designed by Marquis & Stoller for movement, color and easy access, the project suggests that functional barracks need not look like the popular stereotype.

The buildings are planned in three clusters of eight separate barracks units, four per floor (see plan below). Each unit has a dayroom and sleeping quarters for 64 men, plus direct access to a washroom/laundry wing at the same level.

The clusters surround, and open toward, a central mustering (assembly) area for the 1,500 troop trainees stationed on the man-made island. The plan provides each man with direct access from his barracks floor to the training areas.

Concrete ramps, 16 ft. wide, provide exit and entry from the second floor barracks. Much of the early training routine, it seems, is quite literally on the run and ramps are easier to negotiate at high speed than stairs.

The barracks are constructed of cast-in-place concrete columns and perimeter beams, with precast double-T beams for the second floor and roof. The exterior wall panels are precast and prestressed, then sandblasted to appear dark against the light grey cast-in-place elements.

The washroom/laundry wing is distinguished by windowless concrete walls that are textured vertically and by curved, rather than angled, corners.

Perhaps the liveliest part of the design concept is the liberal use of bright, primary colors. Unlike the traditional barracksgrey, red and yellow window spandrels accent the exterior.

Inside the barracks, there are two color schemes, basically. They are used alternately on the first and second floors of opposite buildings and, again, the colors are bright.

The trainces' lockers, pocketed between the perimeter columns of each floor, are also part of the color scheme. Brightening the area further are narrow, fullheight windows that appear at intervals between the locker units. A continuous strip of windows runs above the lockers.

The adjacent dayrooms on each floor open onto a fourth exposure with large, full-height windows. Many look to the San Francisco Bay and, perhaps, to a trainee's first leave.



A STREET, STRE



If the barracks do not resemble conventional military versions, the rows of double-deck bunks are pure tradition. Each of the eight sleeping areas in the three cluster units will bed 64 men (top). The structural system (middle, right) provides column-free interior spaces inside the barracks with precast double T beams, allowing flexibility and movement within. Attached to each barracks unit is a washroom-laundry wing (left), distinguished from the main structure by rounded corners and windowless, textured walls. Access to and from the wash wings (bottom) is from both floors of the main barracks areas.

FACTS AND FIGURES

U.S. Coast Guard barracks, Alameda, Calif. Architects: Marquis & Stoller (Peter Kampf, associate in charge). Engineers: Forrell & Elsesser (structural); Montgomery & Roberts (mechanical); Marion & Cerbatos (electrical). General contractor: Branagh, Inc. Building area: 72,000 sq. ft. Construction cost (including landscaping): \$2,573,200.

(For a listing of key products used in this building, see page 89.) PHOTOGRAPHS: @ Ezra Stoller (ESTO).




(continued from page 29)

Fifth Avenue buildings would be uniquely convenient for luxury apartment tenants, and the reintroduction of residents to the avenue would be a boon to stores and restaurants. Moreover, the proposal would take some pressure off other Manhattan neighborhoods that have been resisting the incursions of luxury apartments.

Special zoning regulations already adopted for the Greenwich Street Development District are in some respects even more sophisticated. One objective of this plan is to preserve a small, but essential retail district from inundation by officeand-plaza behemoths (by requiring 2.5 per cent of floor area in any development to be shopping area). Another goal is to create a continuous system of pedestrian circulation above the streets, and some important links below street level, as well, connected to subways. A major design feature-combining both objectives - will be an elevated, all-weather shopping arcade running along Greenwich Street from the World Trade Center to Battery Park.

The Greenwich Street regulations fix specific locations for the above- or below-grade pedestrian links which developers must provide. And they offer floor area bonuses for other circulation links that developers may contribute outside their own sites (bridges over streets and tunnels under them). They also provide a mechanism for small increases in floor area bonuses in return for contributions to a special fund for cir-



culation improvements, such as renovation of subway stations.

The highly detailed Greenwich Street District plan could not have been drawn up (much less approved) without consultation with all interest groups developers, trade and civic associations, etc. It is a tribute to the tactical skill of the City Planning Commission and the Mayor's Office of Lower Manhattan Development (headed by Richard Weinstein, another design group alumnus) that the final plan encountered virtually no opposition.

FAIRS

DECLINE & FALL, EXPO 70

While negotiations were underway between the U. S. Government and various Japanese concerns for the sale of the U. S. Pavilion at Expo 70, a story appeared in Japanese newspapers offering the inflated structure for the deflated price of \$10. One, of course, would have to dismantle it and remove it, since the Japanese government wants to turn the fair grounds into a park. Dismantling it would cost about \$50,000, the article neglected to note.

The Russians, incidentally, will pay more to remove the monumental banality of their pavilion than it cost the Americans to build theirs.

Nearly all Expo buildings will be removed or demolished. Some countries have offered their buildings to other cities in Japan. Bulgaria will re-erect its pavilion at home.

To remain as part of the planned park will be the Japanese Garden, the Expo Museum of Fine Arts; Japan Folk Crafts Museum; and (April '70 issue) "the biggest and possibly the most majestic building-structure built in this century"—the Japanese Theme Pavilion by Architect Kenzo Tange.

DECLINE & FALL, EXPO 76?

Philadelphia has been planning for the 1976 bicentennial exposition for almost 14 years, and it may be in worse shape today than ever before. Acceptance late in January by the International Bureau of Expositions as a category-one world's fair which provides for participation by other countries at their own expense — was resoundingly anti-climactic.

The Philadelphia Bicentennial Corporation has had to scrap its \$1.2-billion master plan, which involved three major sites and several minor ones (overall planning by David A. Crane & Associates, with different architects for each location). The corporation is now desperately trying to raise money to stay alive for the next few months: special interest groups are clamoring for their own piece of the action; the Bicentennial board has swollen to 112 members under pressure to reflect all areas of the community, and has resisted efforts to reduce its membership; and one black leader has threatened to block the fair "in every manner short of bombing the buildings or site."

The Rev. Wycliffe Jangdharrie, president of the West Phila-



30th St. fair site of rejected plan

delphia branch of the NAACP and one of the leaders in a protest coalition of groups, has indicated that one way to celebrate a revolution is to have another. "We'll get out in the streets" he has said, unless the poor are given an effective voice on the planning body, unless adequate housing is provided for people displaced by fair structures and unless buildings of permanent value to needy neighborhoods are constructed for the exposition.

The corporation's scrapped plan included projects totaling \$363-million for just such purposes, but it was this social action part of the scheme that was first to be rejected by Commerce Secretary Maurice Stans. The National Bicentennial Commission had, after all, selected Washington as the site for a bicentennial community improvement program, and Philadelphia as the site for a world's fair—nothing more. But the reuse of fair structures as permanent community improvements was the basis of the whole Philadelphia plan, and the federal government was unwilling to underwrite anything more costly than temporary fair structures.

As of now, Philadelphia has no alternate plans, and no guarantee of *any* Federal support.

ABROAD

PLANNING IN JERUSALEM

Thirty-one internationally prominent planners and architects convened in Jerusalem last December to advise on recent Israeli proposals—a master plan for all of Jerusalem, a plan for the Central Business District, and a plan for the Old City.

To the distinguished participants (among them Chris Alexander, Bucky Fuller, Philip Johnson, Louis Kahn, Sir Nikolaus Pevsner, Bruno Zevi), the convocation was one of the most stimulating "conferences" ever held. To the local planners, it was less heartening—the international group ended up saying, in no uncertain terms, that Jerusalem deserved better.

One observer sensed a different orientation between those who live in Jerusalem, seeing it with its practical problems, and those who are outsiders, wanting to preserve the holy city as a kind of a "living museum."

Israel's announcement (in mid-February) that it would go ahead with proposed housing on the hills around the city was more than a rebuff to the advisory group (which was to submit its own planning guidelines within six months). International reaction to the housing plans focused on the issue—not under discussion by the planning experts—of Jerusalem's unsettled political status.



GOLD MEDALS '71

The 1971 Gold Medal of the American Institute of Architects will be presented to Louis I. Kahn at the forthcoming convention of the AIA in Detroit. Kahn has been honored many times before, of course, both in the U. S. and abroad, and this latest award is both well deserved and long overdue. Few

American architects have exerted so powerful an influence upon their contemporaries-as well as upon younger architects and students. Though his many impressive buildings, especially those constructed over the past twenty years, have been greatly responsible for that influence, Kahn's work as a teacher, lecturer, and poetic philosophizer of the art of architecture has been equally influential. Just as an earlier generation of architects owed much of its enthusiasm to teachers like Gropius, Mies, and Breuer, so America's younger architects owe much of their inspiration to Louis Kahn.



Louis I. Kahn

• The Gold Medal of the Royal Institute of British Architects will be awarded in June to Hubert De Cronin Hastings, Chairman of The Architectural Press, publishers of Architects' Journal, a weekly magazine published under its present title since 1919 and the monthly Architectural Review, first published in 1897.

Hastings and his executive editors were cited for "drawing attention to many of the most crucial and controversial issues that have concerned the architectural profession in this century: the development of the Modern Movement, the issues of conservation, pollution, landscape, 'townscape', urban renewal, the revival of interest in and the preservation of old buildings, canals and waterways, and the need to protect and preserve historic towns and cities."

CHANGES AT YALE . . .

Herman D. J. Spiegel, professor adjunct of architectural engineering, has been named by Yale President Kingman Brewster Jr. to serve as acting dean of the faculty of design and planning in the Yale School of Art and Architecture and as director of studies in architecture for the spring semester. Charles W. Moore, the regular dean, will be on leave starting with the spring semester.

Yale is continuing its search for a new dean to succeed Moore, whose five-year term expires in June. Dean Moore accepted the post with the understanding that he would serve one term only. But he will remain at Yale as professor of architectural design.

Meanwhile, named to the highest architectural chair of the Yale School of Art and Architecture is Moshe Safdie, the architect of "Habitat" at Expo 67 in Montreal. As Charlotte Shepherd Davenport Professor of Architecture, he will teach a special seminar in urban housing this spring term.

. . . AND MIT

Julian Beinart, architect and urban planner, and Forum contributor ("The Pattern of the Street", Sept. '66 issue) has joined the department of architecture at MIT as a visiting professor for three years.

Professor Beinart is concerned with methods of utilizing spontaneous and non-professional abilities in environmental design, and in planning buildings so that the people who use them can make continuing contributions to their design. In this connection, he has done various case studies, mostly in South Africa, where he was the first head of the department of urban and regional planning at the University of Cape Town.

CAPITOL'S ARCHITECT

For the first time since 1865, a practicing architect has been named Architect of the Capitol. George M. White, of Cleveland, was named to the post late in January by President Nixon.

Houston Museum by Mies



George M. White

White succeeds the late J. George Stewart, who made the job controversial by championing such congressional boondoggles as the Rayburn Office Building, the East Front extension of the Capitol, and the still pending extension of the West Front (see page 27).

White, who is also an attorney and engineer, heads the architectural firm bearing his name in Cleveland and is a vice president of the AIA. His firm's biggest project to date has been the construction of Whitecliff Manor, a large private nursing home, which White owns, in a Cleveland suburb.

MIES ADDITION

The Museum of Fine Arts in Houston has announced a fundraising goal of \$15 million to complete the Mies van der Rohe wing of the museum and establish an acquisitions endowment that "will assure a competitive position in the world market."

The Mies wing — working drawings were completed shortly before his death—will cost \$4 million and will more than double the Museum's present 70,750 sq ft. It will extend beyond and enclose Cullinan Hall. Also designed by Mies, Cullinan Hall was completed in 1958 (Jan. '60 issue). Ground will be broken in October.





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BOOKS

TOWN AND REVOLUTION. Soviet Architecture and City Planning 1917-1935. By Anatole Kopp. Published by George Braziller, New York. 274 pp. Illustrated. \$15.00.

REVIEWED BY KENNETH FRAMPTON

Anatole Kopp's study Ville et Revolution was first published by Editions Anthropos, Paris in 1967. Its appearance in English in 1970 was timely since this past February saw the staging of two modest exhibitions covering the period of the Twenties in Soviet Architecture and Urbanism; the one, the British Arts Council Exhibition at the Hayward Galleries, London; the other, the Delft School of Architecture Exhibition, is being shown here first at the Carpenter Art Center, Harvard, and will be shown later at the School of Architecture and Urban Planning, Princeton University.

Such documentation either in exhibition or book form must primarily be an account of projected ideas, rather than a record of built facts. Yet this incredible decade, (1920 to 1930), fired by the concrete promise of a new socialist way of life, is seemingly inexhaustible. Thus like Vittoria de Feo's, URSS Architettura 1917-1936, of 1963 and Vieri Quilici's L'architettura del costruttivismo, of 1969, Kopp's book is but a selection from the total output of the period.

In illustrative material, the de Feo and Kopp studies are singularly opposed to each other. Where de Feo was simply to photo-copy the extant international European reportage on Russia of the later 20's and early 30's and to make out of this an incomplete and poorly printed compendium of the era, Kopp's approach has been far more selective, to the point of weakening its usefulness as a survey of the period. Thus where Kopp underplays the impact, both plastically and theoretically, of 'revolutionary' studio art and stresses instead the 'public' activities of the Proletcult-their painted, propaganda

Mr. Frampton, a former associate editor of the British magazine Architectural Design, is now an associate professor at the School of Architecture at Princeton University, and is also a Fellow of the Institute of Architecture and Urban Design. In addition to his theoretical work, he practices architecture in the London firm of Douglas Stephen & Partners.

boats and trains-de Feo puts more emphasis upon the formal achievements of Cubo-Futurism and Suprematism. Where Kopp briefly looks for the roots of the heroic Soviet period, in pre-1918 Russian architecture and emphasises thereafter the roles played by the academically trained professionals (by the Vesnin brothers, Melnikov, Golossov and later by the OSA group and the young Leonidov); de Feo gives more space to the striking formal experiments of Ladovsky, Lissitzky and the Vchutemas students. Where Kopp concentrates on the new 'social condensers', the workers' clubs and the commune blocks; de Feo gives more space to the large theater designs of the later 20's and the debacle of the Palace of the Soviets competition.

Independently, both books open up a synoptic, yet distorted view of the period. Neither begins to be a well balanced account or for that matter a *catalogue raisonee* and there is little doubt that for the latter and even possibly for both, we shall finally have to wait upon the works (if they ever come to light) of such distinguished Soviet scholars, as S. Khan-Magomedov.

Nevertheless there remains the need, to a considerable degree fulfilled by Kopp, for a broad critical understanding of both this and reflexively our own period. Such an understanding cannot be arrived at without us realizing, with Kopp, that the Twenties in Russia may not be approached "as one might approach some other period in another country". In his introduction entitled "Why the Twenties?" Kopp states:

"No human achievement can be explained in isolation from its economic, social, political and cultural context. On the other hand, the work of an artist who has reached full maturity can be partially understood and appreciated exclusively in terms of its plastic qualities. It is thus with the work of Le Corbusier, whose buildings and even unrealized projects, are masterpieces in terms of their formal beauty alone (not to mention their other aspects). In relation to the Soviet achievements of the Twenties such an approach would be inconceivable . these achievements never in fact attained the ripe stage of development at which they might have acquired a life of their own, outside their context. Modern Soviet architecture as a movement disappeared before it could reach that point of fulfillment. It is essential to study its intentions as well as its accomplishments, which notoriously lay behind declarations of intent."

Kopp goes on to question the rationale for studying such works, which when they were realized are now largely to be considered as both formally and technically obsolete. His answer should at least give us pause as to the broader intentions of much of our own architecture. "For the avant-garde of the Soviet architects of the Twenties", Kopp writes, "architecture was . . . above all a tool for 'transforming' mankind." . . . "Today it seems obvious that the architects of that epoch overestimated the possibilities of transforming human nature. . . . It may be stated in their defense that they were not the only ones to make this mistake" ... "We now know", Kopp continues, "that the time required to achieve this goal is not measured in years or even in decades. But we also know that changes are possible and that slowly, perhaps, but surely human nature can be transformed. This is the aspect of the Soviet architecture of the Twenties that I propose to portray, for I believe that it is in its search for new social condensers, that its profound originality resides."

Thus Kopp's own socio-political pre-occupations, as a practising architect and planner, evidently condition the general stance of the book; yet this to my mind, in no way diminishes its importance. On the contrary, in concentrating on three particular aspects, it emphasises just those factors, in Chapters 7 to 9, which are likely to be of consequence to us in the future. These factors are (1) under the title of New Social Condensers, the early Soviet development of the commune block, with particular emphasis on the work of the Stroikom group and on the Narkomfin commune of Ginzburg and Milinis; (2) under the title Town and Revolution, the various urban models projected by the

(continued on page 78)

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CONTENTS

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Scientific Factors Science, the Marriage Broker

Economic Factors Landscaping-a Complex Factor

Practical Details A Magnified Look

Interior Design Factors The Finishing Touch

Heuga Landscaped Offices A Bird's-Eye View

Commentary Experience from Actual Practice





(continued from page 76)

urbanists and the de-urbanists; with particular emphasis on the Ginzburg and Barshch "Green City", of 1930; and finally (3) under the title *A New Phase: Ivan Leonidov*, the promise of an, as yet unrealised, unrhetorical aesthetic.

Soviet designs of this period are unique, particularly in respect of the commune and the linear city, inasmuch as they first embodied (or adapted) new type forms, that were to be either applied or developed further by Western architects over the next thirty years irrespective of their own political environments. Thus the physical form and the "relative" success of Le Corbusier's Unite at Marseille and hence by inference of other similar Western superblocks, are both traceable back, in one important vein, to the Soviet experimental commune or domkommuna. Typical in this respect is Sobolev's OSA competition project of 1927, with living units looking over an "interior street", which obviously anticipates the Unite section that Le Corbusier finally adopted at Marseille.

Kopp goes on to analyse critically the realised communes in respect of their viability as "scientific" solutions to problems then (as now) posed by stringent economic conditions and by the pre-existing sociological "structure", as it were, of Soviet society. Despite the most rigorous intentions, these commune designs seem to have been based at least as much upon the intuitive invention of spaces, either in the "deck" corridors or in the double height living volumes, which were then (as now) seen as inducing some mysterious collective esprit, as they were upon the radical and methodical reconciliations of the

conflicting parameters of revolutionary "ideals", costs and domestic convenience. Despite Kopp's occasional special pleading and the undeniable success of the built-in communal elements, such as gymnasia, laundries, nursery schools, etc., the domkommuna family units of the Twenties cannot be regarded on balance as having been a social success. Kopp's analysis could have been a little more rigorous at this point, since the "failure" of the superblock and/or the duplex unit under "optimum" socialist conditions needs to be examined carefully, if we are eventually to re-assess our own received concepts for a more "humane" approach to the problem of mass housing.

Although the "necessary conditions" for creative city planning existed, Soviet urbanism had an equally hard time during the Twenties, not only in regard to realisation, but also even conceptually. Kopp quotes Lissitsky, from his book Russland of 1930, in a poignant critique of early Soviet building. . . . "There is nothing to suggest the existence of a new law of property. In buildings that have been erected so far there is no trace of the new open street principle, of the conception of the city based on mutual relationships and interdependence."

One Soviet answer to this dilemma was to abandon the "city of capital", in accordance with the prescriptions of the Communist Manifesto and to deurbanise the populace in a network of linear cities distributed across the country. Thus the linear city idea dating back to Soria y Mata, was hypothetically pressed into the service of the revolution, in various exotic forms, including Ginzburg's regional Green City based on Moscow; its bands comprising two continuous walls of individual single story cells elevated on pilotis containing within them a park strip, fed by a spine road, giving access at regular intervals to communal facilities and playing fields. Le Corbusier was to adopt a version of this strip city for his cite lineare industriel of 1943.

Although none of these Russian linear cities were ever realised, today some form of linear settlement, built up into a triangulated, regional net, again presents itself as a feasible strategy for both the physical and economic accommodation of future megalopoli, while maintaining within the interstices of the net, areas of relatively unspoilt countryside. (See J. R. James "Planning Strategy for the '70's" R.I.B.A. Journal Oct. '67).

Such a dynamic system of distribution certainly appealed to Leonidov whose linear plan for Magnitorgorsk of 1930 cuts right across the "urbanist", "deurbanist" dispute, in rejecting both the barrack-like communes of the former and the dispersed individual homes of the latter. Leonidov's ville pavillionaire broke down the scale of collective living into clusters of 8 square, 2-story dormitory houses, set amid a green grid of playing fields, gardens, dining halls, clubs and schools. Each of these houses comprised 16 rooms on two floors stacked in four corners around a cruciform 2-story communal space. In an alternative version the same unit was used to provide a mixture of low clusters and highrise residential towers.

Leonidov's Magnitogorsk projected a space which, modulated by ineffable structure, was at once free, open and subject to change. Like the rest of his work it suggested an unsensational architectonic plastic value, which the 20th century has rarely been able to achieve. Significantly this aesthetic has little to do with either Kitsch or Classicism. Its potential for promotional or propaganda purposes is nil. We may find its first conscious traces perhaps in the original Suprematist dream unremarked on by Kopp, or in Shukov's Moscow Radio Tower of 1926; we may find it again in France in Chareau's Maison de Verre or in Le Corbusier's Pavillion des Temps Nouveaux of 1937; we may find it in the 60's, in Ulm, in the student work of Willi Ramstein, or in America in the early works of Fuller and Wachsmann. It is there again, in part. in Hilberseimer's planning and finally and paradoxically in Mies' Lake Shore apartment towers built in Chicago. Such an unrhetorical ethical-aesthetic was cleary prefigured in the visionary work of Leonidov and it is in this, above all else, that Russia in the Twenties remains, as an underground challenge to the shape and content of our future work.

WITH BENEFIT OF ARCHITECT, A Manual for Those About to Build. By Edward X. Tuttle Jr. Published by the Macmillan Company, NYC. $6\frac{3}{4}$ in. by $9\frac{1}{4}$ in. Illustrated. \$7.95.

REVIEWED BY BO THORNE NILES

For the architect who finds himself at a frustrating impasse with a client who is a neophyte on the subject of architecture in general and his own building in particular, this book might prove invaluable. Architect Tuttle, who sounds as if he himself must have experienced such dilemmas of noncommunication with clients many times, has put together a step-by-step manual for "those about to build." He addresses the book directly to the client, and the architect might well recommend the book as a guide to solving problems of indecision, etc.

After a general description of approaches to Architecture or Building — Utilitarian, Imitative and Abstract are the categories here—Tuttle describes what the client can expect of the architect, and of the contractor. Through the "case history" of one couple's decision to build a house, he leads the reader through every stage of the building process: from the initial preliminary design through to the completed structure.

This handbook is very complete, including a glossary of terms and an alphabetical index at the end. One would only ask for a fully indexed table of contents at the beginning for easy referral of each stage and problem, and for a quick understanding of the whole process at a glance.

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This month's Product Review concentrates on new lighting equipment for offices, theaters, and institutional buildings.



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A new three-dimensional luminous ceiling system, made by Integrated Ceilings, Inc., is designed around an 8-way fitting in its structural grid that creates an irregular pattern of lighting pyramids. Called Lightrium, the new system can diffuse light up or down in uniform or alternate patterns. The system can also be supplemented with decorative incandescent lamps at exposed grid junctions, which can make a ceiling change from a skylight appearance to that of a chandelier, according to the company. Color diffusers may also be interchanged with standard white versions. The system is made of an extruded aluminum grid that has triangular openings. Standard, modular sizes are available, plus special sizes up to 5 ft. by 5 ft.

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General Electric Co. has introduced a new U-shaped group of lamps called Mod-u-line. The company claims that the lamps have thick glass and metal bracing that assure easy and safe storage, installation and maintenance. The lamps are designed in 40-watt strength and have a cathode shield innovation that collects particles emitted during burning so that the lamp remains clean and will not blacken. Three of the lamps fit in the same space it takes for two conventional 6-in.-wide lamps and, says the company, often three lamps are required to provide recommended light levels. The lamps also promise more light per unit over their life.

On Reader's Service Card, circle 102.





NO-GLARE LUMINAIRE

A high visual performance luminaire by Lightolier is designed to eliminate glare and veiling reflections through a large polished reflector and parabolic louvers. Two 40-watt fluorescent lamps, mounted one above the other, are directed so that glare is reduced. Patents are pending on the luminaire, which is 12 in. wide, modular, and designed to supply or return air.

On Reader's Service Card, circle 103.





FLUORESCENT LIGHTING

An integrated fluorescent lighting and air handling system, made by Lightolier, claims simplicity, flexibility and economy. Called Ventilume, the new system features a continuous black reveal on its sides, extruded aluminum lens and trim frames. An acrylic, prismatic lens, either regressed or flush with the ceiling plane, spreads uniform illumination over task area. All latches, hinges and adjustable vanes for controlling air patterns are concealed in the black slot. Designed to meet most illumination levels, air distribution and installation requirements, the system comes in a variety of sizes, lamp models and fittings. On Reader's Service Card, circle 104.

continued on page 86

Interiors SECOND BOOK OF OFFICES EDITED BY JOHN PILE

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The up-to-date, complete and practical sourcebook on current office design

An excellent cross-section of office design today, this is a book that will help both designer and client, individually and together, to achieve maximum space utility and increased office efficiency while achieving increased attractiveness.

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Two good reasons why you should specify a Norelco Mastercom System for your new construction or modernization projects.

1. Meets the needs of your clients for an efficient, trouble-free, internal communications system • quicker and more convenient than using a telephone • voice controlled for hands free operation • superb design complements any office • unlimited expansion for future growth • frees telephone system for important outside calls • solid state electronic system needs little or no maintenance. 2. Provides simplified, low cost installation without complex construction problems or complicated wiring • dependable, fully electronic system without relays, crossbar switches or other moving parts • simple to install, no electrical adjustments or maintenance of contacts • central control pack and stations are plugged into sockets connected in parallel in one continuous 8-pair cable in each section • stations can be moved and plugged in anywhere in the section without any changes or rewiring.

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Attractive, reliable, easy-to-use; pushbutton control keys; designed in rich looking rosewood or blond oak wood grains and hand finished metal; true to life sound quality . . . microphone and speaker are built in; decentralized duplex system.

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From a small business or professional suite to a large industrial plant or institution, a Norelco Mastercom system can achieve maximum efficiency in internal communications and pay for itself many times over. It is the world's most advanced inter-communications system. A Norelco communications specialist will be happy to consult with you on your particular requirements. Call him today for all the facts and complete specifications. See the yellow pages under "Intercommunications

Equipment" or mail coupon today.

Heart of the system ... small, noiseless, trouble-free; needs no special dustfree climate controlled room—can be located anywhere; contains power amplifier, switching circuits; power supply; high impact metal or polystyrene cover.

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Single continuous 8-pair cable avoids complex wiring and structural problems . . . cuts installation time and costs; twisted pairs, color coded, non-shielded, polystyrene covered; allows quick expansion of system.

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83



WITH LESS LIGHT

SEE BETTER than you do with typical troffer lighting WITH LESS LIGHT in the zones that produce glare and veiling reflections.

Our new HVP (High Visual Performance) luminaire enables you to see better because most of its light ouput is within the $30^{\circ}-60^{\circ}$ zone, and only a relatively small portion is directed more horizontally (into the glare zone) or more vertically (into the veiling reflection zone).

HVP is a low-brightness luminaire that is very comfortable to live with. For instance, in a 60' x 60' office lighted to 100 footcandles it yields a Visual Comfort Probability of 95. This means that 95% of the people seated in the least favorable position—at the rear wall directly under a row of lights—will still find the lighting comfortable. Visual comfort reduces fatigue and assures a more efficient working environment.

Another important benefit from HVP is the reduction of veiling reflections, those reflections of the light source in the task which decrease the contrast between detail and background and make seeing more difficult. If you're having trouble with reading this page it may be because reflections of the light source are bouncing up into your eyes, masking the words you are trying to see. You can, of course, get rid of the problem by tilting the page or moving your head, but this can be inconvenient and awkward, especially if you are working at a desk in an office or classroom.

Wouldn't it be better if the lighting system itself provided the solution by reducing that part of the light that is reflected back into your eyes and increasing the part that helps you see the print? That's what HVP does.

Since HVP provides better visibility, it will, in a number of situations, permit the use of fewer fixtures, with related savings in installation cost, branch circuiting and air conditioning. In almost every case this new low brightness system will create a less distracting, quieter, more agreeable ambience.

HVP utilizes two 40-watt fluorescent lamps. It is 12" wide, precisely modular, and is designed to supply or to return air.

Another Lightolier contribution to the architecturally integrated luminous environment.

Write Lightolier, 346 Claremont Avenue, Jersey City, N.J. 07305.



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FORMS & SURFACES

Bonded Bronze

The ageless beauty of sculptured bronze in a new series of designs for walls, doors and furniture. A new type of bronze casting reinforced with fiberglass produces panels that are large in size yet light in weight. Also bonded nickel silver, copper and aluminum.

Part of a large collection of architectural materials that includes carved wood panels and grilles, doors, handcrafted doorpulls, metal tiles.

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continued from page 81



MINIATURE RECESSED FIXTURES A complete series of miniature recessed fixtures for standard 120-volt wiring is called "Little Lights" and is manufactured by the Halo Lighting Division of the McGraw-Edison Co. The series uses a 40-watt S-11 lamp and features six trims, which all fit one 6-in.-deep recessed housing. Trims include baffle, pinhole, wall-wash, drop-opal, crystal and eyeball models, as pictured. The trim diameter for the units is $4\frac{3}{4}$ -in. On Reader's Service Card, circle 105.



LIGHTING MOUNTS

A new line of weatherproof "mini-plates" permits fast and easy mounting on any new or existing outdoor lighting or post lanterns, with flat, hexagonal, octagonal, round or curved surfaces. Made by Bell Electric Co., the plates provide handy access to power sources and are available with receptacle, switch or fuse holder. The plates are 2 in, by 3 in, and protect against weather with snap-cover plates and tight-fitting gaskets. The flat-backed model is made of brass, the curved and snap covers are heavy-gauge die castings finished in baked aluminum enamel.

On Reader's Service Card, circle 106.

LIGHTING PANELS

Glass lighting panels, by the Corning Glass Works, come in 2-ft.-sq. size in fixtures centered in 5-ft.-sq. ceiling modules, recessed 10 in. above the ceiling line. The coffered lighting system offers easy maintenance and the glass does not attract dust. Each unit contains two 40-watt U-shaped fluorescent lamps and the glass panes feature a raised hexagonal prism pattern that eliminates excessive glare, yet provides high illumination.

On Reader's Service Card, circle 107.



LAMP ENCLOSURES

Protective cube-shaped concrete enclosures offer security for outdoor lighting systems. Manufactured by Lans-Cube, Inc., the cubes feature steel-reinforced concrete with heavy metal grillwork that locks. Colors are available. The cube is designed to accept "Wide-Lite" fixtures for mercury vapor, metal halide, and high pressure sodium lights from 175 to 1000 watts. On Reeder's Service Card, circle 108.





THEATRICAL LUMINAIRES

New theatrical and television luminaire provides a 27-degree field angle. Made by Kliegl Bros., Inc., the unit is rated at 1,000 watts and is one of a series of ellipsoidal reflector spotlights. This model (#1357/6W) is designed to provide a wide angle, but intense field of light. It is equipped with a "C" clamp for hanging from pipes up to 2 in. in diameter and available on an off-the-shelf basis for about \$160. Also available is model #1357/6, which offers an 18-degree field angle, a throw distance of about 60 ft., and is priced at \$145. On Reader's Service Card, circle 109.

MERCURY LAMP

A new mercury light, by Westinghouse Electric Corp., is designed for indoor commercial use. Formerly, mercury lights have been used primarily as an outdoor or industrial light source, but this new lamp is designed for interior use in supermarkets, department stores, schools, service stations and other applications where highefficiency lighting is required. A luminescent coating makes this lamp produce light with a broader color spectrum than most mercury lamps. Initial sales will feature the 400-watt size. The lamps can be used with standard mercury lamp or metal halide ballasts. On Reader's Service Card, circle 110.

These additional products will be of interest to our readers:

REVERSIBLE WINDOW

An improved reversible window, made by Hope's Windows, of solid, hot, rolled steel sections, is made for high strength. Suitable for air-conditioned hospitals, office buildings or other multistory buildings where cleaning is a problem, the Series 3000 window unit allows the ventilator to rotate 180 degrees so that the glass may be safely and easily cleaned from inside. Weather stripping assures a tight seal. Key locks are standard, but emergency equipment with manual operation is also available. Corners are solidly welded and the window accommodates insulating glass as thick as 1 in. The units are available in a variety of finishes. On Reader's Service Card, circle 111.



THEATER SEATING

The new Citation Comfort Slope line of chairs, manufactured by Irwin Seating Co., allows installation with a more backward slope than conventional chair lines. The slanted chair backs allow extra comfort, says the company, especially for the main floor of a theater or other areas where the floor is level or only slightly inclined. The chair back may also be installed at two conventional angles. On Reader's Service Card, circle 112.

continued on page 89



ary **VENIN**

A cascade of light is this new chandelier of trilobi components. Of extraordinary beauty and grace, the chandelier is obtainable in various sizes and color combinations. Shown here #963.6, 10″x57″. A virtual must for high ceilings and stairwells.

showrooms and executive offices: 16 East 39 St, NY other showrooms: D&D Building, 979 Third Ave, NY

Speaking of roofs

... and architects everywhere are doing just that as they "rediscover" the visual excitement which an imaginative treatment of this basic structural element can so easily provide. And they are simultaneously "re-discovering" FOLLANSBEE TERNE. For here is a roofing material almost uniquely adapted to the special idiom of contem-

porary design. Almost alone among architectural metals, it

possesses a natural affinity for color, and through a wide diversity of application techniques, permits a positive approach to the problem of form. TERNE, moreover, is suprisingly inexpensive, particularly when its cost is related to a lifeexpectancy measured in decades rather than years.

Concordia Lutheran Junior College — A College of the Lutheran Church, Missouri Synod — Ann Arbor, Michigan Architect: Vincent G. Kling, FAIA Philadelphia, Pa. Roofing Contractor: Detroit Cornice & Slate—Detroit, Michigan



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300 320 340 360 380		302 322 342 362 382	363	304 324 344 364 384	365	326 346 366	367	348 368	369	330 350 370	311 331 351 371 391	332 352	353 373	374	335 355 375	336 356 376	337 357 377	378	339 359 379

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COPPER CLADDING

LIGHT COPPER ROOFING

A new copper-plywood roofing system is available from Weyerhaeuser Co. that promises to cut costs and installation time. Developed in collaboration with the Copper Development Association, Inc., the system uses textured panels of 8-oz. copper laminated to $\frac{1}{4}$ -in. exteriorgrade plywood. Each panel has a $\frac{1}{2}$ -in. overlap of copper that seals the panel edges and forms the required horizontal joints. Vertical joints are covered by roll-formed battens combined with a sealant.

On Reader's Service Card, circle 113.

The following is a listing of the key products incorporated in some of the buildings featured in this issue:

FLORENCE HOLLIS HAND CHAPEL ARCHITECTS: Hartman-Cox. (Materials & Manufacturers as submitted by the architects). BRICK, BLOCK & STONE: Cushwa. ROOFING: slate with ternecoated steel by Follansbee Steel. FENESTRATION: PPG. GLASS: PPG. HARDWARE: Corbin. ELECTRICAL EQUIPMENT: Cutler-Hammer. LIGHT-ING FIXTURES: Lightolier. PLUMBING FIXTURES: American Standard, Speakman. UNIT VENTILATORS: Trane. HEATING VALVES: Bell & Gossett. SPECIAL FANS & VENTILATORS: Greenheck. FLOORING & CARPETING: Armstrong Tile, Schumacher Carpet. FURNITURE: Southern Desk, Hanseatic Chairs.

THE NEW YORK SHAKESPEARE FESTIVAL PUBLIC THEATER

ARCHITECT: Giorgio Cavaglieri. (Materials & Manufacturers as submitted by the architect). DOORS: U.S. Plywood. HARDWARE: Sargent, Van Duprin. LIGHTING FIXTURES: Gotham Lighting Corp.

COAST GUARD RECRUIT BERTHING FACILITY

ARCHITECT: Marquis & Stoller. (Materials & Manufacturers as submitted by the architects). HARDWARE: Monarch Hardware Co. INTERIOR MATE-RIALS: Mosaic Tile. ELECTRICAL EQUIPMENT: Arrow Hart Switches. PLUMBING FIXTURES: American Standard. HEATING BOILERS: Killebrew. HEATING VALVES: Stockham, Walworth. DIFFUSERS: Taco. FLOOR-ING: Armstrong.

THE NEW MUMMERS THEATER

ARCHITECT: John M. Johansen. (Materials & Manufacturers as submitted by the architect). FOUNDATION WATERPROOFING: Sonneborn. CON-CRETE & CEMENT: Ideal Light Cement, Delose Concrete Co. BLOCK: Thomas Conc. Products. STEEL: Fort Smith Structural Steel. CURTAIN-WALL: Elwin G. Smith Metal Siding. ROOFING: Ruberoid Co., Carlisle Sure-Seal Butyl Rubber Membrane. THER-MAL INSULATION: Owens-Corning Fiberglas & Urethane. ACOUSTICAL MATERIALS: Zonolite Mono-Kote Plaster. GLASS: PPG. INTERIOR PARTI-TIONS: Ferrometal Toilet Compartments. DOORS: LOFTuf-flex glass doors, Kawneer Alum. Slid., Tex-Steel Corp. HARDWARE: Yale, Stanley. Rixon. INTERIOR MATERIALS: Flintkote Vinyl, McKee Expanko Cork, Mosaic Tile Co., Valvetone. PAINT: Devoe. ELECTRICAL DUCTS: Jones & Laughlin, EMT. ELECTRICAL EQUIP-MENT: General Electric, EMERGENCY POWER: D. W. Onan & Sons standby generator w/Ford Engine. LIGHTING FIXTURES: Prescolite, Kurt Versen, Lightolier, Shalda. PLUMBING FIX-TURES: Crane, Swan Inc. PIPING: Steel Pipe: Lone Star; Copper Pipe: Wolverine. HEATING BOILERS: Kewanee Boiler Products. UNIT HEAT-ERS: Electromode, Chromalox. HEAT-ING VALVES: Honeywell. A / C COMPRESSOR: Dunham-Bush. UNIT A / C: Carrier. DIFFUSERS: Barber Colman Diffusers, PACO sump pumps, Bell & Gosset. INTERCOM SYSTEMS: Fentriss Sound Eng. Co., Altec Lansing Sound Equipment. SPRIN-KLER SYSTEM: Pyrotronics, Inc., Star Sprinkler Corp. CEILING MATERIALS: United States Gypsum, Expand-x. WATER COOLERS: Halsey - Taylor. FLOORING: Downs Carpet Co., General Felt Co., Johns-Manville masonite, FURNITURE: American Seating Co.



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To order material described, circle indicated number on self-addressed Reader Service Card, facing page 88.

COATINGS/SEALANTS

Handsomely illustrated full-color booklet is a guide to stains and staining. Answers basic questions on types of stains, interior & exterior. Application techniques, hints for better results. Concise, easy to read and well illustrated. Samuel Cabot Inc. On Readers Service Card, circle 200.

New data brochure describes and evaluates building sealant products based on Thiokol LP liquid polysulfide polymers. Brochure discusses program, gives specific information and provides physical characteristics. Thiokol Chemical Corp. On Readers Service Card, circle 201.

DOORS/WINDOWS

Industrial and cold storage doors, manual and power operated, with galvanized steel, aluminum or Kayon (TR) plastic skins over urethane cores. Clark Door Co. On Readers Service Card, circle 202.

ELECTRICAL

Completely new catalog on snow melting & floor beating systems. 8 page, two-color brochure gives details, specs, selection guides, etc., on full range of products. Easy-Heat Wirekraft. On Readers Service Card, circle 203.

Descriptive bulletin on new design award-winning Service Pole unit available. Fully describes how unit puts circuits, outlets, data and communications terminals at desk-top level, get all wiring concealed and installation simple. Electro-Link Systems Ltd. On Readers Service Card, circle 204.

4 page, 4 color brochure on Norelco intercom systems. Describes applications and features. Norelco, Philips Business Systems, Inc. On Readers Service Card, circle 205.

FLOORING

The 1971 catalogue of Romany-Spartan ceramic tiles is 16 pages and cover in full color. Complete illustration of glazed, matte, crystalline, decorative tiles, for wall, floor, countertop, mural installation. Specification guide and trim assembly details included. United States Ceramic Tile Co. On Readers Service Card, circle 206.

New 1971 Handbook for Ceramic Tile Installation includes updated information and several technical changes. Additional information on floors of light performance levels included. Quick reference details and outlines cover most installation methods & conditions. Tile Council of America. On Readers Service Card, circle 207.

FLOOR COVERINGS

"Antron II the no-show carpet fiber fights dirt not profits." A three-color brochure to guide specifiers in selection of carpet. E. I. du Pont de Nemours Co. On Readers Service Card, circle 208.

The Landscaped Office—a new series of reviews showing examples of office installations where loose-laid floor covering was but one of many elements. A comprehensive brochure showing all elements that go into landscaping an office. Heugatile Corp. On Readers Service Card, circle 209.

FURNISHINGS

Office '71 Furniture. Catalog of full range of products—desks, chairs, bookcases, credenzas, file cabinets, etc. Prices, dimensions & descriptions included. Cole, Division of Litton Industries. On Readers Service Card, circle 210.

Card with price list and other information on unique decorative mirrors. Process is float technique assuring unique configuration. Colonial Mirror & Glass Corp. On Readers Service Card, circle 211.

New brochure on Reveal desk system covers typical installations using wire-concealing raceway components and various work station solutions. J. G. Furniture Co. On Readers Service Card, circle 212.

Krueger Metal Products offers catalogs of chairs designed by G. C. Piretti. Full color catalogs introduce a new modular dimension for wherever people come together. Krueger Metal Products. On Readers Service Card, circle 213.

Catalog sheets describing the first free standing fireplace. Washington Stove Works. On Readers Service Card, circle 214.

Brochure on Street Furniture which includes custom benches, tables, planters, chess-checkers tables, plaza seating, mall seating, etc. United States Playground Equipment Co. On Readers Service Card, circle 215.

HARDWARE

Contemporary design—lifetime performance of McKinney Moderne hinge described in brochure. Many types of hinges illustrated, and suggested specification given. McKinney Sales Co. On Readers Service Card, circle 216.

1971 condensed catalog. 20 page catalog describes full line of ad-

vanced architectural hardware including specifications and function charts. Sargent & Co. On Readers Service Card, circle 217.

HEATING/AIR CONDITIONING

Brochures showing design flexibility of zoneline individual heating/cooling system in residential high-rise with comparison of gas and electric systems. General Electric Co. On Readers Service Card, circle 218.

INSULATION

A new 48 page publication, "Using Gypsum Board for Walls and Ceilings," describes the different kinds of gypsum wallboard including their composition, uses, and correct methods of handling and installation. Gypsum Association. On Readers Service Card, circle 219.

New asbestos-free direct-to-steel spray fireproofing described in new bulletin. Technical information, specifications, U/L ratings, etc. included. Provides fire retardant ratings. Cafco Blaze Shield Type D C/F. U. S. Mineral Products Co. On Readers Service Card, circle 220.

LIGHTING

8 page brochure describes crafts available from guild-like N. Y. Studio. Lighting systems and fixtures, metalwork, mosaic, murals, decorative painting, woodworking, stained glass. Rambusch Studios. On Readers Service Card, circle 221.

MASONRY

New 14 page brochure shows exterior and interior applications of new Pyram, glass-ceramic architectural facing. Includes mounting systems, color samples and specification data. Pyram Products Group, Corning Glass Works. On Readers Service Card, circle 222.

METALS IN BUILDINGS

Maximum security fence in colors described in catalog from Colorguard. Full range of products described, separate sheet for maximum-security fence included. Colorguard Corp. On Readers Service Card, circle 223.

"Identification in Metal"—a 1971 catalog in full color showing complete range of letters, finishes, Corporate Identity medallions, special castings and colors. Sizes, mounting details and other information included. James H. Matthews & Co. On Readers Service Card, circle 224.

Information and Literature, 16 page color brochure, USS Cor-Ten Steel, the original weathering steel. United States Steel. On Readers Service Card, circle 225.

PLASTICS IN BUILDING

A complete brochure on "in use" applications of **CONTINUOUS CAST ACRYLIC SHEET** for indoor & outdoor use. Technical bulletins include bonding & cleaning procedures price list, too. Swedlow, Inc. On Readers Service Card, circle 226.

PROFESSIONAL SERVICES

Literature in bound booklet on ARGO-SHEEN carpet cleaner and ARGO method. Includes tips on carpet selection and easy maintenance, how to test carpet for easy cleanability, etc. Useful information for designers. Argo & Co. On Readers Service Card, circle 227.

WALLS & LAMINATES

"Panel Systems 1970" 8 page, 4 color illustrated booklet gives installation, application and maintenance data on panels for high moisture areas and large commercial applications. Formica Corp. On Readers Service Card, circle 228.

Brochure describing unique indoor swing-out wall panels for handball, paddle-ball courts within existing space. J. E. Gregory Co., Inc. On Readers Service Card, circle 229.

Spec-information on all panels. Includes Marlite plank and block, Korelock and firetest panels. Marlite Division, Masonite Corp. On Readers Service Card, circle 230.

See catalogue offering by United States Ceramic Tile Co. under Flooring.

4 page brochure lists performance of 15 typical sound-barrier systems using thermafiber sound attenuation. Included with description of dry wall and plaster assemblies are fire rating test number, STC rating, relative cost index and a folder reference. 4 systems are illustrated; FHA standards for partition forms are listed. U. S. Gypsum Co. On Readers Service Card, circle 231.

MISCELLANEOUS

"Kodak Compass", a booklet describing how photographic techniques such as paste-up drafting as well as economical production of renderings, shadow prints, multiple floor plans, and reduced-size prints can save architects hours of repetitive drafting time. Eastman Kodak Co. On Readers Service Card, circle 232.

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ADVERTISING INDEX

Acme-Refrigeration	ļ
Carrier Air Conditioning Co 21	ι
Clark Door Co 80	\ \
Copper Development Association, Inc 9-20	١
Eastman Kodak Co 91	
Edison Electric Institute2, 3	
E. I. duPont de Nemours Co., Inc. 26	1
Follansbee Steel Corp 88	
Formica CorpCover III	
Forms & Surfaces 86	
General Electric Co74, 75	
Gregory Co., J. E	
Heugatile Corp 77	
JG Furniture Co., Inc	
Libbey-Owens-Ford Co	
Lightolier	
Lippincott Inc 22	
Marlite, Div. of Masonite Corp. Cover IV	
Norelco, Philips Business Systems, Inc	
Sargent & CoCover II	
Southern California Gas 20W2-W3	
United States Ceramic Tile Co 4	

United States Gypsum 73 United States Steel Corp. 79 Venini Ltd. 87 Washington Stove Works20W1

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