Le Corbusier's recent work
GIBRALTAR
IN NEWARK...
PRUDENTIAL'S
NEW PLAZA
BUILDING
EQUIPPED
WITH TYLER
ELEVATOR
CARS AND
ENTRANCES

ART OF ARCHITECTURE

The contribution of Le Corbusier 81
A 25-page review of the recent work of the man who this month will receive the Gold Medal of the American Institute of Architects—plus a discussion of the three basic objectives which his work pursues: new forms and spaces, a new kind of city, and a new system of proportions.

Portland's great hall of glass 106
The ambivalent Coliseum by Skidmore, Owings & Merrill may have been distorted in execution, but this does not ruin its gift of soaring, luminous space—a criticism.

Child-size school 114
Mario Ciampi's prize winner in Daly City, Calif. is scaled to the people who use it.

Noteworthy buildings 118
A refreshing oasis amid the showrooms of a Texas trade mart.... A compound for atoms on the coast of Israel.... a warehouse of great elegance on a Miami highway.

BUSINESS OF BUILDING

Building resumes its upward trend 104
A revision of Forum's 1961 forecast finds building construction on the upgrade.

Building's No. 1 contractor 112
Behind the growth of George A. Fuller Co. is a smooth kind of selling, an uncanny sense of cost, and a close liaison with clients, architects, and subcontractors.

TECHNOLOGY

Aviation eyes the building industry 122
Much that has been learned in making air frames could be used in construction.

EEBUILDING

A department store reborn 126
Within a 1915 shell, Architects Ketchum & Sharp have given May-Cohen in Jacksonvile 50 per cent more space for the "forward content" of visible merchandize.

Two case studies 130
An old loft in San Francisco provides handsome office space at $3 a foot.... A factory in downtown Philadelphia makes way for a new kind of hospital.

Roundup 133
Public housing rebuilt for use as private apartments.... Three ways to spur FHA-financed rebuilding.... Cooling comes to 12,000 stores, the Alamo, and a harem.
Now you can key your design plans to Sheffield's newly designed open-web steel joists with greater assurance of effecting construction economies than ever before.

1. Tripled capacity in a brand new fabricating plant —
2. —equipped for fast, precision production with the very latest electronically controlled cold forming machines —
3. —assures a full measure of the benefits flowing from high productivity in volume —
4. —affords the economies derived from dependable on-schedule shipments to meet construction schedules.

A new design. The visible difference of the new Sheffield S-series joist is that both top and bottom chords are made of cold-rolled strip steel formed into a "hat" section, instead of hot-rolled shapes. Instead of bars at bottom and two angles at the top, the chord member is now a one-piece, stronger unit. In tests to destruction, the new design has met or exceeded Steel Joist Institute standards.

Add these advantages to design economies which stronger, lower deadload joists make possible and you come up with competitively substantial structures at lower cost.

The steel that goes into Sheffield Joists is made in Sheffield's own mills to specifications and under quality controls. This enables Sheffield to make double sure that Sheffield joists meet Steel Joist Institute specifications.

Your Sheffield distributor and nearest Sheffield office will co-operate in making available detailing service on your projects.
New Joist Data Book - Free!

40 pages of up-to-date and complete data on new Sheffield S-series and on Sheffield L-series joists. Contains properties and dimension data, load design tables, floor, roof and ceiling applications and accessories data, revised Steel Joist Institute specifications and recommended code of practices. For this complete working manual, write Sheffield Division, Armco Steel Corporation, Sheffield Station, Kansas City 25, Missouri.

ARMCO Sheffield Division
Free from Reznor: Learn about this profitable use of
duct furnaces along with other valuable information on
make-up air in our just published handbook "What to
Consider in Designing Make-Up Air Systems."

Manufacturing plants, chemical, food and material
processors, restaurants, bakeries and dry cleaners are
becoming increasingly aware of the need for make-up air.
They now realize that bringing in clean, heated replace­
ment air through a duct furnace can prevent undesirable
drafts and the infiltration of dust, dirt and fumes.

Reznor's handbook on make-up air is one of a new
series of Reznor Heating Handbooks to help you solve
commercial and industrial heating problems. For your
copy, published by the world's largest manufacturer of
gas unit heaters, fill in the coupon and mail to Reznor.
Or, for more information, call your Reznor distributor
or nearby Reznor district office listed in the Yellow Pages
under "Heaters—Unit."
President pushes construction programs to offset recession, proposes expanded urban renewal

To help stimulate the laggard national economy, President Kennedy used his executive powers last month to push three government programs affecting construction:

- The Post Office Department was instructed to step up its $270 million construction program, getting all of it under way within the next ten months, instead of the scheduled 18 months. About $100 million of federal funds and about $169 million of private funds will be spent for new construction or rebuilding. The private buildings will be erected under lease commitments from the post office.

- The Federal National Mortgage Assn. (Fanny May) was instructed to advance the prices at which it both buys Federal Housing Administration and Veterans Administration mortgages and resells the loans it already owns, thus encouraging financial institutions to use more of their funds to make new mortgages. At the same time the Federal Home Loan Bank Board announced a program to make an additional $1 billion of credit available to savings and loan associations to spur home building. As one Midwestern savings and loan officer commented, however: "We don't need any of this extra credit. What we need is loan applications."

- Housing and Home Finance Agency and Urban Renewal Administration officials were instructed to hold a series of regional meetings with state and local officials in an effort to speed up local renewal and redevelopment projects.

In rapid succession President Kennedy also sent to Congress a series of special messages proposing expanded federal programs for housing and urban renewal, assistance for school and college construction, and stepped-up highway building, all of which could make construction hum in the years ahead.

Housing and urban renewal. In this message the President said he favored creation of a Cabinet-rank Department of Housing and Urban Affairs. (Previously he had called this proposed new agency a Department of Urban Affairs.) Home-building lobbyists have insisted that such a department should give priority to "housing." Its revised title might win greater home-building industry support for the President, but was hardly likely to eliminate opposition of the National Association of Real Estate Boards. Vigorously opposed to federal spending, the Realtors' organization estimated that this Kennedy program would cost almost $6.5 billion dollars, including $2.5 billion for urban renewal grants, $1.9 billion for 100,000 new public housing units, $240 million for extra subsidies for elderly occupants in public housing, and $100 million for loans and grants for "open space" acquisitions.

The American Institute of Architects, on the other hand, endorsed the Kennedy proposals as a "vital and long-awaited program to restore the vigor of America's cities and protect the 75 per cent of our national income which they produce." A.I.A. President Philip Will Jr. said: "For the first time we see a clear recognition of our most important domestic problem at the highest level of government—and one whose elements are stated in the correct order." A special committee of 12 board members of ACTION, chaired by former HHF Administrator Albert M. Cole, also endorsed the administration program. It recommended last month that President Kennedy "give highest priority to housing and urban development," that Congress authorize the President to reorganize existing federal agencies in these fields, and that "there be established a Cabinet post for housing and redevelopment." Four members dissented from the third recommendation, however. They were: Robert H. Levi, president of the Hecht Co., Washington, D. C.; Elmer L. Lindsley, president of the Cleveland Electric Illuminating Co.; Charles K. Rieger, vice president of General Electric Co.; and James W. Cook, vice president of American Telephone & Telegraph Co.

School and college aid. The President continued on page 7

CLIMATRON WINS REYNOLDS AWARD

For the first time since it was instituted five years ago the $25,000 R. S. Reynolds Memorial Award for a significant structure "in the creation of which aluminum was an important factor" was won this year by a U. S. team: Joseph D. Murphy and Eugene J. Mackey, of St. Louis. Their 70-foot-high, 175-foot-diameter, aluminum and plastic Climatron in the Missouri Botanical Garden, said the jury, "was sensitively executed and strikingly appropriate for its purpose"—displaying tropical plants under controlled climatic conditions.

This year a Reynolds prize for architectural students was inaugurated too. First winner of the top $5,000 prize, divided equally between the student and his school, was John L. Dewey, of the University of Cincinnati, who submitted a design for a roof of interlocking truss panels suitable for covering bus stations, display centers, and other limited-area activities that might require shelter in otherwise open shopping malls.
The effective function of a structure and almost all the products used within is dependent on the elimination of moisture migration into the structure. Dampness, condensation, paint and insulation failures, etc. can be eliminated if the structure is isolated from the site by a true vapor seal—"Premoulded Membrane," "PM" is waterproof; offers a water-vapor transmission rating of only 0.0006 grains per hour per square foot; will not rupture or tear during normal installation handling, trundling of wheelbarrows, and pouring of aggregates; may be installed directly over tamped grade or fill; provides a monolithic vapor seal without voids or open seams. "PM" will provide complete moisture protection for the lifetime of the structure. Protect your structure and business reputation by using the best vapor seal available—"PM."

Write for complete information: Request your free copy of our "Design Techniques Manual" and Catalog No. 1691.

W. R. MEADOWS, INC.
6 KIMBALL STREET
ELGIN, ILLINOIS
SEE OUR CATALOG IN SWEETS 9/Me
dent's various recommendations for federal aid for education carried a total price tag of $5.6 billion. He proposed $2.3 billion in grants to states for elementary and secondary schools that could be used for either construction or teachers' salaries; a $577 million college scholarship program; $1.5 billion for loans to build college academic buildings, and expansion to $1.2 billion of the existing college housing construction loan program. These proposals stirred up the greatest controversy. The Kennedy administration has faced to date, because the aid they would provide would not be available to parochial schools. Although Cardinal Spellman and the nation's Roman Catholic bishops insisted parochial institutions should qualify for this assistance on the same basis as public schools, President Kennedy took the position that this would be unconstitutional. No early resolution of this conflict is set and, unless it is resolved, the administration may not be able to obtain the enactment of any education aid measure.

Federal highway program. The President said the nation's $37 billion interstate superhighway program would fall five years behind its 1972 completion date unless it obtains an additional $900 million a year. To obtain this he proposed an increase in taxes on heavy trucks, Diesel oil, tires, and tubes, and cancellation of a scheduled one-cent-a-gallon reduction in the federal tax on gasoline. Of special interest to planners and city officials, he also stressed the importance of integrating highway and urban redevelopment programs and proposed that families displaced by federal highway construction receive federal relocation payments from highway program funds comparable to those paid to families displaced from urban renewal areas.

In his special message to Congress the President gave only broad outlines of the various programs he proposed. Only when specific bills are introduced, worked over in committee, and finally enacted, will it become clear just how much federal assistance will be given to cities and highways.

Chain of 30 domes planned to show building products

Plans for a 30-city network of building-product display and marketing service centers, each in a large aluminum geodesic-dome "Showcase," were announced last month by Mrs. Mildred E. Puddington, of Birmingham, Mich., originator and president of the venture and the retired head of a multimillion-dollar plastics company. The R. C. Mahon Co., of Detroit and Torrance, Calif., will manufacture and erect all 30 structures under license from Kaiser Aluminum & Chemical Co., licensee of R. Buckminster Fuller. Total costs, including equipment and typical 10-acre sites, will exceed $22.5 million, or an average of $750,000 each.

The first Showcase, which also will house the headquarters of Showcase, Inc., the development and management organization, and Showdome, Inc., a separate corporation to handle the construction, licensing, and leasing arrangements, will be started in Detroit this summer. It is scheduled to be opened next January, and if everything goes on schedule there will be another opened every three weeks until the entire chain is completed late in 1963.

Building industry professionals and the consumer public will both be served through the Showcase system. According to Mrs. Puddington, who has been working on the project for almost four years, "Showcase will collate and centralize the primary marketing efforts for products and services in industrial, commercial, and residential building. It will offer permanent product-exhibit space, a brand new film service on building products, informational services, market research and related promotional services on a year-round and nationwide integrated basis." Showcase personnel will neither sell nor attempt to influence sales, but will answer product questions, provide literature, demonstrate equipment, forward "leads," and answer the questions of both professionals and the public on where specific products can be purchased. Operating manufacturers will be able to advertise nationally that their products may be seen at any "Showcase."

One of the most important Showcase features will be a new building-product film-information service using color microfilm, high-speed, easy-selection viewers and equipment for immediate black-and-white reproduction of any detail drawings, specifications or other information in each installation's indexed building-products film library. Each stressed-skin Showcase dome will be 64 feet high, have a diameter of 210 feet, and contain about 35,000 square feet of floor area. In addition to about 460 product display areas of 20 square feet each and about 120 12-square-foot sliding-panel displays, it will have several general-purpose rooms and areas suitable for conferences, sales meetings, and public gatherings (available free for nonprofit events).

Don Muntz of Mason, Muntz & Associates, Los Angeles architects and engineers for the structures, says the geodesic dome was adopted because it is easily built, it is suitable for exhibit needs, and, as "an architectural form it lends itself for use as a national promotional symbol."

One out of 18 New Yorkers a public housing tenant

One person out of every 18 in New York City now lives in public housing, and, when all of its currently approved projects are completed, the city will be the landlord for almost one out of every 14 citizens.

This revealing estimate of the proportion of New Yorkers who now live in City Housing Authority buildings—not counting occupants of other publicly subsidized housing that receives the benefit of tax abatement or low-interest public loans—is derived from a report of the City Planning Commission recording the 25th anniversary of the start of the city's public housing program. This program now provides almost 116,000 apartments for about 400,000 persons, or a population greater than Newark's," says the Planning Commission report. The units under construction or approved total 38,520, or more than one-third of the existing units. Relating these figures to the city's 1960 population of 7.8 million, and allowing for a population of no more than 8 million by the time all approved projects have been completed (between 1960 and 1960 the city actually lost 110,000 population), 5.5 per cent of all New Yorkers now live in city-owned apartments, and projects now under construction or approved will boost this to 7.1 per cent.

The growing scale of public housing in New York City is also revealed in the 1960 annual report of the New York City Housing Authority. It shows that assets exceed $1.5 billion, including an increase of more than $105 million during 1960, an average advance of more than $2 million a week. Excluding working cash and other inci-
Architects find "quality of manufacture" is real key to lowest maintenance

Most people agree that aluminum is the ideal material for windows—it cannot rust, will not warp, swell or stick, and never needs costly painting. Experience, however, shows if lowest maintenance costs are to be realized, the design of the window itself and the care exercised in its manufacture are equally important.

To protect architects, contractors and building owners against unsatisfactory windows, the Aluminum Window Manufacturers Assn. has established quality specifications that carefully spell out the requirements for good quality windows in terms of the metal alloy used, wall thicknesses, strength of sections, size limitations, hardware, protective coatings, as well as performance tests for air infiltration, deflection and other physical load tests.

These standards are the result of many years of hard and diligent work. They reflect the thinking of thousands of architects and contractors, as well as quality-concerned manufacturers. They are not theoretical, maximum standards, but practical and workable minimum standards.

If you want to make sure your clients enjoy all the benefits that good quality aluminum windows have to offer, specify windows that carry the AWMA Quality-Approved seal. It's positive proof of full compliance with these quality standards. For a copy of latest AWMA window specifications, together with the names of AWMA manufacturers and the types of windows they produce, write to Dept. F-614, Aluminum Window Manufacturers Association, 630 Third Avenue, New York 17, N. Y.
dentals, its land and buildings on December 31 were valued at almost $1.4 billion, which represented development costs of $1.5 billion, less amortization. In round figures the authority's income was $85 million a year, expenses and debt service were $119 million, leaving a deficit of $34 million a year—not counting real estate taxes the city sacrificed. Including land and commercial facilities at some projects, but excluding projects in construction, the agency's $1.5 billion of assets averaged roughly $13,600 for each of its 110,000 existing units.

Eleven developers bid for California beach project

Santa Monica got a wealth of proposals last month from developers eager to purchase its 36-acre beach-front Ocean Park redevelopment property a half-hour drive from downtown Los Angeles. Eleven different offers ranged all the way from the aggregate upset price of $5.8 million to a high of $9.9 million on a 50-year rental plan covering one portion of the tract that would then revert to the city.

This part-purchase and part-lease bid, from Kern County Land Co. and Del E. Webb Corp., and the two highest conventional offers, $8.3 million by Deane Associates, of Van Nuys, Calif., and $7.5 million by Dworman Associates, of New York, were also unusual for another reason. All three would exceed the City's land acquisition and improvement costs and would eliminate the need for any federal Title I grant for the project.

Architects for several developers displayed imagination in conquering a large public parking area between the project's apartment buildings and most of its one-third of a mile beach-front. The most unusual in this respect was a design by William L. Pereira for the Western Urban Renewal Corp., representing New York Developer James H. Scheuer. Pereira's scheme (see photo) would create three "man-made highlands," under which would be three seven-level garages that would be covered with irregular clusters of apartments designed to resemble Italian Riviera cliff houses. However, the bid submitted by this group was far down the list: $5.5 million.

The local Redevelopment Agency's plans for evaluating the various proposals are flexible, and Executive Director Russell F. Priebe believes it will be able to select the winning developer on continued on page 11
Whatever your approach to architectural beauty . . .

THERE'S A MODERN STEEL TO MAKE THE MOST OF IT

The beauty of modern steel is twofold: beauty that is and the beauty that does. The strength and durability are still there, but now you can achieve and maintain almost any visual effect you want as well. Result: a value-to-dollar ratio that's more inviting than ever. Case in point: the products of Weirton Steel Company.

TAKE WEIRZIN® FOR INSTANCE—an electrolytically zinc-coated steel with excellent corrosion resistance and, when chemically treated, superb paintability. Weirzin fabricates easily and economically—right up to the limits of its steel base—with no chipping or peeling. Result: enduring handsomeness plus a minimum of maintenance for such applications as baseboard heating panels, acoustical ceiling tile and light fixtures.

OR TAKE WEIRKOTE® particularly for applications which require its zinc coating for corrosion resistance (roof decking and siding, for instance) and low maintenance costs (ductwork, ventilator fans, etc.). Weirkote galvanized steel fabricates economically without flaking or peeling. And steel's low expansion/contraction rate gives Weirkote a vital edge over lighter metals—namely, an edge that stays put at the seams. (Weirkote is also available from National Steel's Midwest Steel division—Portage, Indiana.)

OR PRE-PAINTED OR VINYL-COATED WEIRTON STEELS—Factory pre-painted Weirkote and Weirzin or hot-rolled and cold-rolled steel are available from National Steel's Enamelstrip Corporation, Allentown, Pennsylvania (for wall partitions, siding, decorative paneling, etc.). Pre-painting offers you built-in economy, controlled quality and any shade you choose. Vinyl coating can be ordered in almost any texture and color. Fabricating qualities: excellent.

TAKE MODERN STEEL—particularly in any of the Weirton forms mentioned above. For full details, write Weirton Steel Company, Weirton, West Virginia.
Seven buildings win A.I.A.

First Honor Awards

From a total of 270 submissions an all-architect jury selected seven buildings to receive the 1961 First Honor Awards of the American Institute of Architects, including two by Philip Johnson. The jury said this year’s prize buildings “went far beyond mere competence and achieved true significance.”

Morris Ketchum, of New York, was chairman of the 1961 jury. Serving with him were Fred Bassetti, of Seattle; Richard D. Butterfield, West Hartford, Conn.; Arthur Q. Davis, New Orleans; and William L. Pereira, Los Angeles. Their selections:

**FIRST HONOR AWARDS**

U. S. Embassy, New Delhi, India, by Edward Durrell Stone (Forum, Jan. ’60).

Fernando Rivera Elementary School, Daly City, Calif., by Mario J. Campi and Paul Reiter, associate architect (page 114).

Shrine, New Harmony, Ind., by Philip Johnson (Forum, Sept. ’60).


Nuclear Reactor, Rehovot, Israel, by Philip Johnson (page 120).

Pepsi-Cola World Headquarters, New York, by Skidmore, Owings & Merrill, and Pietro Belluschi; Reynolds Aluminum Service Corp. with Victor Grun & Associates; Santa Monica Developers with Adrian Wilson & Associates.

**AWARDS OF MERIT**

Ivery Tower Restaurant, Santa Monica, Calif., by Richard Dorman & Associates.


Dr. Henry G. Simon Residence, New Orleans, by Charles R. Colbert.

Chapel, Moline Public Hospital, Moline, Ill., by Henry Hill.


Unitarian Church, Concord, N. H., by Hugh Stubbins & Associates.

Crown Zellerbach Building, San Francisco, by Herzka & Knowles, and Skidmore, Owings & Merrill, associated architects (Forum, April ’60).


Willow Creek Apartments, Palo Alto, Calif., by John Carl Warnecke & Associates.

---

Late schedule change will result in the convolution to honor Le Corbusier, in the Four Great Makers series of Columbia University School of Architecture, being held on April 26, instead of April 24, as listed in thousands of programs already distributed. The program originally scheduled for the 26th will be held on the 24th.

**Under an overpass** of the Seattle Freeway the nation will soon have its first atomic fallout shelter incorporated into a highway project. Anderson-Bjornstad-Kane, Seattle consulting engineers, have been retained to design a prototype shelter for 200 persons that will cost about $60,000. Construction funds will be provided by the federal Office of Civil and Defense Mobilization.

---

People

Talented members of the Philadelphia chapter of the American Institute of Architects have been entertaining architects all across the nation to lure them to the national A.I.A. convention there April 23-28. More than 30 chapters have been viewing a novel convention-promoting movie written, acted, photographed, produced, and distributed by the Quaker City architect-thespians. In the ultimate of compliments, several chapters have asked the Philadelphians for advice on how to produce similar silver-screen dramas to promote local architectural subjects to civic groups.

---

**PERFORMERS PRICE (L) AND BOULWRE**

The script for the Philadelphia film, prepared by a committee headed by Vincent G. Kling, tells the improbable story of how an out-of-town architect, played by Lyle Boullware (see photo), will be welcomed at the Philadelphia convention, and then follows him on a tour of noteworthy buildings and historic places. Along the way he meets many of the city’s best-known architects, including Louis Kahn, Oskar Stonorov, Charles Peterson, J. Roy Carroll, Alfred Bendiner, John Harbeson, Morton Keast, Edmund N. Bacon (and Conductor Eugene Ormandy, promoting the convention’s special concert by the Philadelphia Orchestra). For some suspenseful Hitchcock-type comedy relief, Beryl Price, chairman for the host chapter’s hospitality efforts, appears in a succession of roles as airplane mechanic, taxi driver, hotel doorman (see photo), short-order chef, watchman, musician, Japanese houseboy, and finally as a corpse. Architect-cameraman: Louis de Moll. Architect-narrator: George Qualls.

---

**TOP PUBLIC HOUSING POST FILLED**

A vigorous, articulate woman of 56 with waving gray hair—and an expert on housing for the elderly—was appointed last month by President Kennedy as the new Commissioner for the federal Public Housing Administration, the highest post continued on page 16
New **Executone** sound systems give you great design freedom in planning

**PLACES OF ASSEMBLY**

1. **Broaden capabilities of large rooms—with sound.**

Today's institutional activities—and the economies of space use—demand a broad range of service from public assembly rooms and buildings.

A civic auditorium, for example, must accommodate meetings, broadcasts, musical and theatrical events, ceremonies, expositions, etc. A gymnasium may be called upon to serve as a social hall . . . theater-in-the-round . . . community forum . . . exhibition area.

A sound system capable of handling such diverse functions can be provided with surprising economy—if it offers enough flexibility of input, coverage and control.

Executone's unique zero-level design, with transistorized controls, accepts any combination of close or widely separated inputs—mikes, record players, tape decks, movie projectors, radio or TV tuners and telephone line sources. An Executone control panel, capable of mixing 9 or more inputs, is available in a light, fully portable console. It requires no plug-in power source or ventilating; can be located at any distance from the inputs and power amplifier—without noise or loss of quality. Zero-level transmission permits use of single conduits for both input and output wiring—for substantial installation savings.

2. **Control sound from best audience vantage.**

Control of sound levels and balance depends on some person's subjective judgment. This person should be situated where his hearing corresponds truly to that of the audience, to insure full coverage without excessive volume. In an auditorium, for example, controls traditionally located backstage or in projection booths may now be brought unobtrusively into the audience. A rear column or wall can accommodate a compact, flush-mounted Executone mixer. Or a portable mixer may be plugged into a special receptacle under a conveniently located seat. These units—with edge-lighted lucite panels—can be operated even in a completely darkened auditorium.

Another solution is the placement of Executone mixers in conventional locations—with small, matched line amplifiers at critical spots in the audience. In a church, an usher's station would serve. In a night club, a rear table might be chosen. Such auxiliary controls greatly increase the system's flexibility.

3. **Permit split or combined room functions.**

Frequently, spaces are physically joined—or subdivided—to accommodate varying events or audiences of varying size . . . e.g., banquet rooms, multi-purpose school rooms, etc. In these cases, Executone system flexibility is important—especially in the location of sound sources and controls. It becomes even more vital when isolated areas are to be joined by sound alone. In planning a church system, for example, you may wish to offer your clients the use of an area for overflow congregations . . . sound distribution to selected classrooms and Brides'
or Mothers' rooms...to and from chap-
els and sanctuaries.

Executone implements these functions, at low cost, by simple input switching through the main power booster—for bridging and separating individual sound channels. Small, conveniently placed, transistorized line amplifiers serve as secondary controls. Executone's zero-
level transmission eliminates distortion and noise problems.

4. Maintain quality reproduction from moving sources.

Church and synagogue services illustrate a problem that arises frequently in large-room design. That is: the need for multiple sound pickups capable of evenly reinforcing speech or music from roving participants. System planning based on the complete Executone line finds ready solutions. For example, the wide variety of specialized microphone pickup patterns helps the church designer provide sensitive coverage of altar, pulpit, organ, choir, Stations of the Cross, and all other points from which services are con-
ducted. Placement of controls in the congregation—as explained in (2), above—assures maintenance of proper volume and balance.

5. Link separated functions with intercom.

Executone communications are invaluable in rooms where a number of separate functions have to be coordinated. In theaters or auditoriums, for example, stage management, lighting and other functions mesh smoothly when instant contact is available—via Executone.

6. Apply system planning to acoustics, aesthetics and performance.

The importance of a coordinated sound system goes far beyond the savings available through single-source specification. Matched electronic characteristics are essential for clear, life-like reproduction. System planning minimizes the architect's aesthetic problems, too. The compactness and smart detailing of Executone components...the wide choice of units and unobtrusive mount-
ings...flexibility of placement...all contribute to good appearance.

The broad line of reproducers meets the special acoustic demands of any in-
terior. Low-level coverage is available through a wide selection of multiple ceil-
ing reproducers...high-level coverage through carefully designed theater type systems.

With an integrated Executone system, you also have the assurance of full in-
stallation responsibility, and on-the-spot maintenance for any contingency—by factory-trained technicians. There are no field assemblies. Each system is manufac-
tured and tested—in its entirety—at the Executone factory. All units are engi-
neered to stringent transportation termi-
nal standards—for operation 24 hours a day, 365 days a year. Every component is guaranteed by the factory for a full year.

Use the coupon below for complete data including wiring plans and speci-
fications on Executone sound systems for places of assembly.
The earth shifted just after this shopping center was completed. Serious cracking

an adjustment to the exterior of the structure. A well-adjusted building is what

Owner: (left) Stanley J. Harte, President, Harte Haven, Inc. General Contractor & Developer: (center) Edward J. DeBartolo, President, Youngstown Industrial Development Corp. Steel Fabricator: (right) Stanley Macomber, Macomber, Inc.

This mark tells you a product is made of modern, dependable Steel.
of the façade was threatened. Fortunately, its strong backbone of steel permitted

Stan Harte might call his $4,000,000 Harte Haven Shopping Center in Massena, N.Y.

“All we had to do was make spandrel adjustments,” Harte says, “which would have been impossible with other types of construction. Also, steel allowed us to use a fast, locking design that eliminated field bolting and riveting. Steel cut our installation time 25%.” 400 tons of USS Structural Steel did the trick. Fast delivery of Structural Steel can be secured from United States Steel.
in the federal housing agencies ever occupied by a woman.

Washington-born Mrs. Marie McGuire, once a journalism major in the Capital’s George Washington University, has lived in the Southwest for the past 32 years, the last 19 of them actively engaged in operating local public housing programs. In 1942 she joined the Houston Housing Authority as a project manager, and was soon appointed assistant executive director; since 1949 she has been executive director of the San Antonio Housing Authority, which now shelters some 21,000 persons in 5,154 apartments in 1,942 buildings. Recently Mrs. McGuire has won national fame for her role in developing San Antonio’s Victoria Plaza project, more popularly known as the “Golden Age Housing Center,” a high-rise apartment and related facilities designed especially for the aged. Architect Thomas B. Thompson devoted three years to studying the housing needs of the aged before starting actual designs for this project. Largely as a result of this project’s success, Mrs. McGuire was selected to make the keynote speech for the housing sessions at the recent White House Conference on Aging.

ARCHITECTS AND THE ARTS

Among the nine new members to be inducted into the National Institute of Arts and Letters next month, raising its membership to 246 out of a maximum of 250, will be Mies van der Rohe, Painter and Muralist George Biddle, and Sculptor Jacques Lipchitz, the last two the creators of works in many public buildings. The Institute’s 1961 Brunner Award, $1,000 given to “an American architect who has made a contribution to architecture as an art,” will be presented to I. M. Pei.
Certified* to shut out sounds
other partitions let through

New! Steel-Walled Modernfold
• First in sound reduction ... first in heavy-duty design.
The greater the weight, density and rigidity ... the better a wall shuts out sound. That's why Modernfold
designed the new Soundmaster 240 with twin walls of
24-gauge steel panels ... and why this new partition
leads the industry by a full five decibels in sound reduc­
tion. This sound superiority is unfailing, because
Modernfold custom trims all eight horizontal edge seals
on the job. Each partition fits its opening exactly—up
to 25'0" high and any width.

In addition, no other partition matches Modernfold
heavy-duty construction ... the massive steel and fabric
strength that pays you a dividend of longer, trouble-free
service. With no maintenance cost. But compare the
facts for yourself. The chart at the right shows con­
struction and sound ratings (in decibels) for the best
model offered by each of the four largest partition
manufacturers. Just look:

| Partition | "240" | "A" | "B" | "C"
|-----------|-------|-----|-----|-----
| *Sound Reduction 125-4000 cps av. | 37.4 | 32.4 | 31.8 | 27.9
| 354-4000 cps av. (Industry Standard) | 41.8 | 35.8 | 36.4 | 33.0
| Acoustic Panels | steel 5/16" wide, wt. 1 lb./sq. ft. uses cardboard | steel 3/8" wide, wt. 1 lb./sq. ft. uses cardboard
| Sealer Strips | 8 | 8 | 4 | 4
| Foam-Lined Jamb-Seal | yes | yes | no | no
| Air Release | yes | no | no | no
| Pull-In Latch | yes | yes | no | no
| Best Fabric Weight—Outside Covering Only | 45 oz. per lin. yd. | 45 oz. per lin. yd. | 38 oz. per lin. yd. | 27 oz. per lin. yd.
| Top Row Horizontal Hinge Plate Depth | 4½" | 3" (vertical) | 1½" | 1½"

NEW CASTLE PRODUCTS, INC.
NEW CASTLE, IND.
Manufacturers of Modernfold Partitions and Doors, Air Doors, Modern-Cote Wall Coverings, Precast School Furniture and Pyrex Shielded Thermocouples.
In Canada: New Castle Products Canada, Ltd., St. Lambert, Que.

*Decibel ratings by Geiger & Hamme Laboratories per ASTM E90-55

Furniture by Peabody

NEW CASTLE PRODUCTS, INC.
Dept. A141, New Castle, Ind.

Gentlemen: Please send full information on Soundmaster 240.

NAME ____________________________
FIRM ____________________________
ADDRESS ____________________________
CITY ____________________________ STATE ____________
Trane Unit Ventilators with space-saving design ... now available with air conditioning!

Units have modern, "built-in" appearance, save classroom space, meet all climate requirements

When a group of school architects saw the first models of these new Trane Unit Ventilators, they said, "Most advanced design in the industry... best-looking, most compact units..."

These modern Trane Unit Ventilators are more compact than any others. They save space along the wall, can provide a wider aisle. Attractively styled, Trane Unit Ventilators complement modern school design and decor. Matching trim blends the components together to form a single, continuous unit. The top surface is covered with a patterned hard-top material that enhances appearance, resists wear.

And now the Trane Unit Ventilator system is available with complete, year-around air conditioning. Chilled water source for air conditioning may be included when the system is installed—or easily added later. The same space-saving cabinet is used for all types of systems: hot water, steam, chilled water or electric heating.

For complete facts on the new Trane Unit Ventilators, call your nearby Trane Sales Office; or write Trane, La Crosse, Wisconsin.
**TRANE Unit Ventilators**

provide these important features for the modern classroom

- **Space-saving design.** Most compact units in the industry provide more usable classroom space. All 28" and 32" high conventional units are 11½" deep. 28" high Kinetic Barrier air conditioning units are 14½" deep.

- **Modern appearance.** Matching trim blends components together to form a continuous unit. Attractive shelving provides built-in storage and cabinet space.

- **Versatility.** TRANE Unit Ventilators provide just the type of system needed. Five basic types to meet the requirements of any school, any climate. Same space-saving cabinet used for all types.

- **Exclusive Kinetic Barrier Action.** Provides continuous powered ventilation and heating or cooling from room-wide outlets. Eliminates window downdrafts, sleepy corners... provides an ideal climate for learning all day long!

For any air condition, turn to

**TRANE**

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING AND VENTILATING EQUIPMENT FOR THE MODERN SCHOOL

For any air condition, turn to TRANE

The new TRANE Unit Ventilator is 21½% thinner than other makes of heating units... 29% thinner than other makes of heating-air conditioning units. (Other makes of units are as much as 16½" deep.) Same space-saving cabinet design is used for all systems—water, steam, electricity.
Recessed Slendex solves tough ceiling problems
... in low ceilings ... in minimum cavities. Recessed
only 1 1/2" ... so shallow it handles like tile.
Surface-mounted Slendex is only 3" deep overall
... ideal for low ceiling installations. Simplify
your next project with Smithcraft Slendex.
One foot wide for two lamps;
two feet wide for four lamps.
Slendex, as well as all Smithcraft fluorescent
lighting equipment, may be leased under the
Smithcraft LEASE-LIGHT* Plan to conserve capital
while enjoying the benefits of good lighting.

Smithcraft Lighting CHELSEA 50, MASSACHUSETTS

*Registered Mark Smithcraft Corporation

SPECIFY SMITHCRAFT UNITS FOR EVERY LIGHTING APPLICATION

OFFICES — Smithcraft LARGE ELEMENT Pre-assembled modular units for high-level, comfortable illumination of any area, in any pattern.

SCHOOLS — Smithcraft CHELSEA Tops them all for crisp, clean good looks, cool low brightness and fast, easy installation. More fixture for your money!

STORES — Smithcraft SONOLUME CEILING SYSTEM High-level illumination, plus effective sound absorption. Just 7" deep — adapts to any ceiling plan.

INDUSTRY — Smithcraft POWERO-GROOVE INDUSTRIAL Up to 2 1/2 times higher lighting levels at a lower cost per footcandle. PV series provides 25% uplighting.
...the practical approach to air conditioning

Compact...Efficient...Trouble-free

"What, in your opinion, are the outstanding attributes of Acme-system air conditioning equipment." This question, asked of the men responsible for specifying, installing and maintaining the Acme comfort conditioning system in the Lassen Memorial Hospital, Susanville, California, resulted in these replies...

R. H. Charles, Charles and Braun, Consulting Engineers, San Francisco...

"We specified Acme on this project because we consider it quality equipment. In addition, small size was essential to fit all the equipment into the allotted space."

A. H. Brown, Brown Sheet Metal, mechanical contractors, Oakdale...

"We have found Acme equipment to be the most compact available...provides trouble-free performance, too."

J. D. Preston, hospital maintenance engineer...

"I am more than pleased with the operation of our Acme system—both in its heating and cooling efficiency and its low maintenance cost."

These men...each one a well-qualified expert in his field on the subject of air conditioning...are sold on Acme. Their reasons why, important to them from a professional standpoint, are equally important to building owners as well.

Small size and light weight reduce floor space, floor loading, headroom requirements, to lower building costs, cut installation expenses. High efficiency, low maintenance, trouble-free performance add up to big savings in operating costs. Yes, owners are also sold on Acme...you will be, too.
Major breakthrough in chemistry and wood

WITHSTANDS SMUDGING AND WEAR. Even in the heaviest traffic areas of schools, hospitals, and other public buildings, dirt and abrasion that would permanently mar paint and other wood finishes leave no impression on Permagard-surfaced Doors and Paneling. The Permagard surface is far more abrasion-resistant than even the best high-pressure laminate's—at least four times more, by standard laboratory tests. Permagard-surfaced wood works cleanly, and can be sawed, drilled, and nailed with ordinary woodworking tools.

RESISTS SCUFFING AND STAINING. In commercial interiors...such as restaurants, theaters, stores, and hotels...cooking fumes, tobacco smoke, food stains—even shoe polish—won't discolor Permagard Paneling and Doors. The satin-smooth Permagard surface provides a protective, nonporous barrier between the wood and dirt, spills, and smudges. A gentle wiping with a damp sponge is usually all that is needed to wipe them away. Stubborn dirt can be removed with standard chemical or abrasive cleaners without harming the surface.
technology announced by United States Plywood

GIVES FREEDOM FROM REDECORATING. From the busiest corridors, lobbies, and lounges to private offices and conference rooms, office building interiors that have Permagard Paneling and Doors by Weldwood stay beautiful under all normal conditions, in all climates. Hot, cold, humid, dry, and even rapidly changing weather do not affect the native beauty and color of this luxurious real wood. In the event of severe abuse, the Permagard surface can be repaired in the field.

WELDWOOD PERMAGARD
PANELING AND DOORS
add unprecedented beauty and wear resistance to the surface of fine wood

What does "Permagard" mean? It is the trademark for a totally new type of Weldwood factory-surfaced hardwood paneling and doors that have been sheathed at the factory with a thin, tough, invisible armor of new plastic resin film. This film is virtually fused to the wood's fibers to preserve its native beauty and protect it from scratches, stains, moisture, and extreme climatic changes.

In addition to providing superb wearing qualities, Weldwood Permagard Paneling and Doors yield important savings in installation and maintenance. The Permagard protective film is applied with a unique roll laminating technique that reduces to a simple operation the steps that normally require prolonged staging in standard four-coat, conversion-type, on-the-job finishes. The result is that United States Plywood can supply Weldwood Permagard Paneling and Doors at prices competitive with ordinary finishes.

The future design opportunities that Weldwood Permagard-surfaced wood promises to architects and decorators are virtually limitless. For a free sample and literature on Permagard Paneling and Doors by Weldwood, mail the coupon.

PERMAGARD™
paneling and doors made only by WELDWOOD®

SEND FOR FREE SAMPLES

United States Plywood
55 West 44th Street, New York 36, N. Y.

Please send me free samples of Permagard Paneling, along with descriptive technical data and suggested specifications for Permagard Paneling and Doors by Weldwood.

Name
Firm
Address
City Zone State
35 YEARS LATER, AND AGAIN
NEW YORK LIFE INSURANCE CO.
SELECTIONS GENERAL BRONZE

... for its new home office building

There's no better endorsement of a product or service than to have it repeatedly specified by satisfied architects and owners.

In 1926, the renowned architect, Cass Gilbert, designed a new Home Office Building for the New York Life Insurance Co. and specified Permatite windows "by General Bronze." Now, 35 years later, the New York Life plans a new, modern curtain wall building to house its ever expanding operations and, once again, "General Bronze" has been specified. This time by the architects, Carson & Lundin.

Reflecting the modern trend in architectural design, the new building will feature a glass and aluminum grid curtain wall system set in 21 ft. bays between full height stone piers. Horizontal mullions of dark gray anodized finish give emphasis to the staggered vertical mullions which are finished in natural color anodized aluminum. All details were designed to permit setting the glass in premoulded channels with pressure glazing stops. Aluminum track guides for window cleaning equipment are designed into the jambs.

As the country's foremost producer of curtain walls, windows and architectural metalwork in either aluminum, bronze or stainless steel, General Bronze is anxious and ready to serve you, too. Call us in on your next job. Our Catalogs are filed in Sweet's.

GENERAL BRONZE
CORPORATION • GARDEN CITY, N.Y.
SALES OFFICE: 100 PARK AVE., NEW YORK 17, N.Y.
goes out of doors to create plazas that surround a building with light, space and color. Any design, any color combination can be specified. A terrazzo plaza enhances a building, adds prestige, provides a safe walkway surface. Upkeep is negligible. When planning terrazzo plazas, consider ATLAS WHITE portland cement. Only a white cement matrix brings out the true color value of aggregates and pigments. For a brochure of terrazzo color samples with white cement, write Universal Atlas, 100 Park Avenue, New York 17, New York.
NOW—EVEN THE ELJER TRADEMARK IS NEW—to match the NEWEST line of bathroom fixtures in the industry. The staff of famous designer Dave Chapman went all out—put fresh, imaginative ideas in every fixture, every fitting. Sparked-up styling. Beautiful pastel colors. Bathroom planning with real sales appeal. You can’t miss when you specify Eljer. So look for this new symbol of excellence in distinctively modern fixtures and fittings of unmatched quality and unique value. Eljer Co., Three Gateway Center, Pittsburgh 22, Pa.
Prefabricated in modular units… installed quickly and easily

Light and bright inside, yet no glare... thanks to Thinlite

Only Thinlite curtain wall gives design freedom plus daylight control... with weather-tight permanence

Thinlite offers the architect an almost infinite variety of design possibilities for any building being planned. In modular units, Thinlite panels are readily available in solid colors or with individual color tiles positioned in each panel according to your specifications.

In addition to the design freedom which Thinlite offers, you are assured of maximum daylight control, for “solar-selecting” Thinlite tiles cut glare and radiant heat, while directing diffused daylight to interior areas.

And, important in curtain wall construction, Thinlite is weather-tight due to its Neoprene gasketing system. Thinlite requires little maintenance, provides a permanent, beautiful exterior surface.

For your free brochure about Thinlite, just write to Kimble Glass, subsidiary of Owens-Illinois, Toledo 1, Ohio.
unique floor beauty that won't "walk off" . . .

Vina-Lux® 800 Series

Now, a vinyl asbestos floor tile with distinctive color chip styling that won't wear away under heavy, concentrated traffic. The chip pattern is distributed at every level through the full thickness of the tile. Vina-Lux 800 Series costs no more than ordinary vinyl asbestos tile...yet delivers so much more value.

The Vina-Lux 800 Series can be specified for installation over concrete — even below grade, or over wood subfloors. In 12 fashion-coordinated colors; 9" x 9" size; 1/8", 3/16" and 1/4" gauges. See Sweet's Catalog or write for samples, color charts and complete architectural specifications — no obligation, of course.
A roundup of recent and significant proposals

**SKI LODGE IN NEW MEXICO**

The six jolly peaks at right will top off the restaurant and sun deck of a new ski center in Lincoln National Forest, near Ruidoso, N. M. The peak shapes are derived, in part, from Victor Lundy’s study of the site and its pine forests and, too, from ski patterns in the snow, and they will be carried out in laminated wood beams crisscrossed for wind bracing and shingled on the outside. Jutting out beneath these cones, diamond-shaped sun decks will cantilever over a brook on one side and a skating rink on the other. This is the main building of the base site, but in addition to the bar lounge (upper left), the project will include several lodges, a manager’s house, and a summit restaurant.

**BOAT-SHAPED OFFICES IN CONNECTICUT**

Riding at its moorings in Constitution Plaza, Hartford’s downtown redevelopment project, the boat-shaped Phoenix Mutual Life Insurance Co. building will contrast sharply with the straight-sided structures around it. Harrison & Abramovitz give two reasons for this shape: the company’s desire for a distinctive building, easily recognizable as a company symbol, and the construction economies of reducing the tower’s surface area, quite literally cutting corners. The two-story square around the tower base will insulate it from traffic, give the company bulk office space for business machines, and enclose a private garden.

**DOUBLE-SHELLED CHAPEL IN WASHINGTON**

A single concrete column will support this chapel, part of the Church of the Good Shepherd in Bellevue, Wash. (above), the chapel floor, a concrete hyperbolic paraboloid shell, and the roof, a twin shape of wood. Between these shells will run thin wooden rails and glass, providing sweeping views from the chapel in all directions. In a separate building at the bottom of the hill, the church school, social hall, and administrative facilities will be quartered. Both the chapel and the auxiliary building are the designs of Kirk, Wallace, McKinley & Associates of Seattle, who estimate the total cost to be $120,000.
RE-NEW-COAT® PROTECTS MASONRY AGAINST SURFACE EROSION . . . IN ONE EASY APPLICATION!

Down go construction costs! One staging, one application . . . and the job is done!

You can design longer life into masonry structures by specifying one application of Truscon Re-New-Coat.

Re-New-Coat is actually a masonry surface in itself, and it has even greater strength and durability than concrete. Not to be confused with a film-forming paint, Re-New-Coat anchors itself into masonry walls and becomes part of the structure. It looks like masonry, it feels like masonry, it is masonry.

Truscon engineers borrowed from concrete technology, combined it with the wonder world of epoxy, and produced a new masonry surface in a wide range of colors. Instead of using only finely dispersed pigments in a soft drying vehicle like ordinary paints, Re-New-Coat also contains large-size graded minerals suspended in a tough, hard-setting vehicle. As a result of this graded aggregate principle, the masonry surface gets super-protection from hard interlocking minerals bonded tightly together by tough Devran epoxy resin.

Conventional paint pigments give no protection against film shrinkage. Re-New-Coat’s interlocking aggregate principle eliminates internal shrinkage stresses.

RE-SURFACES OLD MASONRY, TOO

Re-New-Coat renews the eroded surfaces of older masonry buildings, and, as in new structures, only one application is required.

Re-New-Coat has a heavy body and resembles soft, creamy mortar, except that it has more cohesive qualities. It is high in solid content and thus it produces a substantial build-up on the surface being treated. It dries to a hard flat finish with a slight textured effect.

RESISTANT TO CORROSIVE FACTORS

Re-New-Coat is resistant to the alkali that is present in all masonry, and is also resistant to acid fumes, gases, and other harmful elements present in industrial atmospheres. It presents a hard, dense surface to driving rains, alternate freezing and thawing, hot sun and wind . . . shielding the structure from damage while providing an attractive masonry finish.

PROVEN FOR OVER SIX YEARS

More than six years of successful use all over America is your insurance that Re-New-Coat lives up to every statement made here. Not new and untried, but an experienced, successful protector of new and old masonry surfaces in all types of environment.

Truscon will welcome the opportunity to furnish you with photographs of typical applications, complete specifications and technical data, and actual samples of Re-New-Coat in color. Send coupon now for fast action.
**SIMULATED SPACE IN PENNSYLVANIA LABORATORY**

One part of the huge space technology center that General Electric is building at Valley Forge, Pa. will be this "envelope" for an egg-shaped simulator which will test actual space vehicles. On the outside, 12 large steel columns will rise from truncated concrete bases; these will support the roof, which will cantilever into a canopy. Architects-engineers: Jackson & Moreland, Inc.; architect: Vincent G. Kling.

**DRIVE-IN STADIUM FOR UNIVERSITY OF OREGON**

Avoiding the problem of selling end-zone seats, the University of Oregon Alumni Assn. proposes a stadium in Eugene banked with 400 tiered parking spaces in the end zones for drive-in game watching. Engineer Marshall Bessonette's scheme will also give the university 40,000 pedestrian seats, 9,000 of them in a covered, reinforced concrete shelter at the top of the stadium, the rest in 50-row blocks.

**NEW JERSEY CLASSROOMS**

Earth tones, in keeping with the predominant brick flavor of the campus, will be used on the exterior of this new classroom-laboratory at Douglass College in New Brunswick, N. J. The exposed aggregate cast into the large wall panels and window frames will be warm brown, and the base, brick in a harmonizing color. Architects Kasser & Weisbecker of Princeton point out that these large precast concrete sections will not only be economical in construction, but their deep reveals will cut air-conditioning operating costs.

**PHILADELPHIA LABORATORY**

Reinforced concrete in a sequence of 11 bays, two of them recessed, will run the full depth of the Philadelphia Presbyterian Hospital's new medical science research laboratory (right), and each laboratory or office will occupy a single or a double bay on one side of the building. Inside the two setback bays will be the service areas—stairs, elevators, and lobbies. Besides the exposed white concrete of the frame, the exterior finish will be red brick and glass. Architect: Vincent G. Kling.

*continued on page 53*
for construction headaches, use the dependable

24-HOUR CURE

Incor 24-Hour Cement speeds construction... cuts costs to the bone by earlier release of men, forms and equipment... lets concreting move ahead smoothly the year-'round... even in cold weather months. Makes clients happy because they can use the building sooner or collect rent earlier.

Remember Incor. It's the next best thing to a good architect for saving clients money.

Specify Incor on your next job.

AMERICA'S FIRST HIGH EARLY STRENGTH CEMENT

LONE STAR CEMENT CORPORATION, NEW YORK 17, N.Y.
MILLION-DOLLAR SCHOOL IN FLORIDA

Although best known for his flamboyant Miami hotels, Architect Morris Lapidus demonstrates work of a plainer style below, the Hebrew Academy buildings in Miami Beach. Under roofs of prestressed concrete folded plates, the school will have 23 classrooms, a 700-seat assembly hall, a cafeteria, a library, and a chapel. Architects: Morris Lapidus, Harle & Liebman; Connell, Pierce, Garland & Friedman.

FINNED LIBRARY IN FLORIDA

A September bond vote will determine whether or not this city library goes ahead; if it does, it will replace the old Jacksonville city hall on a downtown corner. This proposal, by Architects Hardwick & Lee, is a five-level structure, two levels underground. The building will be faced with precast concrete panels on the upper stories, which will be solid on the sunny sides and glass filled on the others.

INSURANCE COMPANY BUILDINGS IN LOS ANGELES

EmbarKing on a $25 million building program in downtown Los Angeles, the Occidental Life Insurance Co. has announced that it will rebuild its present headquarters and erect three entirely new buildings: the 25-story tower and nine-story service building above and a 700-car garage nearby. The architects in charge of designing Occidental Center: William L. Pereira & Associates of Los Angeles.

GYM FOR INDIANA STATE TEACHERS COLLEGE

In Terre Haute, on the campus of Indiana State Teachers College, work is under way on the new physical education building above, the left-hand portion topped by a prestressed concrete roof spanning more than 160 feet. The three gyms under these eight folded plates will convert into one large gym for intercollegiate basketball games and other college events. Architects: Miller, Vrydag & Miller of Terre Haute.

PLEATED ROOF ON MILWAUKEE CHURCH

Fifty-foot circular steel columns, tapering from top and bottom to the center, will carry the pleated steel-webbed roof over St. Agnes Church in Milwaukee, under construction now and due for completion this summer. Designed by Milwaukee Architects Herbst, Jacoby & Herbst, who describe it as “contemporary Gothic,” the church’s exterior will be of brick and cast stone, the latter forming pierced screens.
Room Comfort is Occupant Controlled

The Dunham-Bush unit system of air conditioning... with 'CR' room air conditioning units in all rooms and one central plant to handle the entire heating and cooling load... is ideal for any multi-room building.

Individual room control permits each occupant to select the conditions he desires—without affecting other rooms or zones. One unit handles cooling, heating and circulation of fresh, filtered air... quietly!

Perfectly suited for either new construction or existing buildings, the Dunham-Bush unit system requires no costly, difficult-to-install central duct system. A single piping system is utilized year 'round.

Units are available in 4 sizes from 220 to 600 CFM... for heating and cooling by water, direct expansion or steam; for vertical floor mounting in exposed, semi-recessed or fully recessed installation; for ceiling suspended, exposed or fully recessed installations.

Request Catalog #6014A containing complete specifications.

DUNHAM-BUSH, INC.
WEST HARTFORD 10, CONNECTICUT, U. S. A.
SALES OFFICES LOCATED IN PRINCIPAL CITIES
Plastic domes . . . wall and roof panels . . . steel partitions

WORKING PANELS
With the addition of two shear end walls to carry the lateral load, Fenestra's new load-bearing wall and roof panels form a complete shell for a one-story building. This integrated system, called Fenmark III, spans up to 92 feet with continuous runs up to 150 feet without an extra shear wall. In most cases the use of structural steel is unnecessary. Erected by Fenestra crews, the panels go up quickly: after the wall panels are in place, the roof panels are welded to them. Insulation, finish roofing, and glazing are installed after roof and wall panels are up.

Standard Fenmark III panels are 9, 10, 11, and 12 feet high and 4, 6, and 8 feet wide, but special sizes may be ordered. Wall panels are porcelain enamel on steel, with or without glass-fiber insulation, and mullion caps are aluminum in two finishes. Fenestra offers two kinds of roof panels: one unfinished on the interior, the other finished with either a plain or acoustically corrected ceiling. Costs depend on materials and engineering services required.


PREFAB DOMES
Monsanto Chemical Co. is going into the dome business, designing, manufacturing, and marketing plastic geodesic domes under license from R. Buckminster Fuller. These Geosphere domes, produced by a wholly owned Monsanto subsidiary, will be sold initially as ready-to-assemble package units, easily glued together on the site to make domes of two sizes, 22 and 9 feet in diameter. At 85 cents per square foot, the domes are cheap, waterproof shelters for a variety of uses, such as temporary warehouses on construction sites, disaster housing or, in the case of the smaller dome, swimming-pool cabanas for motels or clubs.

Included in the package are panels of Fomcor, lightweight foamed styrene laminated to kraft paper and coated with a weather-resistant alkyd inside and out, a treated pine base ring, eye bolts, iron staking rods, neoprene adhesive, and instructions. The dome is assembled from the top down, pasted together joint by joint, and finished off with the wooden base and eye bolts. Stakes driven through the eye bolts secure the dome to the ground. Erection time varies with the skill of the workmen, but three unskilled men need less than a day to complete a dome. The 22-footer costs $300 f.o.b. Baxley, Ga., but no price has been set for the smaller dome, to go into production April 1.

Manufacturer: Filtered Rosin Products Co., Baxley, Ga.
BEAUTY and PERMANENCE
in Ellison Balanced Doors

Ellison has had 45 years experience that can help you solve any entrance problem. Ellison engineers can make recommendations on structural support, traffic flow, wind and suction conditions that will be helpful in early planning — for either new or modernized buildings. Along with all these advantages — the customer receives a trouble-free door.

ARTIFICIAL REVERBERATION

This electronic acoustical system for new and rebuilt auditoriums and churches relays sound so that rooms designed primarily for voice reverberation can work equally well for musical programs. Manufactured by a division of Litton Industries, the Westrex 1400 Distributed Reverberation System makes up for the short reverberation time of voices by spreading the sound, creating a complex train of repetitions in diminishing volume. Sounds are recorded on magnetic tape, which then passes over a succession of reproducing heads. Tape speed and head spacing determine the frequency of repetition, and both factors may be adjusted to the needs of a particular room. To further the illusion of sound passing from front to back with successive reflections and diminishing volume, each head connects to an individual pair of loudspeakers installed on opposite sides of the room, and the reproduced output feeds back onto the tape at decreasing volumes. Once installed, the system is flexible enough so that it may be adjusted to several kinds of musical programs, some of which, particularly religious music, require longer reverberation times than others.

The equipment needed falls into three groups: the tape transport, including erase, record, and reproducing heads; the distributed reverberation assembly, including recording and reproducing circuits; and amplifiers for each speaker. The basic price for this equipment is $10,000, excluding microphones and speakers.

CLEAN ACOUSTICS

A thin, waterproof vinyl sheet stretched over acoustical tile gives it scrubability without reducing its sound-absorbing efficiency. Manufactured especially for hospitals, laboratories, restaurants, and food-processing plants, where acoustical tiles are washed often, the vinyl sheet withstands repeated scrubblings, protects the
tile face from water damage, yet does not affect the penetration of sound into the tile’s porous core. It will not shrink, crack, or separate from the tile, and is said to be the first washable film which actually repeats the fissures of the tile beneath rather than carrying a printed design.

This tile is incombustible and may be installed by mechanical suspension or by cementing. Sold only in white and in 12-inch squares, Vinyl Face Travertone costs about 85 cents to $1 per square foot installed.


EPOXY MORTAR

Threadline, an epoxy-based mortar, forms a strong bond between brick, concrete block, and other masonry units, but the thin joint, which is less than 1/16 inch, limits this material’s use to precision-ground units. Threadline is mixed on the site and squirited from a caulk gun in a thin bead around the block. It cures in 24 hours and reaches full strength in 72. According to the manufacturer, even though Threadline costs twice as much as cement mortar and requires more expensive masonry units, the labor and time saved cut as much as one third from the cost of a masonry wall. Threadline is sold in packages containing mortar for 100 blocks, measured and sealed into plastic bags ready for mixing. A single kit costs about $10.

Manufacturer: Raybestos-Manhattan, Inc., Bridgeport 2, Conn.

PATTERNED PANEL

The new Soulepanel for curtain walls is a six-layer sandwich faced on the outside with a layer of Mosaica, a glass-chip material. The other layers in the sandwich consist of an inorganic matrix, cement asbestos board, glass-fiber insulation, aluminum foil, and an interior finish of cement asbestos. Aluminum sections frame the whole panel, and in panels larger than 9 square feet galvanized steel channels add stiffness. Mosaica, which has been on the market for some time, looks deeply grained and rough (see photo below) but is actually smooth enough to write on, and it comes in 17 standard colors and continued on page 58
In the Jack Tar...

Public Rooms do Double Duty through Folding Walls by...

Fairhurst

Changing space needs are met by changing space areas in San Francisco's most modern hotel. No fewer than ten Fairhurst Walls in the Jack Tar mean quick and easy conversion of room areas for peak demands. There is no waste of usable space — Fairhurst Walls are as nearly soundproof as modern engineering can make them.

Send for free booklet showing how to get the most into your hotel with Fairhurst Unitfold & Unitslide Walls; no obligation, of course.

John T. Fairhurst Co., Inc.
45 West 45th Street  New York 36, N. Y.
FAIRHURST . . . First Name in Folding Walls

faceted (half glossy) or matte finishes.
Panels are made to specifications in four thicknesses—1, 1\(\frac{1}{4}\), 1\(\frac{1}{2}\), and 2 inches. Typical prices for 1,000 square feet are $1.90 per square foot for the 1\(\frac{1}{4}\) inch panel and $1.95 for the 1\(\frac{3}{4}\) inch panel. Both prices are f.o.b. San Francisco.

Manufacturer: Souë Steel Co., 1750 Army St., San Francisco.

ACCORDION WALL

Twelve layers of material, two of them 24-gauge steel, seal out sound in the Modernfold Soundmaster 210, a heavy-duty folding partition. Pulled into place, it has an average sound attenuation of 41.8 decibels, equivalent in effectiveness, the manufacturer claims, to a solid apartment wall in making normal speech inaudible from one side of the partition to the other. Credit for this goes not only to the 12 layers but also to polyurethane cushions along the jambs and double felt and rubber seals at the horizontal edges. The outside covering is heavy vinyl.

The largest single partition is 25 feet high and 60 feet wide, but wider expanses present no problem—several partitions may be fitted together to fill the space. In closed position, a partition 20 feet wide
folds to 32.4 inches. Cost: about $5 per square foot.
Manufacterer: New Castle Products, Inc., Box 353, New Castle, Ind.

COLORED PLYWOOD

Georgia-Pacific's new colored fir plywood has two baked-on finishes, one on top of the other: a high-density resin-fiber undercoating and an acrylic overlay available in four colors (red, blue, green, or white). The acrylic overlay is a permanent all-weather finish applied to one or both sides, and panel edges are weather-sealed at the factory. This factory finish makes plywood weather-resistant and tough enough for use in highway signs and exterior building walls, either as a curtain-wall panel or a structural component.

Georgia-Pacific is offering this treated plywood in standard thicknesses of 5/16, 3/8, 1/2, 5/8, and 3/4 inches, widths of 30, 36, 48, and 60 inches, and lengths of 72, 84, 96, 108, and 120 inches. To give an idea of cost, the company quotes 6.5 to 87 cents per square foot for the 5/16-inch thickness, one side overlaid with acrylic, the exact price depending on specifications and quantity.

Manufacturer: Georgia-Pacific Corp., Equitable Building, Portland 4, Ore.

PREVIEWS

General Electric laboratories are experimenting with a vapor lamp (below) which combines high light output and favorable color quality. Thin envelopes of GE's Lucalox, a polycrystalline alumina ceramic, tolerate higher pressures and temperatures than quartz or other conventional bulb materials without melting. If the experiments are successful, the new metallic vapor lamps will be marketed primarily for industrial, commercial, and defense lighting purposes.

Brunswick Corp. and Mohasco Industries, Inc. are working together on the production of a flexible room divider consisting of a lead-filled fabric for sound-deadening. Although designed specifically for schools, the Acousti-Flex material is expected to find use in commercial and industrial buildings as well.
Workability:
Field cutting-and-trimming is swift, clean and neat with Gold Bond® Acoustiroc. Its felted structure (long mineral wool fibres, uniformly interlocked) gives Acoustiroc unusual workability, strength and dimensional stability. Felting also accounts for its sag resistance: 500% greater than other
12" x 12" fissured mineral wool acoustical tile. Acoustiroc can even be installed before plaster and terrazzo work are dry, saving a week or more of building time. Acoustiroc is an excellent choice, any way you look at it. National Gypsum Company, Buffalo 13, N.Y.
"G-E Remote-Control Wiring has saved money since the day it went into this building in 1953," says Mr. Donnelly, standing in front of 3-story, block-long office building, Menands, N. Y.

"G-E Remote-Control Wiring saved us $20,561 in this N. Y. Telephone building - on installation alone!"

... Mr. H. J. Donnelly, Supervising Electrical Engineer New York Telephone Company, Albany, N.Y.

"We compared General Electric Remote Control with an ordinary switching system that would give us the kind of lighting control we wanted," says Mr. Donnelly. "We were surprised to find that, in addition to its other advantages, the G-E low-voltage system cost $20,561 less to install!

"On top of the initial savings, we reduced our operating costs, because G-E master switching makes it easy for maintenance crews to turn ON only those lights needed, rather than lighting up whole floors. Switches at convenient locations save our men extra steps, too.

"These savings were all in addition to the original reason we considered Remote-Control. That was extra safety in controlling the 480Y/277-volt power system we chose for its saving in branch circuit copper. Remote-Control relays in the ceiling control the 277-volt lighting circuits, so there's only a low, 24 volts at the switches. Of course, the lightweight, 24-volt switch wiring makes it easier to relocate office partitions, too. And the elimination of switch-loop voltage drops that can cut the life and efficiency of lamps, is still another feature."

General Electric would appreciate the opportunity of working with you on the design of a Remote-Control Wiring System tailored to fit your particular needs. Write Commercial Engineer, General Electric Company, Wiring Device Department, Providence 7, Rhode Island.

"Don's the lights you don't need!" is standard procedure for maintenance crew, in building from 5:00 to 11:00 p.m. G-E Remote Control makes it easy.

G-E master selector switches at ends and center of each floor control lighting separately for each ½ floor. Building contains 2000 fluorescent lamps.

Progress Is Our Most Important Product

GENERAL ELECTRIC
There can be no compromise here*

On galvanized metal surfaces — be sure of lasting performance with Rust-Oleum GALVINOLEUM® Coatings

Galvanized metal surfaces present a special problem—"getting a coating that will really stick, to eliminate paint peeling headaches." Rust-Oleum Galvinooleum is that coating—it can be applied directly over brand new galvanized metal without etching, without weathering, without waiting —and it lasts and lasts! It is available in four attractive colors—red, gray, green, and metallic. Specify Rust-Oleum Galvinooleum coatings for galvanized buildings, metal gutters, downspouts, roofs, siding, vents, etc. Would you like a guide to lasting performance on galvanized metal surfaces? Write for your free copy of the new 30-page Rust-Oleum Architectural Catalog. Just attach the coupon to your letterhead and we'll send it promptly.

RUST-OLEUM

There is only one Rust-Oleum. It is distinctive on your own fingerprint. A matter of excellence.

Your nearby Rust-Oleum Industrial Distributor maintains complete stocks for your convenience.

RUST-OLEUM CORPORATION
2517 Oakton Street
Evanston, Illinois

New 30-page Rust-Oleum Architectural Specifications Catalog. Features actual color charts. Clip coupon to your letterhead for your free copy of Form No. 259-A.

Architectural Forum / April 1961
SOLEX® glass protects their eyes...

In the corridors, PPG polished plate glass was used in the upper sections and HERCULITE shock-resisting tempered plate glass was below where damage could occur.
HERCULITE® protects the school

Large expanses of glass create a feeling of unlimited spaciousness in the new Quincy, Illinois, Senior High School. Glass performs many practical functions, too. PPG SOLEX green tint, glare-reducing, heat-absorbing glass not only protects young eyes from solar glare but keeps classrooms cooler in summer. HERCULITE tempered plate glass, because it is four to five times stronger than regular plate glass of the same thickness, provides plenty of impact resistance in corridor areas likely to receive the most abuse.

Polished plate glass, SOLEX and HERCULITE are deftly woven into the design pattern to produce a brilliant, modern look which opens the building to the whole outdoors.

For more information on any of these products, write Pittsburgh Plate Glass Company, Room 1100, 632 Fort Duquesne Boulevard, Pittsburgh 22, Pennsylvania.

The driver training classroom gets plenty of light but glare and solar heat are greatly reduced by SOLEX green tint plate glass.

TUBELITE doors, surrounded by large panels of PPG polished plate glass, accentuate the open-vision theme.

Architects and Engineers: Charles F. Behrensmeyer & Frank W. Horn, Quincy, Illinois
Contractor: Simmons Construction Company, Decatur, Illinois.

PPG glass products for schools:

SOLEX® Plate Glass—green tint, heat-absorbing, glare-reducing glass
SOLARGRAY® Plate Glass—a neutral gray, heat-absorbing, glare-reducing glass
PENNVERNON® GRAYLITE™—a neutral gray, heat-absorbing, glare-reducing, heavy sheet glass
HERCULITE®—shock-resisting tempered plate glass
TWINDOW®—the world’s finest insulating window
Polished Plate Glass—for clear, true vision
PENNVERNON® Window Glass—window glass at its best.

Pittsburgh Plate Glass Company

Architectural Forum / April 1961
New...from VAN HUFFEL

COLD FORMED CONTINUOUS
SINGLE WELD
STEEL TUBING
IN RECTANGLES
AND SQUARES
IN SIZES THIS
BIG
FOR
INDUSTRIAL AND
ARCHITECTURAL
APPLICATIONS

WHERE BIG IDEAS TAKE SHAPE IN METAL
APPLICATIONS

Because of its high production potential and adaptability, the uses of Von Huffel square and rectangular tubing are practically unlimited. Here are a few:

ADVANTAGES

MORE STRENGTH
Roller Die, cold formed continuous welding on one side ONLY provides maximum strength throughout.

GREATER SAVINGS
High strength-to-weight ratio permits use of lighter gauges or smaller sizes than solid metals.

UNIFORMITY
Uniform wall thickness, square sides, accurate radii and straightness.

FUNCTIONAL BEAUTY
Smooth finish, free of scale and protruding flash, ready to paint.

STANDARD SIZES AND GAUGES

Squares:
- 5" x 5" — .165" to .259 wall
- 6" x 6" — .165" to .259 wall

Rectangles:
- 4" x 6" — .165" to .259 wall
- 4" x 8" — .165" to .259 wall
in any lengths and all common grades of steel.

ACTUAL SIZE: 4" x 8" .259 WALL

Structural Columns
Sign Supports
Canopy Supports
Beams
Steel Buildings
Farm Equipment
Earth Moving Equipment
Bridge Work
Automobile Transports
Storage Racks
Guard Rails

ACTUAL SIZE
6" x 6" .259 WALL

Van Huffel also produces this wide range of standard welded sizes and gauges:

ROUND: ½" thru 6" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

SQUARE: ½" thru 6" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

RECTANGULAR: ½" x ½" thru 4" x 8" in gauges from .020 (25 ga.) thru .259 (3 ga.) and all intermediate sizes.

All Van Huffel Welded Tubing stocks are available through Steel service centers in principal cities.

WRITE FOR FREE
48 page handbook
Two separate Chrysler Packaged Air Conditioners cool each floor in Dayton’s largest apparel store

One large air conditioner could have done the job. But Metropolitan, Dayton’s largest family apparel store, decided on two 30-HP Chrysler Packaged Air Conditioners for each floor of the building. The reasons are interesting:

First, for economy. One 30-HP Chrysler unit can handle the cooling load on all but the hottest days. It costs less to operate this unit at maximum capacity than it does to run a much larger unit at reduced efficiency.

Second, for flexibility. When cooling loads are less, the Chrysler units can be operated efficiently at as low as 25% of capacity—compared with 50% for other equipment. And with separate units, ideal conditions can be maintained on each of the floors, independently of the others.

Third, for protection. The stand-by unit is always ready to go to work whenever outdoor temperatures rise to their peak.

Why was Chrysler equipment specified? Because installed cost is low . . . and operation is more economical. And because Chrysler, the pioneer manufacturer of packaged air conditioning equipment, offers the top quality unit for any building need.

Before you decide on your next air-conditioning job, check with your local Chrysler Engineer. Or write today for technical data.
FABRICATED ENTIRELY from DISTRIBUTOR’S STOCK...

Transoms, sidelights, borrowed lights, entrance frames—all assembled by your local distributor for daily delivery. Steelcraft's pre-engineered components permit unlimited design variations. Doors are available with standard cut out for cylindrical, mortise, unit and integra-locks. Your own choice of hardware, panic devices, concealed closures, trim and finish. Frames are all prepared for Universal Strike (ASA).

STEELCRAFT
standard METAL DOORS
and FRAMES

Over 4,000 door types, styles and sizes
... over 7,000 frame variations

Now you can have complete versatility in standard metal doors . . . and frame variety to match. Rugged, handsome doors—flush, exceptionally sound deadened, and with “billiard table” flatness due to their unique Honeycomb core that tests prove to be superior to girder type construction. Quality at low cost, too—for Steelcraft's standardization and modern-flow assembly make possible passed-on production economies. Get the full story today on why more and more architects specify Steelcraft. Valuable brochure on request.

STEELCRAFT
THE STEELCRAFT MANUFACTURING COMPANY
9017 Blue Ash Road, Cincinnati 42, Ohio

Please send me the Steelcraft brochure on the most complete line of standard steel doors and frames in the industry.

NAME
ADDRESS
CITY  ZONE  STATE

Fredericktown Elementary School,
Fredericktown, Ohio
Architect: Joseph Baker and Associates,
Newark, Ohio

Architectural Forum / April 1961
IT TAKES A TEAM OF THREE TO BUILD A BANK

Or enlarge or improve one. A banker to set the goals and supervise. An architect to design the structure. And a LeFebure representative to plan the most profitable operating systems and equipment. LeFebure's 60 years of service to banks is your assurance of efficient, economical systems. LeFebure's Architects Service Division is available without charge. For descriptive literature, write today to LeFebure Corporation, Cedar Rapids, Iowa.

LeFebure is a subsidiary of Craig Systems, Incorporated
Complete Kewanee® heating package

New Kewanee forced draft units give you the whole heating package—high- or low-pressure boiler shell and integral Kewanee gas, oil, or oil-gas combination burner with all operating controls. Plus Kewanee Starting Service. The experienced service representative in your territory will start your boiler after installation, thoroughly check out its operation, provide operator training, and service your unit, at no extra charge, for 90 days after startup. For more complete information, contact your nearest sales office today. American-Standard Industrial Division, Detroit 32, Mich. In Canada: American-Standard Products (Canada) Ltd., Toronto, Ontario.
In the world’s most beautiful buildings

You’ll usually find

SOSS
INVISIBLE
HINGES

for complete information and prices, see your building supply dealer or hardware dealer, or write us.

SOSS
MANUFACTURING COMPANY

"The Hinge That Hides Itself"

AF-12
P. O. BOX 38, DETROIT 13, MICHIGAN
Copper batten seiiin roofing on the new Senate Office Building, Washington, D. C.

New Senate Office Building has copper roofing for enduring protection

Approximately 75,000 pounds of Anaconda copper were used for the batten seam portion of the roof and the deep, boxed concealed gutter on the new Senate Office Building. In the nation’s capital and in cities throughout the country, copper roofs are establishing records of long service and low maintenance costs.

The roof was fabricated and erected by the Overly Manufacturing Company, Greensburg, Pa. A modified “Overly” batten was formed from copper strip. Roofing sheets were formed from 30-inch cold-rolled copper. Architect of the Capitol, J. G. Stewart. Architects: Eggers and Higgins, New York City. General Contractor: George Hyman Construction Co., Washington, D.C.

A realistic comparison of roofing costs requires the inclusion of two important factors—estimated maintenance costs over the years, and estimated serviceable life of the roofing material. Copper has proved its economy. Performance records covering many years of service show that expected long life and minimum upkeep are based on fact, not guesswork. Here is an example:

When the 47-year-old Grand Central Terminal Building was razed recently to make way for the huge new Pan-American Building, more than 150 tons of sheet copper were removed from the roof. The copper was still sound and beautifully colored by nature’s patina. It is also worthy of note that the scrap value of the removed metal was considerably higher than the price for ingot copper prevailing when the roof was installed in 1913.

FOR MORE INFORMATION on Anaconda Sheet Copper for building construction, see your Sweet’s File or write for Publication C3-SA. Also, if you do not have your copy, ask for our “Modern Sheet Copper Practices,” 109 pages of drawings, specifications, and general information. Address: Anaconda American Brass Company, Waterbury 20, Conn.

ANAConDA®
SHEET COPPER
FOR BUILDING CONSTRUCTION
Anaconda American Brass Company
TEAMWORK
WILL CUT MATERIALS HANDLING
AND WAREHOUSING COSTS
FOR YOUR CLIENTS

Working with the architect on a new plant or renovation job, our engineers can effect substantial savings in the handling and storage of materials and improve the efficiency of manufactur­ing facilities. We invite your inquiry and suggest you contact any of the leading companies we have served.

GEMAR ASSOCIATES, INC.
Consulting Materials Handling Engineers
74 Greenwich Avenue, Greenwich, Connecticut
OVER 30 YEARS EXPERIENCE

What will it cost?
CHECK YOUR BUILDING PROJECT with reliable JOB COSTING figures

1961 ARCHITECTS ESTIMATOR
and COST REFERENCE GUIDE
Supply accurate preliminary unit building costs in convenient form. Here are all the important facts and figures on current unit costs for every construction job large or small from excavation to final sub-contractor. All costs in this invaluable book include mark-up, overhead and profit. Regarded by architects, engineers, contractors and users in the building industry as the most comprehensive guide to normal profitable operation. Valued highly by industry and government in planning construction projects. Special section devoted to foreign building costs. Revised yearly, new edition just published.

PROFESSIONAL
CONSTRUCTION ESTIMATOR
A Labor & Material Calculator
Both compiled by the foremost professional estimator, Jacques Ing Cramer Priest
SAVE 10%—Order both books at a combined price of $45.00

CHF No. SB 419
A tubular cantilever stool base available in 20", 22", 26" heights: Satin or Bright Chrome.

CHICAGO HARDWARE FOUNDRY CO.
SHOWROOMS IN ALL PRINCIPAL CITIES
NORTH CHICAGO - ILLINOIS
Spruce up the old... Accent the new

LIGHTING INSTALLATIONS
MADE WITH
LUSTREX® PERMA TONE

Luminous ceilings, luminaires, louvers, refractors, diffusers and modules made with Monsanto Lustrex Perma Tone Styrene have given years of service as a dramatic and effective source of light in hundreds of buildings of all types—both new and old.

In major renovation projects, these lighting installations are an economical and easy way to brighten up dark corners with strong, yet softly diffused illumination. Over-high ceilings can be brought down and unsightly beams and pipes can be masked behind a ceiling of bright new beauty. In new construction, lighting installations made with Lustrex Perma Tone give you a highly flexible means of creating unique decorative effects and accounts.

Fixtures made of Lustrex Perma Tone deliver uniform surface brightness and excellent color stability. Exceeding IES-NEMA joint specifications for ultraviolet light stabilized styrene, Perma Tone assures the whitest of whites or a wide range of molded-in clear, permanent colors. Dimensionally stable, they are also light in weight for easy handling, installation and maintenance. To make sure you get this combination of performance at an economical cost, specify installations made with Monsanto Lustrex Perma Tone.

MONSANTO DESIGNER IN PLASTICS

If you would like additional data on Lustrex Perma Tone in lighting, and the names of manufacturers of fixtures molded of Lustrex Perma Tone, send coupon below to Monsanto Chemical Company, Plastics Division, Room 818, Springfield 2, Mass.

MONSANTO CHEMICAL COMPANY, Plastics Division
Room 818, Springfield 2, Mass.

Please send me comprehensive report on general-purpose and impact Lustrex Perma Tone Styrene, and other data on styrene in lighting. Also list of manufacturers of lighting fixtures of Perma Tone.

NAME: ____________________________________________________________
TITLE: ____________________________________________________________
COMPANY: ________________________________________________________
ADDRESS: _________________________________________________________
CITY: ___________________________________________________________
“let’s consider playspaces”...

A NEW 16 page sketchbook of dramatic playground ideas, layouts, landscaping designs and themes to help architects, park, recreation and school executives with playspace problems.

A portfolio of 50 installation blueprints and specifications available to authorized design engineering and architects offices, (quantity limited)

WRITE FOR FREE SKETCH BOOK.

play sculptures

A DIVISION OF
CREATIVE PLAYTHINGS, INC.
P. O. BOX 1500, DEPT. AT-4
PRINCETON, NEW JERSEY

LOW COST, WHITE ROOFING AGGREGATE

CRYSTALITE
Bondable, Whitest White Highly Reflective Marble (cuts air conditioning expense)

Sparkling white Crystalite makes a beautiful built-up roof—yet costs very little more than the cheapest aggregates. Crystalite is approved for bonding by leading roofing material manufacturers. Crystalite is a hard, nonporous limestone marble. It will not crumble, deteriorate or change color. Because of its heat reflective properties, air conditioning expense is greatly reduced. Crystalite, clean, dry and ready to use, also saves on handling expense.

Write for Complete Information, Samples and Prices
BLACK WHITE LIMESTONE CO.
Front and Eighth Streets, Quincy, Illinois

THE SAPPHIRE BY PETERSON

perfect window complement to modern architectural styling

The Sapphire Aluminum Rolling Window by Peterson is recognized as the ultimate in fine fenestration for commercial buildings, institutions and thoughtfully-planned residences throughout the architectural field.

Clean, linear styling . . . smooth, effortless operation on permanently lubricated, corrosion-resistant ball bearing rollers . . . rugged, lasting construction . . . maintenance-free service life. These are just a few of the many reasons for the Sapphire’s wide acceptance by architects, as well as by builders and owners.

Famous Peterson attention to design and production detail assures positive weather protection. Air infiltration in the closed position tests to .36 cubic feet per minute per foot of sash perimeter when subjected to a pressure equivalent to a 25 mph wind. This is better than twice the performance recognized by national standards.

The Sapphire is supplied in vent heights to 6’6” and widths to 10’ with single, double or sealed insulated glazing. It is also available in curtain wall construction in single or multi-story units. Write for complete dimensional and structural details today.

PETERSON WINDOW CORPORATION
706 LIVERNOIS AVENUE • FERNDALE 20, MICHIGAN
It creates a lace-like metallic pattern of silver or gold over a wide variety of glamorous new decorator colors...
an exciting effect previously available only in the most expensive wall papers...now possible with paint at a fraction of the cost!
Your painting contractor applies MetaLace...quickly, easily, inexpensively for long lasting beauty.
Mail coupon for details on this unique new paint product.

PLEXTONE Corporation of America
2125 McCARTER HIGHWAY, NEWARK 4, NEW JERSEY
PACIFIC COAST DIVISION: 10781 VENICE BLVD., LOS ANGELES 34, CALIF.
If there is ever a better flush valve...its name will be SLOAN

Continuing research by SLOAN for more than 50 years has made the ROYAL Flush Valve the standard by which all other flush valves are judged. Product improvements—such as no regulation, non-hold-open, inside cover, segmented rubber diaphragm, parts of Du Pont Delrin®—are made only after years of thorough field testing. Thus, long lasting, low maintenance performance is the result of excellence in engineering and research. This is the bonus of quality you expect, and receive, from SLOAN.

SLOAN FLUSH VALVES
SLOAN VALVE COMPANY • 4300 WEST LAKE STREET • CHICAGO 24, ILLINOIS
On April 24 to 28 the American Institute of Architects, the chief professional body related to the art of building, will convene in Philadelphia to discuss “redesigning urban America.” Today this seems natural. In 1956, when this magazine proposed a convention on this subject, perhaps it was premature. Ten years ago it would have seemed visionary. Anyway, President Will and the A.I.A. are right, and are to be congratulated.

As for Philadelphia, way back in 1947 it treated itself to a wonderful show on the future of the city (Forum, Dec. ’47). Gimbel’s department store gave the space for the exhibit to the indefatigable architects of the local A.I.A. chapter. There were, of course, people then who thought that the businessmen backing this move were premature, that the architects making the giant models were dreamers, and that this magazine in devoting so much space to it was unbalanced. Not so. Cities were beginning to have to move, though only the leaders yet knew this. Two years later Congress passed Title I of the Housing Act of 1949, and thereby enacted the first, epoch-making, urban renewal legislation. At last Philadelphia and other cities had a major usable tool for steady redevelopment operations. The “redesign of urban America” was on the way.

Doubting Thomases yield hard. Despite the manifest devotion of all the Philadelphia architects who put on the 1947 show—Stonorov, Bacon, Kahn, Kling, and many others—forum kept hearing that “architects could not possibly be interested in that kind of blue-sky stuff,” anyway not rank-and-file architects. Nevertheless, forum settled down to regular treatment of the urgent city subject. Mayor Dilworth of Philadelphia, successive planning commissioners, and Planning Director Edmund Bacon must have heard equally assured statements that businessmen could not possibly care for urban renewal either. Wrong again. Now businessmen are with it all the way across the nation.

Philadelphia’s businessmen have gone so far as to create an exemplary redevelopment corporation; Philadelphia’s central business district stands visibly transformed; other big transformations are under way elsewhere all through the city.

Break-throughs seldom come singly: one leads to another. Urban renewal has been followed by the discovery (heavily shared by this magazine, see the February issue) of the importance of rebuilding; and also of the importance of having cities and suburbs solve their problems together (forum, Jan. ’61).

All these “visionary” moves result ultimately in construction activity involving billions upon billions of dollars. Urban renewal adds several billion construction dollars a year, and rebuilding—which must soon become an organized effort—includes more billions annually than all new houses do.

There still remain Doubting Thomases who regard these latest break-throughs of imagination as “visionary.” But most architects, builders, and manufacturers in the building industry are bold by nature, not picayune; all they need is good leaders, like the Philadelphia folks. The Doubting Thomases will be on board in the end, no doubt declaring that they did it all.
TEXTURE

COLOR

COMBINE

TO BRING YOU

A NEW

DIMENSION

TEXTURE . . . from dramatically pronounced to just a bit above smooth.

COLOR . . . from the deepest of hues to the most delicate of pastels.

DIMENSION . . . to poured, precast, or prestressed concrete; concrete block, brick or masonry; asbestos board, pressed wood or overlay plywood.

BOSTIK Architectural Coatings bring you a whole new scope of design expressions ideally suited to your present or future projects.

Franchised, factory trained specialists are available to apply BOSTIK Architectural Coatings.

Complete details are in Sweet’s 1961 Architectural Catalog File, Section 9B/b. Better still, write on your company letterhead to BB Chemical Company, 784 Memorial Drive, Cambridge, Mass. for more information.

Bostik*

ARCHITECTURAL

COATINGS

another polyurethane coating advance FROM

BB CHEMICAL COMPANY

Subsidiary of United Shoe Machinery Corporation
784 Memorial Drive, Cambridge, Massachusetts

See Bostik Architectural Coatings in booth No. 55, at A.I.A. Show, April 24, 28, Philadelphia

*BOSTIK is the trademark for BB Chemical Company Coatings.
The familiar face under the jaunty hat (in front of an equally jaunty and famous roof) is, of course, that of Charles-Edouard Jeanneret, better known as Le Corbusier and generally, nowadays, referred to as “Corbu.” Incredibly, Le Corbusier is now 73 years old. He is also, in the opinion of most of his peers, the world’s greatest living architect.

This opinion is being given tangible expression this month in Philadelphia, where Corbu will receive the Gold Medal of the American Institute of Architects. But Corbu’s importance to the architecture of our time is given even more tangible recognition every single day in every part of the world: for there are very few modern buildings completed nowadays—whether in New York, Bangkok, Berlin, or Rio—that do not owe a significant debt to the vastly resourceful work, over the past 50 years, of this remarkable innovator.

In recognition of this fact, the editors of FORUM are proud to devote a major portion of the present issue to his work.
Corbu is not only an architect and city planner; he is also a leading modern painter and sculptor, a passionate pamphleteer, an incisive writer, and a surprisingly lyrical poet. But the most significant body of his work is in architecture and city planning; and in these areas he has shown a consistency and single-mindedness almost unknown among artists since the Renaissance.

Three specific objectives have dominated his work: first, the creation of forms and spaces characteristic of our time; second, the development of a vertical city-in-a-park and the solution of problems posed by such a city; and, third, the establishment of a flexible system of proportions in architecture and planning. Corbu has pursued these three objectives for half a century. In the course of this search his idiom of expression has changed frequently, his fundamental objectives never. The next 20 pages are devoted to Corbu's three basic preoccupations.

New forms and spaces. Cézanne once said that everything in nature is formed according to the sphere, the cone, and the cylinder. To this trilogy, Corbu added the cube, and then substituted the word “architecture” for “nature.”

Le Corbusier’s early architecture was pure “machine art”—compositions of cubes, spheres, cones, and cylinders, all very smooth and polished. But sometime in the thirties, “organic” forms began to interest him—the forms of plants, snails, pebbles, and rocks. Today, his work has a richness of form and of texture far removed from the sleekness he and others practiced in the twenties. But the basic preoccupation remains: the search for bold and simple forms, clearly man-made, raised up to be silhouetted against the sky; the search for tall, dramatic spaces of many levels that reflect the discovery of something new—the things that happen to a space as one moves through it; and the search for more plastic forms and spaces stimulated by new techniques in engineering.

A new kind of city. Corbu has designed some 30 or 40 vertical cities to date, and he is in the process of building the center of one of them—Chandigarh, capital of the Punjab. While most of his vertical-city projects remained on paper, he was able to build a number of tall, individual buildings that demonstrate three aspects of the vertical city which Corbu considers important: first, the stilts (or pilotis) which raise most of his buildings off the ground to permit unobstructed circulation at pedestrian level; second, the roof garden which recaptures, several hundred feet up in the sky, some of the park space lost to construction at ground level; and, third, the free and varied façade which introduces a rich texture into the great “walls” that shape the outdoor “rooms” of Corbu’s new townscape.

And a new system of proportions. From the start, Corbu has been interested in dimensional coordination to permit the mass production of building parts. But he was never satisfied that such coördination must mean monotonous repetition of identical units. Instead, he tried to develop a proportional scale of related dimensions, which would make standardization possible—but would still permit much freedom of choice and of effect. His Modulor scale, formalized in the years after World War II, is the culmination of this effort.

Le Corbusier’s work has been prolific to a degree that staggers the imagination. He has designed every kind of building, every kind of city, automobiles, boats, monuments, even mountains. The grilles, space frames, arches, vaults, storage walls, prefab kitchens, suspended stairs, form-fitting furniture, et cetera, that are hailed as “radically new” today were designed and often built by Corbu in the twenties and thirties. The work on the following pages is a mere sampling of one of the most creative minds of our times.

Opposite: the great entrance portals to the High Court building at Chandigarh, completed in 1956. The human scale is deliberately denied in this portico to achieve monumentality.

Architectural Forum / April 1961
New drama. When one speaks of "time" as a "new dimension," it is to say that three-dimensional spaces in architecture acquire a special quality when one moves through them. Corbu has long been aware of this quality of space in motion, and his tall rooms, with projecting galleries at many levels, are a significant part of his personal vocabulary. The great, open ramps that connect different levels within the High Court at Chandigarh (below) turn the prosaic climb from one floor to the next into a drama of changing views and changing light.
New spaces. Quite often, Corbu gets his spatial effects by carving a void out of a seemingly monolithic structure, and then making that void a lively and somewhat theatrical space by filling it with sculptural accents like stairs and balconies, all played upon by streaks of sunlight. In the Millowners' Association building at Ahmedabad, India (above), a ramp leads up into a kind of outdoor lobby that seems to have been carved out of the mass of the building. This lobby then becomes an airy stair tower, interrupted by bold cantilevers of concrete.
New forms. Sharp-edged, geometric forms, like pyramids and conical sections, have been a characteristic part of Corbu's vocabulary from his earliest paintings to his latest details in rough concrete and stucco. The oval splash basin at the southwest end of the High Court building at Chandigarh (below) catches rain water from a concrete scupper above, and conducts this water through a shallow canal into large reflecting pools in front of the building. Yet this menial function has been turned into a sculptural performance, vaguely reminiscent of the early astronomical instruments of stone found in many parts of India.
New structures. In the early thirties, Le Corbusier expanded his vocabulary of forms beyond the pure geometric to include more curvilinear, or organic, shapes as well. His motivation was not only a renewed interest in natural forms, but also a readiness to use the new possibilities of advanced engineering. The roof of the chapel at Ronchamp (above) is built like an airplane wing: two membranes of concrete, with vertical stiffeners between them. The Philips Pavilion at the Brussels Fair (below) is a series of hyperbolic paraboloids. Corbu designed his first suspension structures and space frames just before World War II.
New walls. Le Corbusier understood from the start that a concrete- or steel-frame structure could liberate not only the plan, but also the skin of a building. Unlike others who liked to drape monotonous graph-paper patterns over their building frames, Corbu tried to make his nonbearing walls a free and lively composition of solids and voids. Below is a typical concrete and fixed-glass detail at the Couvent de La Tourette, near Lyon; and opposite is the famous wall at Ronchamp. Over the years, Corbu added another dimension to his free façades—texture. For these new walls are of béton brut, or “reconstructed stone,” as he likes to call his kind of rough concrete; and the proportions of the openings are governed by the Modulor scale.
New volumes. Throughout Le Corbusier's work, the "pure prism," as he calls it, is a recurring theme: the rectangular form, raised up, generally, on stilts, and thus sharply silhouetted against the sky. This pure prism has undergone many variations in detail. At the right, it is the top of a bell tower at the Couvent de La Tourette; below, it is the complete form of the new museum in Tokyo; and on the opposite page, it is the museum for the cultural center of Ahmedabad. But regardless of function or scale, the uplifted cube is symbolic of Corbu's concept of architecture and nature: architecture being a man-made thing, raised above the landscape so as not to interfere with its natural formations, and living with the trees, hills, and skies in a complete and respectful harmony of contrast.
duced a theoretical plan for Paris which has been one of the most recurringly influential of his shrewd visions. He is also one of the few people who has brought urban design into individual buildings, in the ways shown on the next six pages and in his impressive roster of large urban buildings, above. To achieve this, he has been not only anti-horizontal in his thinking, but positively pro-vertical, making each of his tall towers a self-contained city in itself, with shops, recreation facilities, gardens—and views. Three of the methods he has used toward these ends are analyzed on succeeding pages: his roofs, pilotis, and spacing.

Left to right: Chandigarh Secretariat; Marseille apartments; Berlin apartments; Brazilian Pavilion at University City, Paris (designed with Lúcio Costa); Nantes apartments; Brazilian Ministry of Education and Health (designed with Oscar Niemeyer, Lúcio Costa, et al.). Below: sketch for the reconstruction of Saint-Dié. Photos by Vernon Gibbard, G. E. Kiddler-Smith, Peter Blake.
A new kind of city

Le Corbusier likes cities; he basically is an urban type. (Even his famous Moduler figure has been dubbed a subway strap-hanger.) When Corbu first visited New York, in 1936, he returned home with numerous startled impressions, among them: "...the skyscrapers...a thousand feet high! That is an event in the history of architecture—an event of psychophysiological importance....I cannot forget New York, a vertical city, now that I have had the happiness of seeing it."

Yet any great architect must be a realist, and Corbu was one of the first to see the dreadful trouble modern cities were building themselves into. ("Manhattan is so antagonistic to the fundamental needs of the human heart that the one idea of everybody is to escape....In New York the skyscraper is only negative. It has destroyed the street and brought traffic to a standstill....") Back in 1922 he pro-
Plazas in the sky. To Corbu, the city is a three-dimensional organism: the space lost to the construction of tall buildings at ground level must be recaptured at the level of the roof. Here he creates private parks, playgrounds, plazas, and the like, quiet and far removed from vehicular traffic. These plazas in the sky are often places of singular enchantment: not only will there be benches and screens, but also terraces on many levels, concrete “hills” for children to climb, and pools for them to splash about in. By surrounding these plazas with high parapets, Corbu takes care to block out all views except those of distant landscapes.
Pilotis. The legs on which Corbu sets his tall boxes of offices or apartments have always been more than mere exercises in structure. They characterize their buildings—and also Corbu’s periods; from slim stems in the earlier days (when the buildings were close to being cubist expressions of industrialism) they have evolved, gaining weight, into the burly concrete shapes of the more recent Corbu architecture. They are an emphatic way of giving a large plain structure muscle (left, facing page), and the muscle is exposed where it is most in use.
New heart, new circulation. At Chandigarh Le Corbusier is sinking the principal roads into the plain, thus making open-roofed tunnels of them, to preserve the ground level of the city for the pedestrians. At the core of his new creation, he deliberately is spreading this pedestrian space lavishly in majestic areas among the mighty pieces of architecture. Special features of these spaces are large pools (below) in the Indian tradition, and great sculpted mounds (model air view, facing page). Architect Paul Rudolph, who visited Chandigarh last summer, reports:

"One approaches the capital group across a great plain, with the mountains rising out of that plain. The first sight of the buildings is the Secretariat on the left hand, sitting at right angles to the mountain range. In every way it opposes the mountains: the angled stairway, the ramp on the roof, the projecting viewing stand—all of these angles are obviously and carefully conceived to oppose the receding angles of the land masses.

"Slowly one becomes aware of what appear to be foothills among the buildings themselves, but these subsequently prove to be man-made hills rising out of the plain. Their scale is immense; this is sculpture. These man-made hills are as important to the siting as the buildings, and are indeed an integral part of the whole complex. One is not aware that the buildings are still on the plain. The artificial hills obscure the view at first of the High Court building, and they also define the limits of the entire site as well as shutting off the major part of the city of Chandigarh when one is in the governmental complex. Indeed the relation of the buildings to the site—also, the manipulation of the site in terms of the various levels of both the geometric depressions and the irregular hills—is unsurpassed anywhere at any time. You think you are on the face of the moon. In a sense it becomes one great horizontal plaque. Most of the sunken automobile accesses are not yet there, but the intent is clear.

"As time goes on I am sure that every man will understand the importance of Chandigarh; people will go there as they now go to the Piazza San Marco. They will go not because of any individual building but because of the relationship of buildings to site, the environment created, the aspirations of man realized. It is the only grouping of the twentieth century of which I know that makes any sense whatsoever, undoubtedly the century's greatest."

ASSEMBLY (nearing completion)
A new system of proportions

Corbu’s first houses, in the twenties, were proportioned according to the ancient “Golden Section.” In the years since World War II, he perfected his own Modulor scale—a system of related proportions, all based upon the dimensions of an average human figure, with upraised arm (below, left). “I am, in principle, against modules when they curtail the imagination,” he said. “But I believe in the absolute nature of a [poetic] relationship. And relationships are, by definition, variable, diverse, and innumerable.” The significance of the Modulor scale is that it is not a “modular” system of identical units, monotonously repeated, but a family of numbers that can be used with great flexibility to solve almost any problem from the dimensioning of a civic center to the dimensioning of a bathroom window. In a mass civilization, Corbu feels, it is necessary to lay down rules that will “make the bad difficult and the good easy,” as the late Albert Einstein put it to him. The walls of the Secretariat at Chandigarh (above) and of the Couvent de La Tourette (below) were given variety and unity through the Modulor rule.
New fenestration. Each man in Corbu’s drafting room has a list of two columns of ten numbers, each, pinned up on the wall next to his table. According to Corbu, these ten pairs of numbers are all that is required for the use of the Modulor scale in practice. The two systems of fenestration shown here demonstrate the great flexibility of the scale: the slot windows at Ronchamp (above) make a tense, abstract pattern of light and shade, oddly in balance despite the great variety of openings; the vertical window divisions at the Couvent de La Tourette (left) set up a “vibration” (as Corbu puts it) that makes the whole façade shimmer like ripples in a pool.
New monumentality. The High Court at Chandigarh is Corbu's Parthenon; and like the proportions of the original Parthenon, those of the High Court building are extremely subtle: although the main façade is divisible into five identical squares (left), the actual division is quite irregular and free, to emphasize some parts of the structure and play down others. However, the five squares do establish the basic monumentality of the building, for each square measures 70 by 70 feet. This monumentality—especially noticeable in the full-height entrance portico—is suitably in keeping with the majestic backdrop provided by the Himalayas (below). At the same time, the powerful building is quite intimately scaled to the human figure when seen at close quarters (opposite): this is so because the monumental façades have been broken down into small-scale patterns of irregular, concrete sunshades that protect the glass walls behind them. These sunshades, as well as other dimensions experienced at close quarters, were scaled according to the Modulor, and thus according to the human figure.

Nearly 40 years ago, Le Corbusier wrote: "For 2,000 years, those who have seen the Parthenon have felt that here was a decisive moment in architecture." And he added: "We are now at a decisive moment." The quality of Le Corbusier is in the decisions he made when that moment arrived for him.
Building resumes its upward trend

Revised FORUM forecast for 1961 indicates that general increase in building construction will more than offset sluggishness in house construction.

BY MILES L. COLEAN

Six months ago FORUM's 1961 forecast indicated that construction activity would reverse the downward trend of 1960 and surpass the record set in 1959. This forecast still stands despite the faltering pace of house construction and the general business recession which has characterized the months since the original prediction was made. This year's total construction expenditures will be somewhat smaller than first anticipated, of course, but still impressive. They will aggregate $57.5 billion, up 4.2 per cent from last year, and 2.3 per cent above the 1959 level.

The breakdown of this figure is presented at the right in a new format which shows the outlook for each of the three broad classifications of construction (building, house, and "other") and for each kind of building in the first classification. This building construction classification, the biggest of the three, will also fare the best in 1961; it is expected to total $21.1 billion by year-end, up 6.4 per cent from the 1960 level. On the other hand, house construction (one- and two-family dwellings) will advance only 2.4 per cent, and other construction (principally highways, power and pipe lines, sewer and water systems, farm structures, and military facilities) will increase only 3.6 per cent.

Building construction. Within the building classification, the biggest dollar increase is expected in the educational field. Here substantial gains in both private- and public-school and college construction will raise the total for this kind of building to $3.7 billion, up $325 million, almost 10 per cent above the 1960 level. Other substantial dollar increases are expected in both the office and mercantile categories of commercial building (up $378 million, about 10 per cent) and in the construction of apartments (up $146 million).

The 5.4 per cent increase in apartment construction, to $2.9 billion, will be entirely financed by private funds. Despite the talk of a much increased public housing program, it is doubtful that federal measures adopted this year, whatever these may be, will do more than hold multifamily public housing at its present annual rate of about $300 million. Combined public and private financing will produce about 225,000 apartment dwelling units this year, 25,000 more than last year.

All other types of buildings will participate to some extent in the general increase forecast for building construction. Religious buildings will be up 1.7 per cent; hospital and institutional buildings, up 7.3 per cent; social and recreational buildings, up 4.7 per cent; hotels, motels, and dormitories, up 7.8 per cent; public administrative and service buildings, up 18.4 per cent; and industrial building, up 0.6 per cent.

The relatively small increase predicted for industrial building is not surprising, for it has already reached a high level of activity. This kind of building last year made the biggest peacetime advance in history—36 per cent—reaching a level of $3.3 billion which will not be easily exceeded during the next few years.

Private financing will account for $14.6 billion, or more than two-thirds of the building construction total. The $6.5 billion balance will be financed by local, state, and federal governments.

House construction. Although the construction of one- and two-family houses is expected to be a little better this year than last, the sales market seems to have entered into a phase which is likely to result in a sluggish volume for several years to come. The basic causes of this are: 1) the low rate of growth in the number of families in the 25-to-44-year age bracket which has customarily provided the bulk of the home buyers, and 2) the high ratio of home ownership (about 58 per cent) already attained by families in this age bracket. (The large increases in both the younger and older households will help the apartment market more than the house market.) Beginning from the low base of 1.2 million private nonfarm houses started in 1960, the volume in
FORUM CONSTRUCTION REVIEW AND FORECAST (expenditures in millions of dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>$2,861</td>
<td>$ 419</td>
<td>$3,280</td>
<td>$2,900</td>
<td>$ 400</td>
<td>$3,300</td>
<td>0.6%</td>
</tr>
<tr>
<td>Offices and warehouses</td>
<td>2,072</td>
<td>...</td>
<td>2,072</td>
<td>2,250</td>
<td>...</td>
<td>2,250</td>
<td>8.6%</td>
</tr>
<tr>
<td>Stores, restaurants, and garages</td>
<td>2,000</td>
<td>...</td>
<td>2,000</td>
<td>2,200</td>
<td>...</td>
<td>2,200</td>
<td>10.0%</td>
</tr>
<tr>
<td>Religious</td>
<td>1,032</td>
<td>...</td>
<td>1,032</td>
<td>1,050</td>
<td>...</td>
<td>1,050</td>
<td>1.7%</td>
</tr>
<tr>
<td>Educational</td>
<td>580</td>
<td>2,820</td>
<td>3,400</td>
<td>625</td>
<td>3,100</td>
<td>3,725</td>
<td>9.6%</td>
</tr>
<tr>
<td>Hospitals and institutional</td>
<td>579</td>
<td>400</td>
<td>979</td>
<td>625</td>
<td>425</td>
<td>1,050</td>
<td>7.3%</td>
</tr>
<tr>
<td>Social and recreational</td>
<td>671</td>
<td>131</td>
<td>802</td>
<td>700</td>
<td>140</td>
<td>840</td>
<td>4.7%</td>
</tr>
<tr>
<td>Public administrative and service</td>
<td>...</td>
<td>591</td>
<td>591</td>
<td>...</td>
<td>700</td>
<td>700</td>
<td>18.4%</td>
</tr>
<tr>
<td>Apartments</td>
<td>2,403</td>
<td>301</td>
<td>2,704</td>
<td>2,550</td>
<td>300</td>
<td>2,850</td>
<td>5.4%</td>
</tr>
<tr>
<td>Hotels, motels, and dormitories</td>
<td>921</td>
<td>150</td>
<td>1,071</td>
<td>1,000</td>
<td>155</td>
<td>1,155</td>
<td>7.8%</td>
</tr>
<tr>
<td>All other</td>
<td>685</td>
<td>1,251</td>
<td>1,936</td>
<td>715</td>
<td>1,310</td>
<td>2,025</td>
<td>4.6%</td>
</tr>
<tr>
<td>TOTAL BUILDING CONSTRUCTION</td>
<td>$13,804</td>
<td>$ 6,063</td>
<td>$19,867</td>
<td>$14,615</td>
<td>$ 6,530</td>
<td>$21,145</td>
<td>6.4%</td>
</tr>
<tr>
<td>TOTAL HOUSE CONSTRUCTION</td>
<td>6,700</td>
<td>266</td>
<td>6,966</td>
<td>18,150</td>
<td>270</td>
<td>18,420</td>
<td>2.4%</td>
</tr>
<tr>
<td>TOTAL OTHER CONSTRUCTION</td>
<td>6,425</td>
<td>9,815</td>
<td>16,340</td>
<td>6,585</td>
<td>10,350</td>
<td>16,935</td>
<td>3.6%</td>
</tr>
<tr>
<td>TOTAL CONSTRUCTION</td>
<td>$38,929</td>
<td>$16,344</td>
<td>$55,273</td>
<td>$40,350</td>
<td>$17,150</td>
<td>$57,500</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

1. Excludes all farm construction.
2. Mainly public office buildings but also post offices, courthouses, prisons, etc.
3. Buildings containing three or more dwelling units.
4. Includes fire stations, zoos, veterinary hospitals, animal havens, boathouses, greenhouses, transportation terminals, crematoriums, heating plants, grain elevators, etc., plus FORUM's estimate of the amount of building construction (such as power plants, terminals, barracks, maintenance shops, pumping stations, etc.) usually reported in the Census Bureau's predominantly nonbuilding categories—see footnote 4.
5. One- and two-family nonfarm dwellings.
6. Includes farm construction of all kinds amounting to $1.250 million in 1961; and public utility, military, highway, sewer and water and public service construction, exclusive of the amount of this kind of construction estimated to be for buildings of various kinds—see footnote 4.
7. All categories include major alterations and additions.

Source: Estimates by Miles L. Colean based on figures collected by the Census Bureau.

1961 can hardly be expected to exceed 1.3 million units.

Other construction. Embracing a wide range of structures other than buildings and houses and including all kinds of farm structures, this classification of construction will account for $16.9 billion of expenditures in 1961, about 3.6 per cent more than last year. Highway work will comprise the biggest part of the total ($6.2 billion) and will increase the most (6.1 per cent). Almost as big in dollar volume, privately financed public utility projects will increase about 3.5 per cent. Only farm construction (which will amount to about $1.3 billion) is expected to fall off from last year, and only 2.2 per cent at that.

As in the past, about three-fifths of the activity in the "other" construction field will be publicly financed. Farm and private public utility work accounts for most of the balance.

The outlook for construction this year is in marked contrast to last year's behavior. Whereas 1960 was a year of strong cross-currents in construction activity (house construction was down about 10 per cent while industrial building was up 36 per cent) and the first year since World War II to suffer a decline in total construction expenditures (1.8 per cent), 1961 promises to be a year of modest general improvement. Barring an unforeseen international crisis, a sharp rise in costs, and failure of the recession to "bottom" by early summer, three basic assumptions which underlie FORUM's forecast, it seems likely that construction expenditures in 1961 will exceed those of all previous years and that the industry will work its way back to the long-term upward trend line established during the fifties.

This revised forecast takes into account the fact that the industry's record during the first two months of 1961 was not impressive. Preliminary figures for January and February indicate that house construction was down almost 12 per cent from the corresponding months of 1960, that all kinds of building construction were up by margins ranging from 7 per cent for commercial to 15 per cent for industrial, and that the total was almost unchanged. However, as weather and economic conditions improve, future months are expected to make up for this slow start.
Criticism

Portland's great hall of glass

The dual new Coliseum may have its faults, but they cannot ruin its gift of soaring, luminous space. BY ALLAN TEMKO

At nightfall, when the rich green Oregon countryside goes dark, Portland's recently dedicated Memorial Coliseum—a great cube of light on the east bank of the Willamette—glows like a civic beacon in the heart of the regional metropolis (1). As an expression of vitality in a city which, since pioneer days, has curiously lacked gusto, the Coliseum is a rousing success. Virtually every evening, after the lights go on within the tremendous walls of glass—revealing the powerful form of the oval arena curving freely through the luminous interior space—the crowds converge from every part of the city to fill the 9,000 seats during basketball and hockey games and make the immense structure resound with partisan cheers. When no sporting event is scheduled, they still come by the hundreds to skate or dance. A few times each month a stage is erected at the end of the oval, extra seats and bleachers are installed, and a capacity audience of 13,500 applauds a musical show.

Never before has bland Portland possessed such an enlivening social resource. It belongs not only to the new age of mass leisure, but also to a new architectural era of vast, unobstructed spaces, exhilaratingly free in them-
selves, multipurpose in function, and in a profound esthetic sense, liberal in concept. The transparent Coliseum is candidly open to the world at large.

Never before has Portland enjoyed a structure of such spectacular strength. Not even Pietro Belluschi's suave but very direct Equitable Building of 1948, the first of the postwar "skin-and-bones" towers and still the city's finest large building, approaches the Coliseum's prodigious masculine vigor. Only four massive concrete columns support the 360-foot-square roof; and when the building is illuminated, the immense ceiling floats in light above the oval bowl, which rises like an enormous sculpture out of the spacious concourse. Seen like this—at its festive nocturnal best, when the vivacious crowd provides indispensable human scale—the Coliseum must be considered one of the stirring glass-enclosed arenas of the world.

Yet in the harsh light of day, although the Coliseum remains a strong and even formidable building, it perceptibly loses force and grandeur. What had seemed an extremely large and dynamic structure at night appears considerably diminished and subdued at noon. Viewed from a distance, in the context of a rather forlorn urban riverfront, the building is a sharply defined, but severely contained, horizontal box of elegant gray glass, capped with an unexpectedly heavy and smooth white lid (which went quite unnoticed in the dark). If the interior volume still may be reckoned to be tremendous, the building's crystalline transparency nevertheless has vanished. For the glass curtain wall—all 80,000 square feet of it—turns almost opaque, as do most glass surfaces unless seen directly against the light; and within the shadowy depths of the interior, except at close view, the splendid form of the oval is difficult to discern.

This daytime reduction in scale and mood, moreover, is accompanied by a disconcerting change in proportions. The 22-foot-deep and featureless roof fascia, which gives no indication of the steel trusswork it conceals, seems to crush the elevations. This unfortunate effect might have been rectified by a strong base, but the main facade, high on the sloping site, has no base at all; and on the other sides of the building, where the fall of the land exposes a recessed basement, the indentation looks strangely like a toe space at the bottom of the 80-foot-high walls.

Outsized as the fascia may be, its neutral off-white surface of acrylic overlaid plywood seems insubstantial in so large a monument. This is the first sign that the Coliseum, distinguished as it is in many respects, has been badly compromised by false economy, lack of vision on the part of the lumber industry, and other disheartening factors which affected the design.

Indeed, when the ill-starred history of this imperfect monument is pondered, it seems remarkable that Portland got so good a building at all. As the architects, Skidmore, Owings & Merrill, have laconically observed: "The problems encountered... were many and complex."

In fact, they were almost maddeningly vexatious. Although SOM recommended an inexpensive, spacious, and otherwise admirable site in the urban renewal area on the opposite (and more appropriate) side of the Willamette, the voters were induced to choose instead a cramped location which provided inadequate parking, so that the Coliseum stands hemmed in by a skimpily landscaped expanse of blacktop. The small site severely compressed the architectural program also, with the result that a large exhibition hall, originally foreseen as a
separate building, has been consigned to perpetual darkness beneath the parking lot. Other public rooms have been relegated to the almost equally forbidding basement of the arena. Lack of money, as well as want of space, caused these programmatic changes, for this bad site had the additional disadvantage of costing $1.9 million, or nearly one-fourth of the bond allocation of $88 million. This led to the cheapening of the entire project.

Designs one, two, and three

After these setbacks the architects turned to the design of the arena, but again they encountered frustrating difficulties. The firm’s gifted structural designer, Myron Goldsmith, was assigned to the job, and SOM thereupon gave Portland the opportunity to erect one of the purest and most powerful arenas of the twentieth century. This great building would have been a circular structure of prestressed concrete, 360 feet in diameter (5). Its catenary roof, given the pattern of a gigantic abstract chrysanthemum (6) by petal-like, precast elements, was to be hung from a compression ring supported by 80-foot-high X-frames. A circular bowl and surrounding concourse were to be sheltered by this magnificent roof.

The design was rejected. No one had anticipated the objections of the lumber industry, which exerts an understandable influence in forested Oregon, and which demanded a wooden structure as a showcase for its wares. Although Goldsmith took no further part in the project, other SOM designers produced a brilliant new concept in wood (7). Fundamentally this was the concept for a glass-walled, square structure containing an oval bowl that was carried out in the completed Coliseum, except for one all-important feature: an extraordinary “delta” roof of 12 huge, triangular wooden plate trusses which was to have crossed the width of the building and terminated in richly expressive fascias (8). A pair of cross-beams was to have passed beneath the trusses at right angles, and these in turn were to have been held up by four massive concrete columns—one at each corner of the vast room—which remained in the final design. This ingenious roof design, which displayed exceedingly staunch resistance in design tests, would have been an incomparable advertisement for the technological potentialities of wood. Yet when the bids came in several hundred thousand dollars too high (partly because sprinklers were needed), neither the city nor the lumber interests made an accommodation.

One last time the structure was redesigned. The delta roof was replaced by an ungainly, two-way system of steel trusses which taper at their cantilevered extremities (9). They cost comparatively little, but did not prove cheaper than the wonderful prestressed covering of the first design would have been. Not surprisingly, SOM hid this workaday steelwork with a hung ceiling; the roof fascia went blank. Innumerable thrifty minor changes were made with lamentable effect on the detailing. Portland got a ruggedly useful, but incompletely realized, building: in no sense a masterpiece, but in some respects a very significant work of architecture.

The major significance of the Coliseum resides in the unique spatial organization of the interior (10). Although the great space possesses almost radiant clarity when the sunlight pours through the curtain wall, filling the hollow of the bowl as well as the concourse, and playing over the white plane of the ceiling, this unprecedented room is far from simple. If the scheme can be seen as a classical circle within a square, the circle is very far from being a blithe, predictable ring. It rises
and falls with surging plastic vitality, exuberantly traveling through space. To control this effect of liberation, to provide it with the inner order which distinguishes true freedom from mere liberty, required a high degree of civilized art.

It also demanded multidimensional vision by the designers. The concept of placing a dynamic sculptural form within a prismatic glass cube is unparalleled, perhaps, in structures of this size. There are not many oblong, flat-roofed rooms of these dimensions in the world; and excepting possibly some hangars and industrial buildings, probably no rectangular structure can match both the transparency and the 270- and 240-foot clear spans of the Coliseum. Almost certainly none is borne aloft by only four supports.

To master this problem the architects of the Coliseum drew on several resources that were partly controllable: the calm geometry of the enclosure; the upright strength of the cruciform columns; the optimum seating pattern which governed the upward sweep of the bowl on the long sides of the playing surface; and, within the limited scope of the terrain, adroit use of the site, so that on its high platform the Coliseum commands an exhilarating panorama of the river and the towers of the business district on the opposite bank, and beyond, the view of hills lifting steeply to the west.

None of these design factors could be controlled absolutely, of course; and in view of the impediments placed in the way of pure design, the architects did well. Some harm, to be sure, was irreparable. The great columns, much less clearly expressed than in the original design, were moved inward for economic reasons, in order to shorten the spans, thus badly crowding the oval where it needs room most, swinging through the wonderful corner spaces (12).

On the other hand, some handicaps were turned to happy advantage, as in the case of the 85-foot-high laminated wooden mullions of the curtain wall. These, of course, were a concession to local emphasis on wood, but if the delta roof had been built, their esthetic logic could not be questioned. Beneath a steel roof in a structure of this magnitude, however, wood is less convincing, since steel or another industrial material presumably would have been competitive in price and inevitably finer in profile. The mullions naturally are not bearing members, but they do take the considerable wind load, and are
therefore very husky (9 by 40 inches) in section (15).

Yet this very bulk saves them from banality, and greatly enriches the play of space. The accordion effect of the curtain walls—their varying gestures of openness, depending on the angle of view, as the mullions contract or expand—in this sheathing attains monumental power. The mullions have the quality of a colonnade: during intermissions, when crowds throng the concourse, they provide inviting spaces, much like alcoves, for small groups.

The vigor of the curtain wall is especially evident as the main entrance is approached (across the grass parking lot) on the east (11). It is possible to see not only the eastern façade in action, but to have two, three, or at times all four enormous planes of glass in view simultaneously. One's glance carries through surface after surface, and on to sun and clouds.

On the disgracefully tiny entrance plaza—all that could be rescued, evidently, from the traffic engineers—there is an upswept canopy mounted on four tapered columns (14). This little pagoda was not very carefully studied in relation to the oval looming behind it, but in the absence of any other sculptural adornment it serves as a cheerful foil for the rectangular walls. On inspection, its shell roof turns out to be not concrete, but wood; and the brief play of space beneath is an intimation of the spatial drama which commences immediately inside.

Inside, a composition in motion

Overhead, at the crest of its wide, lifting turn, the top of the concrete oval swoops broadly away and gradually downward to either side, narrowly missing the great columns, but setting the whole composition in motion on the swell of this tremendous movement. How well the present generation of architects has profited from the lessons of Nervi and other masters can be seen in the design of the stands, which are mounted on inclined beams that rest on their columns like slanting seats, so that the underside of the precast seating tiers makes a saw-tooth pattern with the long diagonal (12). Running along the top of the grandstand is an obviously nonstructural plaster housing for the black curtain which is drawn to the ceiling when the arena is darkened for certain events: a neat and almost ridiculously inexpensive answer to a problem which has caused most arenas to be solidly enclosed (12 and 13).

This arena, as one enters from the concourse at mid-level in the stands, shows what has been missing in other buildings of this kind. From almost every seat there is a view over the high surrounding rim to the sky. On afternoons when the rink is filled with skating children and the sun shines brightly on the ice, the arena takes on a warm elation that is rare in stadium architecture. Everywhere the design of the stands is admirably handled. Access is easy and quick. The graphics are plain but clear. The spare use of color (which indicates seating dispositions) is sensitive. The seats are comfortable and rather more spaciously arranged than in most indoor arenas. Visibility is excellent even from the topmost rows, and the lowest seats are high enough for a fine view of the playing floor. This bowl could have been more luxurious; it could not have been much more thoughtfully designed.

But it is above all in the ever present, ever exhilarating expanse of space that the civilized strength of the building is most deeply felt. The modern architect, Eero Saarinen, has protested, has talked more and done less about space than did architects of previous times. One wonders. Here in a provincial city is a building—suitably continued on page 181.
Building's No. 1 contractor

Behind the steady growth of George A. Fuller Co. is a smooth kind of selling, an uncanny sense of costs, and a close liaison with clients, architects, and subcontractors.

BY DAVID B. CARLSON

In a year which is expected to establish new records for building construction, the building contractor that has consistently headed FORUM's directory of the 100 biggest is happily anticipating commensurate gains. Last year, the George A. Fuller Co. put in place an estimated $193 million dollars of buildings, represented by a wide variety of projects going up under Fuller's energetic direction. Although it works on much heavy construction too, Fuller is mainly occupied with buildings, and has become best known for its widespread activities in the development and construction of the skyscraper. In fact, the popular image of Fuller is that of a skyscraper builder, particularly as the leader in the furious activity of the recent skyscraper boom in Manhattan.

It is an image well earned, but somewhat incomplete. The Fuller company has probably placed more well-known landmarks on the American scene, aside from skyscrapers, than any other building company. The frieze at the top of these pages shows only a few of its projects going up under Fuller's energetic direction. Although it works on much heavy construction too, Fuller is mainly occupied with buildings, and has become best known for its widespread activities in the development and construction of the skyscraper. In fact, the popular image of Fuller is that of a skyscraper builder, particularly as the leader in the furious activity of the recent skyscraper boom in Manhattan.

In its 79 years, the Fuller company has earned a reputation as a pioneer in building methods. This has involved not only new construction techniques, but also a business rationale that has made Fuller a profitable enterprise, in an industry where profits are frequently hard to come by. In the last five years Fuller's construction operations have grossed from $4.2 million to $6.2 million and netted $800,000 to $1.3 million per year. (The postwar peak was reached in 1958.) With a working capital now built up to over $7 million, Fuller has shown that it is possible to flourish in an industry that last year claimed 1,020 business failures, representing $111 million in liabilities.

A great part of Fuller's success results from its resiliency and its willingness to change its operations in response to advances in building technology. When George Allon Fuller formed the company in 1882, in Chicago, contractors used their own workmen to do just about every phase of a job and frequently designed most of the projects as well. Fuller himself was an architect, a graduate of M.I.T., and had earned early recognition for himself as construction supervisor of several of Manhattan's earliest high-rise structures, including the First National Bank at Broadway and Wall. But in the boldest rebuilding of Chicago, Fuller had visualized the contractor's role as distinct from that of the designer, and set out to provide architects and clients with a full range of strictly building construction services. Before a decade had passed, Fuller's young company had gained its most significant commission —construction of Chicago's Tacoma Building, one of the first completely steel-framed skyscrapers in the nation. With the erection of this building, Fuller pioneered the concept for the building team that would build skyscrapers from coast to coast. Trusted by architects, he became a leader in skyscraper construction in Chicago following the great fire, and his knowledge of high-rise construction, involving the use of electric hoists and a new science of steel fastening, secured that position.

By the time Fuller died, at the age of 49, the company had grown considerably: its initial capitalization of $25,000 reached $750,000 in an industry swarming with pygmy companies. (Today, Fuller's capitalization stands at $9.4 million.) As jobs got bigger—for instance, the Pennsylvania Station and its neighbor, the U.S. Post Office in Manhattan, both built by Fuller—only big companies could cope with the increasingly complex problems of their erection, and Fuller had, by World War I, become one of the biggest.

The contractor's changing role

The company founder would probably be somewhat dismayed by the operations of his creation today, even though he started it on its present course when he began specializing in skyscraper construction. For today, the large contractor, although he has more employees than ever before, does little of his own work, particularly on high-rise jobs. As Fuller President Raymond C. Daly says: "Contracting today is a service industry," and this concept is nowhere more thoroughly developed than at Fuller whose fixed assets (land, buildings, machinery, and equipment) are valued at only $649,000.

Daly means that the days when a general contractor owned his gravel pits and brickyards and hired all his own labor are long gone. They died, he says, mainly because of large-scale unionization of labor and the increasing specialization required in most building trades. As a consequence, general contractors today do little of their own work, Fuller subcontracts an average of 75 per cent of every job, the exact ratio depending on the location and availability of specialists in the area. It subcontracts all of the work on most jobs in New York City where
it does only general supervision and a few minor trade jobs, such as having its own carpenters build fences around its building sites. Fuller long ago learned that well-financed, experienced subcontractors could handle their specialties more efficiently than could Fuller itself, and this is nowhere truer than New York, which boasts the broadest range of building specialists in the nation. And Fuller has carefully cultivated its relationships with top subcontractors. Although Chairman Lou R. Crandall says "We have no pets among the subs, because we have to be prepared to do business with any of them," it is true that Fuller has a strong following of subcontractors who are as large and experienced in their respective fields as Fuller is in general contracting. Fuller is noted among the subcontractors for prompt payment and fair treatment.

Architects, who on most big jobs are instrumental in recommending builders, are fully aware of Fuller's strong following among experienced, reliable subcontractors, and this contributes to Fuller's pre-eminent position. As one leading architect says: "Today, a general contractor is no stronger than his subs . . . and Fuller usually lines up the best subs in the business."

What role do these shifts leave to the contractor? Fuller, in its own definition of a service business, provides its clients and architects with a variety of building expertise on everything from structural systems, materials, engineering techniques, and deployment of building trades to the complex logistics of assembling all the elements of a huge project on the site at the right time.

Fuller's changing role has also permitted it to make investments for its own account in several projects. At one time, Fuller was made a subsidiary of what it was in effect a real estate development concern, called U.S. Realty & Improvement, which did much speculative building. Fuller separated from this organization in 1938, and has stuck to contracting ever since. But on occasion it does take a minority equity position, as it did several years ago with William Zeckendorf on Denver's Mile High Center, which Fuller built. The company had a 42½ per cent interest in the Center, which it sold two years ago at a net profit of $1.1 million. It now holds interests valued at slightly over $1 million in several New York buildings, real estate in Chicago and California, and in an Oklahoma cement plant which it built in 1960. Crandall says that, as opportunities present themselves, the company will probably invest in other building projects.

**Selling cost control**

Perhaps the most important service Fuller performs is controlling the cost of any project it undertakes. This has its effect all the way through the job, from the initial estimate down to the detailed periodic cost reports delivered to the client and architect during construction. Fuller clients, particularly those which have built Manhattan office towers, express satisfaction with its cost-control procedures. But more than that, they are impressed with the fact that Fuller is so often able to build clients' buildings within the cost estimates first given to them, even when contracts are in the most tentative stages of negotiation.

Fuller's cost-control methods constitute the nearest thing yet developed to a scientific method for accurate cost estimating. In many respects, estimating the cost of a large project is the most ticklish, and most important, aspect of selling a client. No one realizes this more fully than Lou Crandall, who is regarded throughout the industry as perhaps the most skillful salesman of a contractor's services in the business. Crandall's salesmanship is a shrewd combination of personal knowledge of all phases of construction, including the pivotal element of costs, and an uncanny knack for convincing clients that Fuller is the one builder that can do the sort of job their buildings deserve. Crandall himself says modestly: "I'm not really a good salesman . . . all I can do is try to convince each client that his building is the most important one in the world . . . and just as important to Fuller as it is to him."

How good Crandall, and Fuller's other top executives, have become at convincing clients of this is plain enough from the number of buildings they are asked to build. But for all Crandall's skill, he is the first to admit that cost is the major element in the selling equation, as it is in the building equation: "It doesn't matter how much charm a fellow might turn on, or how close he might be to a client—if he can't build a job cheaper than the competition, he probably won't have the chance to build it at all."

Fuller uses two distinct estimating techniques, depending on the sort of

**continued on page 168**
The folded-plate roof provides a low, playful roof line. The view above is from under a sheltered entrance passage.
A.I.A. award winner is scaled down to the children who attend it.

Many schools, even primary schools, somehow lose—or never have—a sense of the size of the people they are built for. To put it another way, some communities still build nothing but high schools, even for kindergartners.

Architect Mario Ciampi's triumph in school design—an elementary school in Daly City, Calif., which recently earned one of the top honor awards of the American Institute of Architects—fits its clients like the right pair of Keds. It is an amiable-sized elementary school in terms of program (12 classrooms, plus kindergarten, library, administration, and multiuse room), but even beyond this, the designer has adroitly broken up all the components into visual fractions. The two most evident methods are his treatment of the ground and the roof; the floor plan breaks up the areas of the school into clusters of classrooms bounded by various-sized courts; the roof is not just one single sweeping plane, but instead is a pattern of folded plywood plates reminiscent in character of classroom scissorwork. Somehow Ciampi was able even to pass title of the art and sculpture onto the children. This is true not only in the way the art is set—low, to be appreciated from a 4-foot eye level—but in the compositions themselves.

Yet, for all its midget character, this is a community-use schoolhouse too. It is sited on a stretch of ten green (and slightly soggy) acres among the usual tracts of California housing, and eventually the site will be developed as a recreational park. So far none of the adults using the building after hours has objected to its friendly scale, not even the tallest and broadest of them.
Financial program:
School is the ninth constructed by this architect for the Jefferson Elementary School District over a ten-year period. Total cost with architectural fee, $456,000, including furniture ($25,000) but not site ($55,000). Number of square feet, 24,887; number of pupil stations, 451. The building was financed with a combined local and state bond issue, passed on the first attempt, 4 to 1. There was no effect on the local tax rate because previous issues required maximum tax levies of $.45 per $100. of assessed property valuations. The district tax rate is $2.32; adding the bond redemption rate, the total rate is $2.75 per $100.

Cost breakdown:
- General conditions: $28,000
- Site work: $5,000
- Structure, concrete, masonry, etc.: $142,000
- Masonry: $10,000
- Roofing: $9,500
- Finish: $33,000
- Heating, plumbing, electrical: $89,000
- Kitchen equipment: $2,500
- Sheet metal: $5,000
- Architectural fee: $20,500

The school sits on a circle of fill to raise it above the swampy surroundings.
A fence protects the playground, when in use, from winds, and from vandals after hours.

The projecting saw-tooth profile of the roof is a good shield against sky glare.
Before the owners added a gigantic, flashing neon roof sign, the new warehouse and office building for Plough, Inc. in Miami was an unadulterated composition of great simplicity, honored with an award of merit from the American Institute of Architects.

Behind the crisp façade of matte-finished, copper-colored, ceramic tile, a skeleton of steel columns and bar joists frames the utilitarian building which, for all its tailored elegance, cost only $7.37 per square foot. Because of proximity to the International Airport, all glass areas in the office section were double-glazed for sound reduction.

Oasis amid showrooms

The only real architectural attraction in the huge (980,000-square-foot) Dallas Trade Mart is the skylighted mall (over 300 feet long, 100 feet wide, and four stories high), which runs down the center of the building and was developed by Consulting Architect Harwell Hamilton Harris. Not only does the mall give the weary buyer—escaping from the maze of showrooms and the 3½ miles of corridors—a fountain, a gazebo, pools, trees, and even parakeets with which to relax, but the spidery pedestrian bridges, spanning the mall at quarter points, break up the great space, draw attention away from the indifferent façades, and bring this magnificent “outdoor” room into human scale.

Architects of the building: Harold Berry and Donald Speck. General contractor: Ten Eyck & Shaw. Total cost of the Trade Mart was $12,640,000. The Equitable Life Assurance Society supplied a $6.5 million, 20-year mortgage at 6¾ per cent.
Atoms for Israel

Philip Johnson's nuclear reactor building, designed for the Israeli government and located in Rehovot, recently won a deserved honor award from the American Institute of Architects—deserved for this is a remarkably strong and richly suggestive design.

Its roughly formed, raw concrete walls, unbroken by windows, reflect a conscious effort to turn away from the harsh natural surroundings of the rugged coastal plain. It embraces instead a stylized, serene, artificial nature of its own in the oasislike interior court, which is rimmed with carefully articulated columns and walls of glass.

The secret nature of the work within is suggested by the steeply battered, fortresslike walls which clearly—and powerfully—resist the visitor. This is not a building which invites, but one which repels. Another aspect of the building's function is suggested by the dome, whose restless, faceted exterior hints at the struggle to harness the enormous, restive forces within.

Finally, in the severe, rigidly formal organization, which culminates in the great space of the reactor dome, the building suggests a temple, with a peculiarly regional flavor of ancient Israel and Egypt. And, in a way, it is a temple, dedicated to the new "religion" and served by a new order of high priests.

Supervising architect for the Israeli government: Gideon Ziv. Structural engineer: Dr. Lev Zetlin.
Aviation eyes the building industry

Much that has been learned in making air frames and rockets could be used in the construction of tomorrow's buildings.

By LAWRENCE LESSING

A major revolution may well be under way in the invasion of building by the aircraft industry. The influence of aeronautical design on architecture is already strong. In the finely jointed, thin-aluminum or stainless-steel-clad buildings typical of today there is the unmistakable light touch of the air age. More advanced types of structure, such as space frames, cable-suspended roofs, geodesic domes, and air-supported buildings, show an even clearer debt to aeronautical design. Even concrete, through development of thin-shell construction, prestressing, mesh reinforcement, and lightweight aggregate, has taken on soaring aerodynamic qualities.

Today, by a violent coincidence of economic and technological events, there are signs of an even more direct entry of aeronautic techniques, materials, and designs into building. The U.S. aircraft industry is in the midst of the greatest transition and crisis of its life. The ascendancy of rocket missiles over manned military aircraft is pushing the industry's historic airframe business into a decline from which it is expected never to revive. While most of the big aircraft makers are shifting to rocket-satellite work, and some can continue to count on a small backlog of orders in jet aircraft, the whole business is not expected at its optimum to occupy more than about a quarter of the industry's present 105 million square feet of floor space and facilities. Hence the industry is on a search even more frantic than that following World War II for diversification into other industrial products. And some of the giants are having a

Plastic molding of metals

Essentially, the manufacture of air frames, as it has developed, has become a smooth molding of light metals into curved aerodynamic shapes, whereby metals are more and more treated as plastic materials. For this there has been developed a great range of metal molding and manipulating machines, which, if turned to building products, might well introduce into the generally rigid rectilinear patterns dictated by conventional steel beam-and-column construction some of the curvilinear freedom of such plastic materials as concrete (or an occasional metal form such as the Alcoa Building's soft-cornered windows). Moreover, the range of shapes and sizes thus made available for building could be greatly extended, particularly in the direction of larger, more economical unit components.

Two classes of these metal-forming machines would probably be most readily adaptable to building needs. One is a range of big extrusion presses,
which squeeze out certain aircraft structural parts like toothpaste from a tube. Aluminum extrusions of a smaller and lighter variety are already common in building use, for such things as window framing, stripping, trim, and tubing, but larger, heavier extrusions, beginning to appear experimentally in bridges, are just over the horizon for actual structural members. The other class of machines, probably of even greater potential for building design, comprises a great variety of metal shaping devices and big stretch presses for bending, molding, and stretching sheet metal into compound curves and complex forms. These shapes, in combination with structural forms or honeycomb cores (see below), produce light, exceedingly strong stressed-skin panels that in their freedom of shape and size could introduce a new order in curtain-wall construction.

Furthering this plastic treatment of metals is a radically new technique, developing out of rocket and satellite production, called explosive or high-energy forming of metals. In this remarkably ingenious process, now in full-tilt production at Aerojet-General Corp., Ryan Aeronautical Co., and other companies, intricate or highly curved metal shapes are formed against dies under water by high-explosive charges. With one explosive shot and a minimum of fixed equipment—little beyond an open water pit and a crane—the most intricate shapes are instantly formed, requiring little or no further treatment, machining, or assembly. Dies are the major cost, but for large shapes not held to close tolerances a very low-cost, plastic-coated, concrete die has been developed. And the technique works on a gamut of metals from the most common ones to titanium, stainless steel, and the hardest refractory alloys, in sizes and shapes impossible to form by conventional means. Ryan Aeronautical has formed highly embossed bronze curtain-wall panels experimentally, and this technique might well introduce a new breadth of variety, both in size and sculptural detail, into the flat curtain-wall scene.

As an indication of how rapidly the field is moving, last summer researchers of the Battelle Memorial Institute announced the development of an entirely new and still cheaper method of explosive metal forming. The new technique revolves upon the invention of an extremely simple gas generator that produces from plain water, as needed, a mixture of hydrogen and oxygen gases. This mixture is ignited in a closed chamber to produce an explosion that builds up to a maximum tenfold increase in pressure in ten microseconds. The gas is produced at about one-third the cost of solid explosives, and creates an explosion more controllable, beneficial, and adaptable to large metal forming. While the process is open to license by any industry, it is the aircraft industry, already far ahead in explosive forming, that is more likely to pick it up most energetically.

The aircraft industry's main forte is not only its experience in forming metals but also its long, intensive, basic experience in handling all the most advanced materials of the age under extreme conditions of heat, cold, load, and endurance. In this the industry is one vast test chamber of large significance to building. For, if the problem of building is to be solved by modern industrial techniques, it is primarily a problem of materials, of the economic coordination of new and old materials into advanced designs, able to withstand weather and the force of gravitation. To this task the aircraft industry could contribute much, for it is at the crux of the most prolific development of materials in all history.

Endless materials

The stream of new materials is so great that it cannot be examined in much detail here. It is a mighty mix of new, higher strength plastics, ceramics, and metals, many with remarkable new properties, many leading to entirely new building techniques.

In plastics, the inclusion of chlorine, fluorine, and other inorganic elements in plastic compounds has brought up a whole new range of high heat-resistant, nonflammable, highly stable plastics, overcoming the major defect of plastics in building up to now. New vinyl chlorides by B. F. Goodrich are one example, and an entirely new group of silicon-nitrogen plastics developed by Eugene G. Rochow, a pioneer in silicon plastics, is another. These in turn are leading to new high-strength reinforced plastics by new techniques. One of the most advanced is filament-wound reinforcement, developing out of rocket construction, in which glass fiber and other fibers are stress-wound on mandrels and fixed with a resin binder to form very light, extremely strong vessels, shells, and piping—a kind of prestressed plastic technique that could lead in building to new structural shapes, conduits, and a light, maintenance-free plumbing system.

In ceramics, perhaps the most promising of new materials is Corning Glass's Pyroceram, the first truly crystalline glass, developed for rocket nose-cones. This is a really remarkable material, gem-hard, fireproof, stronger yet lighter than steel, with amazing resistance to thermal shock. In it, fragil-
Explosive forming of metals against a die under water is an efficient new technique developed by the aircraft industry for intricate rocket construction, adaptable to many kinds of architectural shapes and materials. Photos show an explosive water pit at Ryan Aeronautical Co. in California. Explosive pellets of only a few grains exert enormous pressures in a shock wave under water.

ity and glass are no longer synonymous. Pyroceram already has been domesticated in flameproof kitchenware and experimentally in curtain-wall panels, and it may even have distinct structural possibilities. Low in cost and available in all degrees of transparency, opacity, and color from a range of formulas still largely untapped, Pyroceram is one of the new space-age materials of largest architectural potential.

In metals, excluding the well-known light ones, a spate of rare or exotic metals is at hand for entirely new uses by new techniques that may well hold the deepest revolution of all. These include such unusual forms and combinations as foamed metals (for lightweight cores), thin molecular metal films (for electronic circuitry and solar heat reflection), fiber metallurgy (for light reinforcing mats of enormous strength in shell construction), and a magic group of pure and exotic metal combinations.

Perhaps the most significant of new materials, literally and figuratively joining all the rest together, is a revolutionary line of adhesives, mainly epoxy and other new hybrid chemical forms, which totally eliminates or greatly reduces the use of nails, bolts, rivets, and older mechanical fasteners. Adhesion theory has progressed so far, and the tailor-made materials to prove it, that bonds are now produced which are actually stronger than the base materials. And a range of adhesives is available that strongly grips metal to glass to ceramic to plastic to wood, and to other dissimilar materials, with all due allowance for coefficients of expansion. Moreover, the adhesives are available now in such novel forms as tubes, strips, capsules, and microspheres to ease application and allow the final setting to take place with the mere exertion of a slight pressure.

Some small, timid uses of the new adhesives have crept into conventional building, mainly in the fabrication of curtain-wall panels and in strip adhesive sealants for their installation. And National Homes and others have moved into wide use of adhesives in home building. But again the most aggressive user of adhesives is the aircraft industry, which has pioneered them in the production of rivetless bombers and rocket structures, and proved that the chemical bonds withstand enormous stress, fatigue, and load. Indeed, advanced aerodynamic structures would be impossible, it has been found, with rivet and bolt construction. Since the crux and age-old problem of architecture is in the jointing, this development of superadhesives promises the first seamless buildings and a new fluidity of design.

**Toward new constructions**

The variety of new materials is nothing, however, without their imaginative conjugation into new components of construction, often based upon new principles made possible by combinations of new properties. It is here that the aircraft industry has moved furthest out in front, by necessity, and has the most to offer in the application of new aeronautical constructions to building design.

The neatest and newest example of this is the application of thin-film reflective surfaces to glass to solve the hothouse effect of modern architecture's vast transparent planes, a solution being pioneered on two new buildings by Eero Saarinen & Associates (Forum, July '60). The technique of laying down layers of gold or other high-reflective-index metals one or two molecules thick by vacuum deposition was greatly accelerated by the pressing need to protect space vehicles and their occupants from the fierce, unfiltered rays of the sun in outer space. Architects Saarinen & Associates found that the application of such molecular films, now commercially available, directly to glass or to plastic films sandwiched between glass could reflect off as much as 75 per cent of the sun's heat, at great savings in air-conditioning costs and human discomfort, without limiting vision. The same imaginative architects earlier had taken over from the automobile industry, which in turn had got the idea from aircraft window-sealing techniques, the use of neoprene gaskets to make big window glazing easier, more permanent, and leakproof. Thus may an alert architecture integrate the products of advancing technologies.

The most widely assimilated of all aircraft constructions into building is probably the honeycomb core structure. This structure—a hexagonal grid of metal, paper, or reinforced plastics bonded between stressed skins of metal, composition board, or plywood—was devised for aircraft wing and panel construction to provide structures of great lightness, strength, and rigidity. Indeed, honeycomb-core panel construction, using nearly the whole gamut of modern materials, including the superadhesives, provides the highest strength-to-weight and rigidity-to-weight ratios known. Moreover, batteries of high-precision cutting, slitting, and corrugating machines, plus automatic bonding and welding techniques, make honeycomb one of the most economical of modern structural materials.

Under such mass-production pioneers as Hexcel Products, Inc., basic honeycomb products and materials have been pushed out from the aircraft industry.
through a growing number of finished unit fabricators into such building components as flush doors, partitions, ceiling light louvers, translucent room dividers, curtain-wall panels, and hollow floor systems for such rigid and exacting requirements as computer centers. Mainly, these are in the lower-cost impregnated paper or aluminum honeycomb constructions. But building so far has considered or made use of only a fraction of the honeycomb constructions going forward in aircraft and space-vehicle manufacture. A tremendous range of properties can be designed into honeycomb sandwich-panel construction for different purposes, simply by juggling and combining the wide variety of materials. Many more structural exterior and interior wall, floor, and ceiling uses are possible, particularly in prefabricated systems. Little imaginative architectural use has been made thus far of honeycomb's immense diversity and potential.

Fitting into this honeycomb structure in a way that will appear in a moment are all the new, small energy converters made up of exotic metals, called semiconductors, mentioned above. Last year alone nearly $20 million of government-military research funds were poured into these new devices, because space vehicles, in order to maintain themselves in empty space, must carry their own lightweight, independent sources of power, light, heating, and cooling through the conversion of free energy in the universe around them. Hence, rapidly reaching a forward stage of development are solar-cell panels for converting light directly into electricity, thermoelectric generators for directly converting solar heat (focused by thin-film reflectors) into electricity, thermoelectric grids for alternatively converting an electric current into wall heating or cooling, and electroluminescent films (new semiconducting phosphors embedded in plastic) for converting electric current into almost heatless strip or panel lighting.

The common feature of all these new devices is that, operating without moving parts, they all fit compactly and durably into the thickness of a wall or of a skinlike membrane. And authorities now seriously assert that, within another decade of development, they will not only be found in space but also will have changed the entire pattern of electric power generation on earth, unchanged for a century. The new devices make possible wall structures that will act more closely like the human skin in controlling interior environment, walls that will bury all the clumsy mechanical devices for heating, cooling, and lighting that today absorb some 30 to 40 per cent of the cubic space of major buildings. These new structured walls, with their own compact, free-generating power sources, will free building of utility connections and usher in a new era of autonomous building.

**Toward a new integration**

No industry is in a better position than the aircraft industry, it would seem, to put all these new elements together for building. Up to now, however, the industry has been singularly inept in entering new markets. The search for diversification following World War II devolved, in the industry's own disgusted terms, into "making toasters or aluminum canoes." Its approach to building products was equally trivial. Only recently, for instance, Curtiss-Wright unloaded an unsuccessful business in foam-plastic wall coverings. Used to dealing with single big customers like the government, on contracts in which cost was little or no object, the aircraft industry found itself bemused, as others before it, by the highly fractionated, competitive, low profit-margin nature of the building industry.

The only saving point in the situation is that the building industry itself is even more inept at putting together anything new or revolutionary. And recently, under the spur of necessity, the aircraft industry has been taking a much longer-range, more considered look at the problem of entering the building field. Northrup Corp., for instance, is actively working on the building of a portable classroom, a project that could well engage its special technical resources, and it is investigating more ambitious flexible modular systems for prefabricated school design. Lockheed Aircraft is also working up a portable classroom based on trailer design, a general business it is entering because of its closeness to air-frame construction. (The same company also is working on monorail transportation systems, an item to fit into the urban renewal push ahead and another area for growth.

The aircraft industry's best bet obviously is to concentrate on developing advanced, highly integrated building and building component systems, employing the intricate systems-engineering in which it is now pre-eminent. The risks would still be great, but they would not be so hopeless as entering odds and ends of building products into the competitive maelstrom of the building-materials market. Any unique, composite wall system, for instance, might carry a company above the competition for a time to fatter profits. High-cost materials and devices could be incorporated in such a system, for the materials would be subordinate to what the system as a whole could uniquely do. The major requisite in all this is top, imaginative engineering and architectural direction, a commodity which, unfortunately, is severely limited. Few architects are trained by background, experience, or native patience to understand industrial processes.

Yet, if the aircraft industry were to approach the building of earthbound structures with the same integrated, multitalented energies that it devotes to aerodynamic structures, a revolutionary new industrial force would enter building. It is a force sorely needed to meet the mounting problems of national growth and an expanding world population.
Rebuilding

Sensitive remodeling preserved the best of a grandly scrollworked 1912 facade in the Sullivan tradition (left). A stock canopy had already replaced the original marquee (top photo); this was ripped off in favor of a plain cast-stone front, extended all the way around the first-floor level (photo right). New display windows are shaded by a continuous, permanent canopy. The store, topped by a floor of offices in the St. James building, faces Jacksonville's downtown Hemming Park.

A department store reborn

"Replanning takes on real urgency when one considers that only 60 per cent of space in older stores, on the average, is used productively because of outmoded layout and fixtures. We find that a thorough modernization can almost double a store's capacity for selling, without adding a square foot to its size."

So speaks Morris Ketchum, leading New York architect and store designer. His most recent rebuilding job bears him out remarkably.

Although the last coat of paint is barely dry, and specific figures are undivulged, there is little doubt that the $2 million remodeling of Jacksonville, Florida's May-Cohen's department store is helping business considerably. The old basement sales floor, whose renovation was completed first about a year ago, has already shown a sound sales increase. On all floors, related departments have been brought together and clearly identified, and the "forward content" of visible merchandise has been increased roughly 50 per cent. Result: not only are more people attracted to the store, but they can find their way more easily, and make more of their own selections without waiting for a clerk. Sales personnel waste far less time finding items, and running back and forth to stockrooms. Department heads are now able to classify their merchandise and lay out a fuller variety in view. New light levels raised to 60 foot-candles (from about 30) and a modernized air-conditioning plant have also helped put May-Cohen's on a competitive footing with brand-new stores in the area.

When the May Co. took over Cohen's in February 1959, the old St. James building which housed it (and a top floor of small office tenants) still had an enviable location opposite downtown Hemming Park. It also had a distinctly moth-eaten look. Ketchum wisely decided to preserve most of the rich old character built into the 1912 facade by Architect H. J. Klutho, a disciple of Louis Sullivan (see drawings opposite). However, the original wroughtwork marquee (top photo) had been replaced by a less sensitive modern canopy. Ketchum ripped it off in favor of a cleaner, if blander, entrance. The crumbling terra-cotta trim and awnings of the old display windows were replaced by a new band of beige cast-stone panels that gets along nicely with the old beige brick above, and by a continuous, permanent canopy 10 feet wide in charcoal-colored aluminum. Show windows were reduced in size and number to pinpoint intimate displays, reducing operational display costs and gaining some stockroom space against the outside wall. Across the street, needed parking was provided by a new 370-car, privately operated garage.

The bulk of the rebuilding, however, took place inside. A lowered acoustical ceiling now hides the unsightly old beams and column capitals—as well as new lighting fixtures, ductwork, and sprinklers—giving the main floor a cleaner, more spacious look. An existing mezzanine was extended, and customer services such as telephones, post office, and service bureaus were moved up here to free ground-floor selling space (interiors overleaf).

Total contract: $2,101,500 (including $1,135,500 in interiors); financing by the May Co. Architects: Ketchum & Sharp (Rosario D'Agrosa, associate in charge; Herbert W. Riemer and Stanley Wolf, staff architects); Morris Leedom, staff architect for the May Co. Engineers: Smith, Hardaker & Huddleston (structural); Robert E. Hattis Engineers, Inc. (mechanical, electrical). Contractor: Batson & Cook Co., Inc.
Before, the main sales floor had a typical high ceiling, hanging lights, and column capitals obscured by added cooling ducts.

After, the same area was made quieter, more spacious and dramatic by a dropped acoustical ceiling incorporating air conditioning, sprinklers, and incandescent spots. The newly extended mezzanine, with plant boxes for rails, is also seen in this photo.
Sketch plan of the main floor and mezzanine indicates the major architectural changes to the store. Merchandise areas are now consolidated into related departments, and floor space is used as efficiently as in most brand-new department stores. Women's and children's apparel and home furnishings are upstairs on remodeled second and third floors.

Main floor: moving stairs down from the mezzanine and upper floors (left in photo), and up (background) were refinished in a pattern of gold leaf. A new moving stair to the basement was added nearby.

Typical department: china, linen, silverware (shown in photo) are displayed in handsome new fixtures designed by the architects for flexibility, capacity, good looks.
Office space at $3 a foot

By renting space in a San Francisco loft structure, built in 1910 as a syrup factory, and imaginatively remodeling the interiors, the small (12-man) architectural firm of Knorr-Elliott came out with handsome offices in a central location at a total annual cost of less than $3 per square foot, including rent and improvements. Tenants of newer buildings in the area pay from $7 to $11 per square foot.

This saving was not at the expense of quality. The character of the roughly formed beams was exploited with fresh, white paint; floors were finished with vinyl asbestos tile and, in the two-story display court, with precast concrete tile; a delicately detailed circular stair was installed to connect the two levels; and separate heating units were provided for each floor. The resulting space has a strong, individual flavor, appropriate to the work of its tenants.

Knorr-Elliott presently use 3,000 square feet of their 6,150-square-foot holding, controlling the remainder for expansion and for sublease to consultants whom they regularly employ.

Total cost of remodeling the initial 3,650 square feet was $11,500. Breakdown: carpentry, $3,500; electrical, $2,400; heating, $500; painting, $1,050; floor finish, $2,000; doors, stairs, rails, and miscellaneous, $2,050. General contractor: Greystone Builders.
New hospital in an old factory

Aluminum screens veil ugly walls, add privacy, and reduce the air-conditioning load.
From almost any point of view, the Magee Memorial Hospital, a rehabilitation center for the disabled, looks like a brand new hospital. And it works like one, too. In fact, however, it is a remodeled loft structure, built in about 1910 to house light industry.

Languishing on the fringe of a commercial-residential slum, the building had two major assets: a large amount of unencumbered floor area and a strategic location, admittedly near a slum but also near Philadelphia's principal general hospitals. The floors, the skeleton structure, and most of the exterior walls were left intact, although the virtually blank west wall was rebuilt to provide windows. An aluminum screen veils the building's ugly south and west facades, and at the same time considerably reduces the air-conditioning load. Neither the east or north facade was touched because one abuts a taller commercial structure while the other looked out on a slum. The shortsightedness of this decision has been emphasized by the re-development of the area, which now houses numerous hospital staff members.

If the per-bed cost of $28,500 for 70 beds seems high (compared to a national new construction average of about $20,000 per bed), there are good reasons. Unusual disabilities require unusual treatments and specialized, expensive equipment, such as the large therapy pool pictured above. Only 5 percent of the patients are ambulatory; the rest are stretcher or wheel-chair cases, and thus the corridors had to be much wider — and costlier — than in conventional hospitals. Finally, the per-bed cost figure is in itself misleading: Magee Memorial has an unusually extensive outpatient program and, as a result, only two of the five floors are devoted to beds. And, at $32 per square foot, the cost of this hospital is actually below the national average of $35 to $40 per square foot.

Real estate cost was $300,000. Total reconstruction cost, including fees, for 62,000 square feet was $1,996,000, paid for by the Magee estate.


Public housing in Buffalo
rebuilt for private use

In a pioneering rebuilding experiment, the Buffalo Municipal Housing Authority is transforming a low-rent public housing project into a private middle-income cooperative development.

When the 616-unit Dante Place project was built in 1962, it replaced a slum beside Lake Erie just a short walk from the city's central business district. Since then, however, a wave of urban renewal developments has been upgrading the entire adjacent area, and Buffalo city fathers have realized that public housing was not the highest and best use of this site. In converting the project to middle-income housing (while providing additional public housing in other areas), the city will spur continued rehabilitation and upgrading of its choice waterfront area to a higher potential, and will also gain about $50,000 a year in real estate taxes from this parcel.

Interior rebuilding has been completed in five of the seven buildings in the development, now called Marine Drive Apartments, and work on the other two will be started this month. Mainly this has consisted of the removal of interior partitions to make rooms larger (all four-bedroom units are being turned into three-bedroom apartments without any reduction in total area, and most three-bedroom units are being rebuilt as two-bedroom apartments). Bathrooms are being tiled, and showers added; kitchens are being modernized, and doors added on closets. Building entrances also are being modernized. Rehabilitation, under the direction of Backus, Crane & Love, the original architects for the project, is costing approximately $650 per unit.

Says Housing Authority Executive Director Robert D. Sipprell: "This whole operation would have been impossible economically if the project had not been well designed and built of high-quality materials and workmanship in the first instance. This is a credit to the original architects, contractors, and the State Division of Housing, and is a point to bear in mind in the construction of any future public housing where ultimate disposition might evolve."

To finance the conversion, a citizens' committee of Realtors, bankers, contractors, and architects subscribed a $40,000 pool of working capital in a state-chartered limited - dividend housing corporation.

continued on page 134
This corporation has leased the project from the Housing Authority for $460,000 a year, which covers all the obligations of the Housing Authority until the bonds for the development have all been retired. Initial payments of cooperative tenants (on long-term proprietary subleases) run from $200 to $350, and their monthly carrying charges from $67 to $116.

Cole outlines three ways to spur FHA rebuilding

The rebuilding provisions of the Federal Housing Administration Section 220 urban renewal mortgage insurance program enacted in 1954 have been a dismal failure so far, according to Albert M. Cole, former administrator of the federal Housing and Home Finance Agency and now executive vice president of Reynolds Aluminum Service Corp.

Not a single rebuilding project depending primarily on Section 220 financing has been successful—in six years only one rebuilding mortgage for an investor-owner and only 73 for owner-occupants have been insured under Section 220—Cole told a recent meeting of the National Association of Real Estate Editors. Maximum loan ceilings have been too low, he declared, and loan procedures have been too slow and too complex.

Estimating that there are at least 12 million substandard dwelling units in urban neighborhoods that need rebuilding, Cole recommended three changes in the Section 220 program so it could provide "simple, attractive, but sound financing" that would make rebuilding more feasible:

- Make lenders share the insurance risk on rebuilding loans in the same way they are now co-insurers on Title I home-repair and remodeling loans. Under this system all time-consuming FHA procedures would be eliminated: lenders would assume the primary responsibility for investigating and approving all loan applications.
- Instead of establishing loan ceilings, allow mortgages to be based on the prospective sales price or rental income of the property; i.e., the more income available for debt service, the higher the allowable mortgage.
- Create a separate section of the Federal Housing Administration that would deal exclusively with urban renewal and rebuilding projects and would develop the faster, more simple procedures that are essential for an effective renewal and rebuilding program.

Cooling for 13,000 stores, the Alamo, and a harem

Three reports last month gave a revealing picture of the diversity of the market for air conditioning in rebuilding.

- Chain stores are planning 10,790 new stores and 11,375 major remodelings this year, and air conditioning will be installed in 13,050, or 59 per cent of the total, according to the annual air-conditioning survey of Chain Store Age. The chains' direct outlays for air conditioning in these projects will total $138.5 million, compared with $130.2 million spent for conditioning 12,900 stores last year. In addition, landlords usually spend about another 25 per cent for improving stores rented to these chains. When allowance is made for this, outlays for air conditioning in new and existing stores occupied by chains will probably hit $173 million this year, compared with an estimated $163 million in 1960, and $145.8 million in 1959.
- In Texas, air conditioning is being installed in the Alamo. The Daughters of the Republic of Texas, custodians of this historic San Antonio shrine, were uncertain about what course to take last year when one air-conditioning company offered to install equipment free. In recent years the Alamo has been spotted with unsightly fans in summer and small gas and electric space heaters in winter to help make it a little more comfortable for the hundreds of thousands of reverent visitors who go through it every year. But could it be air conditioned without the introduction of large equipment, ducts, and air outlets and intakes that would disturb the old structure's authentic atmosphere? Finally, the Daughters invited proposals from all firms willing to install equipment free, ultimately approved a General Electric dealer's plan for an undetectable 13-ton-capacity heat pump for both heating and cooling. A 5-ton unit will be hidden behind stone breakfronts and decorative grillwork, and two 4-ton units will be concealed in unused loft spaces.
- In distant Saudi Arabia, the royal compound of Nasrayah has become probably the world's first completely air-conditioned city (see photo below). Near Riyadh, the capital, the big enclosure contains the King's palace and homes of the royal family as well as a royal Mosque, royal harem, schools, offices, a library, a hospital, communications center, storage and supply buildings, and residences for all the people who staff these facilities. From a huge $3.5 million, 8,000-ton capacity plant just outside the walls, in which the Carrier Corp. has completed installing equipment for the first 6,000 tons, more than 120 buildings inside the city are now being cooled. More than 19 miles of chilled-water pipes have been installed—buried 6 feet deep. Outdoors the temperature in Nasrayah can reach 110 degrees, but inside the royal buildings the temperature is maintained at a comfortable 65 for the King and his many activities.

Briefs

Victorian grandeur will be restored to the Goodspeed Opera House in East Haddam, Conn., under the direction of the American Institute of Architects, working with Schutz & Goodwin, architects, and Frederick C. Palmer, consultant. The dilapidated structure, erected in 1876, was rescued from demolition in 1958 and turned over by the state to a nonprofit foundation. Its rebuilding as a festival theater and cultural center will include modern lighting, plumbing, and air conditioning.

Hotel rebuilding stimulated increased occupancy in 80 per cent of a group of 62 major hostleries in 46 states surveyed recently by the Walter M. Ballard Corp., institutional designers and decorators. Managers were able to increase rates an average of $1.87 per room in 83 per cent of the surveyed hotels. END.

Walled, air-conditioned royal city of Nasrayah in Saudi Arabia
New Parma Community General Hospital

Chooses Door Closers from Norton's Versatile Selection

Norton Door Closers are used throughout the New Parma Community General Hospital where Norton's versatile selection has allowed specification of the closer best suited to each individual application. You, too, can select the correct door closer for every job when you specify Norton, the industry's most complete line of door closers. Your soundest assurance of quality and dependability is the 80-year record of Norton leadership in door-closer engineering and manufacturing.

Get complete details. Mail coupon today.

NORTON®
DOOR CLOSERS
372 Meyer Rd., Bensenville, Ill.
The Hillside School is one of three concepts developed for NLMA's new book, "Blueprint for Better Schools." An inner court allows excellent lighting and easy access to lower classrooms on the downhill side. Modular modified mill construction offers prefabrication of many components.

The Pavilion School stands for economy, is adaptable to practically any site and designed for expansion using additional units. This structure provides six classrooms around a main room, all with standard frame construction and wood paneling. Exterior permits a choice of siding.
For schools dedicated to the needs of tomorrow
find the better way with WOOD

Wood’s familiar warmth reassures the student, relaxes the teacher . . . to create an unrivaled environment for learning. Wood’s flexibility takes advantage of the most modern methods known, to build a better school free from traditional restrictions.

Wood’s workability permits simplicity in classroom planning, sweeping overhead laminated beams in gymnasium design. Its inherent acoustical qualities help maintain a hushed library, carry a voice from the stage to all seats in a spacious auditorium. You’ll find, too, the economies of wood make it easier to plan schools within the frame of community budgets . . . and wood’s capacity for wear and alteration becomes a continuing asset.

For your free copy of the book, “Blueprint for Better Schools,” and information about NLMA’s new 22-minute color motion picture on school planning with wood, write:

NATIONAL LUMBER MANUFACTURERS ASSOCIATION
Wood Information Center, 1319 18th St., N.W., Washington 6, D. C.

for freedom of design, look to wood

Schools designed for NLMA by Cooper and Auerbach, A.I.A., Washington, D.C.

The Compact School, with its exciting design and structural simplicity, was planned for a level site. Its vast multi-purpose room has a depressed floor-level to afford a straight laminated wood beam roof for economy, continuous skylights over each corridor for brighter interiors. Classrooms open onto separate patios.
SUSPENSION ON THE RHINE

One of the most skillful pieces of architecture yet to grace the Rheinfront is this new single-tower bridge crossing the river at Cologne. Like an old gin-pole hoist, its big steel bi-pod actually seems to lift the great slung weight of the roadway which it straddles—a nice articulation not found in most suspension bridges. The drama is further sharpened by the few fine filaments of steel which spin out from the single lifting point to hold the span. In designing the bridge, engineers of the Gutehofnungs­shuttle steel works and Architect Gerd Lohmer placed the tower asymmetrically toward one bank, leaving the opposite bank for docking use. The single-tower design is also a thoughtful civic gesture: it leaves the city's main sky line unbroken and does not compete with the great spires of the Cathedral of Cologne.

CHARM IN ITALY

For a working-class community in Gubbio, Architect Marco Zanuso has designed a children's school simply and charmingly scaled to its inhabitants. A “village” of five little houses in red and white stucco, each with its own outside door, is grouped around a glazed octagonal garden open to the sky—the village's little "piazza" (photo, right). Walls are only 7 feet high, and the pyramidal roofs rising to full height inside emphasize a hut-like sense of shelter. The school doubles as a community medical center and social hall.
While more and more American emporia are being designed as efficiently windowless, air-conditioned blocks, this new building for Stockholm's PUB department store displays itself and its wares, night and day, in a veritable crystal palace. All walls are of double insulating glass set in a framework of tubular steel, except for larger show windows, which are single panes. Floor edges and other non-transparent parts are covered in enameled steel; the roof is clad in copper plate. Both entrances are shielded by "air curtains" instead of heavy doors. Below their crystal iceberg, Architects Erik and Tore Ahlsen have placed a basement sales level, stockrooms, and garage.

The new Tokyo branch of Turuya-Hatimana confectioners would be a treat on any Main Street. Beneath a neat layer cake of gold-trimmed window slits shielding working quarters, the store is separated from a small garage by a polished stone panel bearing a pelican symbol. Inside, this striking trade mark is repeated. Architects: Matsuda & Hirata.

On the Aegean island of Mykonos, Architect Aris Konstantinidis has shaped his "Xenia" resort hotel in sparse and rugged style to match the island's own special beauty. Unlike Mykonos' softly sculptured whitewashed villages and windmills admired by many a traveling architect (Forum, Feb. '59), the hotel is starkly linear, almost fortlike, its small ports shuttered against the Mediterranean sun, its deep guest-room balconies recessed in rough stone walls. Whitewashed concrete frames and roof lines complete the composition; chimneys and jutting drain pipes are the only decoration. Overlooking the little fishing cove is a two-story administration building, and restaurant-bar (below).
JOHNSON PNEUMATIC CONTROL
assures ideal comfort,
lowest lifetime costs!

This is the ISTA Center in downtown Indianapolis, one of the most modern buildings in Indiana. The major portion of the 9-story structure is devoted to rental office space, while the remainder serves as headquarters for the Indiana State Teachers Association.

A specially engineered Johnson Pneumatic Control System with individual room controls provides the occupants with the ultimate in air conditioned comfort at all times. This important rental feature also permits complete flexibility in making future changes in office layouts.

For added efficiency, a central indicating panel furnishes the building engineer with a continuous display of temperature at key points in the system.

Over the years, the dependable, trouble-free operation of this Johnson system will assure the ISTA Center of an ideal climate for working efficiency at a lifetime cost below that of any other type of control.

When you build or air condition, make certain that you, too, take advantage of the unmatched performance and economy features of a specially planned Johnson Pneumatic Control System. Your local Johnson representative will welcome the opportunity to make recommendations. There is no obligation.

Johnson Service Company, Milwaukee 1, Wis. 105 Direct Branch Offices.
Butternut veneer offers a new concept in receptive beauty that gives you remarkable design freedom. The soft, leafy grain and delicate brown tone of Butternut create a rare beauty distinctly its own. But the same subtle quality that reveals Butternut's unrivaled charm also makes it a natural choice for paneling veneer where design flexibility is desired. The passive graciousness, the quiet warmth of Butternut suggest it as the perfect compliment to any decor, any color combination, any architectural setting. Many other creative design possibilities are inspired by the hundreds of fine woods in Stem's veneer selection, the most complete in the world. Showrooms: New York City, Chicago and Los Angeles. Butternut is a truly American wood as it is native only to North America. Because of its harmonizing qualities Butternut has always been of special interest to interior artisans, cabinet makers, and in equestrian times, coach builders. Centenarians might remember that Butternut bark and nuts were cooked to extract dye for Confederate uniforms... in fact, at one time it was widely used by settlers for dyeing homespun woolens. Today, Butternut veneer is considered one of the most adaptable of all grains for use in American architectural design. Chester B. Stem, Incorporated, 795 Grant Line Road, New Albany, Indiana.
Deserted houses ... opulent art ... daring vaults

AN ANTHOLOGY OF HOUSES. By Monica Pidgeon and Theo Crosby. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 174 pp. 7 3/4" x 10 1/4". Illus. $10.95.

This is another handsome addition to a rapidly expanding collection of books on modern houses. It differs from other, similar books in three respects: first, this anthology is international—there are houses from Finland, Japan, Chile, the U.S., and a dozen other countries; second, this collection is based, largely, upon work originally published in the British magazine, Architectural Design, which has been giving the long-established Review an exciting run for its money in recent years; and, third, the editors of this anthology have shown a degree of discrimination rare in this sort of publication.

Any time an anthology of anything is published, every critic will quarrel with the selection made. The selection, however, is the prerogative of the authors; if a critic wants to make a different selection, he is free to publish this at any time; the present selection, in any case, is just fine!

Two comments seem appropriate: it is heartening to see so high a standard of excellence, spread over so large a part of the globe; and it is eerie to see so many slick and competent photographs of the human habitat, with hardly a human being in sight! In more than 300 illustrations, we spotted only 7½ people and 1 dog, and he was made of excelsior. Those architectural photographers must be getting awfully lonely out there.

THE AGE OF GRANDEUR. By Victor-Lucien Tapie. Translated by A. Ross Williamson. Published by Grove Press, Inc., 64 University Place, New York, N. Y. 305 pp. 7" x 10 1/4". Illus. $12.50.

The Baroque period of art and architecture, which flourished in Europe in the sixteenth and seventeenth centuries, has been much maligned for its unrestrained ostentation and its exaggerated concern for sheer, almost overpowering, splendor and opulence. Traditionally, it has been dismissed as a decadent offshoot of the Renaissance. In this, his latest work, Victor-Lucien Tapie attempts to bury these prejudices by re-examining the movement from a fresh perspective. Using selected examples, he tours the Rome of Bernini and Borromini, the churches of Prague, Vienna, and Moscow, indicating the relationship between the motifs common to Baroque works of art and the general conditions of the society which witnessed their birth and then embraced them. With broad strokes, Tapie presents the Baroque, not as an isolated phenomenon, but as one vital part of the whole fabric of sixteenth- and seventeenth-century thought. Born in a war-scarred Europe, the Baroque was eagerly received because, in its unfailing ability to evoke emotions and excite sensibilities, and in its undisguised search for magnificence, it perfectly mirrored the social, religious, and political aspirations of its time. Thus, Tapie concludes, the Baroque was not a deviation but "... a derivation from the Renaissance, adapting its lessons to express a new ideal in a society that had radically changed."

The Baroque has long been a source of sharp controversy among scholars, and Tapie's work is certain to provoke dissent. But his argument is articulate, well-documented, and, on the whole, convincing. The book contains over 200 illustrations, eight of them in color, but they are unfortunately scattered in groups bearing little relationship to the text that the reader must constantly thumb back and forth to find the cited plate.


The author's interest is not in the spiritual qualities of the old cathedrals, but in the on-the-job methods their constructors used in putting them together, and his book is entirely fascinating. The formwork and centering should not surprise any contemporary builder, but at least one of the devices used for building vaults without laggings or other formwork should make contemporary building code officials sit up and take notice (see drawing).

This is a very rewarding book, a rare piece of scholarship in architecture. continued on page 147
Folded roof to glamour walls...
concrete adds new attraction to drive-in banking

Out of a need for drive-up tellers' windows, as well as parking facilities, came this handsome banking center. Tulsa's First National Autobank is a delightful example of the many ways concrete can combine structural practicality with good design.

Here, concrete plays a major decorative role in many different ways. You see everything from folded plate canopies over the parking arcade to walls and sunscreens in high-style masonry shapes. Drives are black concrete. Upper deck parking area is a hollow-core concrete deck.

Today's architects find there is no ceiling on imagination when they design with modern concrete.
Thorshov & Cerny, noted Minneapolis firm of architects, designed this approach to a modern, high-traffic jet airport terminal. Spaciousness, appealing modern design and long-range economy via minimum maintenance requirements—all these elements were part of the plan.

A unique and original ceramic tile pattern was designed for the floor—a specification which contributes permanent beauty and guarantees long wear with minimum maintenance. Many of the vertical surfaces were designed with ceramic tile—always a prudent choice for any public area.

Practical experience shows that any private or public building gains in appearance, prestige and decreased maintenance costs when tile is used. Fireproof, durable ceramic tile comes in over 200 different colors, a wide range of sizes and an increasing variety of textures—giving the architect the greatest design freedom possible.

"CERAMIC TILE...BEAUTIFUL DURABLE SOLUTION FOR LONG-RANGE ECONOMY"

Thorshov & Cerny, Inc.
The many benefits of ceramic tile will make sense for both you and your clients in any residential, institutional or commercial project you undertake. See your local tile contractor for up-to-date information, including all the details on the new lower cost installation methods and the new dry-set portland cement mortar.

PARTICIPATING COMPANIES

American Clean Tile Co.
Atlantic Tile Mfg. Co.
Aztec Ceramics, Inc.
Carlyle Tile Co.
Continental Ceramics Corporation
General Tile Co.
Gladding, McBean & Co.
Hood Ceramic Corporation
Jackson Tile Mfg. Co.
Jordan Tile Mfg. Co.
Lone Star Ceramics Co.
Monarch Tile Mfg. Inc.
Mosaic Tile Co.
Murray Tile Co., Inc.
National Tile & Mfg. Co.
Oxford Tile Company
Pomona Tile Mfg. Co.
Redondo Tile Company
Ridgeway Tile Co.
Roberson Mfg. Co.
Stylon Corp.
Summitville Tiles, Inc.
Texeramics, Inc.
Wenclol Tile Co.
Weburn Tile Mfg. Co.

TILE COUNCIL OF AMERICA, INC.
800 Second Avenue, New York 17, N. Y.
Room 923, 727 West Seventh St.,
Los Angeles 14, Calif.;
Room 207, 5738 North Central
Expressway, Dallas, Texas

IT'S THE LAW! By Bernard Thomson. Published by Channel Press, Great Neck, N.Y. 496 pp. $7.50.

This is a comprehensive handbook on legal problems involved in architecture, engineering, and construction based on the author's monthly articles in Progressive Architecture, plus supplementary material not previously published. In a brief preface, Architect Edward Durell Stone pays tribute to Thomson for "his intelligent guidance in a field in which the architect, owing to pressures of his own profession, is neither properly aware nor advised—nor does the traditional architectural education provide the proper background."

ECONOMIC PLANNING FOR BETTER SCHOOLS. By Benjamin Handler. Published by the College of Architecture and Design, University of Michigan, Ann Arbor. 107 pp. 105'/2 x 83'/4, $5.

A NEW APPROACH TO SCHOOL BUILDING COST COMPARISON. By Fred M. Fowler. Published by the Utah Department of Public Instruction, Division of School Finance, Room 223, State Capitol, Salt Lake City. 44 pp. 8'/2 x 10'/4. $90.

Each of these books is, in its own way, a recognition of the fact that an isolated figure representing a school's cost is no true indication of that school's worth nor of the fiscal wisdom of the community that built it. Because this fact needs to be widely understood, the books are valuable additions to school-building literature.

Economic Planning for Better Schools divides its seven lucid chapters into two parts: the first is a close-up analysis of the major factors that can inflate or keep down school-building budgets; the second is an analysis of how capital budgeting for the entire community can be conducted in such a way as to keep all costs (schools included) in line with needs and capabilities.

An important (but unpopular) point in this capital budget argument is that school administrators and laymen must surrender some of their well-guarded privacy from other fiscal competitors in the community. They must fight for proper priority ranking for their school-building projects and not assume a guaranteed hunk of the budget. Otherwise the day may come when the reservoir of nonschool public-building needs within the community may burst its dam and overwhelm them all.

A New Approach to School Building Cost Comparison is a two-part formula for the delicate process of comparing school costs. As explained in the introduction, the formula "not only deals with cost units, but gives weight to values lying back of the costs." The first part of the formula covers actual costs, excluding site acquisition and development, fees, and equipment. The "values" that the second part of the formula takes into account are: educational adequacy, safety, long-term cost economy, esthetics, auditory comfort, thermal comfort, visual comfort. The results of the formula are unarguably, but probably as fair as possible. END

are you spending
$12.00
for a one cent job?

If you're duplicating drawing details, you're squandering precious hours of costly drafting time. STANPAT, the unique tri-acetate that is pre-printed with your standard and repetitive blueprint items, cuts time involved from 3 hours to 15 seconds! Figured at current pay rates, this means a $12 job at less than one cent ... the STANPAT way. Easily transferred to your tracings by an adhesive back or front, STANPAT relieves your engineer of time-consuming and tedious details, freeing him to concentrate on more creative work.

here's how simple the STANPAT method is!

STANPAT is available in two types of adhesive backings:

- Rubber base for standard drafting and tracing papers
- Resin base to prevent leaching (for papers that contain oils)

But whatever the application may be, there's a STANPAT product for your specific needs. STANPAT has a guaranteed shelf life of one year from date appearing on lab end. For further information and technical assistance, complete the coupon below and mail.

STANPAT CO., Whitestone 37, N. Y., U. S. A.
Phone: Flushing 3-1693-1611

□ Please quote on enclosed samples.
□ Kindly send me STANPAT literature and samples.

Name

Title

Company

Address

147
Shown: (above) upper grade lecture-demonstration area and (below) isolated group arrangements using new Brunswick Tab-lele Chairs, Trizoid Desks, Cluster Combinations, Modswall Space Divider.
Brunswick

SCHOOL EQUIPMENT WITH THE CHANGE BUILT IN...

Will the school equipment you buy today satisfy your teaching program needs of tomorrow, too? It will if you buy Brunswick. For only Brunswick School Equipment of Advanced Design is specifically designed to implement the diverse and changing classroom requirements of today and tomorrow.

FURNITURE • CABINETS • MODUWALL • GYMNASIUM EQUIPMENT

BRUNSWICK CORPORATION

SCHOOL EQUIPMENT DIVISION
KALAMAZOO, MICHIGAN
Swanson insures low operating costs with GAS and CARRIER absorption refrigeration

Swanson Brothers – nationally known in the foods industry – chose gas-operated Carrier absorption refrigeration to air-condition their beautiful new general office building in Omaha, Nebraska.

The basis for their choice was lower operating costs, with the unbeatable fuel economy of gas and the simplicity and trouble-free operation of the Carrier absorption unit. With no major moving parts, it quietly and efficiently uses steam from a gas-fired boiler to provide chilled water for cooling.

Carrier has solved the problem of sustained efficiency at partial loads in absorption cooling. An exclusive Carrier solution-capacity-control gives partial load efficiency unsurpassed by any other type of cooling system.

You can keep air conditioning costs low and efficiency high, with gas-operated Carrier absorption refrigeration. For details call your local Gas Company, or write Carrier Air Conditioning Company, Syracuse 1, New York. American Gas Association

FOR HEATING & COOLING
GAS IS GOOD BUSINESS!

Trouble-free is the word for this 140-ton capacity gas-operated Carrier absorption unit at Swanson building. Says Wendell Mitchell, Building Engineer, "I really think this system is great. All I have to do is check it now and then. Never a bit of trouble."
OFFICES OF THE BRITISH EMBASSY, WASHINGTON, D. C.
General Contractors: John McShain, Inc.

This distinctive office building uniquely groups over 400 offices and rooms around a central court with a connecting lobby passageway to a circular conference hall which seats 250 people.

The many benefits of natural lighting are obtained through the use of window walls in offices, library and many other locations including the Ambassador’s office. Elsewhere large aluminum windows are recessed in stone surrounds with slate panels below the glazing. The rotunda of the conference hall is entirely glass set in curved-on-plan aluminum frames; privacy and control of lighting are obtained with electrically operated curtains.

All of the various types of aluminum windows, including a seven story curtain wall, were installed by Hope’s experienced erection staff. For further information on the finest aluminum windows and window walls, write for Hope’s Publication 170.
Strong Supports for Modern Production Facilities

...round concrete columns formed with

SONOCO
Sonotube
FIBRE FORMS

Round concrete columns offer many advantages as supports in industrial plants. They are low in cost, strong, maintenance-free, and take up minimum space.

Of course, the beauty of finished round concrete columns is a great asset too...in structures where appearance becomes a prime consideration.

For economy, utility, beauty...include round concrete columns in your designs often. And, specify forming with low-cost SONOTUBE Fibre Forms, to save the contractor time and labor, and to reduce overall building costs. SONOTUBE Fibre Forms for round concrete columns are available coast-to-coast, in several types to meet various job requirements. Sizes 2" to 48" I.D., any length.

See our catalog in Sweet's, or for complete information and prices, write

SONOCO
Construction Products

SONOCO PRODUCTS COMPANY, Hartsville, S.C. • La Puente, Calif. • Fremont, Calif. • Montclair, N.J. • Akron Indiana • Longview Texas • Atlanta Ga. • Ravenna Ohio • Bradford, Ontario • Mexico, D.F.
Federal perils...sacred triumph...tired parks

FEDERAL SPRAWL

“The Wall Street Journal” recently editorialized on the perils of federal aid to U.S. cities but, unfortunately, had no large-scale alternatives to suggest.

According to the diagnosis of the Democratic platform, the cities of the U.S. are generally afflicted with “sprawl” and “blight”—ills that demand a federal cure. To minister to “sick” cities, the Democrats promise a new, cabinet-rank secretary of urban affairs.

This urge to cure the ills of the cities with federal handouts obscures the fact that big cities have always suffered from the natural consequences of having too many people in one place. Many a Roman fumed in the five o’clock chariot snarl, and wondered when something would be done about the potholes in the Appian Way. Just as this chariot-commuter looked to Caesar, so the Democrats suggest that city dwellers look to a remote federal benefactor for everything from highways to slum clearance to sewage disposal.

No government can hope to eliminate completely the “blight” and “sprawl” of the cities unless it first repeals the laws of human nature. Certainly one big city hall in Washington won’t make local government wiser, more thrifty and efficient, especially if indifferent citizens overlook the obvious remedy of cleaning up their own city hall. Indeed, the shift of responsibility for the cities farther away from the cities themselves provides new opportunities for waste and inefficiency. Urban sprawl is bad enough without still more federal sprawl.

THE CLERGY ON LA TOURRETTE

In the “Listener,” Father Illud Evana comes to the defense of Le Corbusier’s controversial monastery.

The La Tourette priory is likely to be counted Le Corbusier’s masterpiece, if only because here the strands of his prophetic understanding of the architect’s work seem to be most closely knitted together. Here, one feels, he has labored with a love that has been shared by those who commissioned him. In the contemporary debate on sacred art, the priory is certainly a vital statement. At La Tourette, unequivocally declared, is the radical distinction between tradition and mere traditionalism, which are so often confused in any discussion of religious art. Tradition is the discipline which any artist must be glad to accept, and within it the sacred must be expressed in every age. It is an acceptance of the subordination of what is made to the purpose of its making. Thus a church is governed by the altar and the sacred action that is done there, just as the monastery demands a coordination of its separate parts in its communal work. But this does not mean, it cannot mean, a tyranny of styles. We must, says Le Corbusier, banish styles. He goes on to say: “All we can do is to think of style in itself—that is to say the moral probity of every work that is truly and genuinely creative.”

How ironical it is that sacred art is so often the least honest of all: the one most dominated by feebleness of purpose and the fear of the future. I think the gratitude, not only of architects, but of all who care for the sacred as deserving to be seen as ever new, should go to Le Corbusier and to those who commissioned him, for at La Tourette something very important has happened—a building has gone up to the glory of God, and it is in the truest and noblest sense a building of our time.

PARKS FOR A NEW SOCIETY

In “Landscape Architecture,” Grady Clay raises some pointed questions about the purposes of city parks.

Nobody who has any hope for the future of cities can get much comfort from the hooliganism, vandalism, and crimes of violence which are taking place in so many city parks and playgrounds these days. Nor from the fact that many bond issues votes for few parks and playgrounds in recent years have failed. Is it not time to admit that many a Grand Design no longer fits the needs and requirements of a community? That a park planned for a middle-class population of 1880, given to croquet and carriage riding, may offer few of its original amenities to a crowded, mobile, working-class population of the 1960’s? That playground redesign may save many a decaying neighborhood?

In a slow and not really mysterious fashion many a park has become what some lawyers, in their inverted argot, might call an attractive nuisance. Whenever trouble breaks out in one portion of the park, the infection spreads to the farthest corners. Thus high visibility, which was an asset in an earlier era, may now become a factor leading to a sense of uneasiness throughout the entire park whenever audible shouts come from the most troublesome corner.

While I would not suggest that any Grand Design be abandoned simply be-

continued on page 162
We at American Sterilizer know little about current concepts of general building design and construction, except that they advance at a headlong pace.

But we DO have the largest single fund of knowledge concerning the design, function and essential workflow of those specialized technical departments which make a hospital different from any other Architectural problem.

This knowledge is yours to use in developing, for your hospital designs, Technical Departments which assure the ultimate in patient protection with simplified staff work and lower operating costs. This specialized information is gathered, evaluated, applied and supported by a group activity at Amsco which is not elsewhere equaled . . . for size, completeness or professional stature.

*This unique combination of services and skills will greatly lighten your design load for such hospital departments as Central Service, Surgical Suites, Solution Rooms, Infant Formula, Central Instrument, Utility and Autopsy rooms. More important, it will enable your client hospitals to carry out the most advanced techniques with the minimum of staff time and cost.
Dividend Engineering is a new, quick method of pinpointing insulation specifications that can project significant savings in initial and operating costs. The example shown illustrates how this system works: roof insulation is increased from one to three inches; wall insulation from one to two inches. Fiberglas† Shading Fabrics are specified for windows. Results: extra insulation cost is $42,000. But it effects a $16,870 saving in initial equipment, plus a projected annual operating savings of $4,753...

**DIVIDEND ENGINEERING**

**DOLLAR SAVING PROPOSAL**

<table>
<thead>
<tr>
<th></th>
<th>Original Specifications</th>
<th>Dividend Engineering Specifications (Illustrated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Heating &amp; Cooling Equipment</td>
<td>$189,450</td>
<td>$130,580</td>
</tr>
<tr>
<td>Savings</td>
<td>$ 58,870</td>
<td></td>
</tr>
<tr>
<td>Additional Construction Cost</td>
<td>$ 42,000</td>
<td></td>
</tr>
<tr>
<td>Net Savings on Initial Costs</td>
<td>$ 16,870</td>
<td></td>
</tr>
<tr>
<td>Projected Annual Operating Costs</td>
<td>$ 64,222</td>
<td>$ 59,469</td>
</tr>
<tr>
<td>Savings on Operating Costs, per year</td>
<td>$ 4,753</td>
<td></td>
</tr>
</tbody>
</table>
a high return on the initial investment. Such savings make the production and comfort benefits of year-round air conditioning an economic possibility for more and more industrial and commercial structures... Let us demonstrate Dividend Engineering on one of your current projects. Contact your local Fiberglas representative, or write Owens-Corning Fiberglas Corporation, Industrial & Commercial Division, 717 Fifth Avenue, New York 22, New York.

*A service Owens-Corning will provide to demonstrate to builders, designers, management and financial groups that optimum use of Fiberglas materials can result in reduced initial and operating costs and improved building performance.

OWENS-CORNING RESEARCH pioneers in making things better with Fiberglas
cause its neighborhood has changed, I would question whether the typical city playground and many larger open spaces, for that matter, meet the city's present needs. Is the block-square park of a former middle-class era, or the flat, formal, village-green-type playground suited to the changing needs of communities around it? Can such areas be redesigned to reduce neighborhood tensions? Are there opportunities for topographical experimentation to “break up” a playground into component areas, each with its own character, its own appeal to different neighborhood needs? Is not total visibility, insisted upon by police, a drawback in many neighborhoods?

Out of such experiments can come the seeds for park and playground redesign.

**TRANSIT FIRST**

At the recent annual convention of the National Association of Home Builders, New York State Housing Commission, James W. Gagno predicted the biggest urban renewal program of all would come to naught without an effective transportation plan.

New York's efforts represent a massive attack on the urban renewal problems of the country's largest urban center, expenditures of private and public funds in the billions, renewal of thousands of acres of city slums, generally improved business conditions, and increased tax revenues to the city. Yet, the maximum potential of this massive program probably will not be realized because the program lacks an essential element—an effective transportation plan. Some 3.3 million persons enter Manhattan daily, almost 2.5 million of these by public transportation that is far from adequate. Sleet, snow, heat, and rain stay all but the postal workers from the swift completion of their appointed rounds, and newspapers carry regular boxes under the head "Why you were late today."

The 800,000-plus persons that arrive in Manhattan daily by private cars, taxis, and trucks represent only one-quarter of the daily travelers to the heart of the city, but they cause almost all the street congestion. The solution proposed at present is more parking in the center of the city. Experience elsewhere has shown that additional parking brings additional congestion and commercial stagnation. Victor Gruen, the country's outstanding planner of large urban and suburban shopping centers, has analyzed New York City's parking program and is convinced that the direct gain in retail sales in the center of Manhattan would be only a fraction of the $100 million a year that the garage planners anticipate. The intent to provide a place to park is laudable, but the economic objective is unrealistic. The answer is not more parking to attract more cars into the center of the city. The answer lies in more parking at the periphery and, most importantly, improved public transportation into the center core.

Something for architects to remember when next designing new structures or updating old ones. AUTOMATIC AIRTUBES can deliver enormous quantities of mail and other paper . . . quickly and continuously . . . to any number of locations.

Yet . . . an AUTOMATIC SYSTEM requires a minimum number of transmission tubes (2 will serve 10 stations) and the AUTOMATIC MONITOR eliminates all manual transfer, speeding service and providing 'round the clock operation if need be.

Check LAMSON before specifying any other method. Send for the new AIRTUBE catalog. Just clip this advertisement to your letterhead and mail to 112 Lamson Street, Syracuse, New York.
the first major improvement in door control since the leather hinge!

- eliminates cost of butts
- eliminates cost of end plates
- eliminates ugly protruding closer arms
- eliminates unsightly surface mounted pot type closers
- eliminates all projecting and protruding elements
- concealed in header where it belongs with absolutely no visible operation
- fits in standard 1⅛" x 4" x ⅝" header
- single or double acting
- 90° or 105° back-stop, with or without hold-open

FOR WOOD DOORS
COMPLETELY CONCEALED IN HEADER

FOR METAL DOORS
COMPLETELY CONCEALED IN HEADER

Take a good look at the latest news in door closers—the Jackson concealed overhead closer, with thousands of proven successful installations, was designed and engineered to be completely concealed in a standard 1⅛" x 4" x ⅝" header.

This unique and versatile new closer that outclasses and out-performs all other closers is adaptable for all type doors, for interiors, hospitals, commercial or industrial buildings.

All working parts are of heat treated chrome moly steel, springs of chrome vanadium steel; the utmost quality in every aspect of the mechanism gives assurance of long and trouble-free service.

Shipped completely packaged ready for easy installation in a matter of minutes.

2-year unconditional guarantee.

Write Today for Free Catalog

Jackson Exit Device Corp.
3457 Union Pacific Ave., Los Angeles 23, Calif.

Please send us your catalog on the Jackson 20-330 closer.

Name
Company
Street
City
State

Available at all leading door manufacturers in the U. S. or contact your architectural hardware consultant for complete details.
In any doorway, Kinnear provides an unbeatable combination of lower door costs, extra protection and higher efficiency. Kinnear's upward-acting curtain of interlocking slats (originated by Kinnear!) coils compactly above the opening. All space around doorways is fully usable at all times. The curtain opens completely out of the way, closes to give you a rugged all-metal curtain of protection against wind, weather, fire, and vandals. 50 years and more of continuous, daily, low-maintenance service have been recorded for many Kinnear Rolling Doors. They're also REGISTERED — all parts of every Kinnear door can always be accurately duplicated from master details kept permanently in fireproof vaults. Get all these Kinnear Rolling Door benefits and more; write for this new 1961 catalog.

The KINNEAR Manufacturing Co.

FACTORIES: 1640-60 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, California
Offices and Agents in All Principal Cities

BUILDING'S NO. 1 CONTRACTOR
continued from page 172

—for every phase of the operation. In its seven fully staffed offices across the nation, Fuller executives are authorized to take on jobs as their facilities permit and to draw on the talents of the main New York office, or any of the others, for services. The emphasis throughout is on teamwork and coordination, not only within the company but with client and architect. As one architect with long experience working on large Manhattan skyscrapers says: "The one thing that really distinguishes Fuller from so many other contractors is its wholehearted attitude of cooperation with the architect." Another architect adds: "Crandall understands design and respects the architect's position—and he will fight for the architect's ideas."

Architects generally like the idea of working with Fuller, too, because they know its top people are experienced and well-trained in building skills. "In too many contracting companies, construction is in the hands of money men rather than engineers," says one architect, "and Crandall always impresses clients with his all-round savvy. On one job he did with us, he looked at the plans for a couple of days, then came to a session with other prospective contractors and stole the show. He had learned as much in a couple of days of looking at the plans as we had in all the time we took developing them, and he started in building it before the client's very eyes. He is a good salesman because he knows what he is talking about."

Crandall and Daly are looking to the future now, as the great New York office-building boom that has carried them to the top of their business shows signs of leveling off. "We have a lot of other things going on," Daly says, "like the UN library, Lincoln Center (a joint venture with several other contractors), five department stores, and a great variety of small projects. Although we are noted for big jobs, we do many smaller ones, though seldom one under $1 million. But if the proper client asks me, I'll go put in a single window for him."

The proper client might be any of the many clients who have done repeat business with Fuller, perhaps as good a measure of customer satisfaction as can be found. Some 59 per cent of all Fuller's business is repeat business, and one client has asked Fuller to build a total of 26 buildings of various types and sizes for him over a period of 16 years.

*New York, Boston, Chicago, Dallas, Los Angeles, Pittsburgh, and Washington.
New **PAN-L-ART**

**sculptured wall blocks**

**LIGHT WEIGHT • SOUND ABSORBING • BEAUTIFULLY TEXTURED**

New, dramatic wall acoustics by Tectum Corporation offer a fresh decorative expression in sculptured deep-shadow designs. Wood fiber Tectum is insulating, structural, fire safe and durable. New 12" x 12" blocks, 1" thick, are offered in fifteen design patterns and a choice of four colors. Now you can have the prestige and drama of carved stone at a fraction of the weight and cost; easily installed with ordinary adhesives. Complete color specifications on request.

**Decorative Division**

**TECTUM Corporation**

535 East Broad St., Columbus 15, Ohio
The plans for Delta College, now under construction in the "Golden Triangle" area of central Michigan, call for the most modern educational facilities and best construction methods. That's why masonry joints on the Delta College buildings are being reinforced with Keywall for added strength, greater crack resistance. The contractor on the job, states: "Delta College is being constructed of the finest materials available and we feel that one of the better crack-resisting reinforcement products on the market is Keywall."

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS
KEYWALL • KEYMESH® • KEYCORNER • KEYDECK • WELDED WIRE FABRIC • NAILS
Located in a fast-growing, industrialized section bordered by Bay City, Saginaw, and Midland, the Delta College is one of the first in the U.S. to be financed by a multiple county tax program. One of its many unique features is a closed-circuit TV studio which will originate educational programs throughout the school and neighboring communities.

For buildings that stay young throughout the years, rely on Keywall galvanized masonry reinforcement. Masons find Keywall easy to handle, easy to adapt to a wide range of applications. It can be lapped at corners without adding thickness to joints. Full embedment and complete bond assure effective reinforcement. Comes in 4", 6", 8", 10", and 12" sizes.
in new finishes...
Distinctive! Decorator-smart! Plywall now offers four new wood-grain paneling finishes to add new beauty, new richness to any installation.

in cost-saving quality...
Poly-Clad Plywall wood paneling—available in a selection of twelve different finishes—provides a lasting quality touch, with low initial cost, little or no maintenance costs. Prefinished. Ready to go right up.

in care-free wearability...
Poly-Clad protected to resist mars, scuffs, stains. Guaranteed against fading, delamination and structural defects—in writing. Stays beautiful without bother, for the life of the installation.

in matching moldings...
Prefinished matching moldings, in ten styles and twelve finishes—save costs, accent the quality look. Perfect for any room decor—paneled, painted or papered.

Let us show you how beautifully Poly-Clad Plywall can fit your paneling needs—for less. Mail coupon today.

Plywall Products Company, Inc.
P. O. Box 625 • Fort Wayne, Indiana
Please send me current literature on Plywall's complete line of prefinished products.

Name ____________________________________________
Title ____________________________________________
Firm ____________________________________________
Address __________________________________________
City ____________________________ Zone ________ State ________

A subsidiary of Evans Products Company
enough, a big one—which is a synthesis of spatial doctrines and structural convictions which belong to no century but the twentieth.

What counts is not the grandeur of the synthesis (although this one is far from negligible), but that a synthesis can be achieved, against great odds, in a period supposedly doomed to anarchic, neo-Baroque “sensualism.” The premise of the plain-spoken Coliseum is not Saarinen’s striving personalization of eloquent forms, still less the deliberate energizing of space which can be witnessed in his Yale rink. On the contrary, the Coliseum displays manly adherence to the “objectivity” of Mies and the “correctness” of Nervi. This is to name only two teachers (the Coliseum’s architects have had others) who, in an age of reviving rhetoric, believe that syntax should come first. The effect of this philosophy on the design of the Coliseum is as unmistakable as the sinewy curve of the oval following its organic path—a path which Nervi helped chart—through Miesian “universal space” which the individual is free to make his own.

Either master could have done better with this building, as the architects themselves abundantly could have, too. But a quick tour of the grim basement accommodations, “dedicated to the advancement of the cultural opportunities of the community,” gives evidence of how far a representative American community has to go before it appreciates its responsibility in such matters. Here, money ran out. The coarsely finished structure, the cheapened detail, the almost incredibly ugly furniture, are the same in room after room.

Of the entire characterless ensemble in the basement the brutal exhibition hall—once envisioned as a glistening dome—is perhaps the most disheartening. Near it, facing on a sunken court which has the look of a prison yard (16), is a cell which at first is taken for simply another meeting room but then appears—because of an altarlike table in front of the ranks of folding metal chairs—to be the chapel of some impoverished dissenting sect. In truth, this is the single formal memorial, in all the vast structure, to Portland’s war dead—to whom the Coliseum is ostensibly dedicated. This, for the time being, is all that has been deemed necessary by the city; and the architects have not been able to do anything more.

But in the great hall above, as the seasons change, and the summer sun fills the space with golden light, the dead have been commemorated with a gift of life, and the vivid air is signed with their honor.
NOW...a true natural-fissured acoustical tile for 2-hour fire-rated ceiling assembly

NEW FISSURED PROTECTONE* MINERAL FIBER TILE
...A CELOTEX EXCLUSIVE

Bringing you all the traditional beauty and authentic character that only natural travertine fissuring provides.

Not too bold, not too delicate... new Celotex PROTECTONE® Mineral Fiber Tile offers unusual design opportunities for architects seeking distinctive near-monolithic travertine appearance and high sound absorption for ceilings requiring 2-hour fire-rated assembly.

Call your Acousti-Celotex distributor for samples, specifications, expert Ceiling Consultation Service. He's listed in the Yellow Pages.

*Trademark
Natural fissured PROTECTONE® Mineral Fiber Tile. Butt edge, 12" x 12", kerfed for concealed H & T suspension system. One of the family of Celotex fire-rated acoustical products.


The Celotex Corporation, 120 S. La Salle St., Chicago 3, Ill.
In Canada: Dominion Sound Equipments, Limited, Montreal, Que.

If it's "by CELOTEX" you get QUALITY... plus!
Arkla-Humphrey Multi-Directional unit heaters are accepting congratulations now. At long last, industry's toughest heating problems have been solved by the Multi-Directional!

Tests show a 15.38% fuel saving with only a 3° temperature differential from floor to 18' ceiling! Smoke photo above shows you why. The Multi-Directional is the first and only unit heater to discharge heat straight down, out in front, or from either side, or any combination of these three! Pulling the heat from the ceiling with top mounted fans eliminate overheated ceilings, too.

Write for complete information.
"THE ENTIRE HEATING, COOLING AND PLUMBING SYSTEM IS DEPENDENT UPON B&G® PUMPS"

The dual-temperature heating and cooling system of this history-making high-rise is designed around the circulation of hot or chilled water to various room air handling units. This water is circulated by two B&G U-13T Universal Pumps.

Says Albert Weiss, president of General Piping, the mechanical contractors: "The entire heating, cooling and plumbing system is dependent upon B&G Pumps—a total of 12, including two High-Velocity Boosters and two Universal Pumps.

"After the system was put into initial operation and all minor adjustments and servicing performed, we have had no service call-backs to date.

"This freedom from maintenance problems on all water circulation, as well as quietness of operation, are the main reasons why B&G Pumps were specified and why the contractor enjoys installing them."

B&G Pumps are designed and built specifically for heating and cooling systems. That explains why, in mass housing projects or single dwellings, over 3,000,000 are in service in such systems today.

**BELL & GOSSETT COMPANY**

Dept. GP-42, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong, Ltd.
1400 O'Connor Drive, Toronto 16, Ontario
The F.D.R. Memorial competition—pro and con

Whatever else it has done, the recently concluded design competition for a Franklin D. Roosevelt Memorial in Washington, D.C. (Forum, Feb. ‘61) has elicited strong, and articulate, feelings, the preponderance among architects and critics being apparently favorable. Among the views stated are those of the competition’s jury chairman and its professional advisor; a minority juror, asked for his dissenting opinion, declined on ethical grounds.

ELOQUENT FORMS

Forum:
The general reaction of the public to the F. D. R. Competition has been rather negative. The Roosevelt-haters seem to have considered this a fine opportunity to vent their repressed feelings. Others have found it easy and smart to use ridicule. I am not surprised.

Maybe this is not the greatest design that could be conceived, but it is as good as can be produced by a society such as ours whose values have not conspicuously been in the realm of imaginative visual expression. I still would guess that the contribution it makes will appear in future times to have been greater than we are now able to assess. First of all, it is the first design produced under competition for a Congressional committee. Here an attempt has been made to find new symbols, to advance from derivative to creative expression.

Ours is certainly not an age of monument builders. Even utilitarian architecture as an art is faltering in many directions; but somehow and slowly there seems to emerge on many fronts an awareness that a society to be great must take into account other and higher values than the ones which have prevailed thus far. The theater, music, the visual arts at all levels are beginning to flourish. Other nations of the world are looking to us for leadership in architecture and the arts, not only because we have the means but also the variety of situations and people and the freedom and opportunity to explore, to test, and even to make mistakes. This competition shows how the government can encourage creativity without dictation.

It is unfortunate that, of the many top-ranking designers in the country who have spoken to me with approval, none has so written to the F. D. R. Commission or to the papers. I wish that they had, because their opinion, convincingly expressed, may be all that is needed to sway the opinion of the many who are often hesitant to accept new ideas.

The winning design is as good as can be produced today. Whether that is good enough is for someone else to decide, but I point out that perfection grows from self-confidence and this in turn needs a climate of freedom to exert. It is an appropriate solution because it is basically a landscape solution. The steles complement the lovely trees on the fringe of the peninsula; they compose with them; their shapes do not compete with the other three memorials; they are transparent and changing; yet visible and eloquent. As forms they are better than any of the more literal entries where sculpture constitutes the main idea.

PIETRO BELLUSCHI
Chairman of the Competition Jury
Cambridge, Mass.

EXCELLENT SCULPTURE

Forum:
The F. D. R. competition results bring into focus the whole problem of monuments and memorials in this age of unbelted, nameless, anti-tragedy.

We cannot, inside ourselves, see any need for the externalization of a feeling we can no longer feed. All architects therefore are ill at ease before the task. The jury was obviously ill prepared; the prize winner. I certainly agree with them in spite of my own minority contribution of a low-domed building to fit between, and in scale with, the Lincoln and Jefferson Memorials. For the prize-winning team, it seemed essential to deny architecture; essential to make sculpture very, very large in order to avoid architecture. The resulting sculpture I like. The balance of slabs is excellent in placing and in change of shape and size. The grouping has some of the space feeling of a Giacommetti “Place.” It is an appealing type with overtures of Stonehenge, totem-pole groups, San Gimignano. I congratulate the jury.

I am glad it is not a “useful” memorial; indeed the lettering on the towers of ghost-written speeches, unreadable anyhow at that height, should be left off. I wonder only about the scale: 105 feet of raw concrete between the marble Lincoln and the marble Jefferson.

I hope it will be built. I am worried it will not.

PHILIP JOHNSON
Architect
New York City

AN OPERA SET

Forum:
Organized chaos! Giant glistening white slabs against a blue sky—a good design for an opera set.

The F. D. R. granite gravestone at Hyde Park, designed by the late President himself, reveals his distaste for pretentiousness.

SAL GRILLO
Island Park, N. Y.

WENT TOO FAR

Forum:
If the winning design is not to go further, perhaps it should stop sooner. Viewed from the water, it is effective as a cluster of primitive shapes in the landscape. Viewed closely, the shapes are no longer primitive, they are sophisticated rather than simple, dynamic rather than static, poetic rather than natural. Their engineering is exhibitionist. Gone is the elemental simplicity of a circle of giant slabs surrounding a clearing in the forest. Gone with it is the profound quiet in which words carved in stone speak loudly. In this instance, stopping sooner means using more primitive structure and possibly achieving more effective architecture.

It is unfortunate our architectural ideas are not powerful enough to dominate our engineering. It is unfortunate we are architecturally too unimaginative to express the character of a man in architectural terms.

HARWELL HAMILTON HARRIS
Architect
Dallas, Tex.
for his life was nothing if not a cheerful battle—in many ways a victory—against tragedy. Yet in spite of the rich potentialities of the program, the designers largely produced melodrama or watery sentimentalism. (That symbolic field of wheat, for instance, should have been, frankly, corn.) The mournful winner is not, I hope, the harbinger of a neo-celtic revival. This outsized Stonehenge, whose primitiveness of concept is in direct opposition to P. D. H.'s own high degree of civilization, needs only canned recordings of barbarian dirges to make it a more obvious failure.

ALLAN TEMKO Architectural critic Berkeley, Calif.

ORIGINAL AND GOOD

Forum: Pedersen & Tilney's winning design is not fully convincing, but its approach is original and good. I like the fact that it has a third dimension, a volumetric consistency, without being a “building” enclosing a static portion of space. It has been stated that it is literature, and not architecture; that it is a memorial not to a man, but to his writings and speeches; finally, that it is anonymous. Perhaps. But if you take Lincoln's statue out of his memorial, and you put a statue of somebody else in its place, don't you have a memorial to somebody else? And what is a man other than his ideas, messages, and inspirations? Roosevelt was not a simple man, and you cannot have a memorial for him based on a simple symbol. This is one of the very rare cases in which I happen to agree with a jury. I feel relieved and happy.

BRUNO ZEVI
Rome, Italy

NOT THE STERILE MOLD

Forum: Because the winning design is based on principles other than those of Euclidean geometry and constructed perspectives, the usual means of representation fail to convey its most significant qualities. The photographs so far available give a very inadequate idea of what it is all about. Anyone who has not seen both models is at a severe disadvantage in forming an adequate critical opinion.

I have trouble in understanding what was wanted by those who object to the "wide-open program." It seemed to me that the report by the advisory committee, which was incorporated in the program, set the utmost possible tone for the entire undertaking, and that anything more would simply have been the imposing of an individual prejudice on all the designers.

There is no doubt that it is difficult for the 573 losing competitors to accept wholeheartedly someone else's solution for the same problem. Certainly the losers don't have to like the winning design, but they do have an obligation to subject themselves to the discipline of being as objective as they possibly can.

EDMUND N. BACON
Professional adviser to the competition Philadelphia

WHAT HAPPENED?

Forum: What has happened to architecture?

I was trained in the classics and still find beauty in the Egyptian, the Greek, and especially in simplified modern classic buildings.

The Stonehenge design seems to me to have been conceived as a Norwegian Parliament meeting place and it is the best idea in the latest competition. But the handling of it lacks the quality of architecture in both beauty and practicality. Perhaps the fault lies in the jurors.

ROBERT NORDIN
Architect
San Francisco

PHOTOS NOT ENOUGH

Forum: The winning design alone created unity combined with multifocal centers of interest, and a space which contained the spectator without alienating the landscape. The conception of Roosevelt's mind as portrayed by his words (not his body as portrayed by a statue) is surely a good concept, especially since the memorial is to a statesman, not a sportsman.

JANE R. BREW
Architect
Cambridge, Mass.

LITERARY, PICTURESQUE

Forum: Our architecture lacks an unself-conscious, authoritative language, due largely to our obsession with individualistic expression rather than with epic values. Furthermore, the disquiet of modern man about himself, illustrious personages and causes, inhibits the heroic stance commonly associated with the monumental.

A monument to F. D. R. must be a memorial to life, to construction and to purpose. I find the tablets in the winning design embarrassingly literary. Roosevelt was not a law-giver like Moses or Mohammed, or even Lincoln. I question whether the picturesque grouping and shaping of elements will, when unraveled in time, possess more than scenic qualities which will determine a more durable power.

G. M. KALLMANN
Assistant professor of architecture Columbia University New York City

RESTLESS MOVEMENT

Forum: The most interesting aspect of the winning design is the provision for movement over the stepped and tilted floor planes, together with the changing vistas of distant landscape which this movement brings. Unfortunately, however, the treatment of the immediately surrounding landscape, with its loops in the A. J. Down- ing manner, while banally fitted to the peninsula, hardly accords with the staccato angularity of movement within the Stonehenge precinct.

A feeling for the earth under­ scores the primitive, elemental quality sought by all finalists and near finalists. In most of the projects, the primitivism appears in uneasy alliance with constructivism. The embarrassment of the modern movement in confronting a monumental commis­ sion also appears in the failure to approach the problem as a building. Architectural landscape and sculpture predominate. Yet this competition is richly suggestive for the monumentality which must come. Despite my serious reservations about it, the jury's choice seems to have been the right one.

WILLIAM H. JORDY
Art department Brown University Providence, R. I.

STRIKING PROOF

Forum: The competition was based on one of the most unusual and stimulating programs ever issued. The entries were of very high caliber and varied in theme. The winning design combines, in an appropriate and monumental composition, the enclosed yet open space reminiscent of the ancient temple themes of Lincoln and Jefferson, and the height, majesty, and sculptural interest of the Wash­ ington memorial. Roosevelt's writings, immortalized on its stone monoliths, seem to define the man more clearly than any statue.

Here is striking proof that to­ day's architecture can produce a monumental memorial of out­ standing merit! I sincerely hope that the folder and superficial criticism of the type that always pours forth when any new and great idea in music, art, or archi­ tecture is first produced will not stand in the way of its final realization.

MORRIS KETCHUM JR.
Architect
New York City