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ARCHITECTURAL FORUM THE MAGAZINE OF BUILDING

PUBLISHER'S NOTE

As a service to readers-and to advertisers-Forum is launching something new this month. The last four pages of the magazine constitute what is perhaps a unique invention in publishing-a combination of manufacturers' product announcements and prepaid postcards. A reader interested in receiving more details about any product mentioned need only tear out the corresponding perforated postcard, fill in his name and address, and drop it in the mail. The card is addressed to the manufacturer, who should receive it within a few days and promptly dispatch the requested information.

This service is unlike that offered by other magazines. They usually provide the reader with a single coupon on which he must check off his interests in many products, and the coupon then goes to the publisher for processing. This is a time-consuming process, usually handled by an outside agency, and the inquiry often does not get from the reader to the manufacturer for several weeks

The FORUM service, on the other hand, is direct between reader and manufacturer and should take no more than two or three days, if the postal people do their part. Another big difference is that FORUM's advertisers pay for this service and should therefore be keenly interested in receiving and servicing inquiries.

Speaking of reader services, once each year FORUM's editors compile an index of all the major articles which have appeared in the magazine during the preceding 12 months. The index for the

period January-December 1962 recently came off the press, and while this index is intended mainly for the use of the 800 libraries, professional clubs, and industry associations which subscribe to FORUM, any reader may have a copy by asking for it.

* *

Among FORUM's other reader services is the availability of various kinds of lists which are maintained by the editors-lists of architectural photographers, lists of architects (compiled geographically, alphabetically, and by scope of practice), and lists of books on various building subjects. Several thousand copies of these lists were sent on request to readers last year.

Readers are also welcome to the market research material prepared by FORUM mainly for the manufacturers of building products. For example, many architectural schools have written in for copies of the chart titled "The Building Construction Market-How It's Concentrated and Covered."

The editorial content of the magazine is, of course, FORUM's main line of reader service, but not everything the editors know is published in the magazine. If you want more, let them know. And, if you would like to see more (or less) of certain subjects covered in FORUM's editorial content, there is an easy way to make your wishes known. The editors have reserved for this purpose one of the prepaid post cards on page 220. They invite you to use it.

-J. C. H. JR.

-14911

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165 BOOKS



Aracon Laboratories, a division of Allied Research Associates Inc., Concord, Mass. Owner: Robert and Norman Leventhal. Architect: Samuel Glaser Associates, Boston. Interior Designer: Hans Krieks Associates, Inc., Boston. Mechanical Engineer: Stressenger & Adams, Newton Highlands. General Contractor: Beacon Construction Co., Boston. Ceiling Systems Contractor: Armstrong Contracting & Supply Corp., Dorchester, Mass.

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N.Y.C. vs. Seagram building (below) First quarter construction shows gain (page 7) Big change due for Boston (page 9) Mass transit bill gets through Senate (page 11)

NEW YORK COURTS UPHOLD TAX ON QUALITY

The Manhattan office tower shown at right can be thought of in two ways. As an expensive building on a prime site, 375 Park Avenue is a most obviously taxable piece of real property. As an example of urban architecture, the Seagram Building by Mies van der Rohe and Philip Johnson is generally agreed to be the best thing that has happened to the city in decades. Some weeks ago, the second highest court in the state of New York managed, in effect, to combine these views —and decided that both the building and its quality were subject to city real estate taxes.

By upholding a new tax category for prestige buildings "specially built to suit the tenant," this startling decision promises to do more than penalize good architecture. It also provides a virtually unprecedented basis for assessing this type of commercial office structure: namely, construction (or reproduction) cost. Thus future as well as past buildings of quality could be penalized, and mediocrity almost certainly encouraged. How did this happen?

To assess quality buildings, find the prestige value

Some time ago, Joseph E. Seagram & Sons, Inc. discovered that the Tax Commission of the city of New York was treating 375 Park Avenue in an unusual way. The land tax had increased by 31.5 per cent over a six-year period while comparable land taxes across the avenue had gone up only 5 per cent.

Similarly, the building was assessed at an unusually high figure for a building in the area*. Instead of determining its worth as an investment by capitalizing its net rental income, it turned out the Tax Commission had based its appraisal on reproduction cost. This, Seagram noted, meant that the time-tested methods of fixing a building's market value were being disregarded.

Market value is generally found

*This can be seen by comparing the building's tax assessment per square foot of rentable floor space with that of two other Park Avenue buildings. Seagram pays \$33.08; the prestigious Lever House pays \$25.53; and the Uris-built Colgate-Palmolive headquarters pays \$17.74. On a prime location on 42nd Street in the heart of Manhattan, the Socony-Mobil building pays \$22.69.

by capitalizing the net rental income (usually at 6 per cent), depreciation (usually at 2 per cent), and land (usually around 5 per cent). Using this method, Seagram contends that its building is worth some \$15 million, and the land some \$2 million. The Tax Commission feels that reconstruction cost reflects a truer value, and based its entire case on this point. According to the city, the property is worth \$26 million (\$21 million for the building, \$5 million for the land). The difference between these two appraisals costs Seagram approximately \$383,000 per annum in extra taxes.

Seagram took the case to court, where the Tax Commission was confirmed in its assessment. Seagram then appealed to the Appellate Division, but was unanimously turned down by the five judges sitting. Apparently neither court could get over the fact that a responsible company would spend \$36 million on an



edifice (which Seagram actually paid, plus \$5 million for land), and then ask that it be assessed at a maximum of \$15 million, using market value. The judges therefore decided that the building must do more for its owners, in an economic sense, than conventional structures, and thus must be treated differently.

Some questions immediately arose. If traditional market value is inapplicable, how *can* the property be appraised? Wrote Justice Breitel of the Appellate Division: "Given a profit-minded owner with available experience and resources, and a competent builder, the cost of construction is likely to represent the value of the newly finished product. Consequently, in the absence of creditable qualifying explanation, for a new building the cost of construction is *prima facie*, the true value."

Justice Breitel explained the discrepancy between construction cost and capitalized rental income (market value) by the extra economic functions of the building: prestige and advertising value, as well as choice and control of office space. "The prestige value," said Breitel, "has a rental value not based on commercially rented space, but on the building's value in promoting the economic interests of an owner. Thus, the owner . . . is investing in a real estate project that will contribute to the production of income in its principal enterprise." The worth of such property, he added, could be related to "owner occupancy

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- CONCRETE REINFORCING BARS Spencer & Lee Architects, San Francisco, California

WELDED WIRE FABRIC REINFORCEMENT Hellmuth, Obata & Kassabaum, Inc. Architects, St. Louis, Missouri

STEEL PLATE Harry R. Powell-Bjorn A. Stiansen Consulting Engineers, Seattle, Washington International Engineering Company, Inc. San Francisco, California

DRAWN WIRE **P. W. Freitag, Jr. and L. S. Kraft** Designers,
The Goodyear Tire & Rubber Co., Akron, Ohio

STEEL BARS Hugh Acton Designer-Manufacturer, Birmingham, Michigan

- STEEL SHEET OR STRIP Henry Dreyfuss Industrial Designer, New York, New York Walter Furlani and J. W. Stringer Designers, IBM General Products Division

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of principal or prestige offices with choice space, the continued power to control its choice of space, and, most often, identification by name of the building with that of the owner." Wisely, Breitel noted the difficulty of attributing the extra value to the real estate rather than to business good will. Despite this, and other difficulties of taxing intangibles, the court finally reasoned that the city's new method of "reproduction cost, less appropriate adjustments" (e.g. depreciation, vacancy factor, and tenant changes), would fix a

just appraisal for the building.

Where the line between "specially built" edifices, and speculatively built office structures bearing tenant names, will be drawn by revenue-pinched New York City, no one can accurately predict. Seagram hopes to take its case to the New York State Court of Appeals. Meanwhile, the general urban public—no less than architects, accountants, and realtors—were left wondering whether real estate taxation had not suddenly entered the realm of architectural criticism (see *Editorial*).



GAY GERMAN PAVILION WINS 1963 REYNOLDS ALUMINUM AWARD

The \$25,000 R. S. Reynolds Memorial award is given annually for "distinguished architecture with a significant use of aluminum." This year's winner fulfills both requirements admirably—with an accent on the latter: as the pavilion of West Germany's Aluminum-Zentrale at the Hannover Fair, it not only shows off aluminum as a structural material, but also houses an exhibition of other uses of the metal. and Editor Hans Maurer (with Ernst Denk, associate), the triangular pavilion is suspended over a fairgrounds lake by steel cables leading from a 65-foot aluminum mast. Its roof is a space frame of aluminum tetrahedrons interconnected by aluminum tension members.

The jury which chose this neatly flamboyant building: Architects Eugene J. Mackay, John Lyon Reid, Max Abramovitz, John B. Parkin, and R. Max Brooks.

Designed by Munich Architect

WYOMING, GEORGIA REAPPORTION VOTES

Widely hailed as a method of giving city-dwellers an equal vote in state legislatures, reapportionment action has been taken in some 15 states. The latest: Wyoming and Georgia. Unlike most states, however, Wyoming's redistricting favors rural areas even more than before: from a total of 27 state senators, it subtracts two —both from urban areas.

give up its "county unit" system whereby the candidate who wins 'a majority in a county also wins all the county's unit votes. One result: U.S. Senators Herman Talmadge and Richard Russell, with an eye on transit-hungry Atlanta's many votes, backed the President's mass transit bill in the Senate vote (see page 11).

Georgia, in late March, had to

NEW CONSTRUCTION EXPENDITURES, FIRST QUARTER 1963 AND 1962

	(millions of dollars)			1962	% Change
	Private	Publi	c Tota	Total	in Totals
BUILDING CONSTRUCTION	12 4 13	Carses II.	1.00	11 4.78	
Industrial	\$704	\$98	\$802	\$768	4.4
Office and warehouse	652		652	554	17.7
Store, restaurant, and garage	461		461	505	-8.7
Religious	226		226	229	-1.3
Educational	145	668	813	819	-0.7
Hospital and institutional	232	93	325	294	10.5
Social and recreational	145	38	183	192	-4.7
Public administrative and service		128	128	143	-10.5
Apartments	894	95	989	869	13.8
Hotel, motel, and dormitory	374	84	458	425	7.8
All other building	177	266	443	425	4.2
TOTAL	\$4,010	\$1,470	\$5,480	\$5,223	4.9
HOUSE CONSTRUCTION	3,790	24	3,814	3,686	3.5
OTHER CONSTRUCTION	1,411	1,957	3,368	3,077	9.5
TOTAL CONSTRUCTION	\$9,211	\$3,451	\$12,662\$	11,986	5.6

SOURCE: BUREAU OF THE CENSUS AND MILES L. COLEAN ESTIMATES BASED ON CENSUS DATA. FIRST QUARTER CONSTRUCTION UP AGAIN

Total U.S. construction volume, despite decreases in several individual categories, rose 5.6 per cent in the first quarter of 1963 over the comparable period last year. There are, however, changes in the composition of the increase.

In 1962, apartments led the upswing. Now, that particular boom has abated in terms of spectacular year-to-year growth. Apartment building, nevertheless, went up significantly this year over last.

The most startling rise of the past quarter, however, was recorded in office construction—up 17.7 per cent over 1962. Dollar volume is the highest reported in the 1960s for the first quarter (see "Office Boom," pages 114–119).

More new hotels are also being built, despite a vacancy rate that steadily inches up in most major cities. Industrial building is increasing, too, though the total dollar volume of construction is still below that of two years ago. In this category, the outlook is considered good (FORUM, Dec. '62); corporations plan a capital expansion program of about 5 per cent above last year's level, according to reports released in March by the Securities & Exchange Commission and the Department of Commerce.

Plenty of mortgage money

A key factor in the continuing good health of the building boom is a solid supply of mortgage money. At present, there is such a high rate of mortgage lending that the competition among investors for loans has become fierce—and perhaps dangerous. Warns Economist Leo Grebler: "There is a real question whether such a large volume of lending activity can continue without increasing deterioration of the quality of mortgage credit, more severe and costly loan servicing problems, and still higher rates of defaults and foreclosures."

The price index for all construction materials remains about constant (0.1 per cent below last year's figure). Labor costs, however, offset the decreases as they rose by a similarly small figure (approximately 0.7 per cent). Spring and summer negotiations are still ahead, and one source feels that new contracts will cause labor wages to move up by as much as 4.8 per cent above current levels. The E. H. Boeckh indexes for all types of building show that New York remains the most expensive place to build in the nation, with Detroit, St. Louis, San Francisco, and Cleveland also high.

A recent FORUM survey of building permits issued in 1962 indicates which cities will probably do the most building in 1963: Los Angeles, New York, and Houston lead the nation, followed by Chicago, Dallas, Honolulu, and Philadelphia. Three California cities— San Francisco, San Diego, and San Jose—round out the top ten. Washington, D. C., which ranked among the leaders for the past few years, slipped to sixteenth place.

7



STRUCTURAL DESIGN NEWS

FROM BETHLEHEM STEEL

NO. 1

BOOM IN STEEL FRAMING FOR MEDIUM- AND HIGH-RISE BUILDINGS . . . It began with the introduction of ASTM A36, which slashed the cost of steel construction. Other new, money-saving steel products, plus the revised AISC design specifications, plastic design, and composite design . . . all these things have convinced architects to take a second look at the economy of steel construction.



Brickell Town House, Miami

THE DESIGNERS OF BRICKELL TOWN HOUSE, 21-story Miami apartment, report they chose steel framing for <u>economy</u>. Its all-welded A36 frame, designed to withstand hurricane-force winds, is 50 per cent lighter than concrete . . . saved an estimated 600 foundation piles.

ARCHITECTS FOR THE CRYSTAL HOUSE, Arlington, Va., report "substantial" savings with steel. They used Bethlehem's V50 (50,000 psi-yield) steel for columns through the sixth floor of the 12-story buildings, to keep column dimensions uniform. Balance is A36 steel. DENVER ARCHITECTURAL FIRM, which formerly designed apartments exclusively

in concrete, has now designed their last eight with steel--for economy. A typical case is the eight-story Saturn Towers Apartments in C o 1 o r a d o Springs. It was



estimated at \$2.35 psf in concrete flat slab...it cost only \$1.94 psf using A36 steel and Bethlehem's Slabform steel centering over open-web steel joists.

600 BROADWAY OFFICE BUILDING, Corpus Christi, Texas, went steel for economy. A36 welded steel frame, 15 office floors over a six-story garage. Steel saved three months, slashed foundation costs, added usable floor area.

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NEW STEELS, NEW DESIGN CRITERIA... make steel framing more economical than ever before. Call in a Bethlehem Sales Engineer when you're in the early design stages. He's a competent professional. He can point the way to savings of time and money. Interested? Get in touch with the Bethlehem Office nearest you.



(Names of the architectural and engineering firms responsible for the projects named above will gladly be furnished on request.)

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. Export Sales: BETHLEHEM STEEL EXPORT CORPORATION



BOSTON DISPLAYS ITS GOVERNMENT CENTER

On April 2, a crowd of notables gathered in Faneuil Hall to get the first glimpse of how Boston's \$185 million Government Center redevelopment area would look when completed (model photo above).

Unveiled as part of the scheme was a \$20 million, 35-story private office building designed by New York Architect Edward L. Barnes for Cabot, Cabot & Forbes (1). Also shown for the first time in final form was the State Services Center (2). This \$34 million structure comprises the Employment Security Building (by Shepley, Bullfinch, Richardson & Abbott), the Health, Welfare and Education Building (M. A. Dyer and Pedersen & Tilney), and the Mental Health Center (Desmond & Lord and Paul Rudolph).

The other buildings (previewed earlier) include: the competition-winning City Hall (3) by Kallmann, McKinnell & Knowles; the siamese twin-towered Federal Building and annex (4), designed by The Architects Collaborative and Samuel Glaser Associates; the curved private office structure by Welton Becket Associates (5); and the private office tower (6) by Emery Roth & Sons.

On the same day as the Government Center model was displayed, the Boston *Traveler* published a lengthy blast aimed at the Boston Redevelopment Administration's \$300 million renewal program. Indirectly, the chief target was redevelopmentminded Mayor John F. Collins, who is up for re-election this fall. Directly criticized were such aspects of renewal as relocation and financing problems. The ability of Boston to absorb the new office space around the Government Center was also questioned.

Gentle praise, however, was more usual. The BRA, and others, noted that construction of the City Hall, State Service Center, and Federal Office Building will start this summer; what used to be decrepit Scollay Square land has already been cleared under the nation's first early land application; and the Boston rapid transit system is extending to the terraced central plaza.

Planned, but not yet designed, are a 2,000-car parking garage (7), and a motel-office building (8). The overall plan was executed by I. M. Pei, and somewhat modified by the staff of Boston Redevelopment Administrator Edmund J. Logue.

About two weeks after the Government Center model went on display, the project was the subject of public hearings. Despite the *Traveler's* sharp attack, few objections were voiced. Support, however, came from such sources as a building trades-union spokesman, who rapped "critics who have no faith in the future of Boston," and the local Chamber of Commerce.

THE REAL ESTATE SYNDICATORS RETRENCH

Over the past months, publicly held real estate syndication companies have been in trouble of one sort of another. Louis J. Glickman, acknowledged king of the syndicators in the 1950s, was found to have amassed, through his syndicating operations, personal debts in excess of \$13 million. Sure Plan, Inc., headed by the now-indicted Albert Mintzer, became involved in a morass of legal action. Such leading corporations as Futterman, Tenney, and Walter J. Schneider have announced drastic cuts in dividend payments. Then the office of the Attorney General of New York State published a significant fact: one of every three 1962 New York syndication offerings has been withdrawn, for a variety of reasons-including the Attorney General's request for additional disclosures, and warnings, to investors. The Securities & Exchange Commission has rapped some syndicators for their speculative ventures where "the investors' risks are substantially increased." And most recently, both the Schneider and Glickman firms announced plans to change their names (to Barrington Industries, Inc. and the Franchard Corp).

Something was wrong. But was it a weakness of real estate as an investment, or a problem confined to syndication? According to one Wall Street analyst, most publicly held syndicating companies "are not a high quality investment. Their payment of dividends-in fact, their whole financial structureis not secure, as it often comes from the sales of property." Said a mortgage expert: "Operating income from real estate remains at a high level. If some syndicating companies are in trouble, it is because of their inability to accept this level as sufficient." And a public opinion poll by Chase Manhattan Bank in 45 cities across the nation revealed that "real estate syndication companies and their purchase of marginal properties give a false impression of real estate values." All three opinions pointed to one fact: syndication can contain the

| seeds of its own downfall.

Its initial success was spectacular. But ever since 1960, safe high-yielding properties became increasingly hard to find, causing syndicators to compete strongly and pay inflated prices—for such properties, and to invest in more speculative ventures.

While the going was good, real estate syndication attracted stock buyers with regular, high disbursements and with the tax-free umbrella offered by the accelerated depreciation features of newly purchased buildings. This use of



a tax loophole has been frowned on periodically by the Treasury Department (News, May '62, and Apr. '63). When the stock market turned bearish last year, real estate stocks tumbled further than most others. Potential investors turned elsewhere, cutting off accustomed sources of new funds. Yet dividends and other payments had to be met, and properties were often sold to fill these obligations. The SEC, noting this in 1962, required that the syndicating companies publish quarterly reports differentiating between rental and sales income. In most cases, the results did not enhance the companies' appeal.

The easing up in syndication removes less money than might be imagined from the building industry. Syndicators tended to spin off existing properties—each time at a profit—between themselves to start accelerated depreciation schedules. The New York Attorney General's Real Estate Syndication Section reports that in 1962 "only about 10 per cent of the offerings proposed new construction, most of them cooperative apartment buildings." Much of what has been constructed ranges, in terms of architectural quality, from fair (see photo, previous page) to poor.

Though the volume of new syndication has certainly decreased in the recent past, it is equally certain that syndication is here to stay. Companies are retrenching. Some now pay dividends in accordance with funds derived from rents and fees. Others, like Kratter Corp., look to diversification into non-real estate ventures. Another example is provided by Walter J. Schneider Corp., which recently acquired two-thirds interest in a knitting goods company it had lent money to.

The last few months' review of syndication will probably result in a more regulated, less speculative industry. As the Wall Street analyst said, "This should have happened from the beginning."

U.S. CULTURAL ACTIVITY EXPANDS APACE

In Washington, D.C., the terms of six of seven members of the Commission of Fine Arts expire this month. After 20 years on the Commission, the last 10 as chairman, David E. Finley submitted his resignation to President Kennedy, who accepted it "with great regret." Speculation on new appointees immediately began. Said to be among the front-running candidates are Artist William Walton, Architects John Warnecke and George Holmes Perkins. Along with Landscape Ar-



Finley

chitect Hideo Sasaki, whom the President named last August, the new appointees are expected to bring a fresher outlook than their predecessors to the federal and District artistic problems they must review.

In an equally important development last month it became known that the President plans to create, by executive order, a Federal Advisory Council on the Arts.

The new Council was proposed in a bill introduced last year by



Heckscher BOB COMEL-LIFE

Representatives John V. Lindsay (R., N.Y.) and Frank Thompson (D., N.J.) (News, Nov. '62). But, as is the case with most such measures, this one never got out of the House Rules Committee. The sponsors polled the 15 committeemen and found that "apparently their constituents are not interested in the arts," and that the bill had "five, at the most, six votes." So Lindsay and Thompson went to the President to urge him to establish the Council by executive order. To lead the 12- to 20-man Council the President picked August Heckscher, Special Consultant to the White House on the Arts. Other members have not been named, but will be private citizens "widely recognized for their knowledge and experience in the arts."

Exactly what the Council will do, and what powers it will have, remains to be determined. But there are places to look for precedents: in 1960 the New York Legislature established its own State Council on the Arts, which



MacFadyen

is now beginning to operate smoothly. Directed by Manhattan Architect John H. MacFadyen, the 15-man Council supervises cultural activities ranging from subsidizing major performances for small towns to making a county-by-county survey of "architecture worth saving." Says MacFadyen: "The only agency in a democracy that can help foster the arts is the government, which ought to take this responsibility. And so we have the Council, which is simply trying to make it possible for more people to have more art if they want it-and they do want it."

The idea seems to be catching on elsewhere. Rhode Island already has an arts council, and California and Connecticut legislatures are considering bills to set up agencies of their own.

BRIEFS IN THE NEWS

Philharmonic Hall in Manhattan's Lincoln Center has drawn much criticism in music circles for the way it sounds. Despite the painstaking efforts of Architect Max Abramovitz and Acoustical Engineers Bolt Beranek & Newman (FORUM, Oct. '62), the music has been dry and brittle. To remedy this situation, Abramovitz called in four acoustical experts to complement BB&N. Their suggestions include: 1) raising and filling in the spaces between the "clouds" that hang from the ceiling and deflect sound; 2) backing up the stage with a solid material so that it forms an acoustical shell; 3) placing variously shaped surfaces around the hall to bounce sound into the audience.

The Senate last year, passed its Wilderness Bill to ensure preservation of the federal government's millions of acres of unspoiled land. The House, however, killed the bill in the last days of the past legislative session. The same pattern seems to be shaping up this year. Last month, the Senate once again passed its bill by a vote of 73-12 and sent it to the House, where its passage is uncertain, due to pressure from mining and lumbering interests.



NERVI DESIGNS ELEGANT STEEL SKYWAYS FOR SAN FRANCISCO

In an imaginative bid to recapture a market that is fast moving to concrete, the Kaiser Steel Corp. invited Italian Engineer Pier Luigi Nervi a year ago to design several elevated freeways for San Francisco. Nervi accepted, noting that multi-tiered highways are here to stay and can no longer be ignored as elements in city architecture. Nervi's five handsome designs were released in late March. In the one pictured above, intended for park areas, sculptured columns created by hyperbolic paraboloids lift the plant-bordered skyway 40 feet above the ground. The designs are now being considered for adoption by the California State Division of Highways.

SENATE APPROVES MASS TRANSIT BILL

The President's bill to aid mass transit in cities with populations of over 50,000 underwent some interesting twists in the past few weeks as it passed through the Senate Rules, Banking, and Commerce Committees, the House Banking Committees, and finally, last month, the Senate. Introduced with bipartisan support, the bill was aimed to help with the staggering problem of traffic congestion. Its sponsors, led by Sen. Harrison Williams (D., N.J.), realized that one of the factors contributing to the "rush hour crisis" was the federal highway building program, which brings more cars, faster, into town. The federal government, the sponsors reasoned, should therefore help untie the snarls.

As originally proposed, the modest measure would have provided \$500 million in federal assistance to transit systems over a three-year period (News, May '62). But, perhaps because this was the President's first important bill of 1963, almost everybody who could make recommendations has.

Rural legislators opposed the idea of subsidizing cities. Retorted Sen. Williams: maybe the big urban states which pay the most taxes "should sharpen our pencils" and take another look at strictly rural projects. Transit unions and the AFL-CIO wanted

safeguards to protect members' jobs. Secretary of Labor Willard Wirtz wrote in such a clausewhich was immediately attacked as not strong enough. Conservative Senators, headed by Barry Goldwater (R., Ariz.) and John Tower (R., Tex.), then held that Wirtz' clauses would promote "featherbedding" and similar practices.

One by one, the objections were overcome. The \$500 million in direct subsidies was supplemented by another \$500 million in federal guarantees on loans-then \$125 million was chopped off both programs. As it stands now, the bill goes to the House Rules Committee in this form: if operating revenue can pay for a transit system's expansion, the federal government will not get involved. If enough funds can be raised with the federal guarantee on loans, then the municipality can issue guaranteed (but not tax-exempt) bonds. And if this measure does not attract enough investors, the project can become eligible for two-thirds federal participation in the share that fare revenues does not cover

Outlook for the President's bill in the House is considered good. Last month the House, despite strong Republican opposition, passed Mr. Kennedy's equally controversial \$450 million public works appropriation to stimulate the economy in depressed areas.



NEEDED: TRADING STAMPS FOR A CHAPEL

Neat, attractive prison chapels | may not be the rarity they once were, but none have been so unusually financed as St. Jude's With- N.Y., the \$150,000, 400-seat Cath-

in the Walls (model photo above). To be built at the Eastern Correction Institution in Naponoch, olic chapel is funded mainly by gifts of trading stamps. So far, approximately one-third of the goal of 100,000 books (representing food-store sales of around \$12 million) have been collected from families and friends of the inmates. Trading stamp companies have agreed to redeem the stamps for cash

The hexagonal shape and banked pews of the chapel, designed without fee by Architects Bentel & Ben-

tel of Locust Valley, N. Y., will bring Mass-goers close to the altar. The feeling of focus will be furthered by diffused daylight pouring through the top of the lantern onto the altar. At night, the lighted cross will be visible from afar as well as from the cells. If the trading stamps continue to come in as expected, construction of St. Jude's (named after the patron saint of desperate cases) will start this summer.



THIN SHELL CONCRETE PLANETARIUM DAZZLES ST. LOUIS, MO.

Monument-like, a bold and graceful new structure rises over Forest Park in St. Louis. Designed by Hellmuth, Obata & Kassabaum, the \$1.2 million municipal Planetarium, financed mainly with public funds, was opened last month, delighting overflow crowds. Its interior is as exciting as its thin shell concrete hyperboloid form: exhibition spaces flank a domed auditorium in which the usual sidereal displays are projected. A ramp spirals to a parapeted rooftop observation deck where astronomers can stargaze shielded from city lights. Below grade are office, classroom, and equipment areas. Dedication ceremonies are scheduled for early June.

WIDE RENEWAL SOUGHT FOR NEWARK, N.J.

A federal demonstration grant allowed city planners to study Newark, N.J., recently, and to describe the city's renewal needs over the next ten years. In presenting their comprehensive report, the authors (the Central Planning Board of Newark, N.J., with the Newark Commission for Neighborhood Conservation and Rehabilitation) do not stress the potential increments for municipal tax revenues, but rather point the way to long-term benefits both to the city and the area.

The extensive program proposed would cost an estimated \$232 million, of which the city would pay one-third. But for the money, say the planners, Newark

could become an attractive, upto-date city with each neighborhood functioning economically.

While recognizing the 11 renewal projects currently in various stages of planning or execution around Newark's rapidly decaving central core, the authors delineated five additional rehabilitation and conservation areas. On a city-wide basis, they found that only 16 per cent of the existing residential blocks and 30 per cent of the industrial blocks should be conserved. They also recommended that 31 per cent of the residential area and 54 per cent of the industrial area be extensively renovated. The rest would have to be razed and rebuilt.

continued on page 13

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"We have a clear choice here. Either the state government will come to the assistance of cities in such challenges as mass transportation, urban renewal, housing, and the rejuvenation of community life, or the federal government will do it."—Pennsylvania's Governor William W. Scranton.

"While some of us are talking so bravely about enlarging our sphere of design and responsibility, golfcourse architects and cemetery designers are well-paid professionals providing a much-needed public service. They have succeeded by becoming Minitects rather than Omnitects."—Sidney N. Shurcliff, President, International Federation of Landscape Architects.

"It is the rush-hour situation which is at the very heart of the urban transportation problem. Without it there would probably be no problem."—Atlanta Transit System Pres. Robert L. Sommerville.



Outdoor advertising on El Camino Real in Palo Alto, Calif.

THREE STATES FIGHT BILLBOARD BLIGHT

Probably the most urgent argument against the existence of billboards along highways is that they distract the driver's attention. A car traveling on a freeway at 70 m.p.h. moves 103 feet per second-or 206 "blind" while the driver spends an average 2 seconds to read the signboard. A recent New York State Thruway study shows that the relative number of "driver inattention" accidents per mile is three times higher on billboarded sections than on sections where no outdoor advertising exists.

In Missouri, however, this point did not seem to impress the state's House of Representatives, where in March a bill was introduced to regulate billboards by placing them no closer than 660 feet to interstate highways. Proponents cited safety, and the advantages of preserving natural scenery for the state's burgeoning tourist industry, and pointed out that the federal government offers states a bonus for enacting a law (before July 1) to control roadside advertisements along interstate highways. (Uncle Sam pays 0.5 per cent of the cost of obtaining interstate rights-of-way and another 0.5 per cent of the costs of highway construction. In Missouri's case, this could amount to a \$3.5 million saving.)

The state's small but powerful billboard lobby, however, retorted that adoption of the proposed bill would hurt farmers by removing a source of income, ruin businesses, create unemployment, and would be impossible to enforce anyway. Result: the House Roads and Highways Committee turned down the bill by a vote of 33-9.

In New York, the Thruway Authority itself fared somewhat better. A bill to ease restrictions on billboards and lighted signs in commercial and industrial areas along the 559-mile superhighway was passed by the state's Assembly but bogged down in Senate committee. There is no indication that the Senators were persuaded one way or the other by the Thruway Authority's study, or by cries from "anti-uglies"—the bill was never reported out of committee.

In California, meanwhile, the nation's toughest anti-billboard measures were introduced in both houses of the legislature last month. Included are provisions to restrict advertisements within 800 feet of any state highway, except within incorporated cities, and to regulate billboards along all freeways. The duplicate bills also give sign companies a fiveyear period of grace to clear their 27,000 boards from the roadsides. The companies answer that "an outdoor advertisement is a business use of property; when land is zoned for business use, then outdoor advertising, too, should be permitted." Outlook for passage of the bill, however, is considered good, as the strength of the billboard lobby is waning.

BRIEFS IN THE NEWS

What price esthetics? Since the beginning, Philadelphia has had to go to New York to finance its Penn Center-with the result that the original plan has been all but scrapped. The latest development is No. 4 Penn Center, a 20story, \$15 million office building which will be 11 feet wider than No. 2, causing, say critics, a "canvon effect." Philadelphia Art Commissioners regretfully approved the design, by New York Architects Emery Roth & Sons, noting sadly that slimming would lead to considerable delay and expense on the part of the New York developers.

Rehabilitation study. The University of Rochester, N.Y., recently completed a six-month study aimed at educating the public on architectural barriers for the physically handicapped. Usual problems such as width of doorways and grade of walks were noted, but the survey also uncovered an unexpected new barrier: the public's fear of, and hostility towards, the handicapped, which prevent their free access to community life.



FIRE GUTS NEUTRA'S HOUSE

Architect Richard Neutra's officehome (above) overlooking Silver Lake, Los Angeles, burned early last month. Built 30 years ago, it became famous among architectural historians of the modern movement as a pioneer attempt to control environment. Neutra's manuscripts and sketches, which he had bequeathed to the University of California, also were destroyed in the fire. "It was," said Neutra sadly, "a terrible disaster."



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COLBERT LEAVES COLUMBIA

Before New Orleans Architect CHARLES R. COLBERT assumed his responsibilities as Dean of Columbia University's School of Architecture three years ago, he mapped out his program for architectural education: "We must give the students the tools of city planning," he said, "even if we have to give them at the expense of other disciplines. We may have to give less drawing, less architectural history, and substitute more social planning." He also felt that the students should get to know about the entrepreneurs they would work with later: "Architects," he explained, "for the past few years have been content to carry out the concepts of contractors or realtors." Colbert implemented these and other ideas with several new courses which reshaped the school's curriculum (*News*, May '61).

The program was greeted enthusiastically in some quarters, not at all happily in others. Colbert also championed correlated campus planning and opposed an administration move which would have absorbed the architectural school and its accumulated funds in an omnibus Columbia art center. While the conflicts common to academia built up, Colbert's architectural practice in New Orleans, which he had never forsaken, continued to demand his time. Result of these many pressures: Colbert last month resigned from Columbia, effective immediately, to return to his practice. His replacement, *pro tem*, is Associate Dean KENNETH SMITH.

Although Colbert's decision to leave touched off a spate of subsequent resignations in the School of Architecture, one associate professor, Architect EDWARD Ro-MIENIEC, left for different reasons. He was appointed Chairman of the Division of Architecture at Texas A & M.

ANOTHER MEDAL FOR MIES

Medal-heavy Architect MIES van der ROHE was honored again last month, this time with the National Institute of Arts and Letters' prestigious Gold Medal for Architecture. Mies was especially cited for having brought "the potentialities of contemporary materials to a classic perfection and harmony."

The Institute also elected Ar-

chitects I. M. PEI and PHILIP JOHNSON to membership, along with Architectural Engineer R. BUCKMINSTER FULLER.

THE COMPLEAT PLANNER

Pittsburgh's Carnegie Institute of Technology last month filled one of its most sought-after chairs with a young English architect, critic, and city planner: DAVID N. LEWIS (below), who will be the first full-time Andrew Mellon Professor in Architecture and Urban Design. Lewis brings to his



New dormitory at Briarcliff College, Briarcliff Manor, New York. Architects: Sherwood, Mills & Smith, Stamford, Connecticut. In this new dormitory, living space per square foot has been kept at a maximum.



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S. F. POLLUTION EXPERT QUITS

BENJAMIN LINSKY (photo right), responsible for holding down air pollution around San Francisco, resigns from public office this month. A pioneer in the field, he held the post of Control Officer of the Bay Area Air Pollution Control District for over six years. During that time he established technical standards, got the cooperation of businesses, institutions, and individuals to help prevent "garbage in the sky" over the six-county district. In leaving, he warns that although a start has been made, a growing number of



pollution sources, including cars and industrial plants, still need regulation. (Despite Linsky's efforts, the smog readings in the district have doubled since 1954 from 0.14 to 0.28 parts per million.) Linsky was reported unhappy that some powers had been stripped from him by the Control District, and that he had been balked in recent attempts to get more money. He also wanted a more strict enforcement policy for industry violations. No successor has been appointed.

EDDIE GREEN'S CRUSADE

Assateague Island is a 23-mile stretch of narrow, low-lying reef owned by Maryland and Virginia. Best known for its beaches, wild ponies, and water fowl, it has been the subject of divergent proposals over the past eight years. While the Virginia portion is a bird and game refuge, owners of property in the Maryland section want to develop their land, and last year successfully lobbied for state construction of a \$1.5 million bridge to the island's northern tip. Opposing this scheme, and favoring preservation of As-



sateague unspoiled, is a retired plumber, WILLIAM ("EDDIE") GREEN, who is dying of cancer.

Spurred by a wish to see the entire island as a park, Green has tried to interest the Maryland legislature in his scheme. His main point: lack of fresh water and the virtual impossibility of digging cesspools in the marshy soil precludes development of any scale. Each time a legislator introduces a park bill for Assateague, however, it never reaches the floor. This past session was no exception. Green has now approached Secretary of the Interior STEWART L. UDALL, who likes the idea of a new national seashore park. But Maryland Governor J. MILLARD TAWES favors the property owners, soon plans to open bids for the bridge's construction. Green vows to continue his crusade, although he recognizes that he does not have much time left.

continued on page 18



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TEXAS TOWER (above). Humble Oil's new 44-story, \$32 million headquarters in Houston ("tallest in the west") is ringed by 14,000 porcelain-enameled aluminum sunshades which reduce cooling loads, cut glare, and serve as window-

washing platforms. Mechanical equipment is atop an adjoining seven-level garage so that the tower can end in a roof-top club. Architects & engineers: Welton Becket & Assoc, Contractor: W. S. Bellows Construction Corp.



NEBRASKA ART GALLERY (above). Yet another of Architect Philip Johnson's neoclassical monuments to the arts will soon be finished, this one the \$3 million Sheldon Art Gallery at the University of Nebraska in Lincoln. Faced with travertine, the building groups 12 galleries, a 300-seat lecture hall, a print room, and a board room for the Nebraska Art Association on two levels around a central hall (whose floor, walls, and ceiling are also of travertine). Contractor: Hazen & Robinson. UNIVERSITY OF HAWAII (below). The \$6.5 million first stage of the new East-West Center at the University of Hawaii is now almost complete. Focal point is a raised administration building with sculptural precast columns and beams, sitting on a podium whose arches frame a cafeteria overlooking a future lake. Designed by I. M. Pei Assoc., it faces a men's dormitory (left), an auditorium (right) and, background in bottom photo, girls' dormitories by others. Contractor: Nordic-McKee.





MILWAUKEE JUVENILE COURT (above and left). In an effort to avoid the sort of brutal, institutional look which makes rehabilitation of juveniles that much harder, court rooms, reception and probation areas of the \$2.6 million Milwaukee County Children's Court Center are contained in a doughnut-shaped structure with a lively folded-plate concrete roof. Other wings, rectangular in shape, house classrooms, bedrooms, and a gym. Architects & engineers: Grellinger-Rose Associates. Contractor: Jezo Construction Co.



SAN DIEGO HOUSING (below). St. Paul's Manor, a recently completed Episcopal retirement home in San Diego, Calif., is the first project of its type to be financed directly by the HHFA under Title 202 of the Public Housing Act. Its 65 apartments hold 88 people and already there is a waiting list of 50. The four-story concrete structure gains a resort-like atmosphere from an open game deck sitting atop a garage, overlooked by the faceted balconies. Architects: Paderewski, Dean & Associates. Contractor: Callahan Brothers. Cost: \$515,000 (about \$12.60 per square foot).







SAN DIEGO MOTEL (above, left). Even more resort-like than the retirement housing shown at the top are these \$1 million additions to a San Diego convention center owned by Handlery Hotels and known as "the El Cortez Complex." The additions consist of a four-story, 38-unit motel (above) and a five-and-a-half-story, 320car garage reached by a circular ramp (left), both of concrete and both connected to the convention center across the street by an arching footbridge. Architects & engineers: Tucker, Sadler & Bennett. Contractor: Nielsen Co.



VERMONT SKI SHELTER (above). America's fantastic ski boom has spawned a host of sprightly structures, among them the new Rams Head restaurant and ski shop, part of the Killington development in Sherburne, Vt. The simple wood frame ends in four peaks, the number of mountains served by the development. Façades are of glass, translucent plastic panels, and cement block. Inside the balconied shelter there are two levels, each a big room, with split-level washrooms at one end. Architect & engineer: Livio J. Segalla. Contractor: Sherburne Corp. (owner). Cost: \$120,000.

MICHIGAN CHURCH (below). Recently completed was the \$72,000 first stage of the Antioch Evangelical Lutheran Church in Farmington, Mich. Built of reddish black brick and a vaulted plywood roof, the five-room education unit shown here will, when balanced by the second-stage fellowship hall, enclose a generous landscaped court. In this court the church proper eventually will be placed, rising out of the gardens and above the low mass of the surrounding buildings. Architects: Begrow & Brown. Contractor: Raymond Misch & Son. Total cost: \$275,000. END



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TOWN AND GOWN

Forum: We sincerely enjoyed the March issue. It was particularly timely because of the recent GNRP Application which we filed with the federal government for funds to prepare a plan for a 500-acre area which includes the proposed University of Wisconsin Campus Expansion Area.

Your article, "Town and Gown," does much to explain the relationship between the university and an urban renewal program. I would very much like to distribute reprints of this article to members of the Redevelopment Authority and Common Council. In a city like Madison, the university has a strong influence on the community and only recently has some agreement been reached toward resolving the present and anticipated problems.

Madison, Wis.

ROGER F. RUPNOW Executive Director Redevelopment Authority

Forum: I was interested in the March portrayal of college architecture, particularly in the remarks in *Publisher's Note*. I share with FORUM pride in the changes that have occurred on university campuses, for I have been harping on this subject.

However, I feel that your presentation did not emphasize the unhappy part of the situation. What we have succeeded in doing is blasting out the tired eclecticism and replacing it with frequently brilliant work by bigname contemporaries. But we have not on the whole related the work of these people very well one to the other.

Most campuses throughout the country are putting on the same kind of brief World's Fair. The campuses are a lot more exciting than they used to be, but they lack any kind of cohesiveness. Corbu's building at Harvard, for example, is unquestiona¹ by a great one, but it is greater out of context than in. So our university campuses have become a part of the world we live in, in which what Geoffrey Scott called "a pageant of great suggestions" has brilliantly unrolled to produce utter collegiate and other confusion.

Cambridge, Mass. JOHN E. BURCHARD Dean, School of Humanities & Social Science Massachusetts Institute of Technology

FORUM agrees that the happy trend to better architecture on U.S. campuses can be too much of a good thing, especially if each building is unrelated to the next.—ED.

BANHAM REPLIES

Forum: My name has been bandied around somewhat in your columns recently—may I be permitted to pick up two points?

Firstly, Saarinen ("Yale Colleges," Dec. '62 et seq.). In self-defense, I must point out that even when baffled by the results, I have always defended Saarinen's right to produce his "unique solutions," and I have been very heavily hammered in the U.S. (e.g., by staff and students at Yale) for

At top, recess type. Above, Counter class-room type.

Face-mounted type

doing so. My objection to Morse and Stiles is that this particular unique solution seems to me the wrong one.

Secondly, Sheffield (Books, March '63). I do not usually argue with reviewerstheir function is to produce a unique opinion. But both Chermayeff and Mumford appear to be in factual error over the human use of the street-decks at Park Hill, Sheffield. The pictures in my book were deliberately not posed ones-they show slightly less than the normal human occupancy of these "group spaces," and we could equally well have chosen other pictures that would make the place look as densely occupied as those misleading pictures of the Piazzetta in Venice that are always getting published. I have spent considerably more time on the streetdecks at Park Hill than Lewis Mumford has, and I can say as a matter of observed fact that, after more than a year's use, his "objection to the actual physical result" is extremely ill-taken. I raise this point, not in self-defense, but in defense of the Sheffield architects who have done nothing to deserve this hit-and-run criticism from one who (in this case) approached the building "with his mind made up and his eyes tightly closed." The social performance of Park Hill is under constant and expert sociological study, and in due course there will be facts available, based on a long enough observation to show how it has worked out as an experiment in high-density living.

> REYNER BANHAM London

CRITICISM COMMENDED

Forum: I should like to commend your publication of architectural criticism. (Why is it that to understand American architecture one has had to read foreign magazines?)

Your issue on Washington was the best FORUM I have ever seen. I should like to see more long analytical and critical articles of this type.

> PETER W. AMBLER Cambridge, Mass.

THOSE "TEMPOS" AGAIN

Forum: Congratulations on your blast against Congressman Thomas of Houston regarding his stubborn resistance to tearing down the "temporary" government eyesores, unfortunately situated in the same area as the White House and Lincoln and Jefferson memorials (*Editor's Note*, Feb. '63).

I worked in the temporaries right next to the monument. I understand your esthetic revulsion with these buildings, but you cannot imagine how rotten and inefficient they are. Each week I called in exterminators for the roaches—almost in vain—and when working overtime, the rumbling of rats through the halls drowned out the clacking of a few typewriters.

Believe it or not, I was working in a highlevel office dealing in international affairs. We constantly received visits from foreign dignitaries and students who seldom failed *continued on page 40*

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to remark how appalled they were at our offices. These foreign visitors invariably made the same remark: that perhaps the U.S. should be the recipient rather than the donor in foreign aid programs.

LETTERS I

Our legislators have many pet projects on which to spend money. It is a shame they don't show a little more pride in our capital —which so many people feel should be a showcase for the entire country.

SHEILA BURNS Washington, D.C.

ARCHITECTURE AND THE CLIENT

Forum: I have just finished reading again the article "Bringing Back the Desire" (Feb. '63). Editor Haskell has my support: great architecture is achieved when great clients retain great architects and demand their best.

I used to think as Sibyl Moholy-Nagy does when I graduated from college, but after years of mellowing in the field of experience I find too many good architects doing poor work not because of any lack of talent, but because of lack of appreciation and understanding on the part of the client.

All architects want to give their clients the best that's within them, but unfortunately many clients won't accept the advice.

Coral Gables, Fla.

O. K. HOUSTOUN, JR. Architect

Forum: I agree heartily with Douglas Haskell's admonition that the architect regain the client's respect by demonstrating his knowledge of business as urged by the AIA Board. Then, to "stir up pride and joy in the new kind of client," I wish there would be a frank avowal of the belief in and search for Beauty, Vitruvius' "delight". Our buildings should be not only delightful for the clients but full of delight for all individual users. This is the clear goal for practitioners—creation of Beauty!

Baltimore, Md. ALEXANDER S. COCHRAN Architect

100 BIGGEST

Forum: Thank you for including us in your query for the "100 Biggest" listings (April '63). We find again, however, that we must decline to participate. While we realize that the listing has great readership interest, we feel again that the structure of your questionnaire prevents the formation of a true profile of the contemporary architectural practice.

The two general areas covered by "U.S. Government and Public Works" are a large percentage of our activity and in both cases they include many purely architectural commissions. But due to the way this work is handled by the contracting agencies, we cannot pull construction cost data out of context in meaningful order to fit your form.

And once again we should like to point out that your questionnaire reflects none of the kinds of work which are becoming an increasing percentage of our—and of all large—architectural practices: planning, eco-

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Los Angeles T. K. KUTAY Daniel, Mann, Johnson & Mendenhall Planning, Architecture, Engineering

ARCHITECTURE OF COMMUNISM

Forum: Your second article on "The New Architecture of Communist Europe" (March '63) was very interesting and well done.

New York City MILOJE STAMATOVIC Yugoslav Information Center

PROPER CREDITS

Forum: We are extremely concerned that proper credit for Cabrillo and Foothill Colleges was not given in the March issue. Foothill was the result of a joint venture of the Office of Ernest J. Kump and Masten & Hurd, Architects, with offices in San Francisco and Palo Alto. Cabrillo College was the result of a joint venture of the Office of Ernest J. Kump and Masten, Hurd & Gwathmey, Architects, with offices in San Francisco and Palo Alto.

ERNEST J. KUMP San Francisco LESTER W. HURD The Office of Ernest J. Kump and Masten, Hurd & Gwathmey, Architects Associated.

Forum: We have noticed that credit was not given to the general contractor for the Brandeis Art Studios Building (March '63): the Perini Corporation of Framingham, Mass. BENJAMIN A. NASAF New York City Harrison & Abramovitz, Architects

FORUM regrets both omissions-ED.

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1. ST. LOUIS STADIUM. Sports fans in St. Louis took heart recently when the Civic Center Redevelopment Corp. unveiled a model of the 50,000-seat Busch Memorial Stadium where the Cards (both football and baseball) will play. The big, scalloped O converts from baseball to football when two sections of seats along the base lines are swung into parallel blocks on either side of the field. All of the structure will be of concrete, except for movable seats of steel. Engineers-architects: Sverdrup & Parcel & Associates,

Inc.; architect-design collaborator: Edward Durell Stone; associate architects: Schwarz & Van Hoefen. 2. SAN FRANCISCO APARTMENTS. Unusual in form and in section, Neill Smith & Associates' Lafayette apartments in San Francisco were shaped to a large extent by two factors: height limits and a park bordering the site. The result is a stack of two-story living rooms on the park side (right), which makes the floor count higher at the back. Walls are to be slipformed from the ground up before floors are poured from the top. 3. AUSTRALIAN PROJECT. Seen in this dizzy view is a model of Australia Square, a \$27 million project which is likely to have an even greater impact on Sydney's financial center than Chase Manhattan's mammoth quarters have had on New York's. Australia Square will have a total of 717,000 square feet of rentable office space in the 45-story, finned concrete tower and a more conventional 14-story slab. The plan will open a congested area to pedestrians with wider surrounding streets, a sizable plaza, two shopping concourses, and a tunnel to the nearest commuter station. Architect: Harry Seidler & Associates

4. CENTURY CITY HOTEL. "We just asked Mr. Yamasaki to create the most beautiful hotel in the world." With that introductory flourish Edward E. Carlson, president of Western International Hotels, exhibited the 22-story Century Plaza Hotel for Century City, the West Los Angeles development in which Alcoa and Zeckendorf Property Corp. are partners. Behind the big curved wall will be 800 guest rooms. *continued on page 59*

Architectural Forum / May 1963



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5. HOUSTON OFFICES. In designing their own office building, two Houston architectural firms boosted the maximum amount of prime space with the best view to the upper floors, which they will rent, leaving the lower level for themselves. The building's skeleton, plainly visible, will be a series of members assembled into one large truss. Architects: Burdette Keeland Jr. & Associates, Howard Barnstone & Partners.

6. ST. LOUIS TOWERS. Maybe Bertrand Goldberg is resigned to it by now, but small replicas of

his Marina City seem to be popping up everywhere. This one is in St. Louis County, where the twin towers will be 16 stories high and contain about 200 apartments each. Ranged around the base will be a variety of shops and services. Architect: Geo. Gaza & Associates, for Lewis & Clark Towers Inc.

7. COLLEGE PHYSICS BUILDING. The University of Southern Illinois in Carbondale is expanding its plant with a new School of Technology, and one of the new buildings, by Perkins & Will, is to be for physics, industrial education, and applied science. Connecting wings will be built around a courtyard.

8. BALTIMORE FEDERAL OFFICES. From the beginning of plans for Charles Center, Baltimore's big private redevelopment, one plot was marked as the site of a federal office building. The General Services Administration recently accepted the design shown here, drawn by a team of Baltimore architects — Fisher, Nes, Campbell & Associates, the Office of James R. Edmunds Jr., and Fenton & Lichtig—and announced that working drawings would be ready this month.

9. AIR RIGHTS IN CHICAGO. The air-rights lease that Developer Erwin Wolfson negotiated with the Chicago Union Station Co. (*Projects*, Feb. '62) has been taken over by the Tishman Realty & Construction Co., which will build these 20-story offices from new designs by Skidmore, Owings & Merrill. The Tishmans call the whole project Gateway Center, to cost \$100 million, and this first building, 10 S. Riverside Plaza.

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13

 LOUISIANA HOUSING. Without an identifying label, the Fountain Community for Senior Citizens in Shreveport, La., could easily pass for a Miami hotel. Aside from the infirmary and one or two other medical names, many of the accouterments seem as resortminded as the decor: sky-top lounges, swimming pools, balconies, and even a "washateria." Three doctors are the project's sponsors; Frey-Huddleston & Associates are the architects.
 11. GEICO EXPANSION. More than

doubling its present space in Chevy

Chase, Md., the Government Employees Insurance Co. starts construction this spring on an \$8.5 million expansion (left half of model photo above). The present four-story offices will be extended 306 feet, and an 8-story tower added. Vincent G. Kling, who designed both the new and the old buildings, will repeat the earlier materials: reinforced concrete, bronze-colored glass, and creamy porcelain enamel panels.

12. DETROIT APARTMENTS. An attempt to provide some of the flavor of fine residential neighbor-

hoods in Georgetown, New York, and Boston brought about this design for 72 apartments in Detroit, arranged around flagstone courtyards. For the Congress Management Co., Tarapata-MacMahon Associates, Inc. developed 12 small buildings, most of two stories, a sprinkling of 3-story-plus-basement units (sketch), and duplexes over two-bedroom apartments.

13. HOUSTON'S SPACE CITY. This impressive skyline is the future downtown center of Clear Lake City, Texas. At an eventual cost of \$500 billion, the Del E. Webb

Corp. and Humble Oil & Refining Co. are building a new city which will enclose NASA's Manned Spacecraft Center on three sides. Coordinating architects: Pierce & Pierce of Houston.

14. LOS ANGELES LIVING. A tower in Los Angeles, to be built along populous Wilshire Blvd., will have 117 apartments, 22 floors, balconies for indoor-outdoor living, a room for poolside parties, and a fringe of penthouses. Architect: Matthew Robert Leizer. Owners: Samuel Weiler and George S. Hunt. END



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* See Sweet's 1963 Catalog, Section 7a Write for descriptive brochures on Acousta-Pane and other Amerada architectural glass products.



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Cost per sq. ft. of stripping, waxing, buffing of floor every 90 days for 10 years (cost per sq. ft. of 0.02×4 times yearly x 10 years)	.80	Cost per sq. ft. of stripping floor 3 times in 10 years	.06
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RESILIENCE



RESISTANCE TO CIGARETTE BURNS

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CIGARETTE STAINING



RESISTANCE TO STAINING

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PRODUCTION MANAGER John R. Wheeler **How to ban architecture:** A grotesque ruling by the New York State Appellate Division has, in effect, just empowered the city of New York to levy a special tax on architectural quality. The case involves the Seagram Building; instead of appraising the building in the usual way (see *News*, page 5) the city decided to penalize it for being something quite special—a *prestige* structure. And now the city has been upheld in this culturally illiterate decision.

What is really being taxed is the self-respect of the owner, a quality generally carried quietly on the books as good will—\$1.00. But Seagram slipped—if that is the word—by translating its good will into something a little more tangible: great civic architecture—a gift to the city of a wide plaza of unoccupied space and a noble bronze shaft among the shoddy speculative office buildings of postwar Park Avenue.

The judges point out that Seagram has accumulated certain advantages in building this structure, among them fame. Granted. But should this intelligently be taxed? Isn't it a little like taxing Madame Tebaldi's high C, rather than just the sums she earns with it? Are the New York Yankees to be taxed for winning the pennant? Commercial prestige either helps Seagram's sales and profits (already taxed) or else it is not good prestige.

What Seagram has asked is that its building be assessed on the same basis as its neighbors, as a rental building. Seagram occupies only seven floors of 375 Park Avenue, which is the official name of the structure. (The name Seagram is only the commonlaw title, a kind of taxi drivers' tribute to architecture.) The city attorneys have based their case on the cost of the building, some \$36 million. The same space could have been built to the usual speculative standards, covering its entire lot, for some \$15–17 million. So if this was all there was to putting up the building, the court observed, it "does not do much credit to the sagacity of the corporate managers."

It is this comparison that contains the most dismal commentary on the entire situation. Who are these judges to set the New York architectural standard at the lowest going? (Ironically, even the city would now disagree with them on that standard; most of the speculative offices built near Seagram turned out to be so greedy in their use of space that the city has since made it illegal to duplicate them under the new zoning laws.) In its decision, the court calls Seagram a manifestation of Veblen's Doctrine of Conspicuous Waste. It might more realistically be described as an example of restraint, from the dignity of the detailing of its wall to the small percentage of site consumed by the structure.

How the city can even apply this new taxing license is very debatable. For one example, how about the prestige-bellowing Pan Am building several blocks south, which is not owned by Pan Am but simply named for the airline as the biggest tenant? How should the fine old Woolworth Building now be appraised —at replacement cost?

This is, at best, a two-dimensional opinion, lulling the city into a nightmare, and it is a real surprise coming from one of the most generally admired courts in the U.S. The despair is beyond the small print. Make no mistake, if this outrageous decision is permitted to stand, its effects on our threedimensional cities will not be superficial, but disastrous. The power to tax architecture on its quality is the power to prevent it.



A different sort of skyscraper puts new life into downtown Detroit's skyline. BY DAVID B. CARLSON

YAMASAKI'S FIRST TOWER

The gleaming white tower just completed on Detroit's river front is a remarkable building by several standards. It is the first skyscraper designed by Minoru Yamasaki, and in many respects his most important work so far. It represents a break with the glass-and-metal curtain wall which has heretofore dominated office building. It reflects some significant advances in the technology of precast concrete. And, finally, Yamasaki, in association with Architects Smith, Hinchman & Grylls, developed an extraordinarily thin floor-ceiling system.

The new 28-story tower is the headquarters of the Michigan Consolidated Gas Company, whose executive vice-president, Hugh Daly, says, "Utility companies used to build anonymous architecture. But we wanted something very special —and we got it."

On these sixteen pages is the story of what they got and just exactly how they got it.



-



Yamasaki's bejeweled lobby forms a dazzling Eastern gateway for a midwestern public utility



Nowhere in the Michigan Consolidated Gas building is Yamasaki's personal touch more evident than in the lobby. By night it is a gleaming white oasis in the gloom of Detroit's river front (left); by day, it beckons, like an Arabian Nights fantasy (2). There is nothing like it in the city, and certainly no other architect anywhere has had the temerity to make an Eastern temple out of the entrance to anything so ordinary as the headquarters of a public utility corporation.

The lobby is high (25 feet), wide, airy, and sumptuous. It is a fine example of that "elegance of detail and nobility" that Yamasaki has always attempted to achieve in his architecture, and particularly in public spaces. Yamasaki has taken particular pains with the lobby; he is, after all, very conscious of the "feel" of a building, as it comes across on close acquaintance. "I think we have mental hands which reach out and embrace a building," is the way he has put it.

"Mental hands" embracing the Gas Company lobby would touch smooth surfaces laced with filigree. There is a machined precision about the marble walls around the elevator core, and even about the glass exterior walls themselves, with their fine threadlike mullions spun in mirror-finish stainless steel. These mullions are drawn through the lobby floor itself and held in tension by a simple spring device attached at the ceiling of the basement.

There is precise beauty, too, in the ceiling, designed by Sculptor Lee DuSell: slender stainless-steel bands arch out from the corners of square plastic panels, and suspend in their grasp small turquoise-colored glass globes. At night, the effect is dazzling—single beams of light pierce the blue glass, making the ceiling glow like some massive chandelier.

The glass walls around the lobby's perimeter are pulled in 20 to 30 feet from the edge of the b 'lding itself (see plan 3.). The company will not permit any co nercial uses in the lobby, except perhaps a newsstand at the rear of the elevators.

These glass sheets, among the largest ever rolled, suffered an early disaster—when the central heating was turned on for the first time, extremely hot air suddenly was thrown against the glass when the outside temperature was well below zero. Result: eight giant 25-foot panes, each costing over \$2,500, were cracked and had to be replaced.

Sculptor DuSell, who did the metal doors for Yamasaki's McGregor Memorial Library (FORUM, August 1958), designed several other elements in the lobby. He has designed a reception desk, which sits in the lobby just to the left of the main entrance (4). It is a bit rococo, with ornate stainless-steel panels rather precariously supporting a scallopededge marble surface. A receptionist will sit inside the marble "doughnut," gaining entrance through an ingeniously weighted and hinged section of the marble. The effect of the reception desk is a little frivolous, and tends to weaken the precise finery of the ceiling and walls. More successful are DuSell's intricately designed metal elevator doors, pressed out of stainless-steel tubing. It is a rare instance of texture lending warmth to steel.

3.

Highlight of Yamasaki's plaza will be the most striking piece of art in the building: rising from the fountain in the plaza pool (1), will be a bronze sea-Venus, now being created by famed Italian Sculptor Giacomo Manzú.







Working spaces are open and light, with the colors supplied by the office workers themselves



As a working building, the new Michigan Gas headquarters is an office worker's paradise. Above all else, the building is delightfully open, so much so that workers sitting at the edge of the building's core still can daydream, gazing out-somewhat distantlythrough the hexagonal windows which surround each floor (3). Only the upper-echelon executives enjoy complete privacy (see page 104), while junior executives operate from wide-open compartments (1) or somewhat more private offices with wide, clear glass doors (left). Large spaces, such as the enclosed computer room on the fifth floor (4), also enjoy a view out of the windows.

Both client and architect agreed from the outset on a policy of open working spaces, and the interior designer, Walter B. Ford & Associates, heartily concurred. Michigan Gas' Hugh Daly says, "We don't think it's a good idea to close people off in cubicles, and we didn't want to deprive the workers in the center of the floor of the view."

Yamasaki, too, was concerned about the accessibility of the view. This was a key reason for his floor-to-ceiling windows: "In a high building, I think it is terribly important to keep the sill as low as possible so that those at the farther end of the room can see what goes on. . . ." At the same time, Yamasaki kept the windows narrow (20 inches) to avoid acrophobia, a feeling he himself has experienced when in other high buildings, such as Manhattan's Seagram tower. "You build buildings for the security of people," Yamasaki says, "and for the sense of security of people." While the windows certainly negate the falling-out feeling, they also preclude any grand vistas. From more than six feet away from the glass, the view is a little like that through a slatted screen.

Ford Associates handled almost every phase of the interior design, with suggestions from Yamasaki. In keeping with the open perimeter approach, the emphasis throughout is on lightness, including the use of color. Walls are plaster painted white (at \$17.70 a running foot, they are about half the cost of most panel walls). In fact, the overall effect of the large working spaces is one of blandness-when they are empty, they are almost cold. This was intentional. Yamasaki believes that "working spaces look much better if you don't put too much color around them," and Ford's associate in charge of the Michigan Gas job, Carl Benkert, says that 2. color was left "to the human factor, such as women's dresses."

Ford Associates not only shepherded overall interior design, choice of fabrics (including cream-colored woolen drapes throughout the building), and color control, but also designed two new chairs for the building. The chairs have a plastic seat and back, chrome legs, and special snap-on fabric for seat, back, and arms (photo left)-except for the secretary's armless model. It was produced for about \$15 less than any comparable chair on the market.

Ford also advised on lighting and the typical office system delivers about 75 foot-candles at desk level. This is sufficient for secretarial work, but not always for drafting (where at least 100 foot-candles are needed), particularly at tables near the center of the floor. Ceiling troffers had originally been designed for four fluorescent tubes, but the company itself cut it to three, thereby saving an estimated \$100,000 and trimming the electric bill.

1.









Executive offices are spacious, with some rich touches; the emphasis is on dignity and restraint



Public utility corporations are understandably sensitive about the "public" part of their function. They are under the scrutiny of various commissions and state legislatures, and are usually somewhat conservative. For the top executives of Michigan Gas, therefore, one of the toughest decisions to make about their new headquarters was how much luxury they might permit themselves. President Ralph T. McElvenny had carefully checked out the lush appointments in such corporate headquarters as New York's Chase Manhattan and Union Carbide buildings, thus he had a pretty fair notion of how far along that road he might go.

The Michigan Gas executive suites are comfortable and sedate, not at all out of character with the handsome but quiet public reception area on the second floor (left and 6). McElvenny's own office has rich teakwood paneling and a fireplace, but in other respects is not a great deal plushier than many junior executives' quarters. It is, of course, bigger—25 by 30 feet—and has a higher ceiling, as does the entire executive floor (12 feet versus the standard 9 feet).

The offices of Vice-Presidents Mack and Daly are not so rich, although both rooms have rosewood paneling and plenty of space. None of the executives' furniture is specially designed, but it is all oversized, scaled to the largest offices. Lighting is provided by a sort of homemade luminous ceiling—the same ceiling found throughout the building with plastic laid inside the grid to soften the light.

HOTOS : BALTHAZAR

The twenty-fifth floor provides the usual special spaces for executive decisions—a conference room and a boardroom, the latter for high-level and ceremonial meetings, the former for everyday consultations. The boardroom has floor-to-ceiling teak paneling, a vast ebony table, and special carpeting.

Yamasaki himself took considerable trouble with the executive floor, even to redesigning the approach to McElvenny's office and the boardroom. This was done, Yamasaki says, to avoid what he calls "the dull journey through some rather ordinary corridors" in most office buildings and to make circulation instead "an adventure through a series of spaces." The trip now takes a visitor past the lobby reception area (4) into a smaller gallery and then through a narrow passage which opens into another waiting area, immediately adjacent to McElvenny's office.

What makes this trip something less of an adventure than Yamasaki hoped is the absence of any real excitement on the way. This is not his fault. There is no art to speak of, and there will probably not be any. This has been one of Yamasaki's heaviest crosses to bear, but McElvenny, despite his position as president of the founder's society of the Detroit Art Institute, has been adamant on the subject. "We have an art museum in this city, and don't need another in the building." The company has instituted a policy of buying only the work of local artists and not paying more than \$100 per piece. Executives will be able to select works for their own offices from an assemblage of over 100 pieces. But obviously, executives and employees alike will have to make the trip to the Art Institute to find art; except for Manzú's sculpture and the photo murals of Balthazar, to be placed at 17 different elevator lobbies (5), there will be precious little of it. 6.















SECTION OF PRECAST SPANDREL

The building's skin, with hexagonal windows set in precast panels, is its most distinctive feature

"Our biggest problem with this building was the skin-the panels and windows," says Yamasaki. Half of the skin is transparent-4,800 hexagonal-shaped panes of gray glass each 20 inches wide and fixed in neoprene gaskets. The rest is made up of 16 marbleclad columns and precast concrete panels with exposed aggregate. The total cost of the building's skin: \$12.50 per square foot; versus, for instance, about half that for many glass-metal curtain walls and \$18 per square foot (6 years ago) for the bronze skin of the Seagram's Building.

The panels themselves have already become the building's trademark, and are its single most distinctive feature. Yamasaki was determined to use a masonry wall for several reasons. First, because the building is in the Civic Center, across the street from the 20story-high white marble end wall of the City Hall. This fact suggested a white building. Next came Yamasaki's own determination to "break out of the glass box." He feels that "precast concrete gets form into a building again."

Yamasaki's chief intent, given his predilection for precast concrete, was to achieve a soaring, vertical effect by using a thin and tall unit for his curtain wall. The job of casting the panels was given to the Otto Buehner & Co. of Salt Lake City, because the company had considerable experience in the field. Buehner, with the aid of both the architectural firms and the engineers from the gas company itself, mixed and tested many different quartz aggregates, before coming up with the right mix-85 per cent white quartz and 15 per cent cement. The panels were prestressed for handling (not for structural) purposes. Each two-story high panel weighs about a ton, and there are a total of 4,503 of several types; to carry this weight, the floor beams around the periphery of the building were beefed up an extra 20 per cent.

Yamasaki's first design for the panels called for the stem and spandrel sections to be cast separately, meaning each window would be surrounded by six different pieces. When this method of erection was tried on the mockup (1), it became obvious the technique would be too tedious and time-consuming. To help solve the problem, Yamasaki called in Hawaiian Architect and Engineer Alfred E. Yee, who quickly worked out the panel design finally used-a shape nicknamed the "double lollipop." This panel (shown to the right in the mock-up picture, alongside the original six-piece design) was 24 feet long, spanned two floors, and was cast, in steel forms, as a single piece.

Once the panels were up, they seemed to pick up dirt quickly. Plans call for steam-cleaning at least once a year—from the roofbased exterior elevator which rides on steel tracks set in the columns—to maintain the building's sparkle.

Despite these difficulties, Yamasaki is well satisfied with the technical aspects of the skin. Erection was relatively simple (2), and panels have been replacedfollowing a minor fire-in a single day. Above all, Yamasaki is delighted that the panels were cast to such precise standards with such a high degree of uniformity -a giant step toward the solution of a problem Yamasaki posed before the AIA eight years ago: "The search for contemporary, mechanically produced ornament to bring delight to our architecture. . . ."







Mechanical systems include several "firsts" and solve, as well as pose, many problems



From its 430-foot-high "crown" to its 100-foot-deep caissons, the Michigan Gas building holds a number of technical firsts: it has the world's largest gas-fired heating-air-conditioning system, and its boiler room is on the roof (2); it is the largest building in the world with an all electrically welded steel frame (this eliminated massive connecting sections and saved about 7 per cent on structural-steel cost); and it has one of the thinnest, most complex integrated floor-ceiling systems erected anywhere.

Perhaps the most striking of all these is the air distribution system, which starts with the rooftop boiler room. Why put boilers on the roof? For one thing, it left the basement free for a garage (for about 70 cars). For another, the boilers use gas which is easier to get up to a twenty-eighth floor than other fuels would be.

Perched atop the boiler room is a 65-foot-high cooling tower, which is rather ineffectively masked by slender, prestressed precast panels (1), different from those that make up the major portion of the building's façade. In an effort to make the most out of the cooling tower, Yamasaki installed multicolored lights to illuminate this crown of the building at night.

The air distribution system has several unusual features. Rather than have two whole floors taken over by mechanical equipment, Yamasaki and Smith, Hinchman & Grylls chose to put a fan room on every floor. This not only makes air control somewhat more precise than it might otherwise be, but it also gives the gas company the functional flexibility it badly needs: some floors of the building have departments which operate on a round-the-clock basis (such as its gas operations section), while others work on a 10to 12-hour basis, and can be run at much lower capacity when they are vacant. On the occupied floors the system functions full force day and night.

Air distribution depends primarily on perimeter floor-sill grilles (3 and 4) with interior supply handled through the integrated ceiling's diffusers. (For more on this floor-ceiling, see page 146). Air return for each floor is through the corridors and back to the fan room (see plan, 5). This system presented a serious problem for air return from the corner offices when these are closed but it has been solved with hollow-metal louvers to permit air return even when the door might be shut (6). At the same time, however, the louvers create a sound problem.

FACTS AND FIGURES

Michigan Consolidated Gas Company headquarters, One Woodward Avenue, Detroit, Michigan. Architects: Minoru Yamasaki & Associates. Associated architects and engineers: Smith, Hinchman & Grylls. Interior designer: W. B. Ford Associates. Pool sculpture: Manzu. Lobby ceiling, lobby elevator doors and reception desk: Lee DuSell. Photomurals: Balthazar. General contractor: Bryant Detweiler Co. Structural steel and panel erection: American Bridge Div. of U.S. Steel Corp.

Total cost of project: \$20 million (not including \$1.5 million land cost). Unit cost: \$44 per sq. ft. Building area: 450,000 sq. ft. (including 14,000 sq. ft. garage space). Construction: steel frame, steel decking topped by concrete waffle slab, integrated celling; precast and prestressed exposed aggregate curtain wall panels; fixed grayglass windows; gas-fired heating and air-conditioning. Financing: building rented on 25-year lease (with 30-year renewals) from two pension funds. 3.







The economics of a striking new skyscraper—or how a cost-conscious public utility, working within a tight budget, built and financed its new headquarters of high quality design and materials

A new headquarters building for the Michigan Consolidated Gas Company has been a long time coming. Throughout the postwar years, the company expanded within the increasingly uncomfortable confines of seven separate buildings, all of them built in the 1920s or earlier. Even though the company never seemed to have the space it really wanted, it always seemed to have more than it needed. This was because Michigan Gas found it cheaper to rent whole floors, rather than fractions of floors. One of the first measures of the efficiency of its new headquarters is that the company is now comfortably guartered in 20 per cent less space than it previously occupied in its old, widely scattered diggings.

Efficiency of this sort is vital to a cost-conscious public utility. But Michigan Gas considered a wide range of other economic variables in building its new headquarters. An important one was corporate prestige and a real sense of building something important on the site.

New life in the Civic Center

As Architect Minoru Yamasaki has said: "The two most important considerations were the marvelous site in the middle of the Civic Center, and the owner's wish to have a building worthy of the Civic Center."

These considerations were tempered considerably by the company's characteristic emphasis on "practicality and efficiency," but the upshot was still a building which, by Detroit standards, is expensive: about \$20 million, or \$44 per square foot including partitions. (Not included: the restaurant being built on the twentysixth floor.) The building cost about 3 per cent more than initial estimates, despite severe cost supervision by the company and the architects and engineers. And it appears even more costly when it is realized that it was built at a time when Detroit's construction industry was extremely slack. As President Ralph T. McElvenny says, "We were fortunate in that respect-building materials were readily available at relatively low prices." While some elements of the building-elevators, steel, and foundation-were bid well under estimates, others went over, particularly the intricate floor-ceiling. The biggest single factor responsible for ballooning costs was the precast curtain wall, which was bid some half-a-million dollars over the \$1.1 million that had been originally anticipated.

From the outset, Michigan Gas executives were wary of high costs. They even were skeptical of the use of a mock-up which Yamasaki and Smith, Hinchman & Grylls wanted to build on the outskirts of town, to test the floorceiling system and panels. But the mock-up, which cost about \$150,000, saved an estimated \$500,000 or more in the end.

Always underlying the decisions that determined costs were two considerations-the company's desire for a prestige building, and the demands inherent in building in the midst of the vital Civic Center. If the company had built to the northwest, on Washington Boulevard, as it once considered doing, it might have built a very different sort of structure. But it realized that the Civic Center site would be the most prestigious in the city. By the time the company had its site, it had spent over \$1.5 million for land.

The question of whether to own or to lease the building came up early and was settled quickly the gas company leases the building (for 25 years with a 30-year renewal) from two pension funds. The basic reason for leasing is that the company did not want to make the large investment of equity capital that would have been required had it owned the building. And it believes it is better off making annual lease payments of some \$1.8 million than paying interest and amortization on long-term mortgages.

The price of prestige

Michigan Gas sublets about 45,000 square feet of space in the building (a little less than four floors) to outside tenants. The rent is steep—at \$7.75 per square foot (net) it is the highest in town. But all floors have been rented except one—the thirteenth is still partially vacant, indicating that some Detroiters might suffer from triskaidekaphobia.

The company itself leases about 324,000 square feet of useable office space (not counting boiler rooms and mechanical spaces) and, thus, based on its annual lease payments plus real estate taxes of \$520,000 a year, pays about \$6.00 per square foot for space on a net basis. It could undoubtedly have built cheaper space, and it might have rented that much space for less in either of the two new office buildings rising nearby (see page 112). But in a sense, Michigan Gas is paying at least a small premium for its new building. Of course, there are many other considerations involved. For one thing, the building is the company's most striking bit of public relations, even though it has no signs.

Some board members asked about a roof-top sign saying "Gas is Best" and Yamasaki simply ignored them for a time. Finally, when the finished model was presented to the directors, Yamasaki was prepared for the inevitable question. When asked about the absence of a sign, Yamasaki said nothing, reached into his pocket where he pushed a small button connected by a wire to a miniature "Gas is Best" sign which then flashed through his shirt pocket. When the laughter subsided, Yamasaki said smilingly, "There is the sign—you can put it on me rather than on the building."

Aside from its value as a prestigious structure, there are other promotional features: the building has the nation's largest gas-fired heating-air-conditioning plant. And it not only gives Michigan Gas new and efficient office space, but the second floor holds a fully equipped gas kitchen and auditorium.

A big question: maintenance

These factors are not so intangible. They all figure into relatively high rental figures somewhere, but they also demonstrate that the relatively high cost of the building was well worth it. A big question mark in the ultimate cost of the building will be maintenance, of course, and so far the company will not even guess at what this might total. One big unknown quantity is the cleaning of the panels-how often and with what sort of materials. At the moment it is expected that they will be steam-cleaned once a year, with a special detergent.

In attempting to judge whether the headquarters is "too expensive," perhaps the final word should come from the client himself. McElvenny is a toughminded corporate chief, with a careful eye for accounting on any level. He assigned his own engineers to some phases of the job as part of a continuous cost check. He says, "Costs were checked every step of the way—this building is as practical as it is beautiful."







Michigan Gas and Detroit think the white tower is great—but Yamasaki has some reservations

The people of Detroit like their new building; and why shouldn't they? It is certainly the happiest, prettiest big building in all of Detroit. City officials are delighted, too, that private enterprise has built so handsomely in the city's Civic Center, and admit (off the record) that the new tower is far superior to any of the existing shapeless buildings that heretofore made up the Center (2). In fact, the gas building has already established itself as the heart of the Civic Center. Moreover, it has been an important factor in spearheading the sudden revival of office building throughout the city (page 119).

Michigan Gas itself is quite ecstatic also. President Ralph T. McElvenny, who has formed a close friendship with Architect Yamasaki in the course of the five years it has taken to do this job, says: "I've known a lot of craftsmen of one kind and another, and I know that a client could not be in better hands than Yamasaki's because he takes the same interest in a job as he would if he owned it himself. For my money," McElvenny adds, "Yamasaki is the best architect in the world."

Yamasaki himself is of course flattered by such unbridled acclaim from the client who gave him his first chance to do a large office tower. He was chosen over several large Detroit architectural firms with much more experience, on the basis of a low-keyed presentation of his own work, none of which had been a large building. Yamasaki says, "This building is the most thoroughly analyzed job we've ever done. We fussed more over it, and devoted more attention to details than ever before."

Yet today, Yamasaki expresses certain important reservations about the building. First, he is disappointed that the building does not read from a distance as he would like it to, "We tried to build a structure which would give a great sense of soaring verticality, and one which, by breaking down the scale, would be more intimate that most skyscrapers. But from far off, the thin panels get lost and only the marble frame stands out." This is particularly true from more than half a mile away-as, for instance, from Windsor, Ontario, across the Detroit River (3).

Yamasaki's other major disappointment is that the slender panels around the cooling tower, at the top of the building, do not sufficiently mask the ventilating openings and mechanical equipment (see pages 108–109). "We had originally designed a Tshaped panel for the crown, but discarded it. I think that if I did it again, I would go back to that original design."

Although the design was developed entirely from scale models (some 50 were built before the design was settled), these visual elements could not be completely foreseen. Yamasaki realizes now that design-by-model has some limitations, particularly in terms of judging the effect a building will produce when seen from a distance, given sun and shadow.

In his own development as an architect, Yamasaki believes Michigan Gas is, in many respects, his most important building to date. Since it is his first skyscraper, it has thrust him into the front-rank of those working on this most prestigious building type. It was largely responsible, certainly, for his getting the commission to do the greatest office complex in the world—the forthcoming \$270 million World Trade Center in Manhattan.



J. ALEX LANCLEY



OFFICE BUILDING BOOM IS GOING NATIONWIDE

Suddenly, from coast to coast, there are big changes in the nation's skylines. The office building boom, so long pent up in the explosive island of Manhattan, is spreading out across the country. As a result, office construction in the first quarter of 1963 was up 18 per cent over the same period in 1962, twice the increase shown by any other building type.

One reason is that the towers built in the last great nationwide spurt of the 1920s are beginning to show their age. Another is the widespread use of the still-new tools of urban renewal to rebuild downtown.

But there is little consistency about the current boom; it varies from city to city in cause, effect—and solidity. On these six pages are reports on its present progress and future prospects in six diverse but representative American cities including the one where it all began:

NEW YORK

Real estate "has been a wonderful business the last 15 years," purrs one broker. Indeed it has. Between 1947 and 1962, 147 office buildings went up in congested Manhattan, containing 50,632,000 square feet of rentable space.

Already this year the legendary Pan Am (left), the world's largest rental office building, added still another 2,400,000 square feet (90 per cent of which was taken by the time the building opened in March), and there are another 41 office buildings totalling 15.5 million square feet in the works.

To put it another way, during the decade ending in 1962, New York built 4.5 million square feet of office space annually, and in the last five of those years the annual tally was 6 million. The current rate, inflated somewhat by a rush to build before New York's tightened zoning ordinance goes into force, is estimated to be 7 million square feet a year.

How long can this go on? The question has been asked repeatedly since the boom began. When Norman Tishman started it all just after the war with 455 Park Avenue, Manhattan's first big new office building in 15 years, there was a great deal of head-shaking. Many expected the big tenants to start a mass exodus to the suburbs.

They didn't, of course, and the epochal rush to build in Manhattan's midtown and downtown cores was on. Curiously, the dire warnings of oversupply have persisted. "There's always a feeling that every time a building is built, it is the last one," says a realtor.

There is a general feeling now, however, that 1964 may be the year when things finally do slow down a bit. Robert H. Byrne, credited with leasing more of the boom-built space than anyone else, believes that the list of potential multistory tenants is diminishing. "From here on there'll be a trend of slowing down," he predicts, and many agree.

Chase Manhattan has forecast a rate of 3 to 4.5 million square feet of new office space annually in the decade 1961–71. If Chase is right—and the consensus appears to be that its top projection is not too far off—it would mean a return to the pace of the early or mid 1950s. And that was not a bad pace at all. ROBERT F. KNIESCHE



BALTIMORE

downtown is uniquely dominated by two large new office buildings standing cheek by jowl: they confront each other in a highly sophisticated architectural rivalry, but their competition for tenants is not nearly so polite.

The two are One Charles Center, a solemnly refined, multifaceted tower by Mies van der Rohe (left); and One North Charles, a sleek, square shaft by Vincent G. Kling. One Charles is 24 stories and One North Charles is 30, but each offers about 280,-000 square feet of rentable space.

Beyond high-minded proclamations of architectural merit, the rival developers have been using every inducement in the book to rent their space. "Some really fierce infighting has been going on," one local observer reports with awe. It was made a little fiercer by the circumstances through which there came to be two buildings instead of one.

One Charles is the first unit of Baltimore's heralded Charles Center Project (FORUM, June 1958), an ambitious public-private attempt to revivify a decrepit 22acre wedge between the city's financial district and its downtown shopping core. Six developers bid to put up the first building, and the winner was Metropolitan Structures Inc. of Chicago with Mies as architect. One of the other five was Oilman Jacob Blaustein, whom FORTUNE magazine has described as Baltimore's richest citizen.

According to close associates, Blaustein had had the urge to build in downtown Baltimore for some years, but had waited patiently until Charles Center approached fruition. When he lost out to Metropolitan and Mies, Blaustein was, to put it mildly, upset. He was even more upset to be told by the Charles Center Corporation that no more rental office buildings were to be put up in the project area for at least two years to avoid a glut.

Blaustein's reaction was swift and emphatic: he bought a department store across the street and proceeded with construction of One North Charles. To some this seemed an exercise of the dictum that if you can't join them, lick them. Blaustein's associates point out, however, that he is not the type to spend this kind of money just for spite: he strongly believes that Baltimore, which has added only one major new office building since the 1920s, can handle more space than One Charles will provide.

Both buildings are reportedly renting well, with Blaustein's in the lead although some months away from completion (his own firm is the major tenant). There is general agreement that they will be filled by the end of 1963. There is less agreement as to what will happen to Baltimore's downtown district from then on.

Baltimore faced the addition of its two new towers with an office occupancy rate which fluctuated around an enviable 97 per cent. Rentals have always been relatively low—good, air-conditioned space can be had for as little as \$4.25 per square foot, while the new buildings are asking \$5.50 to \$7—but are edging upward now. In part this demand is due to the new life downtown, but it also reflects the general sprucing up spurred by Charles Center.

Ground is being cleared for a 480,000-square-foot federal building in Charles Center, but this is Baltimore's only major additional office project at the moment. The city is taking a breathing spell, waiting to see what the impact of the first two new landmarks will be. The future depends on who turns out to be right about the porosity of Baltimore's office market—Blaustein, or the Charles Center Corporation.



HARTFORD

is in the process of taking out a sizable amount of insurance on the continued life of its downtown district. It is, to be specific, increasing its supply of bright new office space nearly fivefold.

Behind the sudden spurt of commercial construction, as might be expected, are Hartford's bestheeled citizens, the giant insurance companies. Travelers is sponsoring the once-imperiled Constitution Plaza redevelopment project, a \$40 million cluster including 542,000 square feet of office space, two blocks from its own quaint headquarters tower (beneath light standard at left). Just across the street from Constitution Plaza, Phoenix Mutual Life is building its new home, an elliptical 13-story building (far left, by Harrison & Abramovitz), sitting on a square one-story base built around an interior court. Phoenix will use 200,000 square feet of the complex and rent out 60,000.

Hartford Banks are in the picture, too. Connecticut Bank & Trust Co. will have its own 20story building in Constitution Plaza. Hartford National Bank & Trust will have a branch in Constitution Plaza, and is also planning to replace its present Main Street quarters with a brand-new 300,000-square-foot tower.

Two years ago, when all this started, Hartford had some 150,-000 square feet in new downtown buildings at the top estimate. Now, another 700,000 square feet has suddenly opened up with some 400,000 more to come.

Hartford real estate people look on it all with surprising equanimity, although it is still too early to gauge the full impact which the new buildings will have on occupancy rates. They admit the prospect of a temporary oversupply of offices but feel it won't take too long for demand to catch up. Roger C. Wilkins, president of Constitution Plaza Inc. (the Travelers' redevelopment subsidiary), shares this view. "A city that is not somewhat overbuilt is underbuilt," he says briskly.

There are some sound reasons for Hartford's optimism. Rental of the new space has so far been going at a satisfactory clip. No one keeps close track of the vacancy rate in the older space, but the general feeling is that there are only isolated soft spots. One good sign is that prices are holding firm: the new buildings are getting \$5.50 to \$6 per square foot, the older ones only about \$1 less, if they are well equipped and in good repair.

Behind this seeming solidity is the highly individual pattern of office occupancy in Hartford. The big national insurance companies used to cluster near the state capitol. As they have edged downtown, the state government growing rapidly, as governments will—has taken over much of the space they once occupied.

Also, the movement of other prestige tenants, notably banks, into the shiny new buildings is contributing to a centripetal force that is attracting tenants who were formerly on the fringes of downtown. These firms are perfectly happy to take the older quarters in order to get nearer the increasingly busy middle of things. And there are even healthy indicia on the fringes: 266 Pear St., a five-story office building at least a quarter-mile from the core, has been given a \$250,000, top-tobottom remodeling and is completely sold out.

The word from Hartford, then, is "so far, so good." What happens after the current boom will depend largely on how easily the new space can be digested, and how much life the new buildings really inject into downtown. It will also depend on the cool actuarial eyes of the insurance companies who call the city home. LOIS BOWEN



BOSTON

is tectering somewhat uneasily on the edge of its first big speculative office building boom. "We're not happy," Alexander S. Beal, president of the Building Owners and Managers Association, states flatly. "The squeeze is on."

Mr. Beal's squeeze is being applied by 2 million square feet of office space due for completion by 1965, and another million or so on the boards. The comparison with the sedate pace of office construction in Boston's postwar years—recently about 200,000 square feet annually—is striking.

Symbol of what Beal considers an imprudent rush to build is the 52-story spire (left), now rising as the first element of Prudential Center in the Back Bay section. The Prudential tower (Charles Luckman Associates, coordinating architects; Hoyle, Doran & Berry, associate architects) will offer some 700,000 square feet of space, well over the aggregate of *all* the office buildings put up in Boston since 1959.

Something close to an equal amount will be provided in a downtown building whose financing came all the way from Britain; the site, at High and Oliver Streets, was bought at public auction by an organization called Boston British Properties (which has retained American Architects Hugh Stubbins and Frederick A. Stahl). Travelers Insurance has plans for doubling the size of the 280,000-square-foot building it put up two years ago, and there is talk of a new 600,000 square footer behind 30 State Street.

Finally, there is the projected contribution of Boston's ambitious redevelopment program. The government center at Scollay Square (see *News*) will include two rental office buildings, a 35-story tower, and a long 3-story crescent, and its public buildings will also drain a good many state and federal tenants from their present privately owned quarters. The waterfront project along Atlantic Avenue has a 17- to 20-floor rental tower in its plan.

What Beal and others fear, of course, is that all this will wreak havoc with Boston's occupancy rate, which stands at a stout 95.4 per cent. "I say there is not enough of a demand for space at \$7 and \$8 a square foot (his estimate of what the newcomers will have to charge) to justify all the office buildings being planned," Beal says. "The worry is that there will be such tremendous vacancies in the new buildings that they'll come in and grab tenants at \$4.50 from the older buildings."

He feels, incidentally, that the boom in new buildings will give further impetus to Boston's already thriving market in the rebuilding of old ones. Some brokers estimate that as much as 300,-000 square feet of existing space will be remodeled in the city this year. Once the market feels the full force of the new buildings, Beal believes, owners of unrehabilitated buildings will have to fix up or sharply reduce rents.

Not everybody agrees with Beal's forebodings by any means. Says Richard R. Wood of Hunneman & Co., a leader in the Greater Boston Real Estate Board: "With the overall business activity operating at a high peak, successful and expanding firms will be willing to move into more expensive space. In addition, as more firms become aware of the advantages of new and efficient office layouts, and as employees demand the amenities of proper lighting and air-conditioning, Boston-located firms will feel the necessity of renting such office space."

Those who are putting out the multimillions for the new buildings obviously agree with Wood, and they are neither profligate nor inexperienced. It could be that Boston's boom is only beginning. OWEN JOHNSON



HOUSTON

likes to do things bigger than anybody, as witness the two new Texas-size towers on its skyline. One is the 1 million-square-foot Tennessee Gas building (by Skidmore, Owings & Merrill), now being completed. The other is the 1,250,000-square-foot Humble Oil building (tower in photo left, by Welton Becket), at 44 stories the tallest west of the Mississippi. Humble Oil opened in March.

Either building would constitute a boom in most cities of a little less than a million inhabitants—but, wait, there are more to come: Also newly opened is the 500 Jefferson building, (foreground in photo left, also by Becket), a relative pigmy at 350,-000 square feet but the precursor of larger things to **•**ome in the \$125 million Cullen Center. And seven more major office buildings are scheduled for occupancy in downtown Houston before the year is out.

Together, the 1963 crop of ten skyscrapers will put 5 million square feet of office space on the market—increasing Houston's supply a tidy 41 per cent. Such an increase would be spectacular enough in a city which had experienced a long dearth of new office construction. In Houston, however, it is coming after a record decade in which the amount of office space increased 149 per cent. *That's* how big they like to do things in Houston.

This megaboom in office buildings is visible evidence of the city's Midas touch. Houston has experienced four separate waves of prosperity, and their cumulative effect is still rolling.

The first came as a direct result of the fact that Houston is, surprisingly, a port in the prairie. A 50-mile navigation channel to the Gulf of Mexico terminates a convenient four miles from downtown. So before World War I Houston already had become a prime cotton shipping and sales center for the southwest, and, temporarily, a lumber shipping point as well.

In the 1920s and 1930s, when the lumber business was tailing off, immense oil reserves were found in and near the city. And as if this weren't enough, during the rubber shortage of World War II, the oil, sulphur, and salt resources made it a hub of the petro-chemical industry.

Finally, in 1960, the National Aeronautics and Space Administration announced that its huge manned spacecraft center would be built in Houston. The NASA installation, now under construction at a cost of \$125 million, will eventually have 5,000 employces.

It is natural, therefore, that Houston should be an optimistic city. Despite the intensive development of the 1950s, when population rose from 596,000 to 938,-000, it still has plenty of cheap land left. A potential speculator, moreover, can do with the land whatever he wishes; Houston has never had a zoning ordinance. And there is an ample supply of labor, fed by a steady stream of Texans moving from the ranch to the city.

Houston came out of its 1952– 62 spurt of office construction with a beefy 94 per cent occupancy rate. In recent months it has declined to about 90 per cent, and the Building Owners and Managers Association expects it to go down still further "with a two- to three-year adjustment period before the new space is fully occupied."

The Association has no doubts that it will be fully occupied. "We believe this is but the threshold of a new era," says President Warren H. Fairchild.

Such ringing statements are made about many cities. In Houston, however, they somehow have the ring of truth.





DETROIT

is at long last assembling a downtown district worthy of its size and commercial importance. It is, among other forward steps, at the midpoint of construction of its first group of major new office buildings in a quarter-century.

The controlling axiom of the city's economic life is that as the automobile business goes, so goes Detroit—and the entire state of Michigan. The automobile business, unfortunately for downtown Detroit, has always chosen to go to the suburbs to build its giant headquarters complexes.

The attempt to generate a counterforce was begun after World War II by the late Mayor Albert Cobo, whose first step was the planning of a major civic center on the Detroit River. Its key element was a giant exhibition center, named Cobo Hall, which has become the site of the nation's largest annual auto show. The second step, undertaken by Mayor Cobo and his successors, was an attack on Detroit's chronic housing problem through a bold redevelopment program on the fringes of downtown.

It has been a hard and protracted struggle, but the twin programs are finally beginning to pay off: for the first time, major private investments are being made in the future of the central city. Their most dramatic manifestations have been the five office buildings started in a compact area near the river front since 1958, contributing 1,250,000 square feet of new downtown space.

The first two, the 14-story National Bank of Detroit and the six-story International Business Machines building, were entirely owner occupied. The newly opened Michigan Consolidated Gas building (pages 98–113) is renting four of its 30 stories. The other two, the 22-story First Federal Savings & Loan building (left, by Architects Smith, Hinchman & Grylls) and the 28-story Detroit Bank & Trust building, will put nearly all of their space up for rent.

The National Bank planned its move with care not to disrupt the office rental market; its old space was entirely leased before the vans arrived. IBM was not a big enough tenant to affect the overall picture significantly when it put up its own building. But Michigan Gas was a major tenant in three downtown buildings and had smaller departments in four others. The ease with which its 300,000-odd square feet of old space is absorbed will be the first real test of whether Detroit's current activity is the beginning of a genuine boom-or a flurry preceding another long dry spell.

An even stiffer test will come when the two all-rental buildings are completed, of course. By conservative estimates, their asking price will be \$6 to \$6.50 per square foot (Michigan Gas is getting about \$7.50 for its four rental floors). Even the wealthiest of Detroit concerns have been used to getting well-equipped, welllocated space for \$5. Whether they will pay a healthy premium for the glamor of newness remains to be seen.

Detroit's office occupancy rate stands at 91.5 per cent, and the hope is that the Gas Company's move won't push it lower than 90. It seems certain to soften further after that, but how much depends on how well the leakage to the suburbs has been pluggedand, of course, on how briskly the 1964 and 1965 model cars sell.

Some real estate men are saying that now is the time to build downtown, while the impact of the face-lifting is fresh. Detroit's downtown office market has momentum, something it has not had for a long time, and it just might have enough to roll right through the period of oversupply ahead.




The new Continental building carries on its city's steel skyscraper traditions at a fine, big scale

LARGE SPANS IN CHICAGO

The striking black shaft at left, towering above an open colonnade at the corner of Wabash Avenue and Jackson Boulevard, is Chicago's newest office skyscraper, and one of its finest yet. Designed for the Continental insurance companies by Architects C. F. Murphy & Associates, it proudly carries on the steel-frame and wide-window traditions of Chicago architecture—with some refinements of its own.

Most evident of these is the size of Continental's office bays: 42 feet from column center to column center across the face and inside, yielding 19,000 square feet of uncluttered space on each floor interrupted only by a central service core. This space, of course, is close to ideal for the big clerical pool areas required by most large insurance companics (for another solution to the problem, see page 126).

On the opposite side from the one shown here, each of these office floors bridges across to an older parent building facing Michigan Avenue; together, the two buildings house the corporate family (Continental Assurance, Continental Casualty, and National Fire) in 1.2 million square feet, the third largest chunk of office space in the city.

Carrying the new floors are some of the heaviest steel beams ever used in a high-rise office structure. They are deep enough (2 feet 3 inches) to accommodate regular openings for air-conditioning ducts, yet shallow enough to keep floor-to-floor depth to 12 feet, thus allowing all floors to connect with those in the older building (details, page 124).

Outside, the spandrel girders, as well as the column covers, are sheathed in ³/₈-inch-thick plates of carbon steel continuously welded and painted black, with all exposed welds ground smooth. This forcefully simple frame is filled with gray-tinted glass held in a crisply raised sash of stainless steel. The 23-story building rests on only 20 columns (of highstrength A440 steel) extending 100 feet below street level to bedrock.

Though an elegant building in its own right, the new Continental is quiet enough not to overpower the old headquarters on Michigan (glimpsed up Jackson Boulevard in photo below).

Wabash Avenue façade of the new Continental Center (left) complements the broad, 20-foot sidewalk with a granite-paved, 22-foot colonnade of its own. It also stands free of neighboring buildings across a ramp which leads down to a 125-car basement garage. Right, view up Jackson to the linked parent building; "El" tracks may be glimpsed in foreground.





Continental's colonnade (left) shelters a classically simple lobby sheathed in glass and dramatically lighted inside (right). The lobby, which wraps around three sides of the elevator core, has electrical floor outlets and other facilities to accommodate changing exhibits.

Ground-floor plan (right) shows building at sidewalk property line, with lobby recessed 22 feet on the major street, 12 feet on the other. Alley at left leads under the link between old building and new to truck docks at the rear.

Right: night view of Jackson Boulevard entrance, with paired revolving doors, accentuates broad bays and fine, stark detailing. Vertical blinds on second floor shield the company's employee cafeteria.















CHICAGO OFFICE BUILDING



Typical office floor (plan and photo, top) is freed of columns and clutter by the 42-foot-square bays and a compact, 42-by-84-foot service core. Photo and drawing (left) show how cover plates of 3/s-inch carbon steel were affixed to the spandrel beams, and fireproofing concrete poured and vibrated between them without need for elaborate formwork. Studs welded to front of spandrel beams and back of facing plates serve to reinforce and bind the final structure into a rigid unit. Bottom photo shows typical floor beams, pierced and welded like trusses for passage of air ducts, permitting a minimum ceiling-to-floor height despite long spans. Beams support cellular steel decking.

FACTS AND FIGURES

Office building for the Continental Companies, 55 East Jackson Blvd., Chicago, III.

Architects and engineers: C. F. Murphy Associates. Associates in charge: Charles Rummel, Jacque Brownson. General contractor: A. L. Jackson Co.

Construction: steel frame (high strength A440 steel for columns on lower floors); structural bays 42 feet square. Column covers and spandrels of welded %-inch carbon-steel plate painted black. Windows: gray tinted glass in stainless-steel frames. Floors: cellular steel, carrying air distribution, telephone and electric wiring. Floor area: 680,000 square feet gross, 405,300 square feet net usable (19,300 per office floor). Construction cost: about \$17 million.





Economy of parts, and integration of structure with equipment, mark SOM's newest office design

BEARING WALLS IN IOWA

The massive, six-story office building shown at left not only displays its virtuoso structure with a flourish; it also promises to get surprising mileage from a few simple parts, each performing multiple duties. Designed by the New York office of Skidmore, Owings & Merrill, it will be the new national headquarters for the American Republic Insurance Company in Des Moines, Iowa.

At first blush, the building might seem a considerable tour de force. Two great structural walls of poured-in-place concrete, each resting on four "pin-point" steel hinges, hold precast, prestressed T beams which clear-span 90 feet on each floor. Beneath, a freestanding ground floor slides under the main mass like the bottom drawer of a giant filing cabinet, absorbing a 10-foot drop across the site, and dramatizing the great side walls by fitting independently between them.

SOM, however, had more in mind than mere architectural effect. Since the basic activity of an insurance company is clerical -and since nothing wastes clerical space like columns-their first objective was to provide large, column-free areas for the company's office force of 600. At the same time, they wanted to make the long east and west walls solid to control glare and minimize cooling loads (they have, in fact, reduced by 20 per cent the airconditioning tonnage required to cool the building).

If the walls were going to be solid, the architects reasoned, why not make them completely structural as well, spanning between

Beneath the building's main mass is a low, independent base element which contains an entrance court and fountain open to the sky, a reception area, elevator lobby, and a computer room toward the rear. them to make each typical floor into two big "rooms," 90 feet wide by 66 feet deep, separated by the central core?

The walls, laced with horizontal reinforcing rods, act as girders between the point supports. Since expansion and contraction will cause the separate sections of the wall to move, their supporting points are hinged, and the middle panel is hung between the end sections with overlapping slip joints. The structure is stabilized by the central core and by longitudinal stiffening beams running across the T sections.

In an earlier scheme, the walls were each carried on two heavy concrete columns which tapered into the ground to knife-edged joints at the foundation (photo below). The scheme was abandoned because the slope of the site truncated the rear columns



awkwardly, because the great width of the columns obscured views from the glassed-in terrace level, and because the architects saw a chance to dramatize the hinge connections by lifting them out into the open.

The walls will display a vigorous granite aggregate, sandblasted as the best method of bringing out the sharp-faceted stones. Tapering as they rise (and as the floor loads they must carry diminish), the walls will be furred out inside—virtually the only applied finish in the building. The furred spaces will act as plenums for return air and will also carry supply air down from the top-floor mechanical rooms in

ARZ



Massive wall sections are supported on steel hinges atop concrete piers. The middle panel hangs between the others, linked by slip joints.







ENTRANCE FLOOR

TERRACE FLOOR

TYPICAL OFFICE FLOOR



On end walls, exposed beams shade recessed glass and act as window-washing platforms.



trunk ducts which diminish in size as they descend, reversing the taper of the structural wall (see section, below).

The large clerical "rooms" needed unusually high ceilings to have any sort of satisfactory shape. By using the T-shaped girders and leaving them exposed as the finished ceiling, the architects were able to increase the apparent ceiling height (already a generous 9 feet 6 inches from floor slab to the bottom of the T) by another 4 feet, the depth of the continuous coffers which the spanning members form. Outside, the ends of the T's are exposed at the top of the building to serve as "nostrils" for the air-conditioning system-and end the building against the sky with a strong, almost classic cornice line.

The exposed ceiling led to the notion of leaving the horizontal air-conditioning ducts exposed as well-a detail which has been handled with particular finesse. The branch ducts, 16 inches in diameter, are simply suspended in the coffers, with continuous slits in their undersides for air distribution. The ducts will wear an acoustical jacket to absorb sound (the spaces will also have wall-towall carpeting). In addition, the ducts act as the lighting fixtures, giving a piggy-back ride to continuous high-output fluorescent tubes (see Technology, page 146).

The winning bid for the 150,-000-square-foot building was \$4.2 million, or only \$28 per square foot—not a high figure considering the many design departures involved. This must have come as a pleasant surprise to the officers of the American Republic Insurance Company, who had originally asked SOM to "send out a stock plan" from their files—and who have since helped develop a distinguished design which promises to give them far more than they had bargained for.



At each end of the building, the giant floor beams are notched into the side walls, which taper from a thickness of 4 feet at the bottom as floor loads diminish. The beams will be weatherproofed by a thin elastomeric membrane. The walls will be of granite aggregate, sandblasted to bring out their texture.

FACTS AND FIGURES

Head office building for American Republic Insurance Company, Des Moines, Iowa.

Architects: Skidmore, Owings & Merrill (William S. Brown, partner in charge; Gordon Bunshaft, partner in charge of design; Roger N. Radford, project designer; Walter A. Rutes, Job captain). Structural engineer: Paul Weidlinger. Mechanical engineer: Syska & Hennessy, Inc. Contractor: Arthur H. Neumann & Bros. Inc.

THE STRUCTURE OF ST. SOPHIA

BY ROBERT L. VAN NICE

This re-evaluation of the basic structural system of one of the world's great masterpieces of architecture, now 1,400 years old, is accompanied by sketches based on the first exhaustive scientific measurements ever made of the structure. Next year, Dumbarton Oaks will publish Van Nice's complete book on St. Sophia, accompanied by his finished drawings, exquisitely clear, accurate, and complete. The present preliminary publication is intended to dispel a "fundamental misinterpretation" of St. Sophia's structure, virtually universal in the textbooks. See also, "Editor's Note," page 154.

JUSTINIAN's great domed church of St. Sophia, built in Constantino-ple in the sixth century, remains an achievement quite apart among efforts of architects across the centuries to design spaces so as to intensify the activities they enfold. The arresting height of the nave built for the emperor by Architects Anthemius and Isidorus - spacious enough to envelop a modern building of fifteen stories-and the inventive combinations of inward-looking forms closing over it, so far surpassed anything done earlier that this extraordinary structure was for eight hundred years the largest enclosed space in the world. Constructed during what might be termed a "crash program" lasting only five years and ten months, it is even more remarkable that after fourteen centuries of continuous use-nine hundred years of service to Greek Orthodox rites interrupted by 57 years as a Roman Catholic cathedral, and half a millenium as a Mohammedan mosque-and in spite of partial collapses of the dome on three occasions, the building comes to us with so much of its original impressiveness undiminished. St. Sophia had assumed legendary proportions throughout the

Western world long before access to it was made difficult by its conversion to the Moslem ritual at the Fall of Constantinople in 1453. Attempts to satisfy understandable curiosity about such a celebrated monument had to depend for the most part upon cryptic descriptions and sketches of travelers in the late Middle Ages, and elaborate misconceptions inevitably resulted. The general form of the church and of the individual elements in its fabric and decoration was clarified by the publication, in the middle of the nineteenth century, of conventional plans and sections. Yet, these regularized drawings provided few indications of internal evidence as to its ceremonial uses, or of its manner of construction, or of the astonishing behavior of the structure.

The first opportunity for really close observation came to Western scholars with the opening of the structure to the public as a museum in 1935, and the present study of the basic structural system is based upon an intensive survey. To run ahead a bit and presummarize, these exhaustive remeasurements of the fabric as it now stands render untenable the interpretation of the structure that has been universal since the nineteenth century, and is contained in all textbooks, but is unsupported by direct observation. The method of measurement will be indicated. The effect of the deformations will be weighed, along with that of repairs and alterations, and finally an account will be given, necessarily oversimplified, of the way in which all loads are actually transmitted at twelve points to the foundation.

So familiar are the interior features for which St. Sophia is famed that they need be recalled only in brief: a central dome carried on four arches rising from piers laid out in a square, the transition from

square to circle being effected by the well-known "pendentives" (diagram, pages 137, 138, photo, page 134); large half-domes opening eastward to the apse and westward to the narthex (diagram, page 137), and supported on secondary piers (these half-domes are what make the nave appear longitudinal, see above); tympanum walls (page 137) standing beneath the north and south arches—they are on colonnades, four shafts at ground level and six above (see above); similar half-domes or exedrae enlarging the spaces under the main half-domes and rising over curved colonnades of two shafts at ground level and six at the gallery; buttresses connected to the main piers by arches and barrel vaults that span side aisles and galleries (page 137); and peripheral walls forming a rectangle only slightly different from a square (page 131). There are, of course, narthexes, vestibules, ramps to the galleries, etc., but these are remote from our primary concern with the structural system as such.

To describe a structure as immense and complex as St. Sophia in terms of simple geometric forms grossly underestimates the stubborn problems faced by the architects in translating their imaginative conception into the uncompromising realities of intersecting masonry arches and spherical forms, all at unprecedented scale. Forces set in action by their design were of a magnitude that had not been encountered before; these forces could be calculated today only with difficulty; and it seems highly unlikely that their ultimate effects could have been foretold by builders of the sixth century.

Any attempt to assess the effectiveness of Anthemius's design must obviously correlate what is known of St. Sophia's physical history with the exact condition of the existing structure.

From documentary sources it is known that the dome collapsed within twenty years of its completion. Although earthquakes were the immediate cause, the fabric had been progressively weakened by flaws in the form and disposition of the elements that were intended to contain the lateral thrusts of the dome, by subsidence of the weak Devonian rock of the site, by plastic flow due to the speed of the initial construction, and possibly by other causes of which as yet we are unaware. The dome we have today—the second dome, to be sure, but one that nevertheless is 1,400 years old and the third largest masonry dome in the world—was built by a nephew of the first Isodorus with a crown higher by some 6.25 meters (about 20 feet) than that of the

Opposite page: Above, St. Sophia in the mist from the southwest; below, view across roofs from northeast, both taken by the author before the application of the present coat of yellow paint. (Both views broadside to nave.) Overleaf, a pendentive shows crimp, due to repairs.











original dome. This second dome has been partially rebuilt on two occasions, first in the tenth century, and again in the fourteenth.^{*} On account of these later repairs, few of the major elements in the superstructure have escaped alteration. The original structural scheme was, however, intrinsically so unalterable that all later repairs were obliged essentially to reduplicate the forms that had fallen. Thus, although reconstructions brought changes in detail, the principles at work were affected only in a matter of degree.

The precise condition of the structure has been determined by plotting its elements within a system of space coordinates consisting of traverses and levels at six critical levels between the ground and the crown of the dome, 56m. (184 feet) above the floor. The overall area within traverses (which include at ground level the accretions added in Byzantine and Turkish times) comprises 18,000 square meters (193,-000 square feet), or the rough equivalent of three-and-one-half football fields, and in places as intricate as a casbah; travérses had to be

Opposite page: View toward southwest gallery wall from base of dome. Preceding color page: Upper view, dome gets repair to its lead roof after a storm-view toward Sea of Marmara. Lower view: temporary removal of cement covering shows Byzantine masonry of apse.

*The account of the rebuilding will appear in the complete book.

extended into more than 139 separate spaces, some all but inaccessible, some hitherto secret.

The investigation of all such places reveals in the layout of certain elements a remarkable degree of precision, in others strange irregularities that were built in; and nearly everywhere deformations of a magnitude that remotely recalls the Leaning Tower of Pisa.

As to precision, the square formed by the projecting corners of the main piers proves, for all practical purposes, to be a perfect square. Measured to the surface of the marble revetments standing about 0.12m. to 0.15m. (4½ to 6 inches) in front of the working masonry, the sides of the square average 30.97m. (101 feet $7\frac{1}{2}$ inches) in length with a maximum variation of only 0.06m. (2% inches). After allowances are made, the error in the layout of the piers is in the order of 1 in 2,000.

That the sixth-century builders could not maintain the same accuracy of measurement above ground level is suggested by the number of irregularities occurring at higher levels, and these are magnified by alarming deformations, one of which illustrates a near-fatal flaw in the original design. The faces of the main piers lean backward 0.22m. (nearly 9 inches) in a height of 9.0m. (about 30 feet) between the gallery cornice and the upper cornice above at the springing of the great arches. As first constructed, this stage of the piers was not only tunneled by a vaulted passage, but its mass was further reduced by a subtraction equivalent to one bay of the adjoining colonnade. The effect of these inequalities was both to throw the center of gravity of this level out of line and to reduce the bracing capacity of the piers by one-third as compared with the larger masses above and below. The overturning forces of the dome did not, therefore, simply tip the piers backwards, but caused internal failures as well within their weakened stages at gallery level.

At the second cornice of the nave, some eight stories above the floor, we begin to see the system of twelve arches of five different kinds (actually six kinds, if one includes the thickening undergone by the western arch during its repair in the tenth century) by which all dead load and lateral thrusts of the superstructure are transmitted to the foundations at only twelve points. First are the four great arches, which from the interior appear to be alike but are in reality of two kinds (page 132) having notably different characteristics: the transverse arches opening toward the half-domes have spans of more than 32.0m. (104 feet) and are relatively thin at their crowns; the arches alongside the nave consist of a combination of two arches of unequal spans and curves not concentric. Beneath the projecting arches visible from the interior rise others with spans of only 22.60m. (74 feet), greater on-soffit widths, and deeper crowns; but, being flush with the inner surfaces of the tympanum walls, they can be seen only from the exterior. Clearly, the pairs of arches at the sides of the nave are much stronger than the single arches of greater spans, yet thinner crowns before the half-domes.

The main half-domes are carried on four arches nearly equal in span but also of two different kinds: thick and broad barrel vaults connect the pairs of secondary piers; but the two arches left and right which join the secondary piers to the main piers spring from slightly warped plan shapes and, even though they do essentially the same work as the barrel vaults, are much thinner and narrower. Because the interior faces of these thin arch rings are lost in the inner surfaces of the



Tunneling of main piers for galleries helps explain tipping of structure outward causing elongation of dome axis (top left to lower right).

larger shells, and because they are too thin to show above the halfdomes of the exedrae outside, these highly interesting elements have received little attention in previous explanations of the structure.

The buttresses, which at ground and gallery are symmetrical in plan, rise above the roofs in two dissimilar stages. Both of these upper stories may well be afterthoughts added successively as evidence of progressive failure became more insistent. But in any event, the arches and barrel vaults connecting the piers and their buttresses were at all levels not strong enough to make them act together as single, rigid units; the effect of the tipping action of the dome was to fracture these arches at their erowns; and as a result, the end walls of the buttresses lean outward 1.0m. (39 inches) in a height of 40m. (130 feet). This inclination—comparable to a lean of more than 3 feet in the wall of an 11-story building—makes St. Sophia nearly 7 feet broader across the roofs of its buttresses than it is at ground level.

Why the half-domes do not brace

This brings us to the dome, the culmination of Anthemius's design and the source of vicissitudes suffered by the fabric. The present shell springs from a cornice sloping at 9 degrees, subtends an arc of 162 degrees, and has a uniform thickness of about 0.65m. (26 inches) above its drum with 40 ribs. Whereas it was doubtless the architect's intention to build a circular dome over his carefully measured plan, the perfect square with which he started at ground level has been deformed into a rectangle at the springing of the main arches, and the cornice of this twice-repaired dome is today an irregular ellipse. Its major axis, approximately 2.55m. longer than its minor axis, lies crosswise of the nave. Such irregularities in plan, along with even more startling anomalies in the curvature of the shell itself, do not materially alter the general principle involved, namely, that the forces generated by domed forms act radially and equally in all directions.

Now that the conditions are known, we are in position to re-examine the half-domes in the light of the widely held belief that every device in the general scheme-including colonnades, vaults of the aisles and galleries, and even the peripheral walls-plays an essential role in a single, tightly integrated system of support for the dome. More specifically, it is supposed that the shells of the half-domes, which contribute so greatly to the soaring effect of the nave, not only provide countersupport indispensable to the equilibrium of the dome, but also that their incorporation in the scheme was dictated by the structural function they are alleged to perform. Conventional sections drawn on the long axis of the nave do indeed seem to confirm this popular belief. In them, the half-domes look like inclined beams that are trying to fall inward but are prevented from doing so by the crowns of the arches against which they appear to press with great strength. This explanation has seemed so obvious that extant sections drawn without reference to the principles governing the forces generated by spherical shells and without measurements of the actual conditions all show the large half-domes as thicker than the main dome, and the exedra halfdomes as the thickest of all. These drawings have led to a fundamental misinterpretation of St. Sophia's structure.

The thrusts generated by a dome are calculated by engineers on the assumption, borne out by experimentation, that at its crown there is compression alone and only farther down in the curve do bursting stresses begin to develop. In principle, therefore, the crowns of St. Sophia's half-domes are trying to fall straight downward, and for this reason they cannot exert any effective force horizontally against the crowns of the great arches. Where lower down in the curves lateral thrusts begin to develop, they act, like those of the main dome, in a downward and outward direction. Since these forces are radial in both the dome and the half-domes, only in a section cutting their centers do lines of force in the two shells coincide. But here the forces themselves do not, as is generally believed, oppose each other; instead, they

continued on page 210







ULRICH FRANZEN: ARCHITECTURE IN TRANSITION

By background and inclination, Ulrich Franzen, 42, of New York, is very much of the main stream of contemporary architecture. He was educated at Harvard under Gropius and Breuer, admits to being strongly influenced by Frank Lloyd Wright, Le Corbusier, and Mies van der Rohe, in that order, and worked for Carl Koch, Anderson & Beckwith, and I. M. Pei before opening his own office eight years ago.

Franzen, standing at left before a house of his own design, even *looks* the model of a main-stream architect. His manner is engaging, his laugh frequent and resonant. When he speaks of his philosophy of architecture, however—and he often does —his manner changes and his laugh is stilled. His face settles into the visage of Hamlet. It is not a look of indecision— Franzen has made up his mind quite definitely about a number of the issues facing his profession—but a searching, solemn expression of concern.

Franzen's thoughts, and Franzen's buildings, have lately been going through a considerable change, the direction of which has a great deal to do with the turbulence currently afflicting the main stream. He is of the generation reared in celebration of the final victory of functionalism over classicism. He is also among the growing numbers of architects who are deeply dissatisfied with the fruits of functionalist theory—and who are seeking a new kind of strength, a new kind of order in their work.







The administration building of the Philip Morris plant at Richmond, Va., above and left, will have an importance beyond its 67,000-square-foot size. The cigarette business is one of making and moving very large numbers of very small items, and it is here that the swift and precise process will be controlled. The two-story building is thus, in Franzen's term, "the anchor" of the entire plant. Franzen set about to make it look exactly that.

Philip Morris had a pretty good idea of what it wanted, but Franzen made his own detailed study. "We've never taken a program without a change," he says. "We make our own analysis, if only to give things a shaking up." In the case of this building, called the Operations Center, all of the departments that were to occupy the main floor were treated as separate clients; their needs were worked out and then put together into the plan (left). The workings of the computerized accounting and data processing units upstairs were also plotted. Franzen then turned to the enclosure.

His concern was that it should have strength both at the bottom and the top: "I didn't want it to be one of those buildings that looks as if there should be more to come." Stout columns will rise from a boxwork base to a blunt, oversize fascia. Between them will be thick fins shielding the secondstory windows, "reaching down for the earth," says Franzen.

The operations center is typical of the solidity of Franzen's recent buildings, but it is intentionally the most static of them. The tiny brick boiler plant (right), with its jogging, rhythmic walls, is more representative of the organic quality of the others (and somewhat reminiscent of Wright's Larkin building). It is scheduled to expand, and so has the look of a growing thing. It is, in fact, all mass and movement.









PHOTOS: @ EZRA STOLLER ASSOC'S

The garment factory on these pages, the Pleasantville, N. Y. headquarters of Helen Whiting Inc., is part of a tough, competitive business not noted for its patronage of architecture. Franzen gave the little plant a suitable toughness, but he also managed to make it architecture, and at a bargain-basement price. Its cost was \$8.75 per square foot (excluding fixtures), a figure guaranteed to gladden any garment maker's heart.

Most of the 43,000-square-foot plant is given over to an open, rectangular loft framed by deep glued-laminated beams (right). The arrangement of dressmaking facilities is a model of logic in an industry used to making do with any available space. Material comes in next to the high-ceilinged cutting room, which in turn leads to the long sewing room. Seamstresses are lined up beside narrow tables which function as assembly lines; each girl makes her appointed stitches, then slides the dress along. It winds up in a twolevel maze of pipe racks, from which orders are made up and conveyed to the packing area, right back at the shipping dock.

It is the enclosure, again, which Franzen has made his primary vehicle of architectural expression. The walls are of humble concrete block (so humble that it took constant supervision to get the workmen to lay them up with the desired degree of care). There is a simple, once-broken plane across the office wing; but around the loft the walls move in and out, like those of the Philip Morris boiler plant. Where the walls protrude, acting as wide piers, they are topped by panels of glass, admitting a controlled amount of indirect natural light; where they are recessed, they are topped by blank panels shielding ventilators. They form a composition of light and shadow, of life and power, standing defiantly on the land.







EZRA STOLLER ASSOC

Ulrich Franzen not long ago was designing garment factories that looked like the one below (the Barkin, Levin & Co. plant in Long Island City, Queens): clean brick planes crisply outlined in steel, the offices in glass pavilions beneath undulating concrete umbrellas. He also produced a notable series of equally pavilionlike houses that were orderly in plan, open to their surroundings, imaginatively roofed, immaculately detailed. All of this brought him numerous awards and the coveted Brunner Memorial Prize of the National Institute of Arts and Letters, whose previous recipients had names like Bunshaft, Rudolph, Kahn, and Pei.

The change in the character of his buildings has been rather drastic. As shown by those on the previous pages, and by the row-housing project at right, they have suddenly become heavier, more assertive, as massive in detail as they once were refined. His most recent house (above, right) reveals still another shift: regularity of plan has been replaced by a lively, almost syncopated organization of individual structural units. In this case there is still a pavilion, but it is surrounded by an uneven cluster of forceful masonry shafts.



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Franzen recently described the evolution of his work to an audience of architectural students. "I have struggled with symbolic structure and platforms," he said. "I have tried to animate the site with podiums of elemental materials, to enhance the sense of being nature bound, and then to terminate the effort with a consciously arbitrary device.

"More recently," he continued, "I have worked with open-ended compositions—systematic in module, organic in composition forms that do not stop external space but spin it, quicken it."

Franzen dates the change in his outlook about four years back, although his disenchantment with functionalism began earlier. In his Harvard days, Franzen recalls, "if anyone talked about beauty, there was an embarrassing silence—it was something too personal to mention. You always had to discuss your work in other terms."

Meanwhile, he was discovering that "the great artists"—first Wright, then Le Corbusier, and later Mies—"simply did what they have always done, following the dictates of their own eyes and hearts. They used the fashionable rationalizations only long enough to give their work a cloak of respectability.

Franzen has two quarrels with functionalist theory. The first is that it "confirmed the idea that art, like everything else, must serve society and history—that art does not exist for its own sake. Modern architecture came to be seen as an ideology, a tool of technological and social progress."

The second is stylistic. The functionalists, Franzen feels, sought to impose a "systematic order" on architecture which had little to do with life.

Once purged of his early faith, Franzen looked with renewed interest to the world of art. "I'd been fascinated by the abstract expressionists and the junk sculptors," he says, "but it wasn't until a few years ago that it became clear what they were saying."

He also mentions the impact of Vincent Scully, whom he encountered while a visiting critic at Yale: "More than anybody else,



Scully has swung the pendulum from extreme refinement to a very tough individuality." Nor has he forgotten the time that a British critic lumped his and Philip Johnson's work under the label "the perfection of the middle style." Recalls Franzen, "That brought me up short."

Whatever its derivation, the remodeled theoretical base of Franzen's new work begins with a consideration of space. Space is, to him, "the ultimate objective, the one property that belongs only to architecture."

"I am constantly intrigued by the dynamic open spaces possible today," he says. "The fluidity of one space merging into another, and finally spilling out into nature —with no other frame of reference but your movement through it—gives a tremendous sense of freedom and power."

Structure is, in turn, "our most intense way of defining space. A sense of structure endows a building with organic rhythm. A sense of structure proportions every detail as an *event*, appropriately sized for its job within the building organism, thereby giving the building scale."

The emerging solidity of his buildings he relates to another prime objective, perhaps the chief residue of his early enchantment with Wright. "One of the first considerations of pleasure in architecture," Franzen says "is the visual resolution of weight and support, of solid and void—the way the building, as a living organism, stands upon the land. We're all structures with constant problems of equilibrium. We can feel this in a building."

Curiously enough for one who has rejected the doctrines of functionalism, Franzen's personal concept of a function is the foundation upon which all of his theories rest. It is not merely a matter of efficient organization. "Everything has to work," he says, "but that's a relatively easy part of the problem. A building truly functions well if it ignites a fresh life, if it brings into being a poetic environment."

Clients, he has observed, "all have a great hunger for uniqueness. They don't want the architect to measure their lives as they are, and then tailor the building to them." Instead they come to him for an experience, the experience of architecture. "The building," says Franzen thoughtfully, frowning as he chooses his words, "must have a mysterious life of its own, strong enough to evoke new life in those who use it." And this, in a sentence, perhaps best explains the nature of his current quest.



CLEANING UP THE CEILING

The suspended ceiling, says Architect Walter Netsch, is the "soft underbelly of U.S. building."

His comment reflects the dissatisfaction of many architects and engineers who are far from content with the way today's conventional suspended ceiling looks or how it works.

The new and specially designed systems shown on these pages have been put together to make the surface overhead a more expressive part of the design or a more efficient tool in controlling the building's environment.

These new systems represent efforts in two basic directions:

> They either try to make an architectural feature of lighting fixtures, air ducts, and floor structure by exposing them to the eve;

> or they try to combine the energy output of the lighting and temperature control systems to achieve greater efficiency.

Unfortunately, no one has yet tried both with one design.

Skidmore, Owings & Merrill's system for the American College of Surgeons Administration Building (photo and section, below) is an example of the first direction. Here, Architect Netsch brought enough mechanical equipment up into a double floor to leave the underside of his structure uncluttered, and thus to expose, neatly, both structure and lighting below.

Major savings are possible

A number of engineers have recently tried to coordinate lighting, cooling, and heating to bring savings in both first costs and operating costs-particularly when the recently recommended boosts in lighting levels are applied.

There are four ways to obtain such cost savings:

First, fluorescent lamps are designed to produce their rated light output at a temperature of 77 degrees. In the ordinary recessed light troffer, temperatures commonly range some 30 degrees higher, so that there is a loss of up to 20 per cent in output. By linking the cooling system with the light fixtures, temperature light loss can be kept down.

> Second, when return air is used to cool the lights to a point close to their optimum temperature, the air can be returned to the refrigeration equipment at a higher temperature without causing discomfort. The larger the temperature differential between supply and return air, the less air is needed to carry away a given amount of heat. Thus, smaller ducts and fans are required.

> Third, a certain percentage of return air is always exhausted from a building to make way for a supply of fresh outside air. The higher the temperature of the exhaust air, the smaller the burden that will be placed on the cooling equipment-and the lower its peak capacity and cost.

Finally, a major cost saving can be achieved by utilizing the heat generated by the lights: often there is enough waste heat from interior lights to heat the perimeter of a building in cold winter months. In some cases, it may be worth-while to store the heat in hot-water tanks to heat the entire building at night.

Some engineers have been working with systems that combine radiant panel cooling and heating with lighting systems. They consider such systems more comfortable as well as more efficient, because air supply can be kept to a minimum, and much of the space normally devoted to ducts can be saved.





Exposed ducts and indirect lighting

A full-scale laboratory test (above) by Engineers Syska & Hennessy made sure that this simple integrated system of lighting and air conditioning (right) would meet high standards of comfort. The system, which was designed for Skidmore, Owings & Merrill and the Amercan Republic Insurance Company Building in Des Moines, consists of suspended aluminum ducts with continuous integral diffusers. They were found to provide quiet, draft-free cooling. Perforated casing duct allows glass-fiber liner to absorb office noise. High-output lights provide 95 foot-candles.



Air floor and triple-duty fixtures for Detroit

Steel wiring ducts support the corrugated steel sheets that form a large, shallow air plenum chamber in the floor (photo above). The system was designed for the Michigan Consolidated Gas Building in Detroit, by Architects Minoru Yamasaki and Smith, Hinchman & Grylls. In the interior zone of the building (drawing, right), the air is delivered through a hole in the center of the 4-foot 8-inch-square coffers. It is baffled and diffused by a fixture that also serves as a light reflector. The baffle is perforated so that the insulating batt above can absorb office noise.





Two problems, however, have arisen in integrating lighting and air conditioning: If some fluorescent lamps in an installation are cooled and others are not, there will sometimes be a noticeable difference in their color. Also, when air is distributed by some systems other than those using conventional ducts, there is a danger of greater sound transmission.

Full-scale tests vital

These problems suggest the need for full-scale tests of new systems. The first installation of Architect Ernest Kump's environmental control system (FORUM, Aug. '62) was completed just last



month in a lecture hall at Stanford University (photo above). Although the tests indicated that the system met or exceeded all the design criteria, they also revealed the need for some minor modifications in detail.

Here are five more examples:

A full-scale laboratory mockup of the ceiling for Skidmore, Owings & Merrill's American Republic Insurance Company Building (page 126) was used to prove that this simple system (top, page 147) would work. Because supply and return air trunks are carried in the cavity between the exterior bearing walls and the furred-out office walls, only small ducts are needed to branch out into the ceiling space. So, one 16-inchdiameter duct with an integral continuous air slot is hung at the center of each structural bay. Its aluminum casing is perforated and the duct liner doubles as sound-absorbing material for the office space. The single line of grooved, high-output lamps mounted on top of the duct was found to give 95 foot-candles of indirect illumination in the tests.

Already in use in the Michigan Consolidated Gas Building (page 109 and bottom, page 147) is an integrated system that saved considerable space in the depth of floors. Air is supplied through a shallow plenum in the floor structure from a fan room on each floor. It is fed up to perimeter low-velocity induction units or through a hole in the slab to the coffers of the ceiling below. In the coffer a triple-duty fixture diffuses the air, acts as a light reflector, and absorbs sound.

Inland Steel's new integrated floor system (top, right) is being installed in the Lincoln Tower Building in Denver designed by Architect Robert Hiester. The cells of the steel deck can carry the limited amount of air required, as well as wiring systems. The radiant ceiling and use of a chemical dehumidifier reduce the amount of air needed to a third of that used in a comparable all-air system. This system not only saved space but considerably reduced the overall cost of the building, which will be less than \$18 per square foot.

> To provide optimum comfort under the 200 foot-candles of light in the new Commonwealth Edison office in Crystal Lake (Architects: A. Epstein & Sons), Engineers Meckler & Hoertz designed the unusual twolevel radiant ceiling system shown above, right. One coil uses cooling-tower water to remove heat from the lights and to transfer the heat to parts of the building that need it. The lower coil cools or heats the louvers beneath the lights. These louvers offer a large effective area of radiant surface to the space below.

A complete set of mechanical services has been worked into a precast, prestressed concrete floor system that can span up to 60 feet with only 24 inches in overall depth (bottom, right). Developed by Architect Robertson Ward and The Engineers Collaborative for the Dynacore panel (FORUM, Sept. '62), this system depends upon a regular pattern of access holes to allow easy installation of all equipment after the panels have been put in place.



Radiant ceilings cut airsupply requirements

Operating costs are reduced by using separate radiant coils to control temperature of lights and office space in the system (above), by Engineers Meckler & Hoertz for a utility company in Chicago (Architects: A. Epstein & Sons.)

Inland Steel's system (right) has a chemical dehumidifier so effective that radiant-acoustic ceiling pans may be kept at lower temperature. Tests revealed that chemical dehumidification sharply reduces bacteria in air. First installation of complete system will be in Denver's Lincoln Tower office building by Architect Robert Hiester.



Services are integrated in precast beams

Lighting, wiring, and a dual-duct air-conditioning system can all be fitted within the 24-inch overall depth required to span 60 feet with the precast, prestressed Dynacore slabs made by General Dynamics' Material Service Division in Chicago (Forum, Sept. '62). The system (drawing, right) was developed by Architect Robertson Ward and The Engineers Collaborative. Access holes are arranged so that mixing boxes, baffles, and diffusers for air supply as well as wiring and lighting can be easily installed after beams have been lifted into place by cranes (photo above).



OLD HOTEL TURNED INTO MODERN MOTEL

Competition from two flashy new motels just down the street was cutting into the business of the 70-year-old Allen Hotel (right), located near the Vanderbilt campus in Nashville, Tenn. To combat it, Owner Sam Allen spent about \$90,000 making his 60-unit hotel look and function like an up-todate motel.

The most startling change is at the front, where a handsome solar screen of delicate precast concrete blocks topped by plywood vaults conceals the old masonry (below and below right). The \$21,000 screen-dramatically lighted at night-is 100 feet long and is set 8 feet out from the old façade to form a long, sheltered front porch. A new driveway cuts across the old lawn and is covered at the entrance by an aluminum canopy. Exterior masonry walls were painted white and the roof black. Inside, only the lobby was touched, receiving minor alterations.

Most of the money (\$55,000) went for purchasing an adjoining property, which was then turned into a 50-car parking lot.

According to the owner, the remodeling has brought a significant jump in occupancy: "It has been a material help." He buttresses his claim by pointing out that business for this March was up 22 per cent compared to the same month last year. Architect: Swenson & Kott. Engineers: Anthony Papuchis (structural), James Simpson (electrical). Contractor: J. E. Crain & Son.





Old hotel (above) was dressed up with a solar screen of precast concrete topped by plywood vaults (below)





BROKERAGE OFFICES MADE MODERN

Reluctance to leave a key downtown location, coupled with the need to expand its staff by 20 per cent, induced Courts & Co., Atlanta stockbrokerage, to remodel its old head office.

Exterior changes were kept to a minimum to preserve the unity of the building they occupied (above). A clean, new entrance was provided, however, with big sheets of plate glass held in a bronze framework (right).

Inside, remodeling had to be done in stages while selling was going on. Ultimately, almost the entire interior was gutted. In the big boardroom, the old plaster ceiling was replaced by a new luminous ceiling, 13 feet high, containing air-conditioning outlets. Executive offices, conference room, and library, which flank the big space, have recessed fluorescent troffers in an acoustic ceiling 8 feet 6 inches high. Walls, which had been of acoustic tile, are now plaster in neutral tones with accents of dark vinyl and, in the executive offices, natural woods. The parapet of the customers' balcony overlooking the quotation board is now covered by handsome vertical battens of oak (right). Carpets cover the old tile floors except at the entrance, where terrazzo was used.

Architects and engineers: Finch, Alexander, Barnes, Rothschild & Paschal. Electrical engineer: Preston E. Newman. General contractor: Barge & Co.



Remodeled brokerage got a new front of glass and bronze (above) and a luminous-ceilinged boardroom





YOUTH CENTER FROM AN OLD THEATER

Like so many neighborhood movie houses across the U.S., the crumbling old Elsmere (left and right), located in the Bronx section of New York, was abandoned following the postwar rise of television. For the 50-year-old theater, however, the future is suddenly bright: after thorough remodeling it now serves as a YM-YWHA community center with special facilities for the neighborhood's old and young.

Outside, a clean, new façade of light-brown brick and porcelain enamel steel panels replaces the cracking terra cotta front (above, right). Most striking element of the remodeling, however, was the conversion of the dark, ornate main auditorium into a clean, bright combination gymnasiumauditorium (photos left). The old balcony was ripped out; a new, level floor was constructed over the old slanting one; and an acoustic ceiling was installed with recessed downlights. Behind the stage are shower and locker rooms (plan right), with a second floor of music rooms added above them in the fly space, supported from the roof by four 63-foot steel hangers to eliminate columns which would have obstructed the stage. Nurseries (right) and craft rooms are at the front of the building on the second floor above offices and a large activities room for the elderly.

Says the architect, Morris Ketchum, Jr.: "You can't make great architecture out of a situation like this, but I think it has worked out pretty well." And pretty cheaply too: \$480,000 (construction cost) for 36,000 square feet of space, an estimated \$200,000 less than the cost of a similar new building.

Owner: East Tremont YM-YWHA. Architect: Ketchum & Sharp. Engineers: Severud-Elstad-Krueger (structural), Cosentini Associates (mechanical). Contractor: Kayfield Construction Corp.



Crumbling terra cotta façade (above) was replaced by a new front of brick, glass, steel -- and large lettering



Ground floor (plan above) contains gymnasium, lockers, lounges, and offices. Below: second-floor nursery



ST. SOPHIA TODAY

The analysis that starts on page 131 of the structure of St. Sophia brings back into awareness one of the grand human monuments of all time and is (for reasons that will shortly be given) a noble historical event in itself.

As Author Van Nice declares, in St. Sophia there is something apart; for never, anywhere, was another such rolling, mounting thundercloud of space raised up to glory by human mind and hand; and nowhere in the Western world is there a monument on which long, sorrowful history has left such mark.

At the outermost limits the edifice starts as a square field that has been enclosed in a wall; inside that wall are long peripheral passages under high barrel vaults that are still visible from under the great central dome, in peek-a-boo views through the multistoried side-screens of the nave. At the nave's two ends, the cloud of space begins to mount and mount. It starts mounting by means of an outer ring of "exedrae" or niches, tall, open-sided cylinders spherically crowned; these open in turn into rounded apses whose great half-domes carry the surging movement upward in another giant wave; finally there is the great, crowning dome-high enough so that a 15-story building could be inserted under it-ringed with a necklace of window lights around its shallow drum, their brightness lifting the dome as a "sky" and making it float, their light illuminating the area while



their own brilliance, by contrast, gives it the majestic value of light subdued. (When the doors were first opened the great pendentives in their well of light under the dome were all burnished with mosaics rich in new gold.) Finally, from the high crown, there drops down, down, down, the cable of the wrought, low-hung chandelier, the plummeting straight line re-emphasizing the great height as the height of a thundercloud is reinforced by shafts of falling rain.

Unlike the Turkish mosques (its later progeny), with their central plans, their flashing display, their ready geometric skill, St. Sophia is subtle in shape and its antiphonies are complex, bounding and rebounding in such various ways. And yet of the outcome there is never doubt; the greatness comes through the instant the pavement of that great central area is betrod: it comes through like a flash, like a thunderclap, at once.

Beyond its basic esthetic appeal, St. Sophia's very imperfections are a source of deep sentiment, for, like a noble human character, St. Sophia is manifestly the outcome of epic struggles, of ever-ready resourcefulness, improvisation, readiness for the stubborn hostility of the vast unknown. Such are the wonderful gifts to us from the pathbreakers in architecture, before the apple polishers have had their turn.

THE NEW INSIGHT

Out of Van Nice's researches, pursued with brave devotion worthy of their object, there seem to arise ideas that he, the historian, has been too conscientiously reticent to spell out.

One contribution of St. Sophia is this: that evidently the principle of skeleton construction and the curtain wall—America's pride and the skyscraper's essence—was one that Anthemius and Isidorus fully knew, 14 centuries ago, and used.

Another: In St. Sophia the architectural concept was the master, construction was the servant, not the reverse. We now have to give up the ninteenthcentury myth that St. Sophia's structural system was all of a



piece, superbly cunning in its interrelationships. Van Nice tells us that the architects, as nearly as they could, simply carried their stresses down, each episode by itself. Yet the true truth is never a sacrifice. We now think we see that what the architects started with was the basic architectural concept of the mounting space; this was what they fought to achieve, and did; it is this that strikes us as wonderful and as all of a piece; it was sovereign and unified; valiantly they devised structure (never untrue to itself) to make the concept good. God be praised.

ROBERT L. VAN NICE

Too modest to permit any personal reference at the head of his article, Robert Van Nice is nevertheless a remarkable man. What happened is this: In 1935, when the great Ataturk first opened St. Sophia to the world, Dean William Emerson of M.I.T.'s School of Architecture saw the new chance. It was before the day of "foundations," but Emerson was the most remarkable one-man foundation of them all, tendering his limited personal funds to student after student for productive inquiries by them. It was he who in 1937 sent young Van Nice to Istanbul as the first to make "measured drawings" of the ancient church. It was Van Nice who, seeing the building, fell in love. A mountain-raised Oregonian with the build and agility of a mountain goat (handy in negotiating narrow cornice rings 150 feet above ground), Van Nice was prepared to take on a monk-like austerity of life in order to do a

far more perfect job than the usual "measured drawing" ever did. He obtained, somehow, the needed transits and theodolites as required, and, during the first years, even acted as his own "pole man."

With slender resources for so immense a job, he was to require 25 years and more on that one building to answer the most basic questions raised by his curiosity, which is unending.

The Turks in the area liked Van Nice, and, besides, they believed fondly that "the crazy man's mind belongs to God." When important repairs were to be made by "WPA projects" on the fabric, momentarily revealing hidden facts, Van Nice was almost always tipped off.

Emerson died before the work came to fruition, but it was taken over by Harvard's Dumbarton Oaks, Center of Byzantine Studies. By now Van Nice knew St. Sophia stone by stone, including marble veining, mason's marks, and architects' guide lines, not to mention the ups and downs of Byzantium's technological history. "If a pigeon lets fly at St. Sophia," Director John S. Thacher of Dumbarton Oaks smilingly observes, "Van Nice wants to know."

One of the most amiable men of steel, Van Nice yields to only one scorn. This goes to archaeologists who, too lazy to gather reachable facts, substitute clever surmise. Bob is a dangerous man to contradict. He not only knows, but his decision what to find out has been guided by comprehensive, loving intelligence.



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"The Gizmo", Students' Snack Room, Knox College. Architects: Perkins & Will. Plate 451.

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BOOKS

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THE GREAT AGES OF WORLD ARCHITECTURE. Final four volumes in the 12-volume series. Published by George Braziller, 215 Park Ave. South, New York, N.Y. Each volume about 128 pp. $7/_2$ " x 10/4", Illus. \$4.95 each.

The final four in Braziller's series of slim monographs continue the high standards set by the preceding eight. Like their predecessors, each consists of a brief (48-page) scholarly essay followed by 60 pages of generally excellent photographs and drawings.

Western Islamic Architecture, by Yale's John D. Hoag, contrasts the airy ornament of North Africa and Spain (e.g., the Alhambra) with the virile austerity of Egypt, and compares both to the monumental Ottoman mosques built in Turkey.

In Chinese and Indian Architecture, Hoag's Yale colleague, Nelson I. Wu, describes the opposition between the Indian concern with eternity and the Chinese concern for an orderly human society (The Indian "Mountain of God" and the Chinese "City of Man"). He suggests that they meet in the Chinese garden, where the Chinese abandons his ordered human world to contemplate eternity.

Donald Robertson, who wrote *Pre-Columbian Architecture*, is not a member of the Yale faculty (five of the 12 authors are) though he did manage to be educated at Yale, and now teaches at Tulane. His fine monograph deals with the pyramids and palaces built by the Aztecs and Mayas in Mexico and by the Incas in the South American Andes.

Japanese Architecture, by editor, writer, designer, and exhibition consultant William Alex, traces the main influences on Japanese architecture from the early but still dominant Shinto religion, to the importation of exotic Buddhist temple forms from China, to the introduction of ascetic Zen Buddhism in the thirteenth century. A two-page postscript briefs the development of modern architecture in Japan since the end of the First World War-M.B.

continued on page 170

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LIFE AND SHAPE. By Richard Neutra. Published by Appleton-Century-Crofts, Inc., 34 W. 33rd St., New York, N.Y. 374 pp. $51/2'' \times 83/4''$. \$7.95.

BOOKS

When Richard Neutra was a boy in Vienna, his older brother suffered a sudden internal hemorrhage. Internist Shrotter von Cristelli was summoned ("The most luminous star on Vienna's medical horizon," Neutra observes with awe), and entered the sickroom "empty-handed" while the frightened family waited outside. Thirty minutes later he emerged to announce, "He's going to get out of it all right. With the lungs he has, he can live until seventy." The brother, Neutra relates, died some 50 years later in a tuberculosis sanitarium, just six months before his seventieth birthday.

"I tell this story," says Neutra, "to explain how impressed I became with clinical wisdom at that early stage in my life. . . . It has colored my thinking ever after."

More than any of his earlier writings, *Life* and Shape, Neutra's autobiography, makes it clear that the word *clinical* is the key to an understanding of his work. It can, of course, be applied to the precisely drawn, absolutely clean planes of which his buildings are composed. But it is of greater utility in explaining his stubbornly consistent approach to the process of architecture.

The historical importance of Neutra's contribution to the modern movement is underscored by the fact that much of his work of the 1920s looks as if it could have been built today. The enigma is that much of what he is building today looks like his work of the 1920s. It is not dated; his buildings never have been. They are simply Neutra. The world has changed, architecture has changed many times over, Neutra's influence is long past its peak ("Perhaps I was too early to produce a turning point," he admits, "and



a little afterward there were many ready and I was too late"). Yet Neutra's buildings change but little, and not in essential character (1927 vs. contemporary house, above).

The explanation is that his unswerving preoccupation has been the nature of man--biological man---who really has not changed

WRITE FOR THE FULLY ILLUSTRATED COLOR BULLETIN, "ORNAMENTAL GRILLES FOR ARCHITECTURAL INTERIOR AND EXTERIOR APPLICATIONS".



ORIGINATORS OF THE GRATING INDUSTRY Offices and Plants at 50-61 27th ST., LONG ISLAND CITY 1, N. Y. 1861 10th ST., OAKLAND 20, CALIFORNIA much either. "After all," he says at one point, "there is something long-lasting and very slow-evolving about the human species. Organic systems like ours are in a steady, only slowly shifting balance. We must not be fickle in housing them, nor zigzag sensationally when we play with life." Again, "I had seen that my passion to be inspired, not amazed, by individuality-if only well understood-would also yield refreshingly diversified individuality for the building-even with an unexotic, safely syntaxed formvocabulary [italics the reviewer's] and without arbitrary self-expressionism on my own." And later, "To search for elemental environmental factors (interlinked with social ones) to which a human organism already has an adaptation of long standing, and fit them into our design, applying in all this the insight of the biologist, is our safest principle and approach."

Neutra's autobiography, then, is the story of his encounters with other "human organisms"-or, more precisely, a series of lengthy, inductive reflections on these encounters. The subjects include his family in Vienna, villagers he met during his World War I service in the Balkans, the other pioneer modernists he came to know (Wagner, Mendelsohn, Gropius, Loos, Sullivan, Wright), and, most entertainingly, his clients. Each person, each event, inspires several pages of philosophizing. Neutra describes his book as 'a tight cluster of ideas and observations, grown together." It takes some unraveling, but the effort is frequently rewarding-DONALD CANTY

TEN DESIGNS: COMMUNITY COLLEGES. Published by the Department of Architecture, Rice University, Houston, Texas. 100 pp. 9" x $10\frac{1}{2}$ ". Illus. Free.

Last June, under a grant from the Educational Facilities Laboratory, ten widely assorted and carefully chosen architects were brought to Rice University for what was called a "Design Fête." Each was given a detailed program for a hypothetical twoyear community college, five architectural students to work with, and nine days in which to come up with his solution in the form of drawings and models. The results are collected in this paperback volume.

One objective, of course, was the edification of the students, drawn from nine universities. For them it was a unique opportunity to watch and work with design-minded architects under pressure of a tight schedule. But the broader goal of the "Fête" was to focus attention on the community college as an architectural problem of increasing importance.

The architects were Charles William Brubaker of Perkins & Will, Chicago; Joe Schiffer, head of MIT's Experimental School in Architecture; Gin Wong of William L. Pereira & Associates, Los Angeles; Franklin D. Lawyer of Caudill, Rowlett & Scott, continued on page 175



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The Warner Company 108 S. DesPlaines St. Chicago, Illinois *T.M. C. W. Stockwell Co. Houston; Donald Barthelme of Houston; Linn Smith of Birmingham, Michigan; Edmond Lay, Cornell visiting professor from France; Gyo Obata of Hellmuth, Obata & Kassabaum, St. Louis; James H. Finch of Finch, Alexander, Barnes, Rothchild & Paschal, Atlanta; and David A. McKinley of Kirk, Wallace, McKinley Associates of Seattle. They drew straws for the programs, which varied in size, climate, character, and location.

Their solutions, not surprisingly, look a great deal better than most community or junior colleges actually being built. Schiffer, given 60 acres in eastern Texas, made his college a single square building set into a sculptured ridge; Wong, assigned a thinly veiled equivalent of Miami, put his in a series of romantic, pagoda-like towers in mid-city park; Lawyer, whose site sounded suspiciously like San Jose, California, also followed a single-building approach, a pavilion divided into flexible, 120-foot-square structural modules roofed by translucent fabric; McKinley, given a tiny plot in a metropolis, came up with a fluted, high-rise cylinder that would do credit to any city's skyline.



Some of the schemes have the academic, blue-sky quality that was perhaps inevitable, but all are interesting. The book does a workmanlike job of presenting both the problems and solutions, although its layout is an unrestrained example of jazz in the graphic arts—D.C.

THE INTELLECTUAL VERSUS THE CITY, from Thomas Jefferson to Frank Lloyd Wright. By Morton and Lucia White. Published by Harvard University Press and the M.I.T. Press, Cambridge, Mass. 270 pp. 6¹/₄" by 9¹/₂", \$5.50.

This is a road-opening book, because it asks a question not previously asked: Why have American intellectuals been steadily against the city? All through history they have been almost unanimously hostile, in varying degree from Jefferson to Frank Lloyd Wright, as the authors point out. Yet during all that time American cities have grown regardless. At last the situation has reached a climax. Though metropolitan areas continue to grow, the central cities dangerously decay, and now *continued on page 182*

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From its infra-red ceiling heaters in baths to its 330 G-E kitchens, Coral Ridge Towers is total-electric. Adm. J. S. Hunt's second co-op apartment, Coral Ridge Towers, North, will be completed this winter. Rentals are being accepted on his third totalelectric high-rise apartment, Royal Admiral. Architect: C. F. McKirahan, A.I.A.

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even intellectuals are for "saving" them. But those who have the job actually in hand, planners and investors and institutions, are able to get from the intellectuals no supporting "mythology or mystique" that would rouse enthusiasm for the resuscitation.

Wisely the authors put no case for the city themselves, nor do they try to simplify the long story of opposition by intellectuals by trying to force the many different hostile attitudes into any all-embracing formula. Indeed they leave the question wide open, but their virtue lies in having raised it. In asking how much of the intellectuals' opposition to cities has been justified and how much is prejudice, the Whites have opened a door that cannot be closed again—D.H.

MEXICAN INTERIORS. By Verna Cook Shipway and Warren Shipway. Published by Architectural Book Publishing Co., Inc., 151 E. 50th Street, New York 22, N.Y. 257 pp. Illus. 81/2" x 11". \$12.95.

An earlier book by the Shipways, The Mexi-



can House New and Old, concentrated on exteriors but gave a few inviting glimpses of interiors through wrought-iron railings and columned galerías. Their latest work provides a welcome follow-up, a closer look at a sampling of rooms and furnishings in private Mexican homes and museums.

Examples have been tastefully chosen to illustrate the unique character of the Mexican house with its heritages from Spanish and pre-Columbian decorative art. The lavish use of photographs, alternating between overall shots and details of furnishings, brings out the distinctive charm and graceful proportions of *salas*, *corredores*, and gardens. The text provides an explanation of origins and the evolution of those designs which are typically Mexican.

The authors are to be commended for providing many dimensions and diagrammed details, as well as careful identifications of each photograph according to location, owner, and designer or decorator—A.P.

ARCHITECTURE: MAN IN POSSESSION OF HIS EARTH. By Frank Lloyd Wright. Published by Doubleday & Company, Inc., 575 Madison Ave., New York 22, N.Y. 127 pp. 91/2" x 1234". Illus. \$10.

The first portion of this book is a brief biography of her father, written with obvious devotion, by Iovanna Lloyd Wright. The remainder consists of reflections by Mr. Wright, also quite brief, on the nature of basic materials—stone, brick, wood, glass, steel, and concrete. The latter are taken from recordings of Mr. Wright's lectures to his students; the book was begun, and its outline approved, just a year before Mr. Wright's death.

Actually, the discourse amounts to a capsule history of architecture. These fragments of Mr. Wright's thought, reflecting the depth of his lifelong search into the essential characteristics of materials, are worth study. Unfortunately, the prolix illustrations, indiscriminately chosen and poorly used, are a major distraction.—D.C.

STORES AND SHOPPING CENTERS. Edited by James S. Hornbeck. Published by McGraw-Hill Book Company, 330 W. 42nd Street, New York 36, N.Y. 181 pp. Illus. 834" x 1134". \$10.75.

Inevitably, magazine articles reprinted in book form seem to lose some of their initial sparkle. And if they were originally written to be published separately (as the articles in this book were), it is difficult to piece them together into any convincing sort of unity.

Though it does suffer somewhat from such defects, this collection from Architectural Record, covering retail architecture from small stores to shopping centers, is generally a useful reference work. Shown are 31 "successful" examples varying in size and type. Abundant illustrations include some 425 continued on page 184 Who brought a gleam of Stainless Steel to Michigan Consolidated Gas Company's new headquarters?



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A friendly salute to the Michigan Consolidated Gas Company; Minoru Yamasaki-Smith, Hinchman & Grylls, Associated Architects and Engineers; Adams & Westlake, fabrication and erection; Van Huffel Tube Corporation, roll forming for windows; and Bryant & Detwiler, General Contractors.

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photographs, structural diagrams, and floor plans. How to make a small store look larger is one of the many subjects discussed. Others: "Architecture for Day and Night," two-level parking, enclosed malls.

SLUMS, PROJECTS, AND PEOPLE: Social Psychological Problems of Relocation in Puerto Rico. By Kurt W. Back. Published by the Duke University Press, Durham, N.C. $61/4'' \times 91/2''$, \$5. If relocation in the U. S. remains a knotty problem (which it does), then relocation in underdeveloped countries should cause planners to wake up screaming in the night. Not only are relocatees asked to move from one home to another, but also they are expected to change abruptly their ways of, and attitudes toward, life. It is therefore small wonder that many of the slum dwellers in Puerto Rico studied in this book resisted the shift. They preferred their familiar, dilapidated (and



rent-free) shacks to the ordered apartment life in the housing projects planned for them.

Dr. Back uses careful sociological methods to investigate what relocation means to individuals. He probes every stage of the move by analyzing extensive interviews with families who 1) live in slum sites marked for clearance, 2) live in housing projects, and 3) have moved away from either projects or relocation sites. On one level, his findings are not surprising; people who consent to move into housing projects, for example, either need the guidance and relief that the projects offer, or plan their stay in the project as a stepping stone to a better life. Again hardly startling, Dr. Back states that large apartment projects may not be the best answer to relocation problems in underdeveloped countries. Rather, he suggests self-help programs might meet slum residents' needs better-as, indeed, the Agency for International Development has begun to stress.

On another level, Dr. Back's book is more important. It reveals ways to explore just how slum residents feel about relocations—and hence about urban life. His painstaking methodology should help all sociologists who study housing. And it might assist planners confronted with such staggering problems as cleaning up monstrous slums like the *favelas* around Rio de Janeiro or the *villas miseria* near Buenos Aires—P.H.

DRAWINGS BY ARCHITECTS From the Ninth Century to the Present Day. By Claudius Coulin. Published by Reinhold Publishing Corp., 430 Park Ave., N.Y. 22, N.Y. 144 pp. 10" x 13". Illus. \$12.75

This is a collection of architects' job drawings, taken from all countries, some of them first sketches of ideas, others details or "presentations." The collection starts with an anonymous plan of ca. 880 A.D. for the Monastery of St. Gall and leads to the present day with Louis Kahn. Reproductions are by offset, mostly actual size; where not, the size of the reproduction relative to the original is given. The intention is to illuminate with the process of architectural creation and the taste of successive epochs. The author obviously likes free, sketchy styles, which predominate; Rasmussen's fine, sensitive little drawings are entirely absent, and Paul Rudolph seems not to have been noticed by the French author.

HOMES OF THE AMERICAN PRESIDENTS. By Cranston Jones and W. H. Schleisner. Published by McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N.Y. 232 pp. 834" x 111/4". Illus, \$13.95.

This survey of the private homes of all 34 U. S. Presidents contributes not only an interesting biographical footnote to their lives but a chronicle of changing architectural styles and tastes—from Mount Vernon to Hyannis Port. The text is written in a chatty style, full of anecdotes, color, and family history and is effusively illustrated with photographs, drawings, and portraits. END Now ... From DAP Research Laboratories ...



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PARIS MEMORIAL. The 200,000 Frenchmen deported to Nazi concentration camps during World War II have been movingly commemorated in this monument by Georges-Henri Pingusson. Prow-

Cité behind Notre Dame, overlooking the Seine (below, left). Wrought-iron sculpture and prison-like bars cover the only exterior view; they are seen above between heavy concrete pylons leading to the symbolic vault.



shaped, it stands on the Ile de la



JAPANESE HALL. Another of the mushrooming new city halls in Japan is this one at Miyazu, near Kyoto. It was designed by two former members of Kenzo Tange's team, Taneo Oki and Yukio Otani, who now call themselves the "Design League." The exposed concrete structure is intended to reinvigorate civic life in the sleepy seaside resort around a new public square (right). A municipal office block links a raised wing (below right), containing a mayor's office and hall, to a smaller section with dining room.





LONDON COLLEGE (below). Scattered faculties of England's Royal College of Art will soon be reunited on a city campus just across the street from South Kensington's famous Albert Hall, First unit completed is this eight-story classroom block, designed by Architects H. T. Cadbury-Brown, Sir Hugh Casson, and R. Y. Goodden. For maximum teaching space all floors are split levels with vertical side-wall indentations to disguise the disjointed floor slabs.







CANADIAN CHURCH (above) Linked to old-world tradition despite its contemporary façade, the Holy Family Ukrainian Catholic Church at Winnipeg has kept the rounded arches and tripartite plan of national Ukrainian shrines. A dimly lit nave with long sloping roof contrasts with the sanctuary, where brightly colored light streams down from the three arched towers directly overhead. A third division, the sacristy, is under the shorter sloping roof. Architect: Radoslav Zuk.

STOCKHOLM MUSEUM. The 1,400ton war galleon Wasa became a Swedish national disaster when she capsized and sank in 1628 on the day of her launching. But she was raised in 1961 and today has become a proud historic relic, the world's oldest preserved ship. A temporary museum and restoration workshop are shaped around her bulky hold (below). Both ship and building (a prestressed concrete frame encased in aluminum) are supported on concrete pontoons. Inside (right), sprays of water prevent the old timbers from disintegrating. Architects: Björn Howander, Hans Akerblad.







ITALIAN VILLA (right). Cognoscenti have been debating recently whether this small house on the Via Flaminia, near Rome, is the beginning of a "New Wave" in Italian architecture, or simply a unique experiment by young Architect Paolo Portoghesi. Alternating convex and concave brick walls are separated by narrow floorlength windows with views of the Tiber. In spite of a small budget, the architect was given a free rein by his client and even designed furniture such as the intricately styled chestnut desk (shown in detail, right) to echo the villa's curvilinear theme. END







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SEVENTY-FIFTH





Precast insulated curtain wall used in unique tri-tower design

DESIGN 1963

On the following five pages you'll see specific examples of howKoppersbuilding products have helped architects and engineers obtain greater latitude of design and save money for clients. These money for clients. These permanent in themselves or they give permanence to other materials.







The new men's residence hall of the University of Pittsburgh consists of three circular towers, 15, 18 and 21 stories, including a common three-story pedestal. The 88-foot-diameter towers give each student an outside room and accommodate 1,868 students. The precast concrete panels for the 70,000 square feet of curtain wall were finished to match the limestone of the University's other buildings, and they saved 7,300 square feet of floor area that would have been lost with a conventional stone and masonry wall system.

Foam plastic board made of DYLITE® expandable polystyrene, a Koppers product, was selected for the panel insulation. Slabs of DYLITE 11/2" thick were sandwiched between two screens of steel wire reinforcing, then placed in the panel form. Concrete surrounds the entire DYLITE core, 134" for both interior and exterior facings. Because DYLITE has a closed cell structure, concrete was poured right against it; no vapor barrier was required. The 5" thick curtain wall panel has a "U" factor of 0.126, and costs only \$4.50 per square foot in place. The panels run from floor to floor, held by one load-bearing angle at the bottom and two securing angles at top and bottom.

the bottom and two securing angles at top and bottom. DYLITE board provides permanent insulation; won't rot or decompose. It has one of the lowest "K" factors of all insulating materials available: 0.24. It can be bonded to any conventional facing material, and it also makes an excellent plaster base. It can be molded in any shape to fit tanks or piping. In addition to residential and commercial wall insulation, it has shown excellent results in cold storage rooms. For complete information about DYLITE for insulation, check the coupon.

rchitect: Deeter & Ritchey; Pittsburgh, Pa. General Contractor: Dick Corporation; Pittsburgh, Pa. anel Fabricator: General Concrete Units Corp.; Pittsburgh, Pa. Insulation board molded by Dyfoam Corp.; New Castle, Pa.

TURN PAGE -



New classroom concept made possible with a new folding acoustical wall . . . SILENTWALL*



new addition of the Berkeley Junior High accommodates 750 students



Walls are key-operated and motor driven









assigned to each class group. Superintendent T. L. Holman states, students. They also wanted the home room to be easily rooms of their new junior high school addition to have a "home room" atmosphere for groups of about 100 also it provides are easily oriented to the junior high school environment; With this classroom concept, elementary school students School officials in divided into smaller classrooms for various subjects. better utilization of the four teachers atmosphere for groups of about 100 Berkeley, Missouri, wanted the class-

There are 19 % tical experts to draw up specifications for the walls. SILENTWALL, sound-retarding automatic folding walls made by Koppers, provided the sound isolation (sound accommodated the new educational concept perfectly." The 52,000-square-foot addition has large "study hall" transmission class moveable walls, so the architects consulted with acousture in the design was the acoustical properties of the into clusters of two- and four-room units. A critical featype classrooms that can be divided by moveable walls the divisible classroom concept. 51, ASTM Designation E90-61T) that "The architects

completed at an room and library. closed, SILENTWALL provides noise reduction comparcludes the classroom clusters, girls' gymnasium, music able to a solid masonry wall. The 25-room addition insmall electric motors along an overhead track. When They are rigid, folding walls, key operated and driven by overall cost of less than \$20.00 per It accommodates 750 students and was SILENTWALLS at the Berkeley School.

vide more efficient use of large rooms such as cafeterias square foot. excellent opportunity to design more utility and flexiand auditoriums Check the coupon for information about SILENTWALL. mercial and office buildings SILENTWALL gives you an be divided into classroom space for 100% use. In compart of the school bility into large SILENTWALLS : conference areas and assembly halls. are being used in other schools to proday. But with SILENTWALL, they can . rooms normally used only a small

*Koppers Trademark

trchitect: Heilmuth, Obata & Kassabaum; St. Louis, Mo. tcoustical Consultant: Dr. Jerome Cox; St. Louis, Mo. Contractor: Buckley Construction Co.; Fenton, Mo.

Now wood roofs get fire-resistive insurance rates

The Barcroft View Apartments in Fairfax, Virginia, conain 367 units on 20 acres. The architect designed pitched oofs for the three-story, town house style buildings, but ire insurance ratings wouldn't permit the use of convenional wood construction. To overcome the rating probem, he selected NON-COM* fire-protected wood—a product of Koppers.

The Non-Com trusses, plywood decking and overtangs were approved by the Fairfax County Board of Appeals, based upon the 1961 revision of the Basic BOCA) Building Code, which recognizes fire-retardantreated lumber for this use in Type I fireproof and Type II non-combustible construction. Non-Com fire-protected wood has a fire hazard classification of 10-15 (the same as gypsum board), by Underwriters' Laboratories, Inc. testing. The building's insurance rates are for fire-resistive construction—the lowest rate available in this area.

The trusses required 150,000 board feet of $2'' \ge 4''$ and $2'' \ge 6''$ NON-COM treated Douglas fir. The 79,840 square feet of decking consisted of 2,495 sheets of NON-COM treated Douglas fir plywood 4' $\ge 8' \ge 1/2''$.

NON-COM wood gets its fire-protective quality from pressure treatment with mineral salts. When exposed to temperatures approaching the ignition point of untreated wood, the NON-COM inorganic salts release non-combustible gases and water vapor from the wood to choke off flame and prevent fire spread. The same chemicals also provide protection against termites, rot and decay. The treated wood is odorless and retains the appearance of natural wood. Check the coupon for information.

General Contractor: Kay Construction Company; Silver Spring, Md. *Koppers Trademark



38-year-old water line shows no sign of rust or tuberculation

When city engineers in Brooklyn recently dug up a 38year-old water line to add new connections, they found that the steel pipe was in perfect condition. No rust, no ruberculation, no reduction in flow capacity. And in all the years it was in the ground, the pipe has received no maintenance. It didn't need any. Before it was laid in 1925, the $\frac{7}{16}$ " walls of the 72" pipe were brush coated inside and out with BITUMASTIC[®] Enamel, a Koppers coal tar coating.

Koppers coal tar coatings prevent corrosion of steel because they form a tough, permanent barrier against moisture. The coal tar molecule doesn't deteriorate in the presence of water, so the coating remains intact, a continuous membrane that prevents moisture from reaching the steel. No moisture—no corrosion.

When the city engineers added 6,935 feet of new 72" and 48" pipe to this line, they again specified a BITUMASTIC 70-B Enamel coating* for corrosion protection of the steel. The new pipe was coated and wrapped and has a $\frac{3}{2}$ " spun lining which provides and maintains the highest carrying capacity of any type of water pipe currently available.

Koppers makes a complete line of BITUMASTIC Coatings for corrosion protection of steel and concrete in building construction, pipelines, plant equipment and transportation equipment. We can also provide contract coating service. Check coupon for complete information.



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In conformance with American Water Works Association standards for coor primer and enamel.	il tar

rchitect: Edmund W. Dreyfuss & Associates, Architects; Washington 5, D. C. russes fabricated by: Anderson Lumber Co.; Easton, Md.

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New dimensional square...New textured surface...New low price!

This new Johns-Manville all-fiber-glass ceiling panel offers a combination of practicality and style . . . at moderate



cost. Square lay-in panels are moulded in inverted coffer shape, projecting 2" downward into the room. As shown above, the visible surface has an attractive, low-relief, rippled texture. Panels are factory-painted white, but can, of course, be repainted to suit any decorative scheme. Measuring 24" x 24" x 2" deep and acoustically effective (NRC of .75) ... Inverted Coffer Panels suggest interesting applications in supermarkets and other broad-expanse areas.



Lay-in Inverted Coffer Panels are quickly installed in an exposed grid-type suspension system.







New textured surface ... with vaulted contour ... at modest prices!

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are moulded entirely of fiber glass with an NRC of .75. They are 24" x 24", rising gently to create a 2" vault. As you see above, the surface is made more visually interesting by a low-relief, rippled texture. White-painted at the factory for easy repainting if desired, Textured Vault Panels offer an opportunity to create a sense of height and elegance, as in the gallery above, and in larger institutional or commercial building areas.

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Installation of lay-in Textured Vault Panels is fast and simple in an exposed grid-type suspension system.

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NEW DIMENSIONS FOR CONCRETE! SPEEDY, SPRAYED-ON TEXTURED FINISH



Poured concrete of the new Cyclorama memorial at Gettysburg was formed entirely in vertical flutings. To protect the unusual architectural detail—and to add distinctive textural appeal—a revolutionary coating technique was used.

THOROSEAL cementitious waterproofing compound was mixed to thin batter consistency. With plaster spraygun equipment, an even coating was sprayed quickly over the entire wall surface.

The closeup shows the new finish. Its pleasing texture complements the Cyclorama's otherwise unrelieved vertical lines. **THOROSEAL** will keep those lines true and erosion-free – impervious to water or weather damage for the life of the structure. **THOROSEAL** protection lasts as long as the walls you put it on!

Write for facts on other new finishes for concrete with products of The Thoro System.

both operate in the same downward direction. These theoretical considerations are more than confirmed by the actual forms of the elements in question.

The true contours and thicknesses of St. Sophia's dome and of the seven half-domes long thought to support it have been established by reading with a theodolite the azimuth and vertical angles of points on their soffits. The large half-domes turn out to be no thicker than the main dome, and the shells of the exedrae prove to be the thinnest of the three—only 0.40m. (less than 16 inches). This is slightly more than the length of one side of the square bricks commonly used in sixth-century construction. That Anthemius and Isidorus couldn't have made these shells thinner without breaking in half their common bricks seems to indicate beyond doubt that they employed half-domes, not as functional elements, but purely in order to enhance the nave's spatial effect.

① We make a hand traverse that can be recessed.

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As you will see in our book when you send for it.

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If in the light of what seems true for the half-domes we look again at the armature of the entire structure, its elements seem to be divided by the nature of their loading into relatively independent categories. In a much oversimplified statement, these categories may be listed as follows: lateral thrusts of the dome and its dead load, along with that of the pendentives and main arches, are carried to the foundations by the main piers; similar loads of the large half-domes are carried chiefly by the secondary piers, with one-third going to the main piers; the buttresses and main colonnades exert primarily vertical pressure on the foundations; moderate lateral thrusts generated by the exedrae half-domes are contained primarily within their thick drums which receive no appreciable support from vaults of the galleries because these also are only one brick thick; these vaults play no part in the main structural system, and their local loads are transmitted to the foundations by the columns on which they stand; and, finally, the peripheral walls, only 0.80m. thick (about 32 inches) and largely non-bearing, are the thinnest that could be built with efficient combinations of ordinary bricks of the period. Like a modern "curtain-wall" skyscraper, St. Sophia's working fabric actually could have been built long in advance of the insertion of colonnades, aisle vaults, and curtain walls, had that been convenient.

In view of its almost frightening deformation, St. Sophia cannot from the engineering standpoint be regarded as an unqualified success. But all architects and engineers, along with generations of laymen who have been deeply moved by this incomparable space, agree that in fashioning it within the unknown capacities of inert materials at their disposal, Anthemius and Isidorus most certainly made the right decisions. END



In final book, it is planned to reproduce detailed plans, like that above and that on cover, in collotype for highest clarity.



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design and america's image abroad

The International Design Conference in Aspen, Colorado, on June 24 through June 28 will appraise U.S. international communication via motion pictures, television, exhibits and visual journalism. Peter Blake, managing editor of Architectural Forum, is program chairman.

The Conference is an annual meeting of people in business, industry and education, who share a common interest in design. It is open to all. This year's meeting will include: Reyner Banhan, Assistant Secretary of State Lucius Battle, Herbert Bayer, Thomas W. Braden, George Freedland, Peter G. Harnden, John Houseman, Allen Hurlburt, Eliot Noyes, Alan Pryce-Jones, Martin Rosenzweig, Arthur Schlesinger, Jr. Patwant Singh, Robert M. Wool. For information on travel and accommodations write the Aspen Chamber of Commerce, Box 739, Aspen, Colorado, U.S.A. Registration fee for the conference is seventy-five dollars; for students, ten dollars. A membership fee of ten dollars provides those unable to attend with a copy of the conference papers.

idca 1963



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*FORUM's readers are solidly interested in the magazine's editorial content. Surveys of reader interest made by Readex, Inc. indicate that, not only does FORUM's editorial content interest an extraordinarily high percentage of readers (a typical issue averages 62% per page), but that it is of almost equal interest to architects, contractors and clients.

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PRODUCTS

Quieter welding, brighter lamps (below) Mechanical draftsman (page 218)





SAFER WELDING

Safer, quieter welding gets a boost from a new attachment for stud welding guns. The attachment, Tranquil-Arc, was developed by Gregory Industries' Nelson Stud Welding Division for Nelson guns, but it also fits guns made by competitors. Before-and-after photographs show the difference rather dramatically. In the second photograph the stud is pressed rather than thrust in, almost eliminating the splatter of hot metal visible in the first. While increased safety is obviously the most important advance, Nelson finds that the weld's quality is also better with the new system, being a trifle

slower but more accurate than the old way. It also does away with cleaning up after the weld.

Tranquil-Arc is an air cylinder operated by leather bellows, extending the shaft of the gun about 1½ inch. It is sold as optional equipment on new guns and may be added to most existing models either by Nelson distributors, where the service is free, or by gun owners who want to do it themselves. The Tranquil-Arc attachment costs \$75 and takes about 15 minutes to install.

Manufacturer: Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio.



PREFAB STAIRS

For buildings of two stories and up —and fire stairs in high-rise buildings—a Maryland firm prefabricates blocks of steel stairs complete with handrails. *Pico Safe Stairs* are delivered to the building site on flatbed trucks, lifted and stacked by mobile cranes. The only part of the building that has to be ready before the stairs' arrival is some sort of foundation that can be leveled and plumbed at the time the first block is placed, to insure level stairs all the way up. Cables brace the stairs temporarily until the rest of the building catches up.

Stairs like these have been available in the Washington, D.C. area for some years, but the company has now launched its product nationally, licensing regional fabricators. All stairs are factory built, assembled and welded to architects' specifications.

Manufacturer: Pico Safe Stairs Co., 4628 42nd Place, Hyattsville, Md.

BRIGHT LIGHTS

Encore is a new indirect lighting system developed by Thomas Industries' Benjamin Division specifically for school and commercial buildings. It uses extra high-output fluorescent lamps (1500 MA) and a sound deadener to quiet the hum from ballasts, which up to now has been a limiting factor in using high-amperage lamps outside the industrial field. The bigger light source cuts the size and number of fixtures needed to light a given area by as much as 50 per cent. The Encore fixture is a slim aluminum extrusion 71/4 inches wide which lends itself to several

installation methods: suspended from thin cables, mounted in rows or patterns on the ceiling, or mounted along the wall as a valance.

The fixture is offered in several colors, lengths (48, 72, and 96 inches), and three types of diffusers. According to Thomas, Encore costs less initially when compared foot-candle to foot-candle with conventional systems, and continues to save money because of fewer lamps and ballasts to replace.

Manufacturer: Benjamin Div., Thomas Industries Inc., 207 E. Broadway, Louisville 2, Ky.



SCHOOL CABINETS

Brunswick's new cabinet system for schools is based on a single aluminum frame of patented design offered in several sizes to fit kindergarten through college-size students. The basic frames take on different panels, finishes, and accessories according to use. They also stack together, hang on the wall, roll on casters, or stand on fixed bases. The basic frame and a wide choice of accessories add up to thousands of possible arrangements, according to Brunswick.

The frame which makes all this possible consists of a corner post extrusion with big fingers at top and bottom. These fasten into channel ends fixed to the underside of the cabinet top and the bottom panel. After the frame, top, and bottom are in place, the side

