

97:6

architectural forum

December 1952

ROBERTSON OFFICE OF ART
2000 17th St. N.W.
WASHINGTON, D.C. 20037 ✓

Frank Lloyd Wright

A church in the attitude of prayer (p. 85 and below)

Seven other fine churches

They point up the problems and questions of today's religious architecture (p. 93)

Industrial building

H. K. Ferguson's success formula: build as little as necessary (p. 116)

Marcel Breuer's theater

His biggest US building is a multipurpose arts center—
full of new ideas for progressive schools (p. 134)

Building engineering

Walk-through trusses save steel in multifloor framing
Double-duty floor planks distribute warm air
Two-faced stadium brings seat cost down to \$16 (p. 140)

\$7,700-a-bed hospital

A case history in cost cutting (p. 129)





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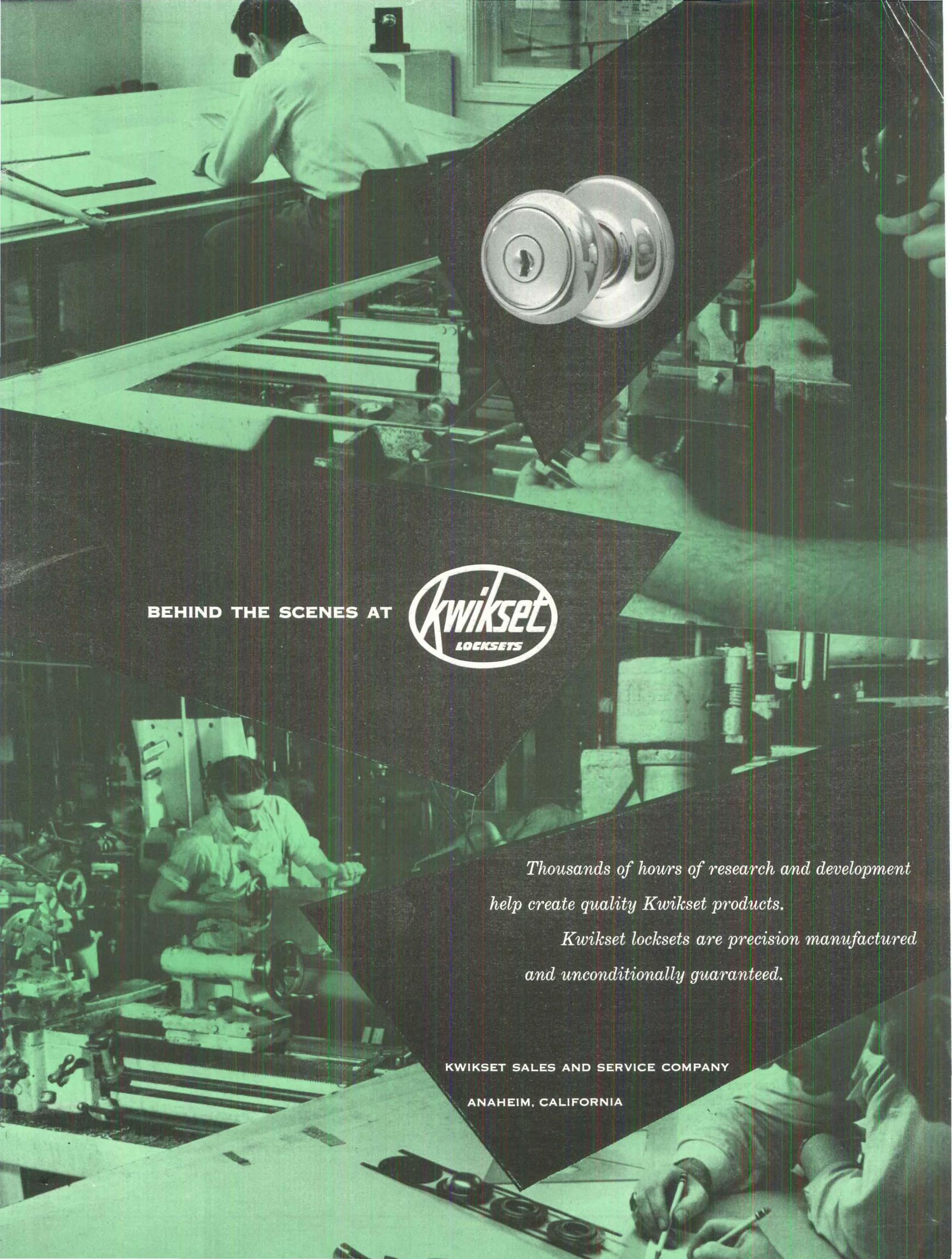
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Trinity White

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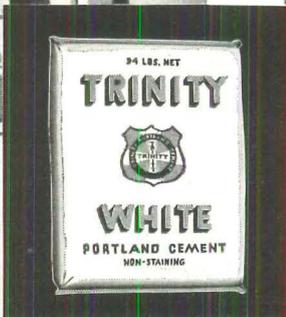
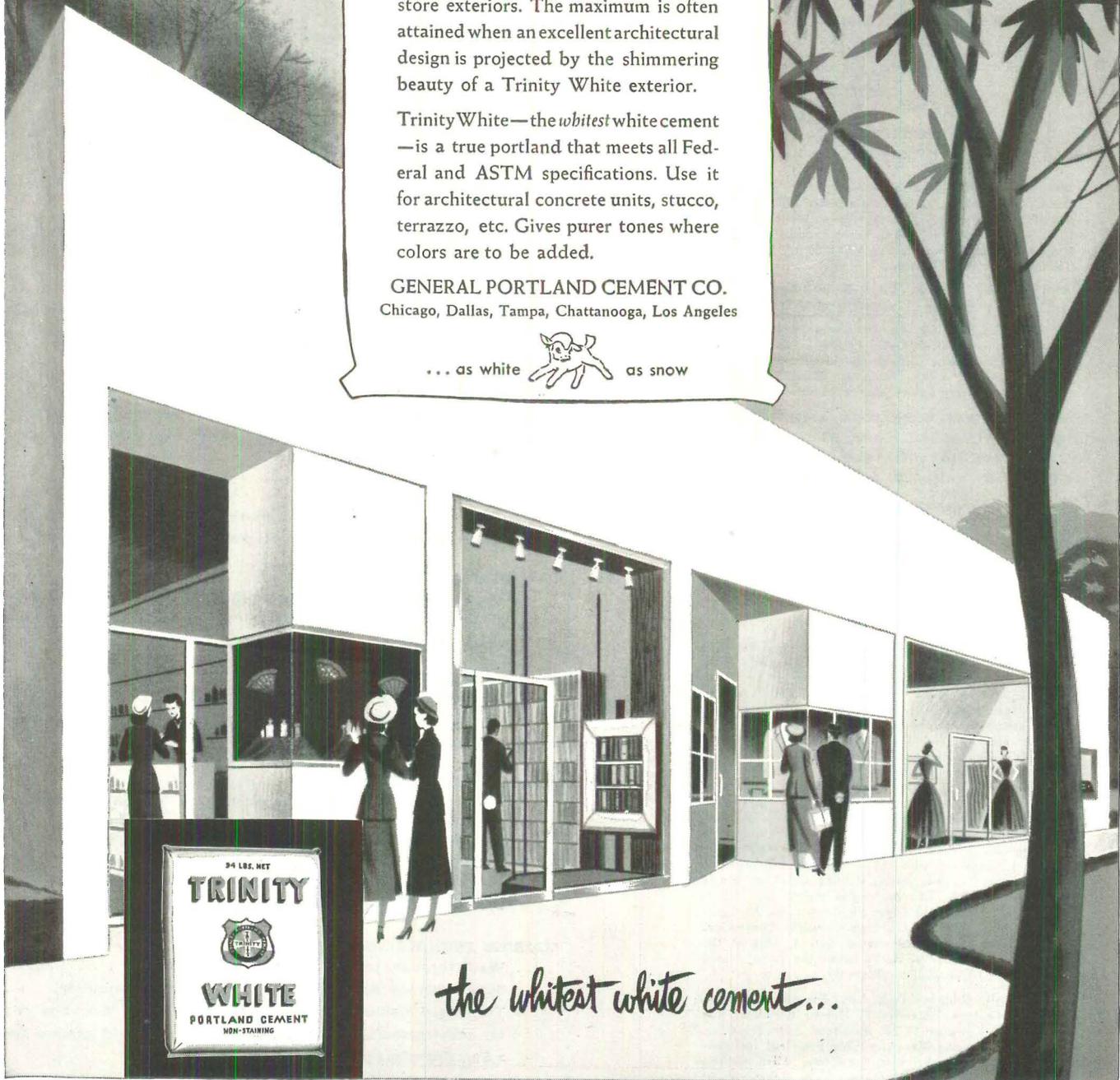
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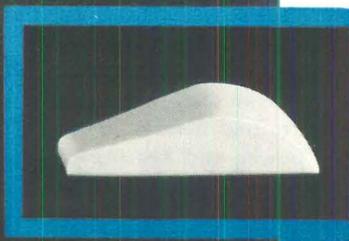
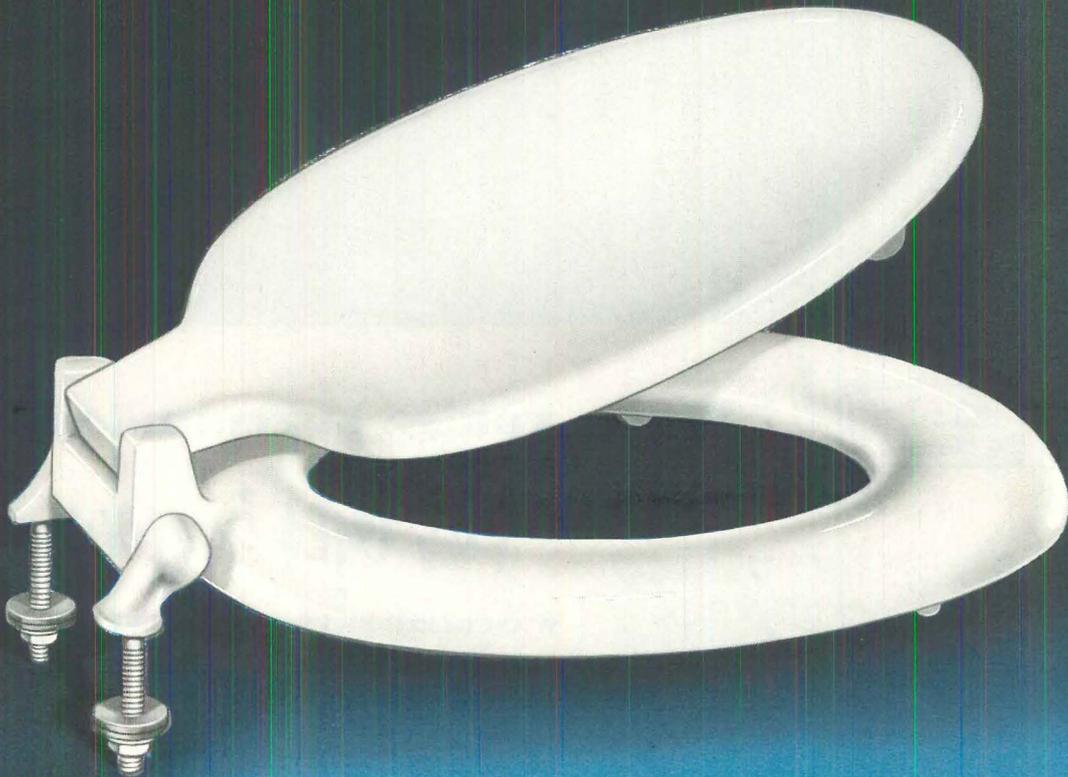
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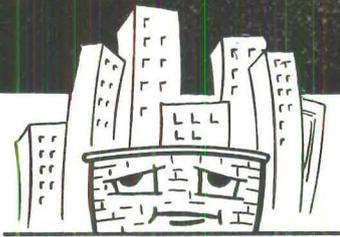
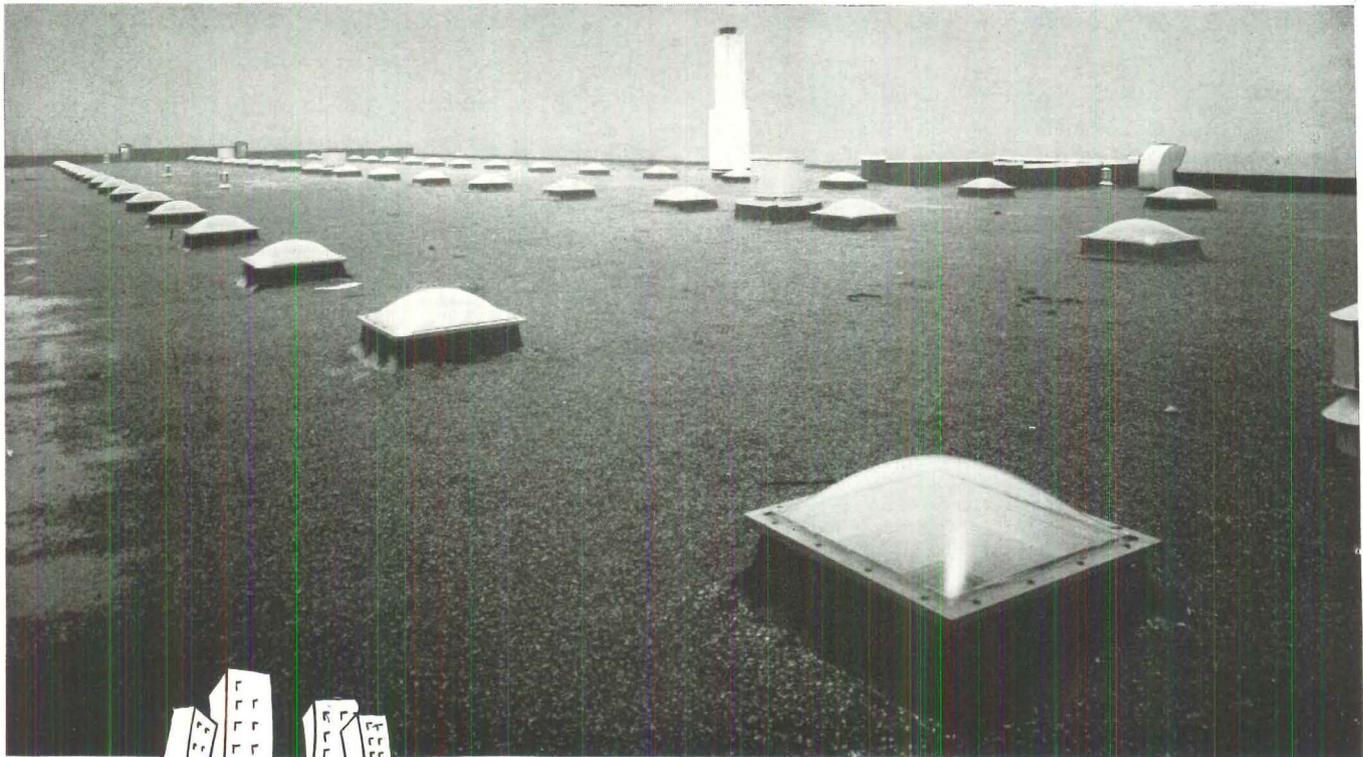
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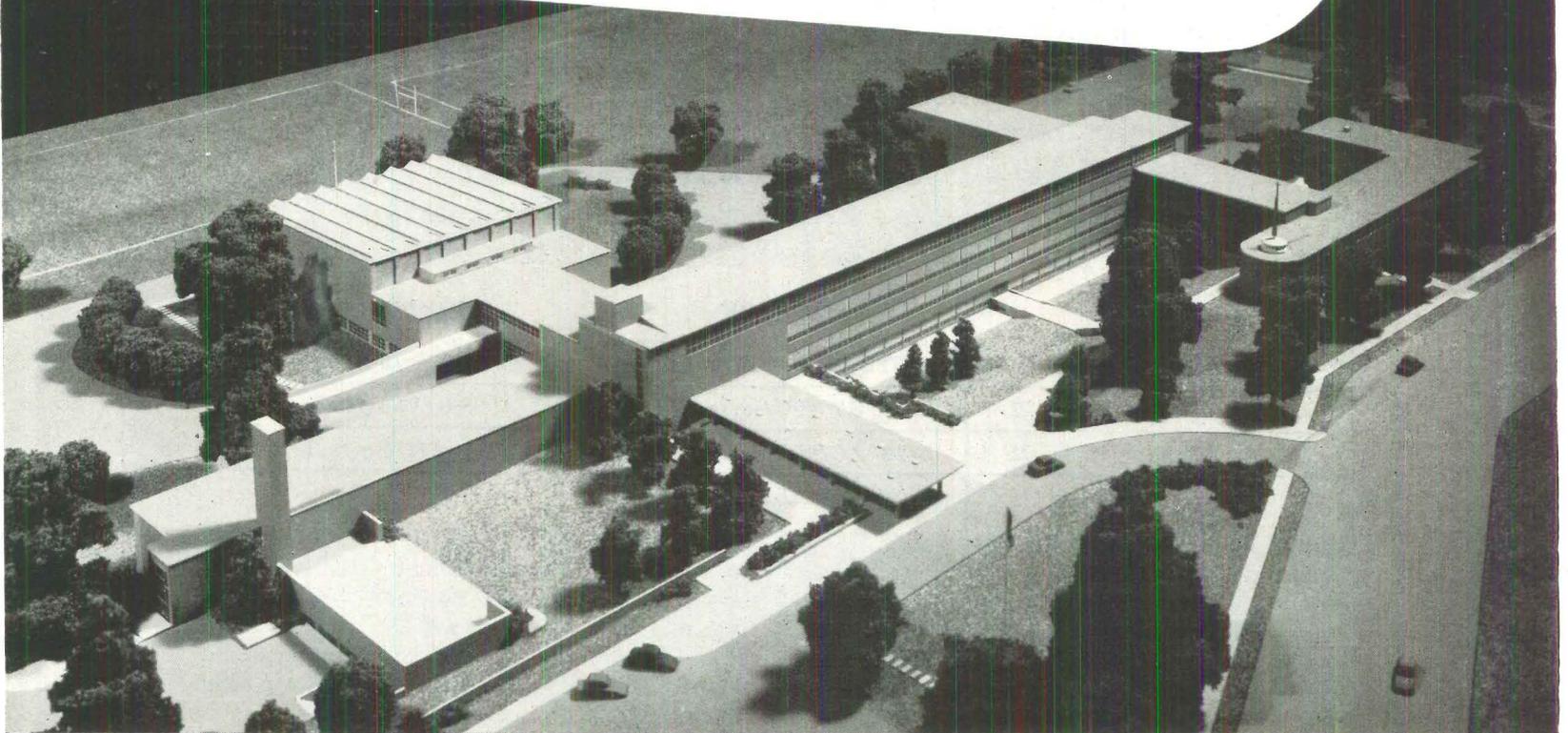
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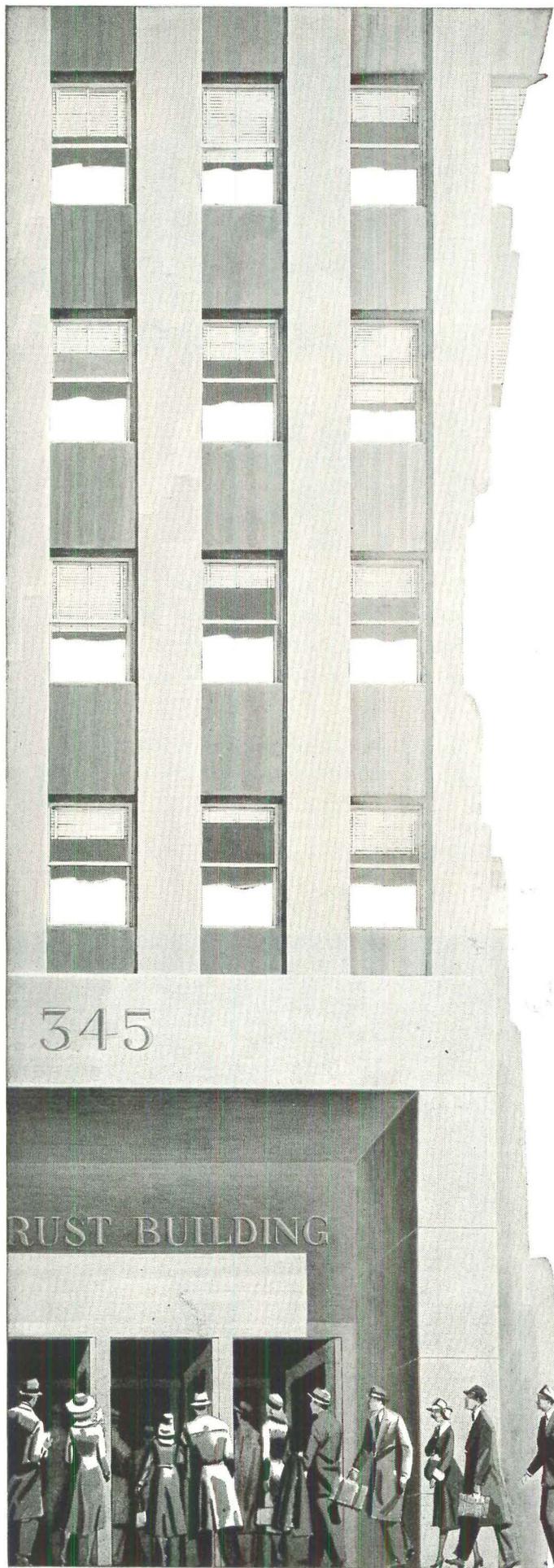
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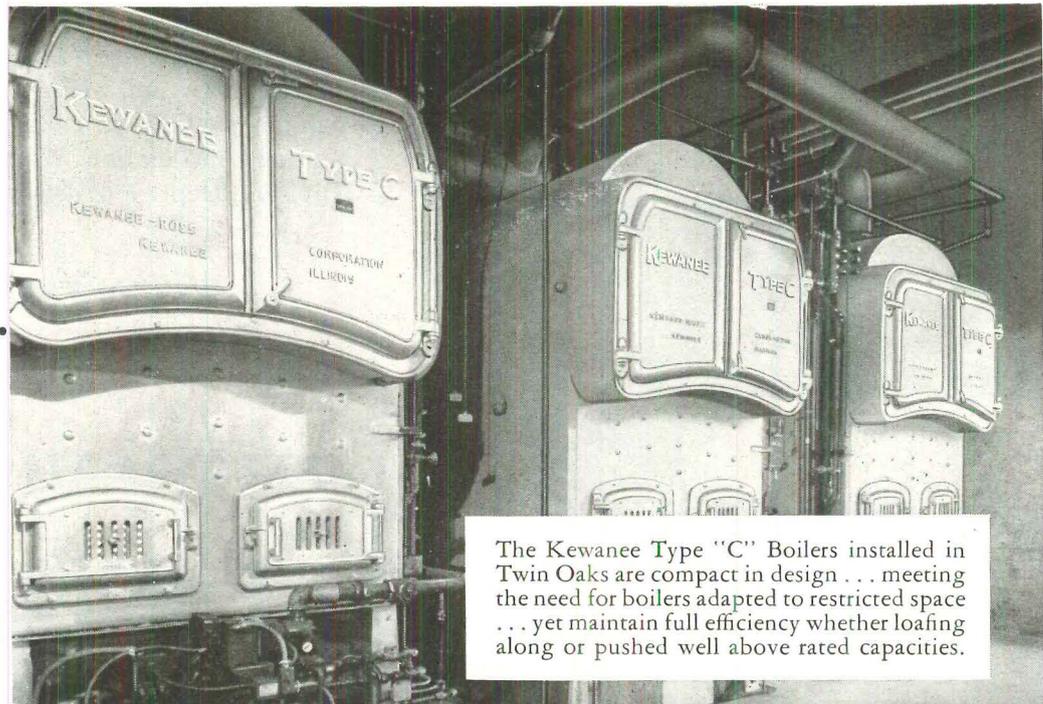
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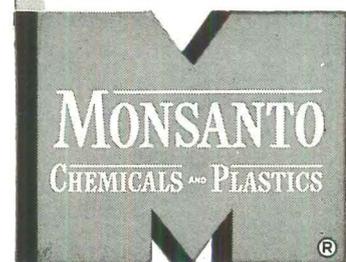
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Building industry warms to GOP climate, likes most appointees

The outlook for construction in 1953 grew brighter and brighter as the post-election haze lifted. Materials controls were being greatly eased (see below). A rapidly developing boom in commercial building looked likely to offset any drop in other segments of construction (see next page). Industrial building, which prophets had tagged for a decline next year as defense goals are reached for steel and aluminum expansion, now appeared to be developing so much strength it might retain this year's level. Much of the industry expansion, businessmen said, stemmed from confidence generated by the Eisenhower sweep.

In the long run, the Eisenhower philosophy that power and expenditures should be decentralized from Washington to states and communities could mean sweeping changes for the construction industry. But it was a safe bet the GOP would move slowly. The trick would be to get the federal government out of the driver's seat for construction and still keep the industry going at a high rate—probably an indispensable part of the business prosperity the Republicans must foster on risk of losing control of the House of Representatives in 1954 and perhaps thus the presidential election in 1956.

Policy overhaul? So far the most authoritative hint of the slow approach was Senator Taft's announcement that he and the President-elect had discussed creating a special commission to study the proper role of the federal government in dealing with state and local governments on matters like housing, welfare, social security and health. Most segments of the building industry would approve such a course, hope the experts could develop, for instance, a cheaper solution to low-income family needs than public housing.

A glimpse of what might be in store in the Republican-controlled Congress was provided by Rep. Jesse P. Wolcott (R, Mich.), who will probably become chairman of the powerful House banking committee. At an NAHB meeting in Oklahoma City, he forecast: "We will put more emphasis on indirect rather than direct controls. . . . The Congress will undoubtedly let price, wage and rent controls expire April 30."

Construction lieutenants. What the construction industry had seen so far of the new administration's top men, it generally liked. Designation of W. Walter Williams of Seattle as the next undersecretary of commerce put a widely respected mortgage banker in a spot to be of much aid to the building industry. Williams, 57 and ex-Washington State GOP chairman, led the highly effective Citizens for Eisenhower movement. Seattle voted him its "most

useful citizen" in 1946. From 1948-50, he headed the Committee for Economic Development, stressed the importance of research in developing prosperity. He is president of Continental, Inc.

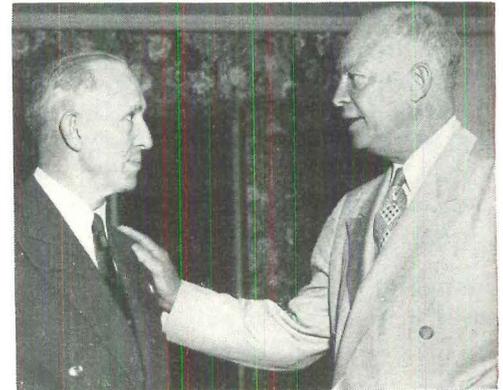
In picking President Martin P. Durkin of the AFL plumbers union as Secretary of Labor (see People), Eisenhower did more than placate organized labor. For the first time since the labor secretaryship was created in Woodrow Wilson's administration, a man with a first-hand knowledge of the building industry would hold the post.

Construction men knew this could work both ways. Though not as outraged as Senator Taft, some Washington building figures wondered whether the head of a union as often branded a racket as the plumbers would carry on much of a housecleaning in the Labor Department, some of whose underlings have feuded, for instance, with retail lumber dealers. To the anguish of general contractors, Durkin as head of the plumbers union had sided with subcontractor groups in pushing for anti-bid-shopping legislation. Durkin told FORUM: "I will continue to support this position."

NPA to relax materials controls on Jan. 1, drop ban against recreational construction

Prompted more by the turn of the election than by the recommendations of its construction advisory committee, NPA this month moved up to Jan. 1 its promised relaxation on controlled materials for construction. Previously, that break for building had been scheduled for May 1 after the steel strike deferred plans for putting it into effect last October.

In deference to incoming Republicans, NPA Administrator R. A. McDonald announced that the new policy was not to anticipate any revision or extension of controls beyond their April 30 expiration date. Since such a wait-and-see policy meant NPA and its affiliated agencies would be virtually out of business as soon



COMMERCE UNDERSECRETARY in the new cabinet will be W. Walter Williams (shown in campaign pose with Eisenhower), Seattle mortgage banker and one-time (1934) president of the Mortgage Bankers Assn.

Favored new code. In more areas, Durkin's views looked likely to win friends in the building industry. He pitched in and helped put across the new national plumbing code. He agrees with management men (and Sen. Taft) that the union representation features of the Taft-Hartley law should not be applied to construction, that it is nonsense to hold representation elections before each job begins. (Taft's bill to remove building from that problem passed the last Senate, died in the House Labor Committee).

On building statistics, Durkin told FORUM: "I intend to support an adequate appropriation for collecting figures on housing volume so that we will know what is going on in building. Also I think studies of the labor and materials going into housing are extremely important." If by that the new Labor Secretary meant he will use his office to fight for sorely needed increases in funds for the Bureau of Labor Statistics, the building industry would applaud.

as they made second-quarter allotments for 1953, the sensible course was to speed up relief for construction.

Chance of extension. There was still a chance that the GOP might extend controls. Significantly, Sen. Homer Capehart (R, Ind.), slated to chair the banking committee, conceded that "it might be necessary to continue controls on a standby basis."

The relaxation order, said Administrator McDonald, was the biggest since materials controls were first imposed Oct. 26, 1950. Biggest beneficiary was recreational building, long banned except for what indulgence sponsors could wrangle on hardship pleas. It was granted self-authorization

tion. Substantial boosts were given the self-certification limits for commercial projects, schools, hospitals, public works, multifamily housing (see below). NPA estimated that the new rules would let a third of the nation's schools and a quarter of its commercial buildings go up with self-authorized materials. Big projects still will have to get approval as usual.

Aluminum delayed. The Jan. 1 date for easing controls covered only steel and copper. Although increased self-allotment limits were set for aluminum, they will not become effective until May 1. Reason: power shortages in the Pacific Northwest and Tennessee Valley have cut aluminum production an estimated 40 million pounds a month. The new rules:

SELF CERTIFICATION

per project per quarter

BUILDING TYPE	STEEL	COPPER	ALUMINUM*
Recreational	5 tons	500 lbs.	300 lbs.
(Not over 2 tons of structurals; foreign and used steel may be used additionally in accordance with CMP Reg. 6, Article VI.)			
1-4 family houses (with copper pipe)	1,950 lbs. carbon + 1,500 lbs. structural	400 lbs.	275 lbs. (unchanged)
1-4 family houses (with steel pipe)	2,300 lbs. carbon + 1,500 lbs. structural	200 lbs.	275 lbs. (unchanged)
Over-4-family houses (walk-ups)		2 tons (not over 500 lbs. structurals)	200 lbs. 275 lbs.
Over-4-family houses (with elevators)		3 tons (not over 600 lbs. structurals)	225 lbs. 275 lbs.

A reclassification gave most other types of building the same self-authorization limits already enjoyed by industrial construction. Included were schools, hospitals, commercial and public works. The new ceilings:

	STEEL	COPPER	ALUMINUM*
"All other"	25 tons	5,000 lbs.	4,000 lbs.**
(carbon, alloy & structurals including wide flange beams but not over 2½ tons of alloy and no stainless.)			

* Effective May 1, 1953

** Only 2,000 lbs. until May 1

Government forecasts record \$33.5 billion building in '53; industrial drop disputed

As a fall business boomlet developed in the wake of the Republican victory, predictions for 1953 construction grew more and more optimistic.

The latest came from the Labor and Commerce Departments: \$33.5 billion of new construction next year, a gain of 4% over the expected 1952 level and a new all-time record (see table). The government figured private construction would climb 2.4% from this year's mark, led by a 27% increase in commercial work. It thought public construction would climb 6%, despite a 10% drop in public housing.

Industrial surprise? No one was disputing the promised gains, but the Labor and Commerce forecast that private industrial construction would slump 27% met disagreement. Martin R. Gainsbrugh, chief economist for the National Industrial Conference Board and a member of the business advisory committee of the President's Council of Economic Advisers, reported a post-election undercurrent of industrial expansion that might produce a 2 to 3% gain next year. At a mutual savings bank meeting Dec. 8 in New York, he spoke of three successive surveys:

▶ The first (by McGraw-Hill) several months ago saw industry outlays for new plants and equipment next year "almost as high" as this year.

▶ The second, in October, foresaw 1953 activity continuing "at about the average rate for '52."

▶ The third, made after the election, led to a conclusion that industrial building would stay "as high as the peak level of the last quarter of 1952"—or a total gain of 2-3% for the year. Gainsbrugh said he could not identify the last two surveys, but both were authoritative.

Replacement boom? Gainsbrugh offered another reason for a continued boom in industrial construction: except for defense

plants, most industrial building since World War II has met only pressing expansion needs. Still ahead as controls are relaxed, he said, are big replacement construction programs that will be absolutely necessary because of the inefficiency and expense of operating in outdated plants.

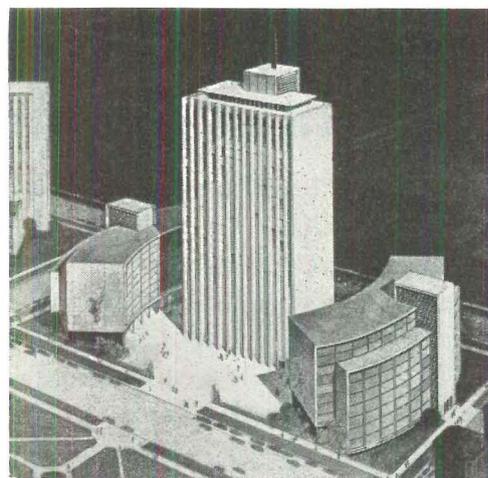
Chorused President Robert H. Pease of Detroit Realty & Mortgage Co. at Pittsburgh MBA clinic the same day: "Most industry is still in multistory buildings. But it is beginning to realize that it costs money to move things several times from floor to floor . . . that this cost can eat it

EXPENDITURES FOR NEW CONSTRUCTION

(in millions of dollars)

TYPE OF CONSTRUCTION	Estimate 1952	Forecast 1953	Percent Change
TOTAL	\$32,318	\$33,500	+ 3.7
TOTAL PRIVATE	21,681	22,200	+ 2.4
Residential building (nonfarm) . . .	11,029	11,450	+ 3.8
New dwelling units	9,820	10,200	+ 3.9
Additions and alterations	1,026	1,050	+ 2.3
Nonhousekeeping	183	200	+ 9.3
Nonresidential building (nonfarm) . . .	4,945	4,600	- 7.0
Industrial	2,289	1,650	- 27.9
Commercial	1,101	1,400	+ 27.2
Warehouses, office and loft buildings	479	575	+ 20.0
Stores, restaurants and garages	622	825	+ 32.6
Other nonresidential building	1,555	1,550	- 0.3
Religious	397	425	+ 7.1
Educational	354	375	+ 5.9
Social and recreational	125	150	+ 20.0
Hospital and institutional	388	350	- 9.8
Miscellaneous	291	250	- 14.1
Farm construction	1,700	1,700	—
Public utilities	3,925	4,350	+ 10.8
All other private	82	100	+ 22.0
TOTAL PUBLIC	10,637	11,300	+ 6.2
Residential building	643	575	- 10.6
Nonresidential building	4,104	4,250	+ 3.6
Industrial	1,649	1,700	+ 3.1
Educational	1,618	1,775	+ 9.7
Hospital and institutional	478	375	- 21.5
Other nonresidential building	359	400	+ 11.4
Military and naval facilities	1,355	1,600	+ 18.1
Highways	2,740	3,000	+ 9.5
Sewer and water	686	725	+ 5.7
All other public	1,109	1,150	+ 3.7

Source: Joint estimates of Departments of Labor and Commerce.



INVESTMENT CONSTRUCTION of a group of commercial buildings in Chicago in the tentative pattern shown above was planned by Continental Assurance Co. The company said frankly that the actual start may wait a year or two, until an authorized 1,206-unit city parking garage on an adjoining block begins to materialize. End buildings for the \$10 million project might be square instead of curved if major tenants desired. Architects for the rendering were Graham, Anderson, Probst & White.

out of house and home . . . that it can't live in an old plant any more than in an old house."

Wider tax writeoff. On the horizon, but far from a sure bet for execution next year, was a plan to stimulate a billion-dollar plant building program as a preparedness and civil defense move. An ODM committee headed by Chairman Harold S. Vance of Studebaker was preparing plans on the theory that stockpiling plants was as vital as stockpiling weapons, and much cheaper than rushing construction if a big war starts. Tax writeoff was under study as the incentive.

New York employers pay \$7.8 million for welfare

New York's Building Trades Employers' Association, which makes the only continuing survey in the US of construction labor welfare funds, finished adding up its 1951 statistics last month. It found that employers contributed \$7.8 million to 27 union welfare funds which gave 71,865 members of the city's construction labor force such benefits as life, accident, sickness, hospitalization, surgical and medical insurance. Every fund provided life insurance, ranging from \$500 (cement masons) to \$3,000 (electrical workers).

One complaint: four unions (bricklayers, composition roofers, glass industry and mason tenders) refused to give coverage to workmen who did not belong to the New York local, although employer contributions were made on their wages. The funds are entirely employer financed by contributions of 3 to 4% of payrolls.

Defense Dept. installations chief readies uniform construction standards for services

As the Defense Department's director of installations, Frank R. Creedon this month chalked up some tangible results in riding herd on \$3 billion a year military construction program. He was putting the finishing touches on a sense-making set of functional standards for barracks, BOQ's mess halls and warehouses for all of the services. He was trying to promote more logical thinking in respect to definitions of permanent and temporary construction. Most promising of all, Creedon was devoting his engineering talents to developing a more orderly procedure for presenting the military construction budget to Congress.

Tenure in doubt. Whether Creedon will be retained by the newly designated Secretary of Defense for the Eisenhower regime—Charles E. Wilson—was still subject to conjecture. If the new Pentagon boss considers him a logical man to stamp out military construction waste—as well he might—Creedon will follow through with a plan to “treat Congress like a board of directors,” account item by item for where the money went, is going, will go. That is how Creedon operated when he ran big construction jobs for private companies, like the \$375 million Hanford AEC works, which was built by General Electric. He sees no reason why Congress should not be treated similarly.

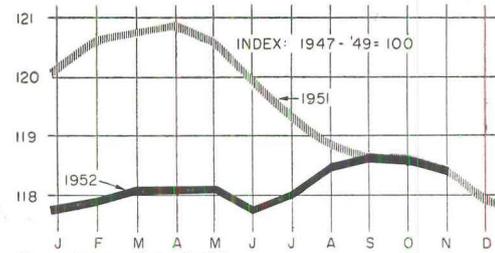
Only from such a detailed presentation, thinks Creedon, will Congress get full information on the rate at which funds have been used. From such item-by-item account-

ing should come a truer-than-ever forecast of the rate of contract awards through the balance of the present fiscal year ending June 30. In this way the legislators will know what has been spent and what is left over in authorization and appropriations.

For each new project, legislators would be given an engineering analysis. Says Creedon: “They should know what they are, why they are needed, how much they will cost—and the methods used in estimating the cost.”

No stock plans. On the subject of greater uniformity in construction for the more common building types, Creedon has no intention of clamping standardized plans on the services. Said he: “We are drawing up performance requirements. We are limiting such things as gross square footage, ceiling heights (and thus costs due to size), plumbing, acceptable practices on exits, heating, condensation and electricity. The Corps of Engineers or the Navy can take our outlines and let architects carry on from there. They are elastic enough to cover the different geographical and climatic regions.”

The definition of what constitutes permanent construction and how many degrees of temporary construction should be recognized has long perplexed military planners. Creedon has some firm opinions on this score. For one thing, he considers it nonsensical to try to steer for any imaginary concept between temporary and permanent. Under the thinking that is now



Source: Bureau of Labor Statistics

MATERIALS PRICES as recorded by BLS dipped slightly last month to 118.4 (from 118.6 in October). Chief contributor to the drop was lumber and wood products, particularly softwood plywood, which dropped almost ten points from an index of 113.1 in October to 103.9 in November.

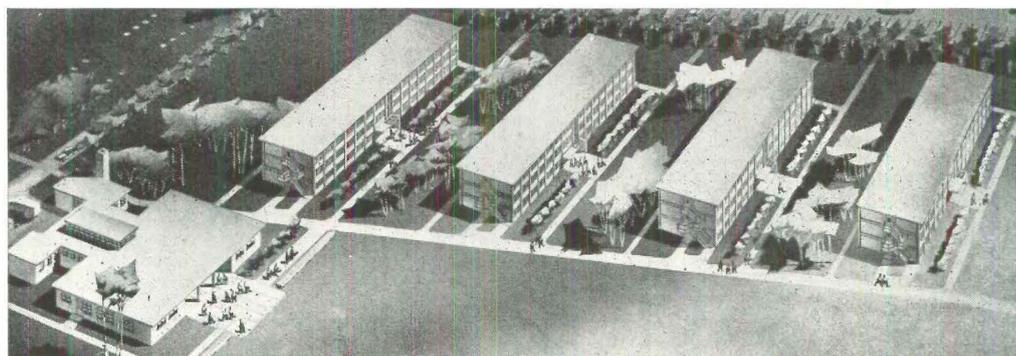
jelling in Creedon's office, permanent would be anything built with a life expectancy of 25 yrs. with a low maintenance and operating cost. Temporary would be anything that would last up to five years without excessive maintenance costs.

For his not inconsiderable watchdog responsibilities, Creedon has a modest staff of 25, including clerks and stenographers.

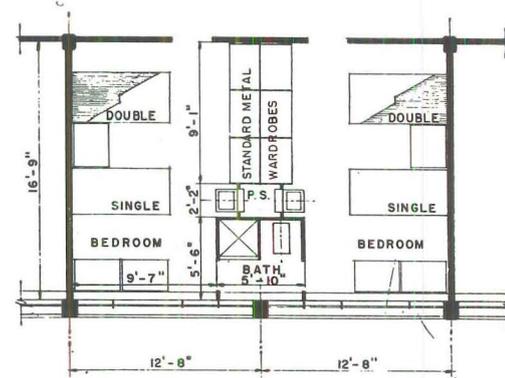
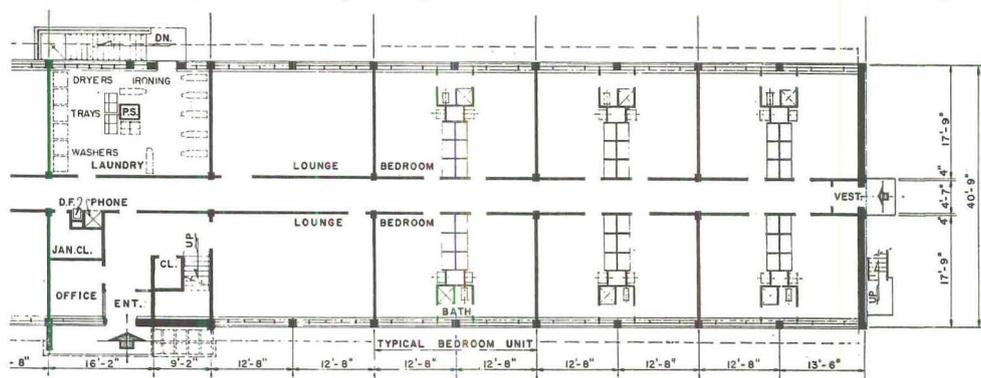
Massachusetts housing bonds flop at 2 1/2%

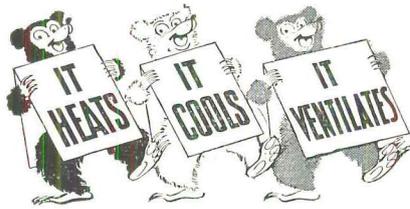
In September, prices paid for \$170 million of tax-exempt public housing bonds sold by PHA translated into an average yield of 2.54%. This month, investors indicated they would take nothing less. Massachusetts housing authorities offered \$8.2 million of 2 1/2% tax exempts on Dec. 3, with a proviso that all bids must be at par or better. They received no bids. Massachusetts decided to proceed with temporary loans, probably await the outcome of the next big federal housing offering (\$140 million), before going to market again.

STANDARD BARRACKS the Air Force is adopting for enlisted men will be three-story concrete-frame, masonry curtain-wall structure with semi-private bathrooms. Army Engineers, who have awarded Architects Harley, Ellington & Day of Detroit contract to prepare working drawings, say bid prices so far indicate barracks will cost no more than present standard USAF design (\$1,266 per man) which has separate rooms but central toilets. New barracks improves on pioneer private-bath barracks at Offutt Air Force Base (H&H, Jan. '52) with more lounge space, easy convertibility to a BOQ.



STANDARD AIR FORCE BARRACKS (ABOVE) WOULD BE MATCHED BY STANDARD MESS HALLS (LEFT)

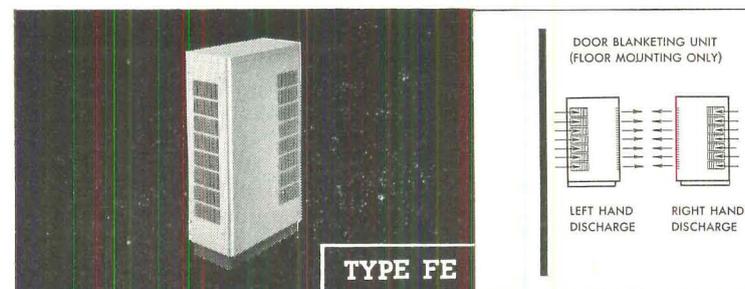
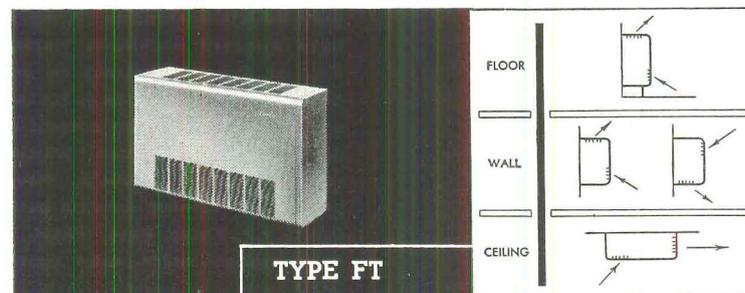
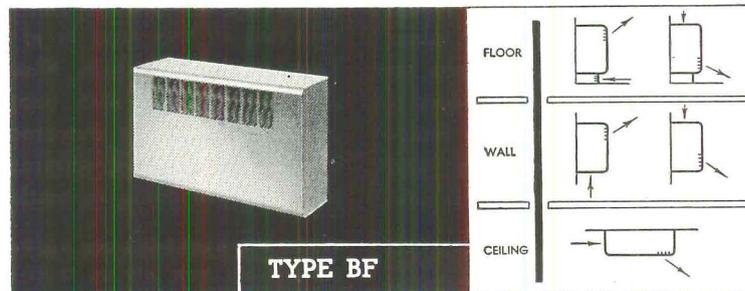
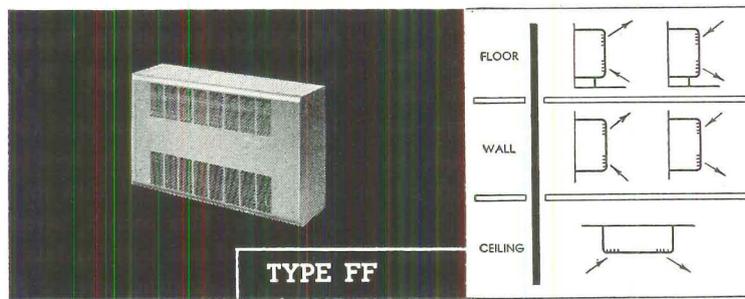
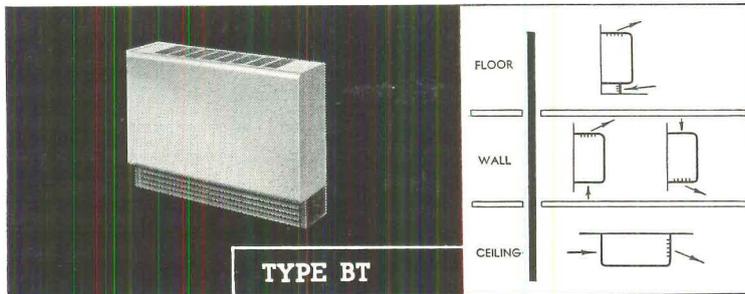




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Economists attack theory of building cycles, say public works won't cure big depression

Some of the construction industry's most widely held theories about itself were challenged this month by two respected economists. In a 340-page book financed by the Committee for Economic Development ("Stabilizing Construction: the Record and Potential," McGraw-Hill, \$6), Miles L. Colean and Robinson Newcomb set forth a statistic-buttressed argument that:

▶ There is no such thing as an 18 to 20 yr. normal construction cycle, which helps touch off depressions. A postwar collapse of US building is by no means inevitable. Instead, with the right government policies, construction can stay at high levels.

▶ Public works cannot be counted on to offset any major recession. Even their limited use as first aid to counteract lesser business setbacks will require far greater long-term planning, budgeting and coordination of federal, state and local programs. Instead, "government intervention should be the last and not the first step in stabilizing construction and investment."

▶ Although the historic instability of the construction market has led to belief that its violent ups and downs multiply their effect on the US economy, actually the building industry is more victim than villain. It wavers less than some other major segments of the economy. In the absence of wars, dropping demand for some kinds of construction is often offset by growing demand for others.

▶ Restrictive practices by employers, labor and government alike have failed to produce the protection against market swings their creators intend. Instead, they have "prevented growth" of the industry by buoying up costs rather than employment, by "discouraging technological advancement and thwarting incentives to increased productivity."

Basic causes. "Instability," write Authors Colean and Newcomb, "is at the heart of the problems of the construction industry. It has given the industry its peculiar pattern: looseness of organization and dispersion of managerial control. . . . It is responsible for an inclination to concentrate technological effort on improvements in adaptability and time rather than on reduction of cost—on the ability to erect an Empire State Building in a year's time rather than to build a house at the lowest possible cost." Against the theory that construction's violent ups and downs come in depression-producing cycles, Colean and Newcomb offer evidence that the real cause is wars. Looking back over construction statistics as far as the Civil War, they find similar big drops in years following the Civil War, World Wars I & II. Elsewhere, the general trend was up, the setbacks irregular.

How to lick depressions. With many a GOPlanner figuring that increased public works are the handiest medicine for any business setback, the two economists' views on the limitations of such remedies took on added importance. It is technically possible, they say, to step up public works enough to offset a 30% plunge in private construction. But this "is not a tool which can ordinarily be used at an early stage of a decline" because it is nearly impossible to tell then what kind of a recession it is. If construction falls off because prices are too inflated, a rush of public works will only

support unsound price levels, make the eventual plunge worse. Huge engineering works like dams, harbor improvements and expressways take so long to get going they are hard to use at the right time. Moreover, building contractors and labor cannot usually shift to such heavy engineering work. Thus if highway building were already fairly high, expanding it to fight a recession "may raise prices more than volume."

Warns Newcomb in a detailed study of



AUTHORS Miles L. Colean (l) and Robinson Newcomb (r) are two of the nation's most influential building economists. Colean, FAIA, now a private consultant with offices in Washington, was the principal creator of FHA technical and property standards. He was assistant commissioner from 1937-40. Newcomb, a government careerist, has been economist for the Office of Defense Mobilization since March 1951. Earlier, he worked for the President's Council of Economic Advisers and the undersecretary of commerce for transportation.

WASHINGTON DIARY

- 11/14 Facilities Review Board winds up first year, reviewed 556 expansion projects involving capital expenditures of \$2.1 billion.
- 11/17 NPA appoints Boyd S. Oberlink to head construction machinery division.
- 11/17 DPA announces resignation of Olaf K. Tackle as chairman of its facilities review board.
- 12/1 NPA issues automatic revalidation of construction allotments from one calendar quarter to another (Direction 9, Revised CMP Regulation 6).
- 12/10 DPA brings its accelerated amortization program to a total of \$23.7 billion, representing 14,748 new or expanded facilities granted fast tax write offs.

how to manage contracyclical public works: "[They] must be used very selectively to provide only facilities which are needed and to absorb unemployment—not to create overtime."

The basic trouble with nearly all stabilization devices, say Colean and Newcomb, is that they "carry the risk of retarding growth and leading to stagnation as well as to stability." Because this is particularly true of government edicts, "government intervention should be the last and not the first step in stabilizing construction and investment." For instance, they point out that fast tax write-off "might tend to expand the volume of investment in boom times and decrease it in depression times."

Within the industry, the "first line of defense" against boom and bust should be increased productivity, the authors say, "rather than government subsidy or the anti-cyclical use of public works." To progress, the industry must rid itself of trade restraints practiced by contractors, by local governments and through labor work rules.

Antitrust indictments name nine Detroit roofing firms

Federal antitrust indictments were returned in Detroit Dec. 9 against the Detroit Sheet Metal & Roofing Contractors Assn., Inc., nine roofing firms and 18 individuals. The accusation: since 1940 the defendants observed uniform bidding rules; collected and exchanged information through the association, which then might "designate" which member would be allowed to be the successful bidder; induced manufacturers to withhold "bonded roof" guarantees from contractors who did not follow association rules. The defendants handled about 70% of the \$10 million built-up roofing business in the Detroit area last year, the government estimated.

Indicted firms were John D. Busch & Sons, Inc.; J. D. Candler Roofing Co.; Wallace Candler, Inc.; Robert Hutton & Co.; R. C. Mahon Co.; Schreiber Roofing Co.; Charles Sexauer Roofing Co.; Sullivan-Bernhagen Co., Inc.; and the Philip Carey Mfg. Co., of Lockland, Ohio.

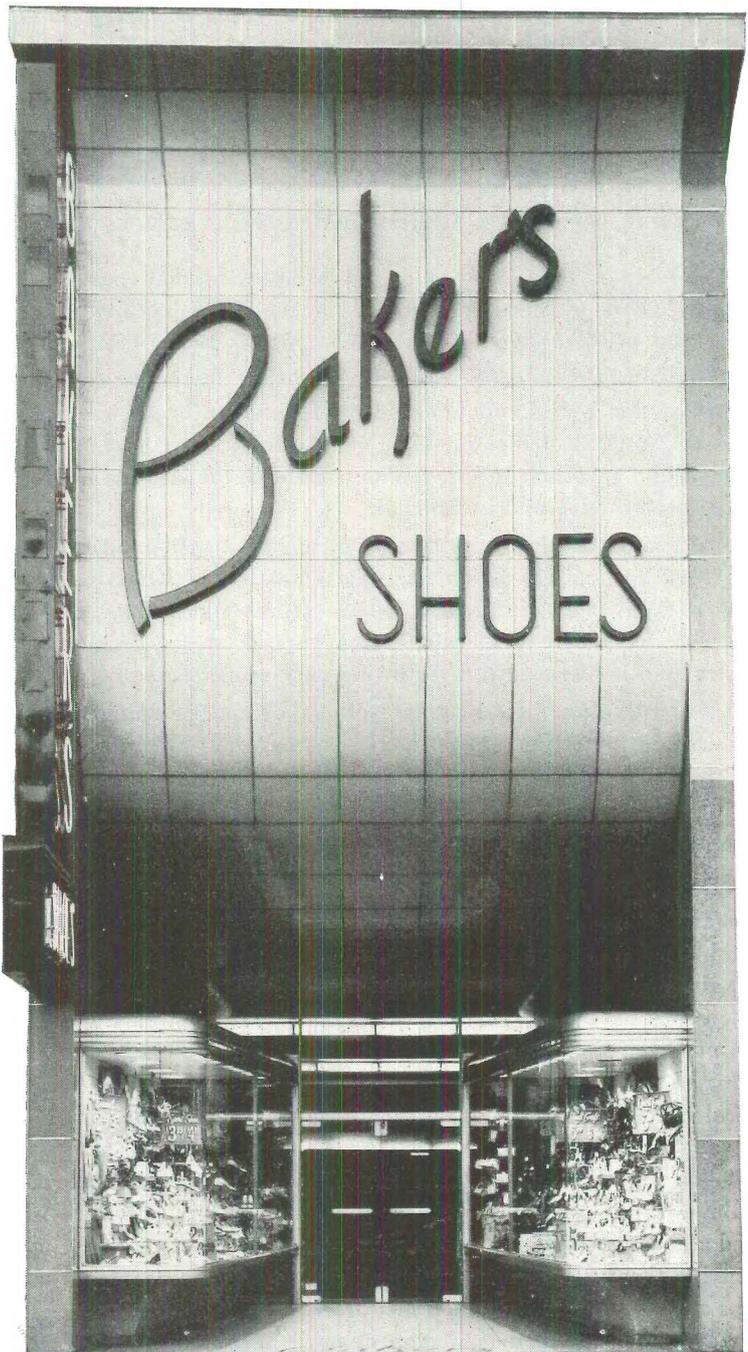
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This shoe store in Richmond, Virginia, features ivory and beige Carrara Glass on its three-story facade and vestibule ceiling, bent to a 17° radius. A quality, permanent, veneer material, Carrara can be applied to store fronts and building exteriors, without the necessity for structural changes. Architect: W. Emil Forman, St. Louis, Mo.



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New York's fabled Robert Moses draws fire on redevelopment scheme for a coliseum

For 30 years, New York Park Commissioner Robert Moses (who also holds nine other state and municipal jobs) has scrapped and bulldozed controversial construction projects into being despite perpetual civic battles. His notable achievements include New York's parkway system, probably best in the nation, and its peripheral playgrounds. He has also used his fearsome invective and ballooning reputation to condemn modern design, oppose such plans he did not devise as New York's proposed rezoning. But though he has lost skirmishes, Moses infrequently lost whole campaigns.



MOSES

This month Moses was amidst another fray pushing through his grandiose plan for redeveloping two blocks in mid-Manhattan's Columbus Circle into a convention-luring coliseum and apartments under the 1949 redevelopment law. He was trying to steamroller the plan through New York's city government despite a louder-than-usual chorus of protest.

Fluted elephant? For one thing, the preliminary sketch of the proposed coliseum (below) had an exterior about as graceful as the rear view of an elephant—fluted. Even the *Herald Tribune*, friendly to the project, complained that “between the hall and apartment buildings there is no contrast in heights, or integration of scale or materials,” that the convention hall “fails to give any sense of the function it will serve, that the project missed a chance to produce such dramatic architecture as the UN, Rockefeller Center. Basically, snorted the *Trib*, the plan displayed a “total lack of coordination.” Retorted Moses: “premature, captious criticisms and disputes about matters of taste.” He wrote the paper: “Suppose you succeed in stirring up a

controversy over this complicated project and as a result it is dropped?”

A City Planning Commission hearing aired more catcalls. “Just plain punk,” sniffed the City Club's Albert S. Bard, deriding the design. “Those of us who care deeply for the beauty and dignity of New York are very puzzled and unhappy,” said Harvey Stevenson, president of the Fine Arts Federation of New York. Others pointed out the location would likely add a new snarl to Manhattan's nearly perpetual traffic knot.

The commission ended its hearing without announcing a decision, but two days later approved the project at a public meeting called on only 1½ hrs. notice. It passed the buck on design by noting that another panel of three architects would review the final plans. Next the project would go to City Hall, then Washington.

Wayward press. New York newspapers—often rated the nation's best—missed many a fact about the project. News reports of the planning commission hearing still described it as a \$40 million project, whereas the total would be only approximately \$26 million (coliseum, \$20 million; housing, \$6.2 million including resale price of land). Still unpublished was the fact that the redevelopment would not increase city tax revenues, as contemplated in most Title I operations. Instead, after tax exemption for the coliseum, it would reduce the taxable assessments from about \$7.5 to \$5 million and thus decrease city income some \$82,000 a year.

Newspapers continued to refer to a city application for a \$6 million federal grant, whereas the indicated write down would only be a little over \$6 million, and the 2/3 federal contribution would thus be limited to \$4 million. Other jokers:

Federal law requires that Title I redevelopment produce “predominantly residential” projects. But the coliseum would occupy 145,482 sq. ft. of the site, the proposed housing only 129,874 sq. ft.

But by reserving 18,000 sq. ft. of garage inside the coliseum for the housing project, Moses managed to label the area “devoted” to housing as 147,874 sq. ft., or 53.4% of the area.

In Washington, Director Nathaniel Keith, of HHFA's urban redevelopment and slum clearance, told FORUM that land reuse was almost the sole yardstick in determining legality of redevelopment. If the Moses application reached Washington the proposed \$20 million for the coliseum against \$6.2 for housing would not necessarily disqualify the project. Neither would proposed land resale of the coliseum area at \$15 a sq. ft. compared with \$7.25 for the housing area land; nor the fact that without the “assigned” garage space within the coliseum portion, the actual land area for housing would be less than 50% of the gross area.

New York state building code adopted by 48 towns

When New York's state building code for one- and two-family dwellings was issued Nov. 1 last year, even its strongest supporters wondered if enough of the state's 1,567 municipalities would adopt it voluntarily to make the \$300,000-a-year cost of drafting and operating it worth-while.

This month—13 mos. later—a surprising 48 municipalities had adopted the state code. A little less than half were communities that made it a replacement or alternative for existing rules. The others previously had no building standards.

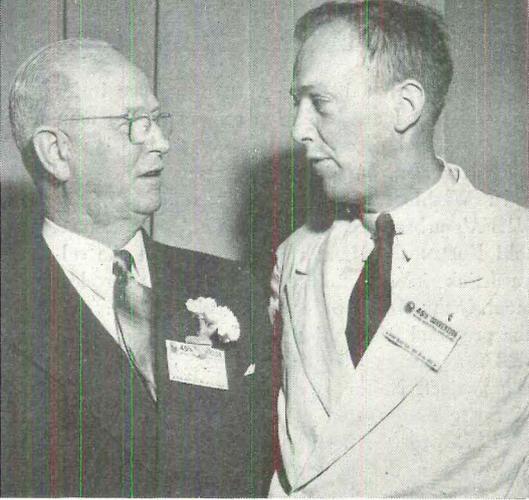
Pleased state code commissioners had also conferred with representatives from more than 100 more interested municipalities, anticipated accelerated acceptances. Added incentive for adopting the state performance standards next year will be the introduction of the multifamily residential code, now nearly completed. During '53 work will also start on a “comprehensive” code, covering nonresidential construction, which commissioners hope will bring still more municipalities into the fold.

The code got a boost this month from New York's Regional Plan Ass'n. It praised New York's commission for “providing municipalities with building code service of outstanding quality and extent . . . facilities for code drafting, guidance and research . . . which are feasible only on a state-wide basis.”

SITE FOR PROPOSED NEW YORK REDEVELOPMENT (LEFT) INCLUDES 24-STORY OFFICE; COLISEUM (RIGHT) WAS DESIGNED BY LEON AND LIONEL LEVY

Triborough Bridge & Tunnel Authority





TEMPERATE LEADERSHIP is expected from Charles B. Shattuck (l), 1948 head of the Appraisal Institute, who will succeed Joseph W. Lund (r) as NAREB president in January. Shattuck is a shrewd appraiser of men as well as realty. Asked at a realtor's meeting to predict the next real estate downturn, he asked: "How many here bought real estate for their own account in 1935?"—None. "In 1940?"—One. "In 1945?"—Four. "During the past year?"—Almost every hand went up. Answered Shattuck: "Then look for the slump in another few years."

A lifelong Los Angeleno, 50-yr.-old. Shattuck heads a small (7-man) realty firm that specializes in business property and appraisals. His most satisfying job: the involved appraising, and negotiating the financing for the new Pershing Square garage in Los Angeles on a subsurface leasehold from the city.

Shattuck's University of California studies were cut short for service in France and Germany in World War I (discharged as a 1st Sergeant). He worked for his father's general contracting firm from 1920-23; then started his own real estate business. In 1924 he married Edith "Polly" Philippine, of San Francisco. Their son, William N., recently started his own real estate and insurance firm in Los Angeles.

Shattuck's brother, Edward S., was California State Republican chairman in 1950, figures as a possibility for appointment to the Senate vacancy caused by Nixon's election as vice-president. Another brother, David S., is president of Technicolor, Inc.

Photos: Photo Arts



HERB NELSON was in a happy mood as the final session ended at what may have been his last convention as NAREB's executive vice president. A plan for him to retire on a progressively smaller fraction of his \$25,000 salary has been worked out, might go into effect next spring. First, NAREB's board of directors must find a satisfactory successor—no simple job. Nelson, 66, has been NAREB's executive head since 1922, directed its growth from 16,377 to almost 50,000 members.

REALTORS' CONVENTION urges tax

aid to fight slums, knocks Title I; market outlook cheerful

Republican victory provided extra sunshine for NAREB's 45th annual convention in Miami Beach Nov. 9-14. Most realtors saw it making 1953 a brighter construction year. The consensus: sounder budget and credit policies, more equitable treatment for business and a more conciliatory attitude from labor will help boost both industrial and other nonresidential work. Some of the cheering:

► Predicted President Thomas McCaffrey, Jr. of the Society of Industrial Realtors: "The new administration can only add impetus to industrial dispersion. This will mean additional industrial construction, particularly in planned industrial tracts."

► Forecast Mark Levy, Chicago mortgage and investment specialist, and S. Edwin Kazdin, Appraisal Institute regional vice president from New York: when federal rent control ends in all but critical defense areas, as pledged in the Republican campaign platform, middle-income apartments will rise in cities where the market still warrants.

► Said William J. Campbell, industrial vice president of Herbert V. Jones & Co., Kansas City: "The trend away from socialism" will spark power and utility projects retarded by threat of government takeover and encourage private housing threatened by public housing competition. Even without politics, a tremendous industrial replacement construction program is in sight as occupants of obsolete, poorly located factories are forced to switch to better-located, single-floor plants to match the efficiency (and savings on high-paid labor) of competitors who already have them.

► Boasted Houston Realtor Charles J. Maybee: "Eighteen industries in the Gulf Southwest have plans for expansions costing about \$250 million during 1953-54."

Drop in 1954? Acting Deputy DP Administrator Alvin Mayne suggested 1953 would see the peak of industrial plant construction. He noted DPA has certified fast tax amortization for \$23 billion of defense-production facilities. Of these, 57% are completed; 85% will be completed by the end of next year. Said Mayne: "Unless industry itself expands, industrial construction appears likely to take a big drop after '53." He saw one cushion: expansion by industries that were denied building materials through the defense buildup.

Chairman K. T. Keller of Chrysler Corp., receiving SIR's industrialist of the year award, advocated *convertible* plants, or else pilot or standby plants *in or near existing industrial centers*. He said: "Industries which employ very many people need to stay where great numbers of people live. People need water, sewers, light and power, services, amusements, supplies—in short, they need cities and their suburbs. We can't build cities to stand by with standby defense plants, and we can't move whole

populations to man them if the time comes to start them going."

Movie mogul Louis B. Mayer, president of Cinerama and chairman of the board of judges that chose Keller for the SIR award, disclosed that studies are being made for two new theaters just for Cinerama.

City-saving plans. Multiplying problems of modern cities concerned the realtors most. They launched an urban conservation, or Build America Better movement (see opp. p.), explored the parking problem and its investment opportunities.

Insurance companies are making more loans on parking facilities, reported John F. Hendon, owner of 16 projects in scattered cities and a director of the new National Parking Association. Equitable Life advanced \$5 million for the new underground Pershing Square garage in Los Angeles, Hendon reported, and he quoted a Prudential executive as saying: "The parking industry has come of age. We'll provide mortgage financing for it, except in cities where there is a threat of municipal competition." Mortgage officer C. J. Faherty confirmed that Prudential has lent close to \$10 million on parking garages in recent years. Although one speaker cautioned that "without a solution of the parking problem you can anticipate commercial slums," Faherty declared lack of parking facilities had never yet deterred Prudential from buying or lending on 100% downtown realty.

To fight slums: tax aids. NAREB's recipe for saving US cities, a "law-enforcement" housing-rehabilitation campaign, should solve the problems created by rent control and public housing, asserted President Joseph W. Lund of Boston. To give this a boost, the convention advocated accelerated *federal* tax depreciation for properties rehabilitated within "conservation districts" to be established by *local* governments.

But NAREB's program would stop short of condemnation or compulsory evacuation of the worst housing, Lund told a press conference. Its goal is "slum prevention rather than slum clearance." In fact, he added, to the surprise of his own press staff, NAREB would even favor repeal of Title I (urban redevelopment and slum clearance) of the Housing Act of 1949. Why? "Because in any federal grant-in-aid program 50¢ of each \$1 is thrown away in bureaucracy; because it gives the US control over municipal governments."

Simultaneously, however, an equally sur-

prising article was being printed in the November *Realtor* magazine of Lund's own Boston Real Estate Board. Under the title "A Rehabilitated Boston?" Richard L. Jones, chairman of the board's public housing and slum clearance committee, wrote that the US and Massachusetts redevelopment acts had challenged Boston realtors and private enterprise to clear slums, but without results. Wrote Jones:

"You have said that land assemblage for slum-clearance projects is too difficult, and the government offers you their right of eminent domain. You say that land costs are too high, and the government slaps your right cheek with the offer to absorb a write-down of land costs to realistic levels and sell the land to you at this level.

"You say that real estate taxes are too high for low-rental projects, and the government slaps your left cheek with an offer to tax you at 40% of the normal Boston tax rate—fixed by statute for 40 yrs.

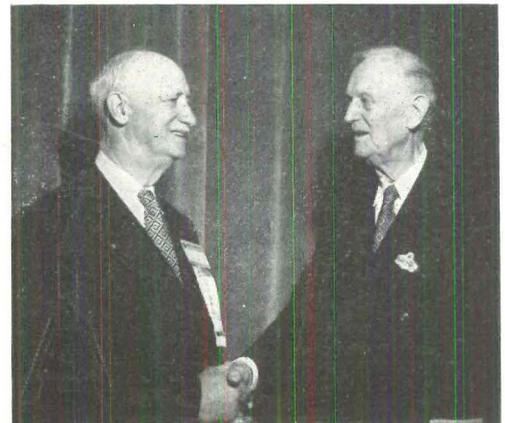
"There is nothing left for you to do, Mr. Boston Real Estate Man. There only remains the doing. Will Boston money develop Boston, as it once developed the West? Or will you sit back in your tweed jacket at your roll-top desk and ruminate on the good old days when Bob Taft would have had it made in a breeze.

"You are capable of doing a better job than the public housers. However, slum clearance accomplished by public housing is to be preferred over no action at all."

Surplus shopping centers. Although construction and market optimism were predominant, shopping centers were one subject of concern. Said Darrel M. Holt, of Minneapolis: "Centers are coming out of our ears. Tenants are leasing anything. Who will get hurt?" Said Miller Nichols of Kansas City: "Unless we have more inflation and local population increases, there are many that have bad leases. We have 11 old, established centers, but only three of them could be built and financed economically today" (under the present outlook). Appraiser Thurston H. Ross warned of leases to "name" stores at low percentages without safe minimum rents. "Big names can fail," he noted. And some big organizations, he added, are saying some new space "would be cheaper than warehouses if business declined" and so would be used primarily for storage in a slump.



EXECUTIVE COUNCIL of the Realtors Washington Committee discussed federal legislation and regulations affecting real estate. Across the head of the table were chairman Paul B. Guthery (standing), Calvin K. Snyder, the committee's executive secretary who, said Guthery, "moulds the bullets and supervises the firing;" Marion Moran, and Henry Waltemade of the Bronx.



GENERAL CHAIRMAN for the convention was Myers Y. Cooper (l), broker-builder since 1896, former governor of Ohio, and NAREB's taxation committee chairman. With him: Louis F. Eppich, of Denver, oldest NAREB ex-president (1923) at the meeting. Cooper also served as general chairman for the 1951 convention, held in his own city of Cincinnati.

Build America Better panel probes city deterioration

Most informative session at NAREB's convention was a panel on the need for urban conservation and preventing needless, economically unsound decentralization. Said moderator and former NAHB president **Fritz Burns** (below, right of speaker): "This program could provide the basis for economic stability without war . . . protection against the boom and bust cycle."

William L. C. Wheaton (3d from l), Harvard professor of regional planning: "Central cities face an 8 to 15% loss of population in the next decade if present trends continue. . . . Some would face disaster in two decades. People are leaving obsolete, crowded, dirty cities because they are not fit to live in." But in the suburbs, "the typical house doesn't pay enough taxes [to cover] its own municipal services."

Builder **Philip Klutznick** (2d from l), former federal public housing commissioner: "Builders build on the outskirts of the city because they are not given the opportunity to build in the city. . . . We have been destroying the central cores of our cities by default. . . . We also have permitted building in our suburbs without adequate facilities. . . . Many unnecessary separate water districts, school systems, etc. will bankrupt one little town after another in the future."

Harley P. Swift (3d from r), president of the Harrisburg (Pa.) Railways: "People, not vehicles, make an area prosperous. When cities will subsidize the users of public transit to the extent

they have subsidized users of private automobiles, the traffic problem in downtown areas will be well on the way to solution, if not entirely cured. Transit could be subsidized . . . simply by restricting, not entirely eliminating, automobile use in business areas, . . . facilitating buses and other public transit. . . . Public transit carries 70% of the people coming into a business area in 6% of the vehicles and uses only 20% of the streets available, while 65% of the remaining 30% are people who will not use their cars between morning and evening."

Thomas McCaffrey Jr. (extreme r), Society of Industrial Realtors president: "If your city has no planned industrial section you are going to be out of luck for new plants. Industry just won't bother to buck zoning and other restrictions. . . . Factories and houses don't mix."

Richard J. Seltzer (speaking at center), former president of the Urban Land Institute: "Among the most critical problems of downtown centers are constantly decreasing accessibility [caused by traffic congestion], and constantly increasing and excessive off-street parking charges." Prospective solutions: "It may be possible to close certain shopping streets to all vehicular traffic during business hours . . . proper highway planning to remove the 40-50% of through traffic that now funnels through the heart of central districts in many cities but which has no business or desire to be there . . . more night shopping hours. . . . If we take care of the inner cores of our cities, later we won't need to take care of their peripheries."

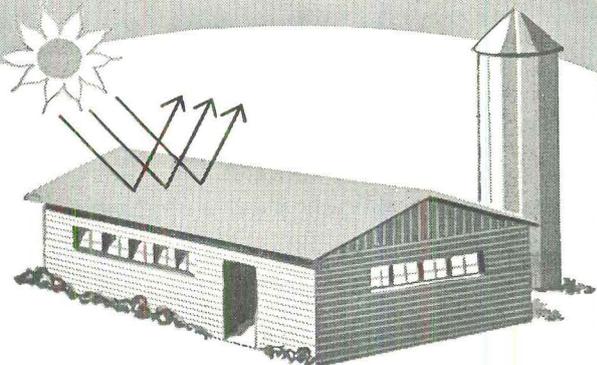




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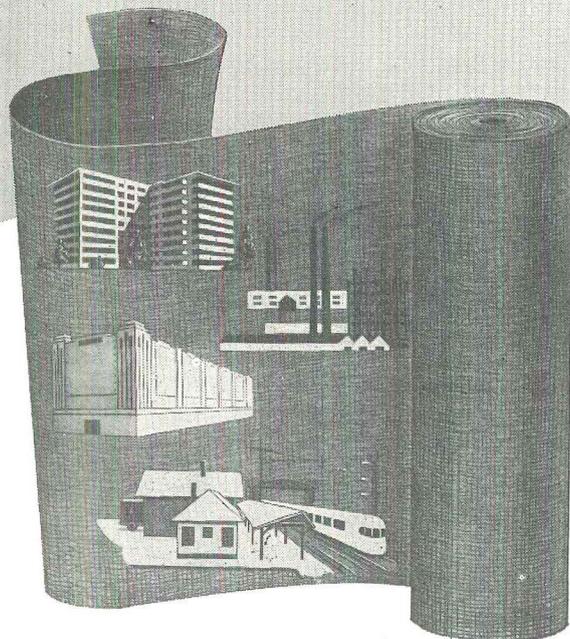
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UNESCO shelves latest building design but asks same architects to plan on original site

At the press conference when UNESCO's latest building plans for its Paris headquarters were explained, tweedy, pipe-puffing Architect Bernard Zehruss remarked that Parisians had yet to be heard from. They were, he observed, a noted bunch of bellyachers.

It was an understatement. Although only a few Parisians were stirred up about the UNESCO building (for a project of its importance it drew surprisingly brief mention in French papers), those who were waged a steady, no-holds-barred campaign against the clean-cut, junior version of UN's Manhattan headquarters proposed by Architects Zehruss of France, Marcel Breuer of the US and Engineer Pier Luigi Nervi of Italy (AF, Oct. '52, p. 150). This month, they succeeded.

"Bottle-rack . . . radiators." The battle opened with a blast from Writer Albert Mousset, a leading member of Les Amis de Vieux Paris: "a building in the style of a bottle-rack . . . a Notre Dame of radiators . . . with a marquee in the form of a jockey's visor." Such modernity, he railed, would spoil "Parisians' most beautiful promenade," the Porte Maillot adjoining the Bois de Boulogne.

Other cultural old-guardists did their stuff behind the scenes. In the deal giving UNESCO the Porte Maillot site after UNESCO reviewing experts rejected Architect Eugene Beaudoin's plans for a headquarters on Place Fontenoy, French authorities specified that Seine Prefect Paul Haag must approve the architectural plans. Haag is known as a man not much interested in building one way or another. But two advisory bodies were: a sites commission and a management committee, corresponding roughly to US zoning and planning boards. Both are havens of Beaux-Arts reaction. Both advised Prefect Haag to reject the design (AF, Nov. '52, News). Grumbled the management committee: it was not "in keeping with the general panorama of Paris as a monumental whole." The committee suggested UNESCO take its contemporary ideas into the suburbs to Rond Point de la Défense, beyond the limits of subway lines and classic monuments.

Cabinet struggle. The twin blows proved fatal. The French cabinet debated the issue and Reconstruction Minister Eugene Claudius Petit warned rejection of the \$7½ million skyscraper sandwich might provoke UNESCO to move to Italy or Switzerland. But education ministry traditionalists won. On Nov. 22, the French govern-

ment withdrew its offer of the Porte Maillot site.

Would UNESCO consider moving to the suburbs, the French wondered? UNESCO would not. For a few days, it looked as if UNESCO's building plans, if not permanently killed, at least faced a long postponement. Then UNESCO dived into budget debates (which led to resignation of Director General Jaime Torres Bodet). The French government, sensing that delegates' minds were more on money than pure esthetics, held out a franc-covered olive branch. It reoffered the original Place Fontenoy site, with this bait:

- ▶ A 99-year renewable lease.
- ▶ Re-offer of a 3-yr., interest-free loan of 2 billion francs (\$5.7 million).
- ▶ Reimbursement of UNESCO's expenses for the rejected plans by Zehruss, Breuer and Nervi.
- ▶ Removal of some restrictions it placed on the Place Fontenoy site when Beaudoin tried to design for it. Most important: UNESCO would not be required to build up to the semicircular curb as the labor and merchant marine ministries alongside have done.

Cash & chains? With the cash lure went artistic hobbles: UNESCO could build no higher than other structures nearby (8 stories); the "architectural design shall seek to create a harmonious entity with the broadest interpretation of the liberty of composition." UNESCO swallowed it, hired Zehruss, Breuer and Nervi to plan afresh, submit a third scheme for the headquarters in April.

This brought the comedy around full circle to the starting point. Whether it would go around again remained to be seen. Paris architects felt the "harmonious entity" stipulation could well lead French authorities to throw out the new plans as they did the old. Moreover, admitted Zehr-

NEW CONSTRUCTION ACTIVITY (expenditures in millions of dollars)

Type	November			First 11 Months		
	'51	'52	% Change	'51	'52	% Change
PRIVATE						
Residential (nonfarm)	930	1,033	+11.1	10,133	10,148	+1.1
Industrial	200	187	-6.5	1,917	2,108	+10.0
Commercial	96	107	+11.5	1,279	986	-22.9
*TOTAL	1,818	1,917	+5.4	20,010	19,989	-1.1
PUBLIC						
Industrial	97	130	+34.0	863	1,498	+73.6
Military	100	117	+17.0	799	1,239	+55.1
Residential	68	48	-29.4	529	599	+13.2
*TOTAL	806	882	+9.4	8,517	9,839	+15.5
*GRAND TOTAL	2,624	2,799	+6.7	28,527	29,828	+4.6

* Minor components not shown, so total exceeds sum of parts. Data from Departments of Labor and Commerce.

CONSTRUCTION EXPENDITURES for November were 7% above November last year, but an equal 7% below October '52. Total for this year so far was \$30 billion, or 5% more than comparable 1951 volume.

fuss in a *Figaro* interview, to bring forth "harmonious entity" between Gabriel's low, 18th-century École Militaire buildings across one street and the bulky merchant marine building across another was a tough job. He suggested trees might line the front of the plot, with buildings at the rear.

Zehruss was also doing his best to placate lovers of bygone splendors. He told *Figaro*: "All three of us are *pénétré* with respect for Paris." He could not help adding: "A new palace? No. You don't make palaces anymore, in the 20th century. But a building for work . . ."

Construction wages rise 6% in 9 months, BLS finds

Wages of construction labor were going up at the fastest clip in two years. The Bureau of Labor Statistics, in its quarterly survey of 85 cities, found hourly union pay scales advanced an average of 6% in the first nine months of 1952. During the same period last year the rise was 4%. In the first three quarters of 1951, it was 5%.

© Ezra Stoller



Central unit for CBS Television City opened

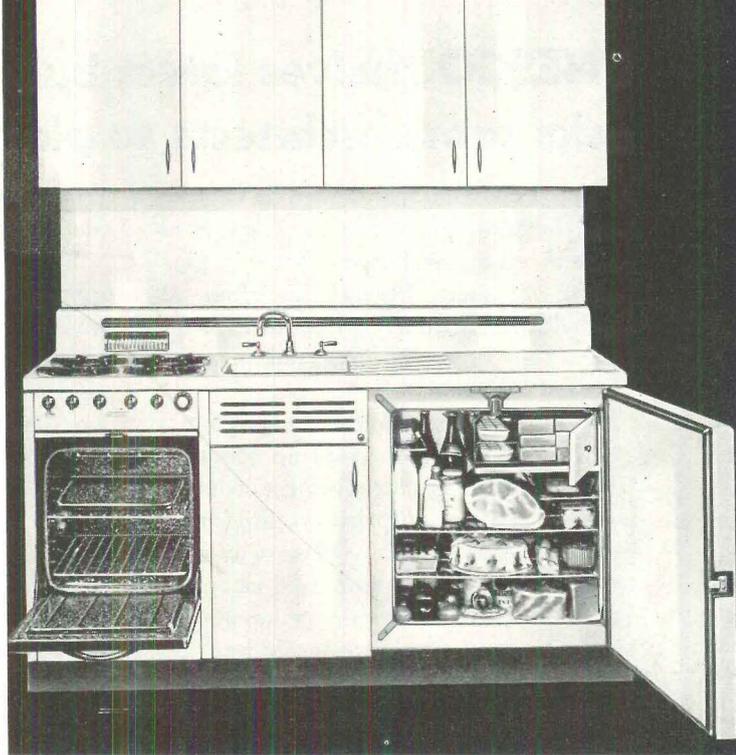
The first unit of CBS' Television City which may become the biggest development of its kind since Rockefeller Center—opened last month in Hollywood. The \$12 million structure designed by Architects William Pereira and Charles Luckman consists of four studios and three rehearsal halls in the right wing, and a three-story glass-

walled service unit at the left containing offices and shops. The ramp around the outside permits scenery hauling, spectator movement. The building has only enough permanent walls to withstand quakes because it is designed for complete flexibility and expandability (as described fully in FORUM last May).

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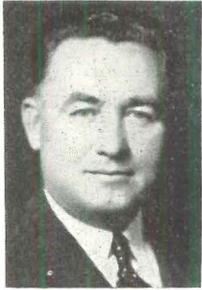
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PEOPLE: ex-plumbers Durkin, Meany win top labor posts; professor envisions cities weather-conditioned by plastic dome

Two top positions in labor went to men who started as plumbers. Eisenhower's secretary of labor, **Martin P. Durkin**, 58, was a steamfitters's apprentice at 17, business manager of Chicago Local 597 of the



DURKIN



MEANY

LIFE: Gordon Coster

plumbers' union for 20 yrs., director of the Illinois State Labor Department, and since 1943 president of the AFL Plumbing and Pipe Fitting international (see p. 39). (Taking over as acting president of the international: First Vice-President **Peter T. Schoemann**, president of the Milwaukee Building and Construction Trades Council.)

Only four days after the death of William Green, the AFL executive council elected as president **George Meany**, 58, who was an apprentice plumber (his father's trade) in New York City at 16. In 1922 he was elected a plumbers' local business agent. In 1934 he became the youngest president ever elected by the New York State Federation of Labor. He has been AFL secretary-treasurer since 1939.

Addressing an architects' air-conditioning course, Prof. **Ambrose M. Richardson**, 35, of the University of Illinois, envisioned a scheme to air (and weather) condition entire cities the year around. He suggested a huge floating dome of thousands of transparent, helium-filled plastic pillows joined together. It could, Richardson thought, start 10' or 12' from the ground, rise to a mile high over the center of a city. Graduate architecture students were making a model under his direction. Next spring, Richardson said he hoped to test the idea with an acre-sized dome. After that, he had in mind a 10 or 15 acre test over a football or baseball stadium. The plan, Richardson insisted, is "perfectly feasible."

Florida's State Board of Engineering Examiners found there was "gross negligence and carelessness" in the design of a municipal bandshell for Hollywood, Fla. by **Louis G. Farrant** and revoked his civil engineer registration. The board took no action on four other charges against Farrant involving dual retainership and the

design of other structures including the Atlas Terminals warehouse where a Youtz-Slick lift slab collapsed three times during erection. (AF, April '52, p. 47; Sept. '52, p. 45). Farrant closed his office in Miami after the charges were filed, and, after a public hearing on them Aug. 1, moved to California.

As first pig iron came from its new Fairless Works at Morrisville, Pa., US Steel completed a reshuffling of its high command.

United Press



HOOD

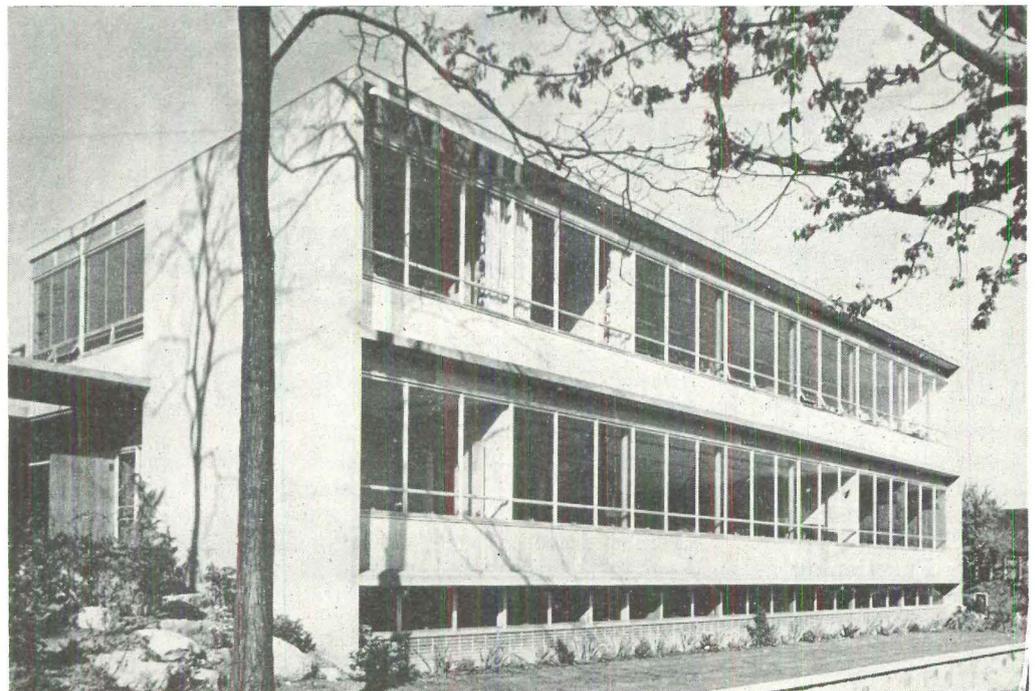
Clifford F. Hood, 58, sales-promotion expert, moved up from executive vice president to president, where he will be responsible for production and sales. **Benjamin F. Fairless**, 62, both president and board chairman since retirement of chairman **Irving S. Olds**, 65, last spring, will now devote his energies only to the board chairmanship, public policy matters, will continue as the company's principal public spokesman. **Harvey B. Jordan**, 57, production authority and advocate of research to develop

new products, was moved from the presidency of American Wire & Steel, to executive vice president in charge of operations.

NAMED: Walter T. Rolfe, FAIA, of Houston, as a member of the US National Commission for UNESCO; **Arthur B. Holmes**, executive director of the New Jersey AIA chapter (president 1937-39), as national convention executive for the AIA; **Frank J. Hanrahan**, chief engineer for the National Lumber Manufacturers Assn. since 1936, as executive vice president of the American Institute of Timber Construction; **James B. Black**, president of Pacific Gas & Electric Co., as northern California's "Construction Man of the Year," by the San Francisco Building Industry Conference Board.

ELECTED: L. S. Meyer, president of Hydraulic-Press Brick Company, St. Louis, as president of the Structural Clay Products Institute, with **Russel G. Eshenaur**, president of Glen-Gery Shale Brick Corp., Reading, Pa. as vice president, and **George Gammie** and **Joseph J. Cermak** re-elected treasurer and secretary; **Frederick S. Blackall, Jr.**, president and treasurer of Taft-Pierce Manufacturing Co., Woonsocket, R. I. as president of the American Society of Mechanical Engineers.

DIED: James W. O'Connor, 77, FAIA, architect for New York public housing,



Construction office wins design medal in Canada

The small Vancouver office building of Marwell Construction Co., one of British Columbia's biggest contracting firms, received the gold medal when the biennial Massey Awards for architecture were distributed at Ottawa last month by Governor-General Vincent Massey.

Moss-colored concrete end walls support the two-story, \$150,000 structure. Front and back

walls are curtains of glass and aluminum. A pond runs under the glass front between a parking area and reception lobby. Flanking the pond is a green marble wall "to steer traffic in" at the main entrance. Architects were Semmens & Simpson, of Vancouver (Harold Semmens, 37, and Douglas C. Simpson, 35). They specialize in commercial buildings, do only contemporary.

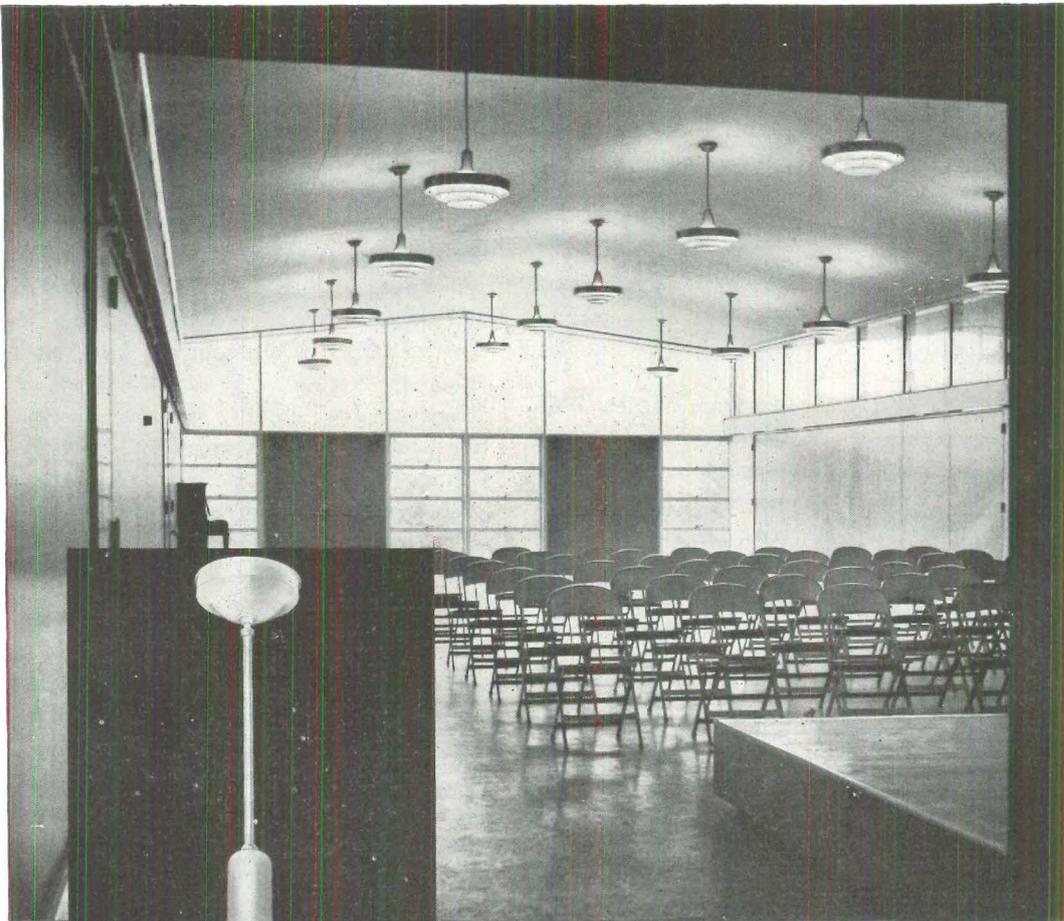


Photo Associates, Dallas — by ULRIC MEISEL.

schools, churches, winner of the New York Architectural League's Medal and President's Medals in 1937 and 1948, Nov. 17 at Glen Cove, L. I.; Architect **Edmund Howe Poggi**, 74, member of Walsh, Sturdevant & Poggi of Wilkes-Barre and coordinator of mechanical trades and engineering for the UN buildings in New York, Nov. 24 at Kingsbridge VA Hospital, the Bronx; **John C. Tredwell**, 56, former president of the American Institute of Real Estate Appraisers who established condemnation values at the Oak Ridge and Los Alamos atomic-energy sites, Nov. 25 in Suffern, N. Y.; Architect **Electus D. Litchfield**, 80, designer of the National Armory in Washington, other public buildings, monuments, and a founder of the New York Building Congress, Nov. 27 in New York; **J. Raymond Prideaux**, 48, retiring president of the New Jersey Association of Real Estate Board and a member of the New Jersey Real Estate Commission, Dec. 5 of a heart ailment in Atlantic City during the annual NJAREB convention.

Tax-free bonds for plants face growing attacks

By constructing plants with tax-free state or municipal bonds and renting them for charges that often ignore real estate taxes, underdeveloped, depressed or waning industrial areas have attracted many a new factory to bolster the local economy. But the practice has drawn increasing criticism during the past year. This winter it faces the threat of Congressional scrutiny. Items:

▶ AFL has demanded that Congress and state legislatures prohibit such financing because it amounts to "direct and indirect subsidization by municipalities of business enterprises, which works to exploit workers and taxpayers." AFL's stand put it in strange company: alongside the Investment Bankers Association, which also strongly urged members to avoid merchandising such bonds, lest corrective Congressional action imperil the tax-exemption for all municipal bonds.

▶ Congressional action was foreshadowed at a hearing in New York held by a House small business subcommittee. Testified Casper H. Citron, New York and New Jersey regional director for the Small Defense Plants Administration: "More plants are being built in the South today because of cheaper labor and also some tax advantages. Some southern cities float bonds to build factories for lease at extremely low rates. They also offer free power and water. This area cannot compete against these odds."

Subcommittee Chairman Abraham J.

continued on p. 54

Silvray 1500 Line units were specified for both the Washington School in Clinton, Okla. and the Fairview Elementary school in Elk City, Okla. by: Caudill, Rowlett, Scott and Associates, College Station, Texas — architects; J. W. Hall, Jr., Bryan, Texas — engineer. The photograph above shows the auditorium of the Washington school.

1. WASHINGTON SCHOOL — Clinton, Oklahoma
2. FAIRVIEW ELEMENTARY SCHOOL — Elk City, Oklahoma

Two new schools install Silvray silvered-bowl lamp fixtures

These two new schools are among the more than 1000 that have installed Silvray silvered-bowl lighting units in the past 18 months.

Silvray installations are characteristically free from eye-torturing glare — both direct and reflected. Largely responsible for the visual comfort afforded by Silvray luminaires is their use of silvered-bowl incandescent lamps. Functioning as both a light-source and light-control element, they collect and direct light to the ceiling making it the pri-

mary source of diffused light. The resulting indirect light minimizes shadows and reflected images . . . permits certified efficiencies of 80-90%.

Yet, a Silvray installation is within reach of every school building budget. In fact, Silvray equipment — because of its low initial cost, maintained efficiency of light-output and simplified maintenance — is often lower in overall expense than other lighting systems.

SEND FOR COMPLETE DETAILS



Smoot-Holman, Inc. — west coast licensee.

SILVRAY Lighting, Inc.

107 West Main St., Bound Brook, N. J.

Gentlemen:

Please send me full details on Silvray indirect lighting units.

Name

Firm Title

Address

City Zone State

4850 Schlage Locks stand watch on the superb, new S. S. United States



U. S. LINES AGAIN CHOOSES SCHLAGE LOCKS

Locks face their most gruelling tests aboard ship. Sea duty subjects locks to everlasting motion during every minute of every voyage, and to the continuing corrosive action of damp salt air.

During 12 years of this rigorous service on the S.S. America, Schlage Locks have proven their ruggedness and

their extreme resistance to corrosion. Now, U. S. Lines has again selected the time-proven Schlage Lock for use throughout the magnificent, new S.S. United States.

Schlage Locks for commercial buildings and residences have the same type of durable mechanism as the locks used on the S.S. United States.

FACTS ABOUT THE S. S. UNITED STATES			
THE LARGEST SHIP EVER BUILT IN THE UNITED STATES			
Length	990'	Gross tonnage	Over 50,000
Beam	101'6"	Total passengers . .	2,000
Depth: Keel to top of forward funnel . .	175'	Total crew	1,000
Number of decks . .	12	Estimated cost	\$70,000,000
Speed	30 knots plus	Builders:	Newport News Shipbuilding and Dry Dock Co.

Schlage Saturn Design in Luster Sealed* Aluminum is used throughout the S.S. United States

*Luster-Sealed Aluminum, treated with Alcoa's alumilite process, permanently resists corrosion and needs no polishing . . . ever!

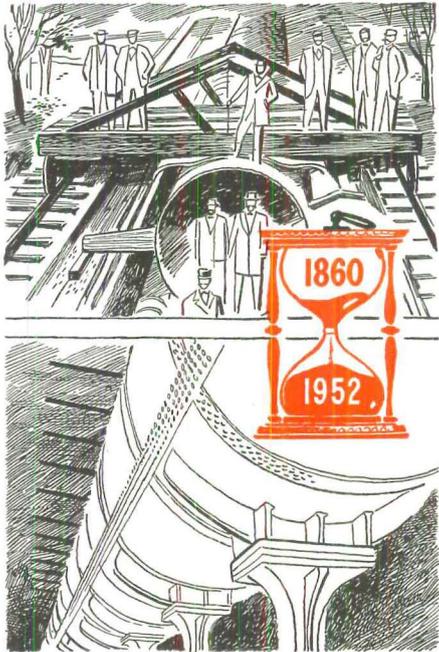


SCHLAGE®

THE TIME-PROVEN CYLINDRICAL LOCK

Schlage Lock Company, San Francisco, California
SCHLAGE LOCK COMPANY OF CANADA, LTD., VANCOUVER, B. C.

A *durability story*
that really **HOLDS WATER**



... AND HAS FOR MORE THAN
90 years

The famous Croton Aqueduct, designed to carry water to the island of Manhattan, is made of genuine wrought iron plates. Installed in 1860, the line has "delivered the goods" for more than 90 years. A recent inspection revealed that it is still in excellent condition.

Here's what it means to your
PRODUCTION PICTURE

Whether it's used for water lines, or any other service where corrosion is a threat to durability, the time-proved corrosion resistance of genuine wrought iron safeguards your operations from the costly consequences of premature pipe failure. In practically every industry genuine wrought iron is answering the need for production continuity, lower maintenance.

● Our booklet, "Proof by Performance," presents some interesting case studies of wrought iron installations from the past. Send for your copy today. Write: A. M. Byers Co., Pittsburgh, Pa.

BYERS
WROUGHT IRON

Multer, D. N. Y., replied that the committee would probably consider the subject in executive session; make recommendations to the tax-writing Ways and Means Committee.

▶ In its recent decision ruling that municipal financing of industrial plants violated the state constitution, the Florida Supreme Court held that "financing of private enterprise by public funds is entirely foreign to a proper concept of our constitutional system. Experience has shown that such encroachments will lead inevitably to the ultimate destruction of the private enterprise system."

▶ In a state-wide referendum last month, however, Louisiana ratified a constitutional amendment to permit its cities or counties to engage in such activity. Other states that sanction tax reduction or use of civic credit to encourage new industries: Mississippi, Alabama, Tennessee and Kentucky.

Federal Reserve opposed. The Federal Reserve Bank of Chicago recently took a critical and scholarly look at the controversy. Its conclusion: "On balance, there are probably many more potential cases in which industrial subsidization would operate to make the economy function *less* efficiently than there are opportunities for 'inexpensively expanding national output' via subsidy."

Beneficiary of a municipal bond issue with a new twist last summer was Stylon Corp. of Milford, Mass., fourth largest manufacturer of ceramic tile. Florence, Ala. agreed to build and equip a factory for the company at a cost of \$1.3 million. The rental will be \$92,000 a year, which amounts to amortization of the city's investment in 25 years with interest at 5%, the same rate the city will pay the bondholders. As Stylon President Joseph Mass wrote his stockholders: "In lieu of annual depreciation charges, interest and real estate taxes, we will pay one fixed rental charge which will be far less than the aggregate of costs otherwise, and without any outlay of the firm's capital for fixed assets."

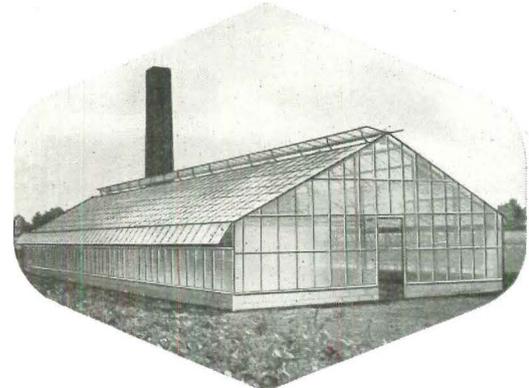
Buy-back proviso. The new plant will help Stylon invade the wall tile business. Previously it concentrated on floor products. It advanced by five years the company's timetable for expansion to the southern market, and put it closer to raw materials: 50% of its clay comes from Paris, Tenn., only 110 mis. from Florence.

The unusual twist: Florence agreed to let Stylon buy the bonds back at any time in the first five years for 500 shares of company stock for each \$1,000 bond; 333 shares in the second five years, 250 in the third, or 200 from the 15th to 25th years.

World's Finest
Everlite

**ALUMINUM
GREENHOUSE**

Your "Garden Under Glass"



● Prefabricated commercial and residential types and sizes.

Commercial models feature large area weather-proof socket hinge vents, rust-proofed steel trusses and standardized aluminum sections quickly assembled by purchasers.

Residential models feature true curved glass eaves, easily-erected standardized sections—any multiple of 8 ft. 7 inches, full house and lean-to models. Foundation & Assembly Plans furnished.

All models are light-weight, fireproof and require no painting or replacement due to rot or rust. Extremely small shadow area—greater sunlight. Ideal for institutions, public buildings, commercial growers and residences.

Transite Plant Benches and Automatic Heating available.

Write for free brochure stating use and approximate size required

ALUMINUM GREENHOUSES, INC., Dept. AF-1
14615 Lorain Avenue
Cleveland 11, Ohio

how Johnson temperature control

Automatically attracts store traffic

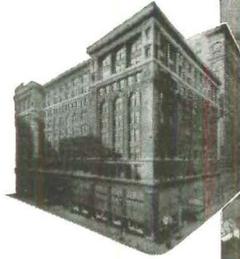
Modern merchandisers recognize customer comfort as a key requirement in attracting maximum store traffic, the lifeblood of department store selling. Providing comfortable temperatures, for example, definitely helps bolster store traffic—and sales. In busy metropolitan areas, where downtown stores must compete with new suburban shopping centers, customer comfort is a "must".

Scruggs-Vandervoort-Barney, Inc., is prominent on the growing roster of leading department stores that depend on modern Johnson Automatic Temperature and Air Conditioning Control to provide the ultimate in customer comfort.

With Johnson Control in command, heating, ventilating and cooling are under complete and precise control at all times. As patrons move from floor to floor or from section to section, uniform temperatures assure the best possible shopping atmosphere. When conditions demand, it is perfectly possible to cool a crowded interior section while perimeter areas of the same floor are being heated.

This accuracy and flexibility are typical of "Planned-for-the-Purpose" Johnson Control because each Johnson system is specifically designed to meet the needs of the individual control problem. That is why you will find Johnson Control not only in outstanding department stores, but in every other kind of public, business and industrial building.

Take advantage of this efficient approach on your own temperature control problems. The experience of the nationwide Johnson organization is at your disposal without obligation. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin. Direct Branch Offices in Principal Cities.



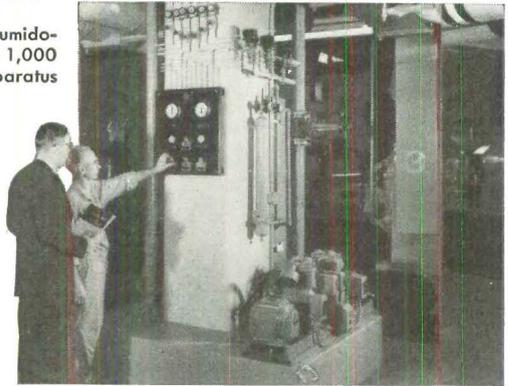
Scruggs-Vandervoort-Barney, Inc., a leading St. Louis department store. Completely air conditioned, this modern store has all-year comfort control by Johnson.



"Johnson Control, a super-brain that no number of men could equal, keeps our temperatures uniform from the basement to the 8th floor," says Coy C. Leach, the store's Chief Engineer. "The system is unusually efficient, and there is a minimum of maintenance. Fuel savings are impressive, too."



Over 150 thermostats, 60 humidostats, 750 valves, and nearly 1,000 other items of Johnson apparatus operate as one efficient control system—and it's all automatic! From this panel in the machine room, 4 zone-control switches position all thermostats throughout the store for heating, cooling or ventilation.



Mr. Leo S. Weil and Mr. Walter B. Moses, mechanical engineers, New Orleans, La., were successful in using a minimum of valuable floor space throughout the store in planning this installation nearly 40 years after the store was built. Sodemann Heat and Power Co., St. Louis, Mo., were the mechanical contractors.



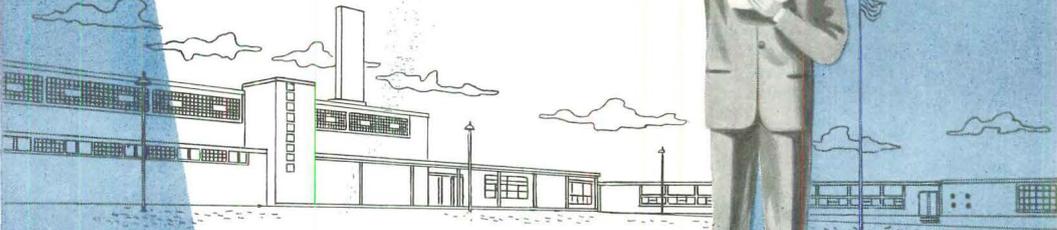
YOU, TOO, may be interested in a store, hotel, hospital, school, factory or office building. Let a nearby JOHNSON engineer help you solve your control problems on any new or existing building, regardless of size.

**JOHNSON Automatic Temperature and
Air Conditioning CONTROL**

MANUFACTURE • APPLICATION • INSTALLATION • SINCE 1885

it's **FIAT** again!

RUGGED TOILET COMPARTMENTS SPECIFIED FOR NEW HOPKINS ELEMENTARY SCHOOL, HOPKINS, MINN.



Haxby, Bissell & Belair, architects chose FIAT Duro Flush Type Toilet Compartments to complement the splendid architecture of this fine new school. Naugle-Leck, Incorporated was the contractor.

Compartments are finished in FIAT baked enamel rose stone color to harmonize with the rose-colored tile and light green plaster walls. Floor is green, rose and beige tile.



These sturdy compartments will withstand the rough usage of school children for years. Panels, pilasters and doors are made of two sheets of #20 gauge stretcher leveled steel, with fiber board sound deadener core cemented uniformly to the metal, and interlocked under tension the entire length of the edges. Pilasters are securely anchored to the floor with an adjustable floor saddle and locking bolt. Durable hardware is chrome plated. Bases of pilasters and floor connections are concealed by 3" high brass chrome plated plinths.

Unique low doors were chosen to facilitate supervision of elementary school children.

MADE BY

FIAT

FIRST IN SHOWERS

WHEN YOU SPECIFY FIAT . . . YOU SPECIFY QUALITY

TOILET COMPARTMENTS
DRESSING COMPARTMENTS
HOSPITAL CUBICLES
PRESWOOD COMPARTMENTS*

*Being used extensively for Army and Navy installations. Catalog on request.

SEE SWEET'S **22b**
Fi
ARCHITECTURAL

. . . for detailed compartment information and the address of your nearest FIAT representative.

FIAT METAL MANUFACTURING COMPANY
THREE COMPLETE PLANTS—ECONOMY • CONVENIENCE • SERVICE

FIAT

Long Island City 1
New York

Franklin Park, Ill.
(Chicago Suburb)

Los Angeles 63
California

In Canada: FIAT COMPARTMENTS are made by Porcelain and Metal Products, Ltd., Orillia, Ontario

LETTERS

SCHOOLS

Sirs:

Congratulations on the October feature on schools! This will do much to revolutionize the generally bad school and college architecture of this land.

Enthusiastically yours,

FENTON KEYES, *business manager*
Skidmore College
Saratoga Springs, N. Y.

Sirs:

. . . The best treatment ever given contemporary schools in any architectural magazine.

NORMAN G. AEHLE, *architect*
Seattle, Wash.

Sirs:

We find this number stimulating and filled with vigor. Congratulations for this forward-looking issue of your magazine. I do not know when I have more enjoyed a publication.

HEROLD C. HUNT, *general supt. of schools*
Chicago, Ill.

Sirs:

Louis Sullivan's comment is sufficient that Dwight H. Perkins (AF, Oct. '52) "is a real man." Thank God for predecessors with courage, energy and wisdom.

WILLIAM A. GANSTER
Ganster & Hennighausen, *architects*
Waukegan, Ill.

Sirs:

I like your statement "Fresh ideas and informed criticism—these are the two essentials without which there can be no sound progress in school design." In planning school buildings these two distinct conceptions must be allowed freedom of play if the best type of an educational environment is to be provided for the children. . . .

F. C. THOMAS, *supt.*
Barrington Public Schools
Barrington, Ill.

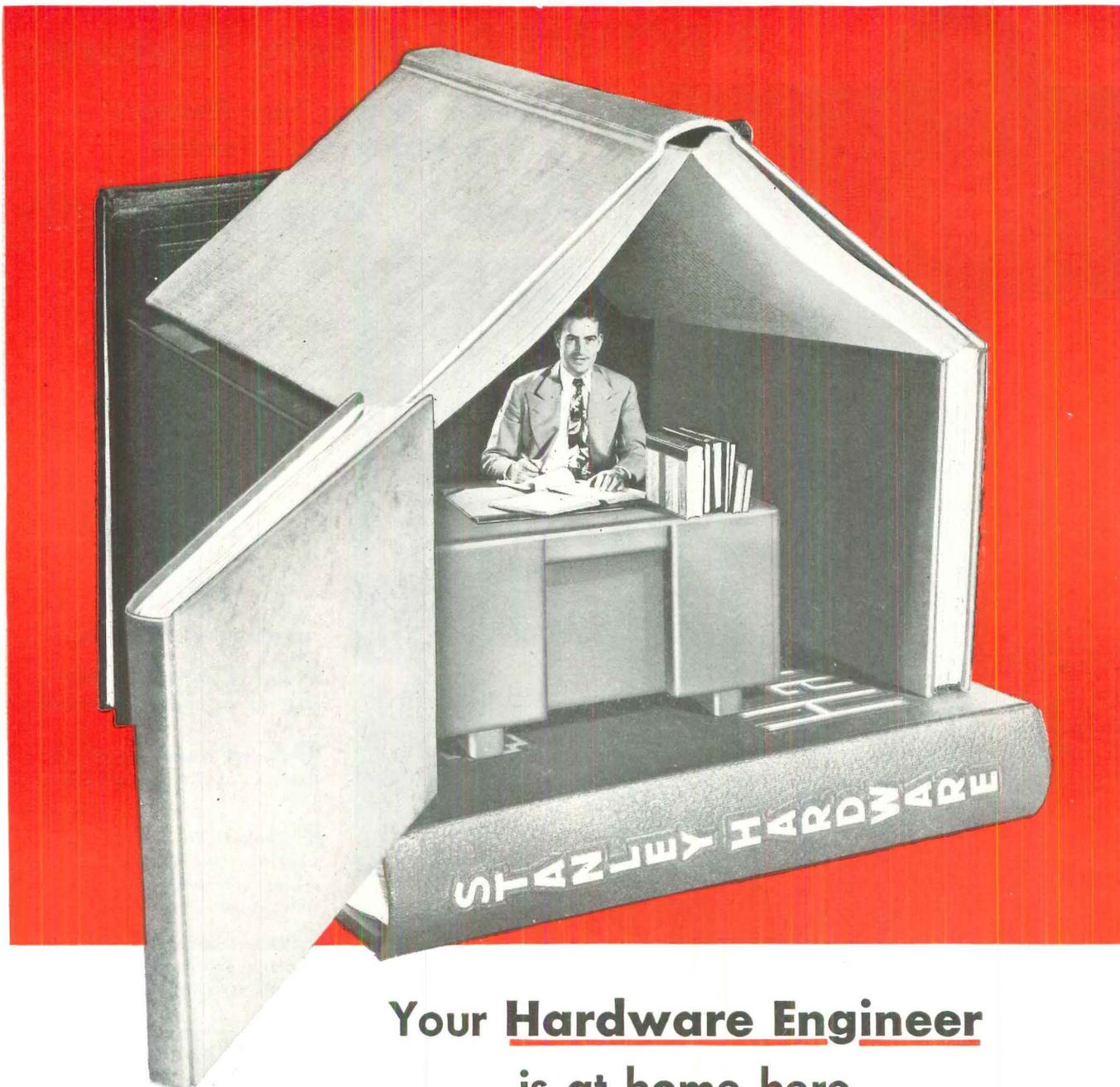
Sirs:

I am suffering from the reaction to an over-emphasis on natural daylighting in the new schools you publish. We have gone too far in a desire to introduce the element of natural daylighting and, as a result, have increased the cost of our schools out of proportion with the ability of communities to pay. . . .

New York State has adopted a sensible viewpoint in this regard, and I am convinced it is the start of a line of thinking which will tend to give us more schools for the building dollar.

JEDD S. REISNER
Reisner & Urbahn, *architects*
New York, N. Y.

continued on page 62



Your Hardware Engineer is at home here

Like the engineers you consult for professional advice and assistance on your building plans, "The Hardware Consultant" (certified) is fully qualified to advise and cooperate with you in the selection, detailing, supervision of installation, and maintenance of builders' hardware.

This *hardware engineer* has complete facilities for specification-writing and furnishing price-data (relieving you of a mass of tedious detail). He has, moreover, the specialized knowledge and training required to service the job.

When you deal with an architectural Hardware Consultant, you may be sure that the hardware he recommends will meet the requirements of

the structure you are planning—from the point of view of design, function, and performance. For that's his specialty.

Take full advantage of the valuable services this hardware specialist in your area is prepared to render to you. If you do not know his name, a letter to Stanley will put you in touch with him promptly.

The Stanley Works, New Britain, Conn.

STANLEY

Reg. U.S. Pat. Off.

HARDWARE • TOOLS • ELECTRIC TOOLS
STEEL STRAPPING • STEEL

3 POWERS Safety Features

Banish "Booby Trap Showers"
In Kansas City's Famous

Hotel Muehlebach



(A)
POWERS
Thermostatic
WATER MIXER

(B)
Diverter
Spout

ADDITION

Architects
NEVILLE, SHARP & SIMON
Mechanical Engineer
WILLIAM L. CASSELL
Contractors
U. S. ENGINEERING CO.

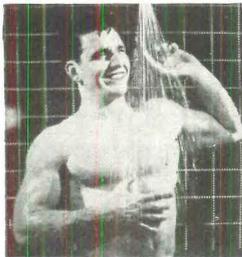


POWERS Thermostatic Water Mixer

Greater Comfort and Safety
assured by these 3 features

- 1 Powers mixers prevent delivery to shower or tub above 115° F.
- 2 Temperature remains constant wherever set regardless of pressure or temperature changes in water supply lines.
- 3 Failure of cold water supply instantly and completely shuts off delivery to shower or tub.

The Most COMFORTABLE Showers Are Regulated by

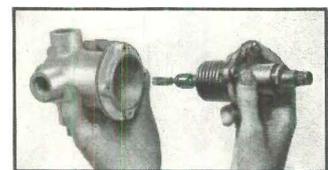


Thermostatic WATER MIXERS

Shower and tub combinations, because they are sometimes used by children and oldsters, require the best protection against scalding and unexpected temperature changes. Subject a Powers mixer to any test you wish. You'll find it the safest made for hotels, schools, hospitals and clubs.

How it Works: Hot and cold water piped to mixer are blended and thermostatically controlled at any temperature desired. For shower or tub bath, Powers mixer handle is turned until water flowing into tub reaches temperature desired. Then

bather enters tub. For a shower, diverter spout knob is pulled up diverting water to shower head. When shower is completed, mixer is shut off. Diverter spout flapper valve returns to "tub" position automatically.



One Moving Part

Easily Accessible from the Front
Easy removal of Thermostatic Motor and Valve Assembly makes it possible to inspect, clean or flush out mixer if necessary. No special tools required. Simple, durable construction insures long life and minimum of maintenance.



Only ONE Shower or Tub
Accident

May Cost Many Times
More Than POWERS Mixers

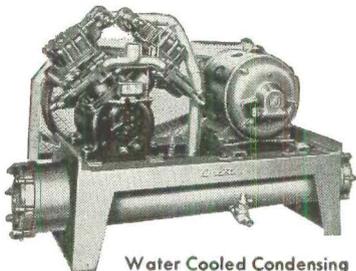
To be Really Sure of Safe Showers • Specify POWERS

(a97)

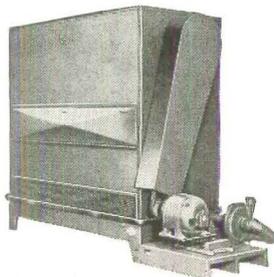
Established in 1891 • THE POWERS REGULATOR COMPANY • SKOKIE, ILL. • Offices in Over 50 Cities

BUILD YOUR **AIR CONDITIONING** SPECIFICATIONS
AROUND

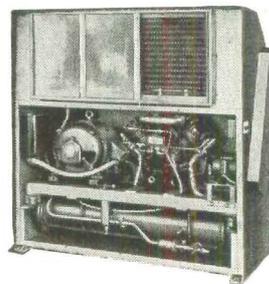
Curtis



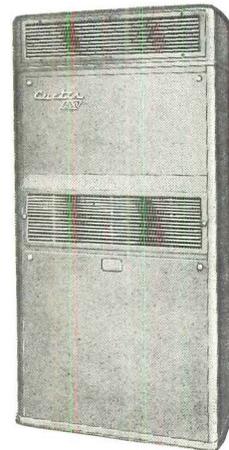
Water Cooled Condensing
Units—through 40 tons



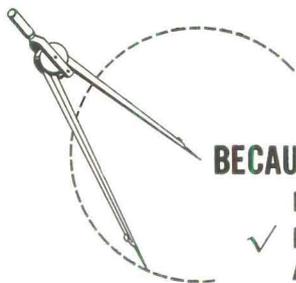
Evaporative condensers—
cooling towers—and air
handling units to match



Central Type—10-15 Ton
Air Conditioning



2, 4, 6, 8 Ton—
Packaged Type
Air Conditioning



BECAUSE... Curtis equipment has an *earned* reputation for performance.

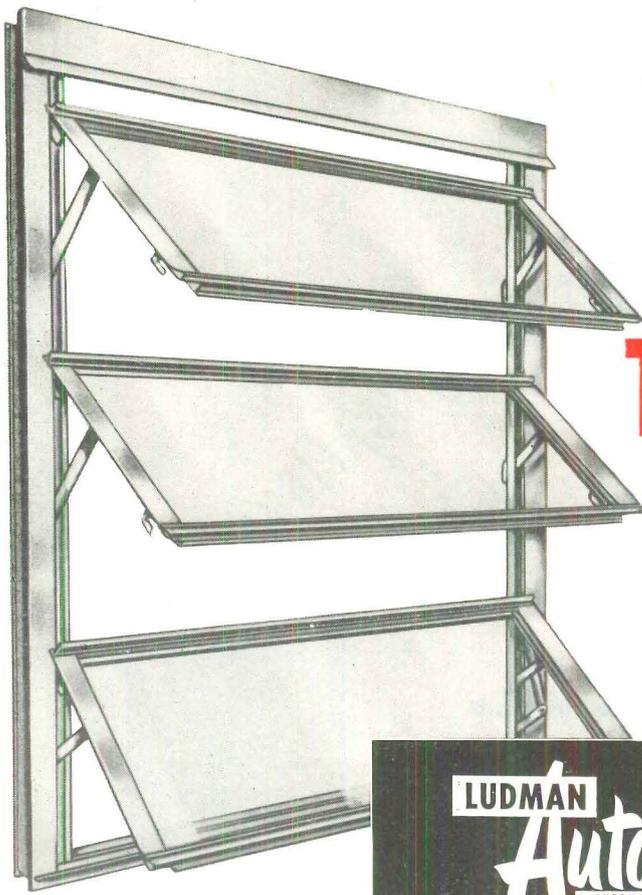
- ✓ Built by a company with over 98 Years of Successful Manufacturing Experience.
- ✓ Competitively priced.
- ✓ Operate economically.
- ✓ Easily serviced.
- ✓ Engineering help is provided (if needed) by Curtis Engineers.
- ✓ New additions to the Curtis line provide the correct size and type for any installation.
- ✓ A new 1952 Curtis Architects Manual will be sent upon request to licensed architects. Use your own letterhead, please.

Curtis REFRIGERATING MACHINE DIVISION

of Curtis Manufacturing Company

1914 Kienlen Avenue, St. Louis 20, Missouri

98 Years of Successful Manufacturing

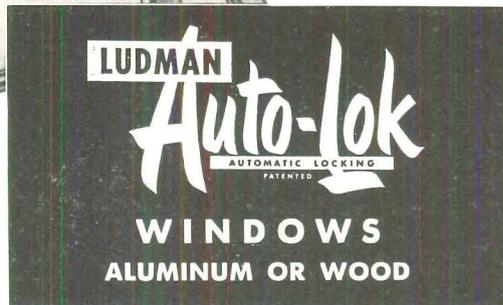


Tightest Closing Windows *Ever Made!*

TEN TIMES TIGHTER

Than generally accepted standards for casement windows and projected sash
*cuts fuel bills or air conditioning costs
for a Lifetime...*

Patented Auto-Lok operation, acting together with "floating seal" weatherstripping, provides and maintains for the life of Auto-Lok Windows a degree of weathertightness heretofore thought impossible in any window.



This degree of weathertightness is maintained always since Auto-Lok hardware eliminates the wear at critical hinge points that results in vents that cannot be closed tight. In other awning-type windows, destructive force must be applied on the hinges at the top of each vent in order to close the vents at the bottom. With patented Auto-Lok operation no force is applied on hinges. Every vent in an Auto-Lok Window closes tight automatically—always. *The result: guaranteed minimum air infiltration...no wear, no hinge adjustments...ever!*

Watch the "Hook" and the "Lug" Pull it Snug!

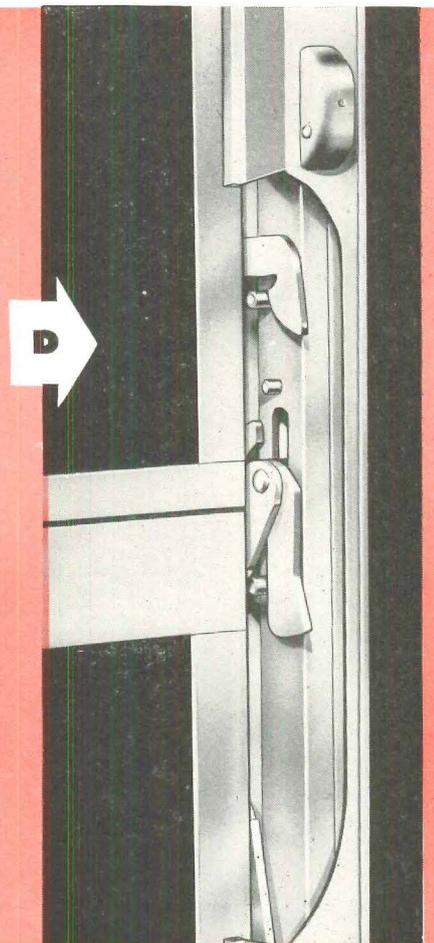
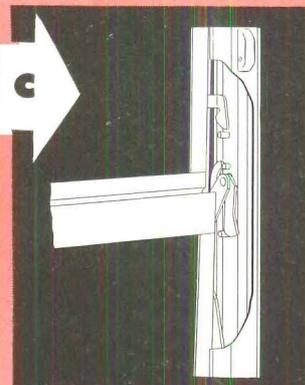
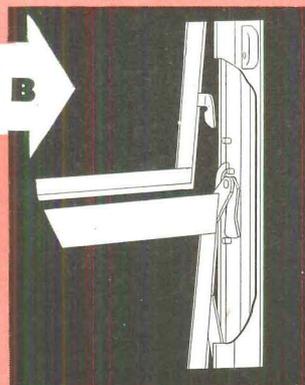
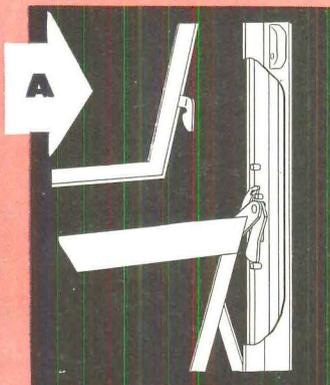
Closes Ten Times Tighter Than Generally Accepted Standards...

Here's how: (a) While vents are swinging in toward the frame, the vertical operating bars at each side of window move up. (b) Note how lugs on operating bars engage hooks on vents as the bar moves up... applying the wedging action that pulls the vents in tightly against the frame. (c) The vents are pulled in snug, and pressure against vinyl weatherstripping assures a complete seal (like the door of your refrigerator). Automatic locking has commenced. (d) Final "locked" stage of AUTO-LOK operation... hooks have moved in, adding extra locking action near the

bottom of the vents, on both sides... without any strain on hinges.

This action is entirely automatic and is accomplished during the normal, effortless turning of the operator handle. There is no destructive force on the hinge points... no periodic adjustments of hinges necessary to close vents tight against frames, and keep them closed tight.

New Center Safety-Lok in convenient center position, pulls bottom vent in tight and securely locks it...provides extra protection against intruders.



L U D M A N L E A D S T H E W O R L D

ONLY  **GIVES YOU ALL 10**
OF THESE Outstanding FEATURES



FRESH AIR WHILE IT'S RAINING...
No more running to close windows... slanting vents keep rain out when window is open.



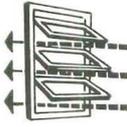
EASIEST TO CLEAN...
Nothing to lift out... no vents to remove... no gadgets to disengage. Simply open wide and clean all glass from the inside... top vent, too!



WARMER IN WINTER...
Auto-Lok Windows are the tightest closing windows ever made by actual laboratory tests. Heat stays in... cold stays out... cutting fuel costs!



FRESH AIR NITE-VENT...
Bottom vent opens slightly for night ventilation, while upper vents remain securely locked... fresh air circulation during bad weather, too!



COOLER IN SUMMER...
Auto-Lok Windows open widest... almost 90°. The slanting vents help to scoop in even the slightest breeze... always inward and upward thus eliminating drafts.



PRACTICAL BEAUTY...
Narrow horizontal lines and graceful tilt of vents in every open position add distinction to any home... lend themselves to a wider variety of architectural arrangements.



CONCEALED HARDWARE
Extra heavy extruded aluminum sections conceal operating hardware. No unsafe, unsightly mechanism exposed to collect dust. Operator does not interfere with drapes, blinds, etc.



FINGER-TIP CONTROL...
for a lifetime. Perfectly balanced, friction-free mechanism operates window at the touch of a finger. No adjustments ever necessary... never sticks, never rattles!

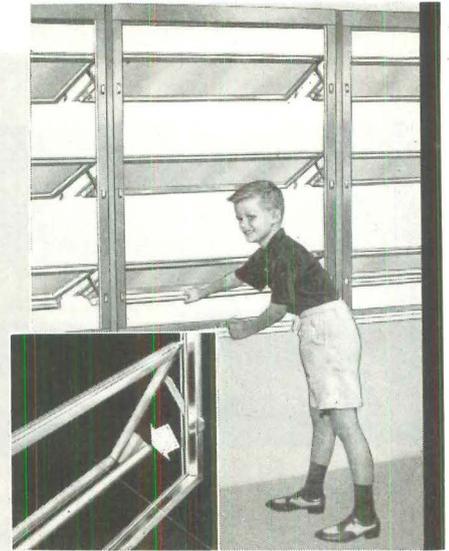


CENTER SAFETY-LOK...
A new improved locking feature that securely locks the bottom vent. Center position makes it handier, more accessible. Extra protection against intruders.



INTERCHANGEABLE SCREENS AND STORM SASH...
Can be handled all from the inside. Just flip the clips... no tools required. Reduce a day's work to an hour!

New Control Bar



THE NEW LUDMAN AUTO-LOK CONTROL-BAR...
An example of how LUDMAN SOLVES WINDOW PROBLEMS...

THE Simplest OPERATING WINDOW EVER MADE!

Here is a new AUTO-LOK Window especially adaptable for schools and institutions... where extraordinary severe usage makes it advisable to use an operating means that is sturdy yet designed for quick, simple, easy operation. A handsome destruction proof smooth aluminum alloy bar takes the place of the conventional operator... an effortless push-out or pull-in operates the window!

Specify Windows on the Basis of Facts

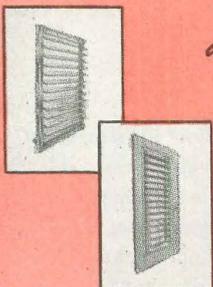
shown by this check chart

Here's proof that Ludman Auto-Lok Windows give you every feature that is important in a window! Here's proof that Auto-Lok Windows are designed and manufactured to give a lifetime of outstanding window service... plus a lifetime of trouble-free operation.

NOTE AIR INFILTRATION COMPARISON FIGURES SHOWN IN THIS CHART... WHICH PROVE AUTO-LOK THE TIGHTEST CLOSING WINDOWS EVER MADE BY ACTUAL LABORATORY TESTS!

* Cubic Feet Per Minute per lineal foot of crack perimeter.
** According to Pittsburgh Testing Laboratories.
*** Generally established standards.

FEATURE	LUDMAN	MODEL 9918	SECURITY	OTHER DOUBLE WINDOWS
1. Automatic Locking	✓			
2. Elastomeric Vinyl Weatherstripping	✓			
3. Center Safety Lock	✓	✓	✓	
4. Feather-Touch Operation	✓			
5. Clean outside from inside... top vent too... Without removing any part of window	✓		✓	✓ (excepting angled frame)
6. Delayed Action Opening	✓			
7. Concealed Hardware	✓	✓	✓	
8. Interchangeable Inside Screens and Storm Sash	✓		✓	✓
9. Flip Clips for screen and storm sash retention	✓			
10. Weather protection when window is open (ventilation even while it is raining.)	✓			✓
11. 100% Ventilation (90° opening)	✓		✓	
12. AIR INFILTRATION*	0.095**	0.5***	1.0***	0.75***
13. Draft Free Ventilation	✓			✓



other LUDMAN products

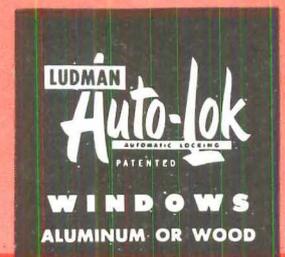
LUDMAN WINDOTITE JALOUSIES...
will turn an old-fashioned porch or breezeway into the most talked about room in the house. And in new building construction, their popularity is increasing at an amazing rate.

LUDMAN JALOUSIE DOORS...
These beautiful doors bring brightness and light into dark foyers and hallways! 3 doors in one — regular door, screen door and storm door.

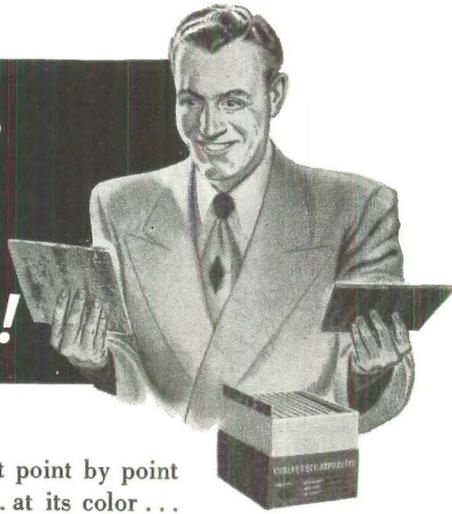
LUDMAN ENGINEERING & ARCHITECTURAL PLANNING SERVICE

Ludman Window "know how" can help solve your window problems. Our engineering and planning staff is at your service.

LUDMAN Corporation Dept. AF-12
Box 4541, Miami, Florida



YOU Be the Judge . . . Examine **AZROCK** From Any Standpoint!



Put AZROCK on trial . . . judge it point by point with *any* competitive tile. Take a critical look . . . at its color . . . its surface . . . its marbleizing. Cross examine it for quality from any standpoint . . . *then* make your decision.

SMOOTH, UNIFORM SURFACE—pick up a 9" x 9" AZROCK tile. Rub your hand across it—*feel* the difference. That super-smooth surface keeps dirt out—makes cleaning easier.

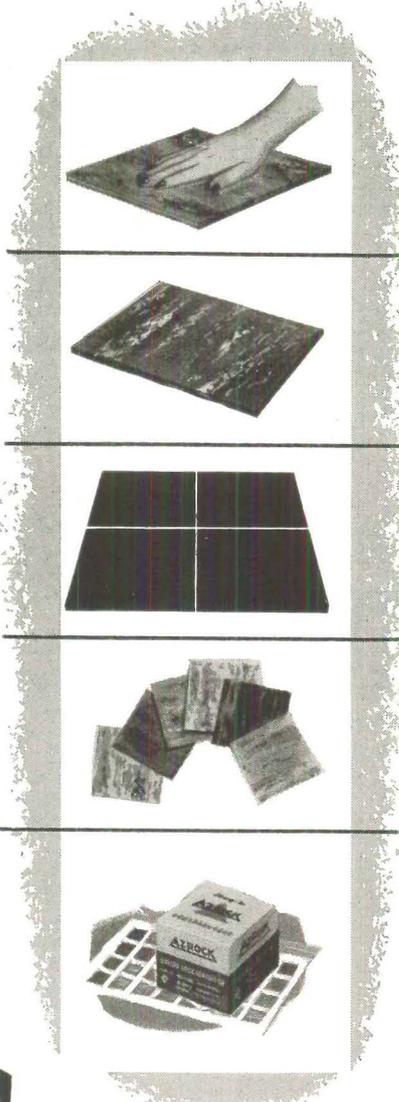
CONTROLLED MARBLEIZING—look at the much more uniform distribution of marbleizing throughout the thickness of the tile. Controlled marbleizing produces more attractive *artistic* directional veining that is more attractive and appealing to your clients.

ACCURATELY SIZED CUT—AZROCK's true, clean, sharp edges are evident. This means tiles that will produce floors of geometrically accurate patterns—floors that lay out in precise, even lines with uniformity and smooth alignment.

ATTRACTIVE COLORS—Your eyes will tell you AZROCK colors are lighter, brighter, cleaner. You'll see the many color choices, too, in AZROCK's wide color range—the right color for any job—the colors most in demand to meet today's modern decoration trends.

When the facts are all in . . . we believe you will agree . . . AZROCK quality is in a class by itself.

Write today for AZROCK'S New  Color Chart and a set of AZROCK tile samples.



UVALDE ROCK ASPHALT CO.

FROST BANK BUILDING • SAN ANTONIO, TEXAS

Makers of AZROCK

AZPHLEX • VINA-LUX • DURACO

"Azrock Makes Fine Floors"

Sirs:

I was extremely interested in not only the unusual and interesting comments, but was impressed by the striking appearance of the pages. The photos were excellent, and the drawings revealing. FORUM is to be congratulated for an excellent contribution.

HAROLD G. SHANE, *prof. of education*
Northwestern University
Evanston, Ill.

Sirs:

Your 33 pages on school buildings in the October FORUM make exciting reading. . . .

WORTH McCLURE, *executive secretary*
American Assn. of School Administrators
Washington, D. C.

Sirs:

I wish that some of the more radical ideas of school design could be given a preliminary tryout by models and then given a practical tryout in a small school or a few rooms before these wild ideas break out in a rash all over the country.

RAY L. HAMON, *chief*
School Housing Section
Office of Education
Federal Security Agency
Washington, D. C.

Sirs:

The proposed new school for Scarsdale was very interesting. Architects Perkins & Will and the school authorities are to be congratulated.

Having erected an elementary school building with hexagonal classrooms in 1950, we are in a position to speak from experience regarding the increased flexibility, greater efficiency and psychological advantages that are possible with such facilities. The 120° angles in our Stockton School designed by Architect Emil Schmidlin present advantages in working arrangements, sight conservation and psychological atmosphere which are evident to anyone who steps into these classrooms.

Since a number of improved school buildings have now been constructed on an unorthodox pattern, but within reasonable cost limits, your magazine is doing school designers a favor if it spreads more of this information to its many interested readers.

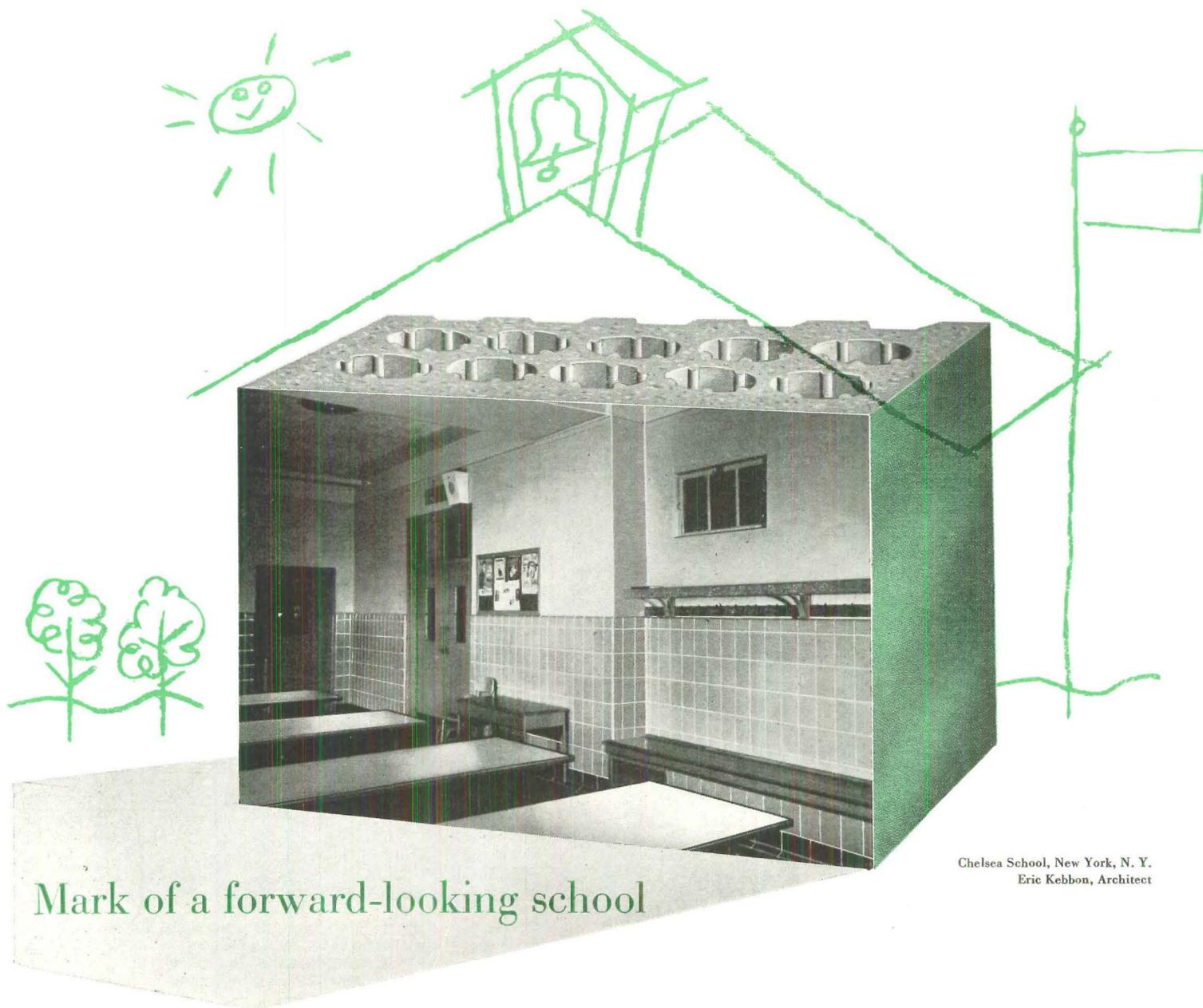
HENRY E. KENTOPP, *supt. of schools*
East Orange, N. J.

PARABOLIC PAVILION

Sirs:

The Parabolic Pavilion illustrated in your October issue is, indeed, a very interesting type of structure. While I suppose that many engineers might consider it an unusual and impractical one, I do not look at it in that way. Frankly, many of us who have been primarily associated with the structural engineering of bridges have not come across many

continued on page 66



Chelsea School, New York, N. Y.
Eric Kebbon, Architect

Mark of a forward-looking school

STARK GLAZED FACING TILE

*lowers maintenance *lasts for life

When you specify Stark Glazed Facing Tile for school interiors, you can rest assured that your original design concept will retain its freshness for years to come.

A color scheme built into the walls with Stark Glazed Facing Tile will stay bright as new—this glass-hard surface will never fade, crack or craze under rough school usage. And Stark's colors are "engineered" to fit a wide variety of school needs—ranging from glare-reduction to high light-reflection for a brighter environment.

Stark Glazed Facing Tile pays for itself many times over in maintenance savings, too. It washes sparkling clean with plain soap and water, completely eliminates the inconvenience and expense of refinishing big wall areas. It's a multiple-duty material—provides a fireproof wall and a decorative finish in one cost-cutting operation.

Our new brochure on Modular Masonry contains full specification data. To obtain one, just write us on your letterhead. Our reference in Sweet's Catalog is 4f-St.

STARK *Ceramics, Inc., Canton 1, Ohio*

14305 Livernois Avenue, Detroit 4, Michigan 15 East 26th Street, New York 10, N. Y.





SAVED...
35¢
per sq. ft.

BISHOP DUBOURG HIGH SCHOOL, St. Louis, Mo.
 MURPHY & MACKEY, Architects
 FRED N. SEVERUD, Consulting Engineer
 NEAL J. CAMPBELL, Structural Engineer
 C. RALLO, Contractor

with **CONCRETE JOIST** **FLOOR CONSTRUCTION**



Bids were obtained on solid slab and concrete joist floor construction for this \$3,000,000 high school. Concrete joist construction, using a 20" removable metal form, was selected because it showed a saving of 35¢ a square foot.

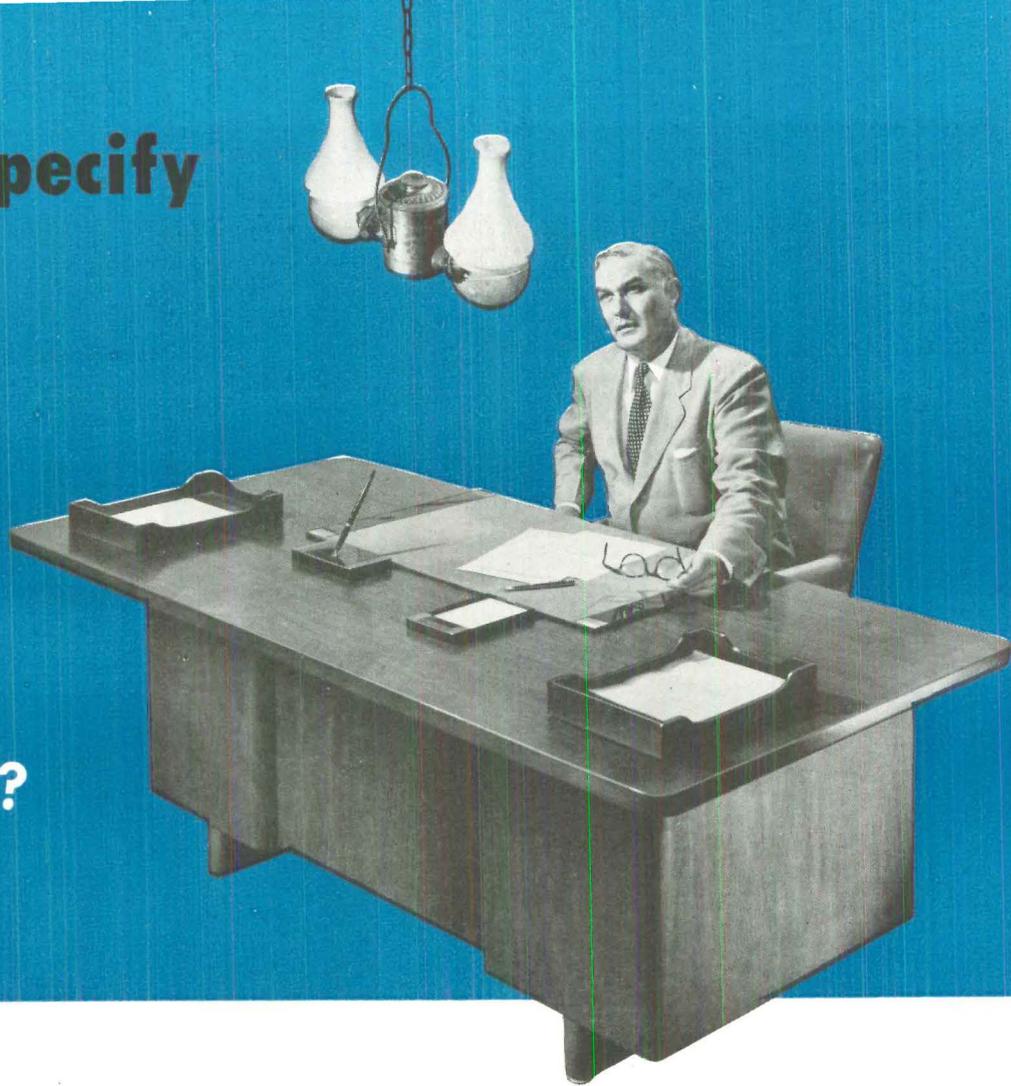
Concrete joist floor construction makes use of easy-to-erect, ready-made, reusable forms. Costs are lower because less concrete and lumber are required. Labor and construction time are also reduced. Furthermore, by eliminating dead weight, concrete joist construction makes possible lighter, lower-cost frames. Write for free booklet — "Reinforced Concrete—A Manual of Standard Practice."

<i>STRUCTURE</i>	<i>COST ESTIMATE</i>
Solid Slab	\$1.45 per sq ft
<u>Concrete Joist</u>	
<u>Construction</u>	<u>\$1.10 per sq ft</u>
(Using 20" removable metal forms)	

CONCRETE REINFORCING STEEL INSTITUTE • 38 South Dearborn Street, Chicago 3, Illinois

**You wouldn't specify
this lighting
today**

**Why specify
outmoded
circuit protection?**



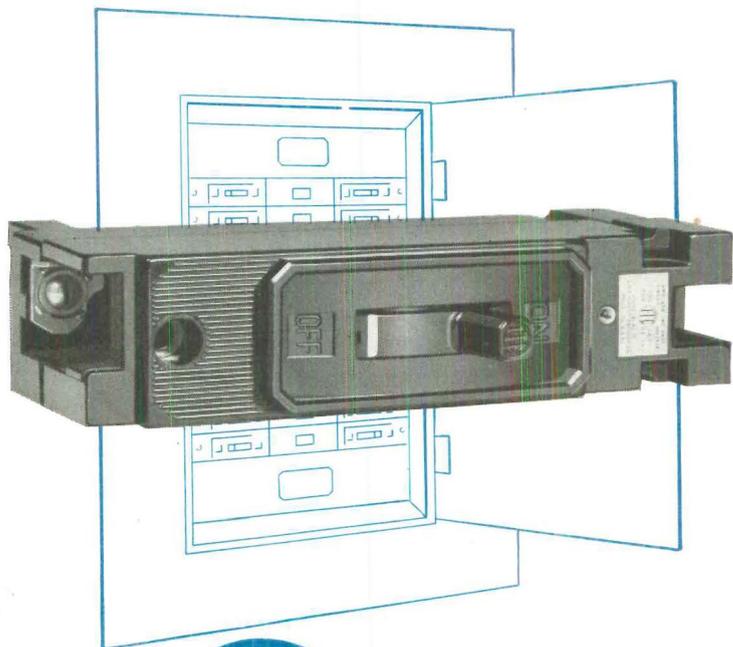
You wouldn't select an antiquated oil lamp to light a modern office. The same should apply to circuit protection.

Many electrical devices are said to provide *adequate* safety. But anything short of the complete security afforded by circuit breakers can't be called adequate.

Remember—only circuit breakers assure: (1) positive electrical protection, *and* (2) swift

restoration of service. And only I-T-E breakers embody those important *extra* features necessary to safeguard modern installations.

So next time you specify the equipment to guard vital lighting, power, and distribution networks, write: "I-T-E Molded Case Circuit Breakers—for all ratings from 10 to 600 amperes, up to 600 volts a-c, 250 volts d-c." Then you'll know you have the finest in modern circuit protection.



I-T-E Molded Case Circuit Breakers

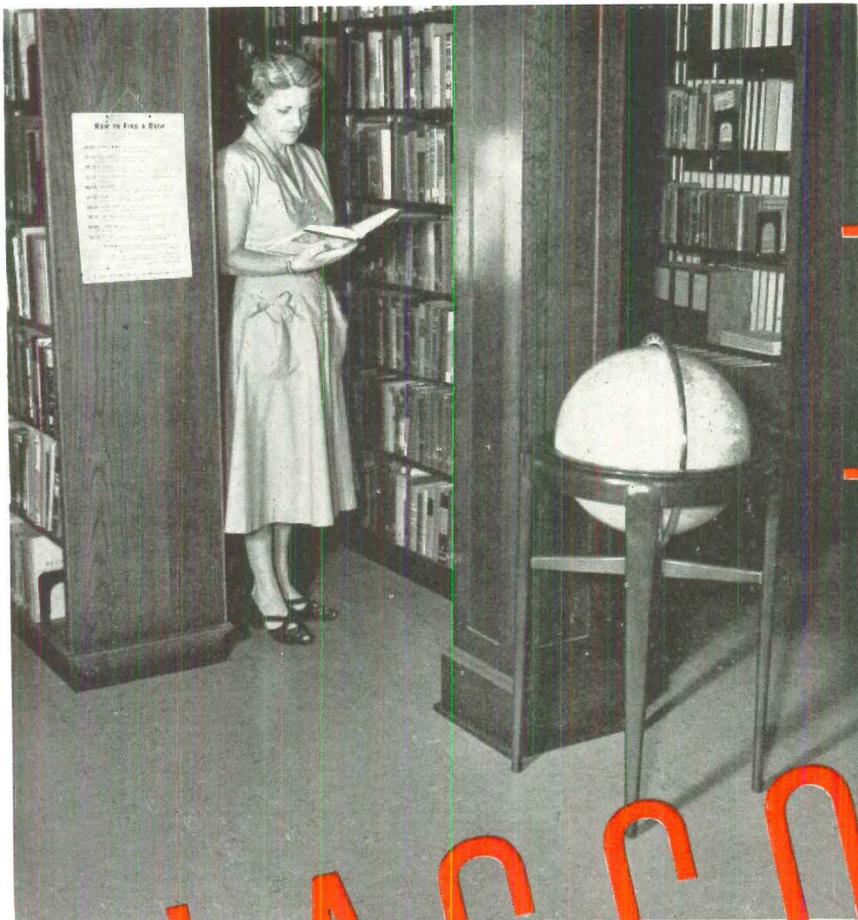
provide not one, not some, but *all* these important advantages:

- First cost the last—nothing to replace or repair.
- Safety for personnel—no live parts exposed.
- Quick restoration of service. 3-position operating handle clearly and unmistakably indicates TRIPPED (upon short circuit or overload)—as well as ON and OFF.
- All breakers accurately calibrated and sealed (to prevent tampering) in sturdy, heavy-duty molded cases.

Specify



MOLDED CASE CIRCUIT BREAKERS



Beautiful Plascor flooring as installed in the Carnegie Free Library, Napoleon, Ohio, by Bernard's Inc. of Toledo, Ohio

PLASCOR

RESILIENT
FLOOR TILES

EASY ON THE EYES, EARS and FEET

A floor that's quiet . . . a floor that's good looking . . . a floor that stands up under hard wear with the least care . . . that's what's needed in libraries, broadcasting studios and hospitals. And, that's why you'll find Plascor in so many such buildings.

Plascor is today's top-quality resilient floor covering. It's made of tough, long-wearing Tygon vinyl plastic. It contains thousands of resin-impregnated particles of shock-absorbing, sound-deadening, slip-resisting cork. Together, these materials make a flooring that's attractive, safe, quiet, chemically resistant, long lasting and easy to clean.

Plascor is unaffected by acids, alkalies, alcohols, oils, and greases. It outwears other resilient floorings several times over. It wipes sparkling clean with a damp mop.

Plascor comes in 11 eye-pleasing, marbled color combinations. The tiles are 1/8" thick by 8 1/2", 11", 17", or 34" square. Harmonizing feature strip and cove base are also available. Installations can be easily made by any of a number of strategically located, franchised flooring contractors.

Write, today, for full information and samples!

55-D

U. S. STONEWARE

AKRON 9, OHIO

LETTERS *continued*

of these unusual structures. However, I am in full agreement with the idea that structures in general should represent the best thinking of the architects and the engineers.

While at first glance I did not see the reason for the design of a structure in the form used for the pavilion, I could well understand after reading through the brief description, that there were certain advantages to this structure from an architectural point of view. . . .

J. M. GARRELT, *professor*
Civil Engineering Department
Columbia University
New York, N. Y.

Sirs:

Matthew Nowicki's magnificent realization of a differentiated tension and compression system in a land-bound structure of unprecedented solution-complex awakens in this witness a sense of plural satisfactions corresponding to each of the stars in the inherent constellation of challenges of the problem, all answered in one spontaneous, courageous and competent initial conception of Nowicki's, which, in the inevitable crises of its processing, always emerged ever more vigorously true to the thoughts of its conceiver.

As for the FORUM's reporting of its inspiring emergence, it is of a standard appropriate to the occasion, a competent lyrically efficient engineering statement. Economists, businessmen, lay readers in general can grasp its specifically significant factors of excellence and timeliness to our newly recognized design responsibilities.

BUCKMINSTER FULLER
Forest Hills, N. Y.

Sirs:

It now looks more like a fairground roller coaster than a building. If the objective was to produce a practical livestock-judging pavilion . . . the state could have obtained one more functional and for less cost.

I traveled 1,600 miles to see what the architect's perspective led me to believe would be a masterpiece, only to be disappointed by glaring departures in its exterior and interior details from my conception of the beautiful and the useful.

I cannot believe that the representatives of the state, the noted young architect, or those completing the scheme, realized what they should and could accomplish for the public. . . . I feel sure that some other public body would utilize the concept, which is not truly original, to produce a real livestock coliseum, one that will be not only beautifully and permanently "spectacular," but adaptable to future demands of agriculture, industry and recreation, and one truly an example of architectural and engineering collaboration that inspires and serves mankind.

H. H. HOUK
Alabama Building Commission
Montgomery, Ala.

continued on page 70

~~Cross off
all window
maintenance
costs~~



with

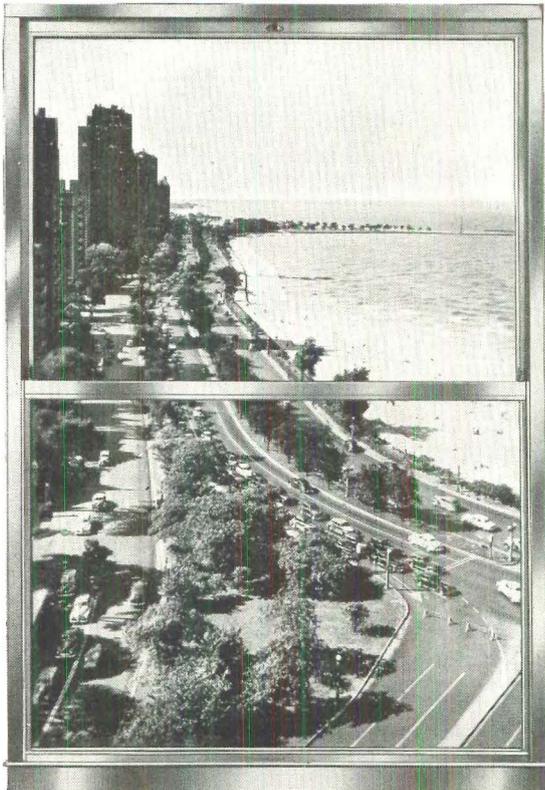
Adlake

aluminum windows

Once they are installed, only the window-washer ever need touch ADLAKE Aluminum Windows! For they require no maintenance whatever, other than routine washing . . . and, in a few years, *they pay for themselves* through this economy!

Because their positive weather seal and finger-tip control are *built in*, they keep their dependable operation for the life of the building. Laboratory tests prove that after *one million* openings and closings, ADLAKE Windows still prevent air infiltration and operate as effortlessly as they did before the tests began.

Find out for yourself about ADLAKE's performance and economy. ADLAKE Representatives are in most major cities.



ONLY ADLAKE ALUMINUM WINDOWS
GIVE YOU ALL THESE "PLUS" FEATURES:

- Woven-Pile Weather Stripping and Exclusive Serrated Guides
- Minimum Air Infiltration • Finger-Tip Control
- No Warp, Rot, Rattle or Stick • Ease of Installation
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THE

Adams & Westlake

COMPANY

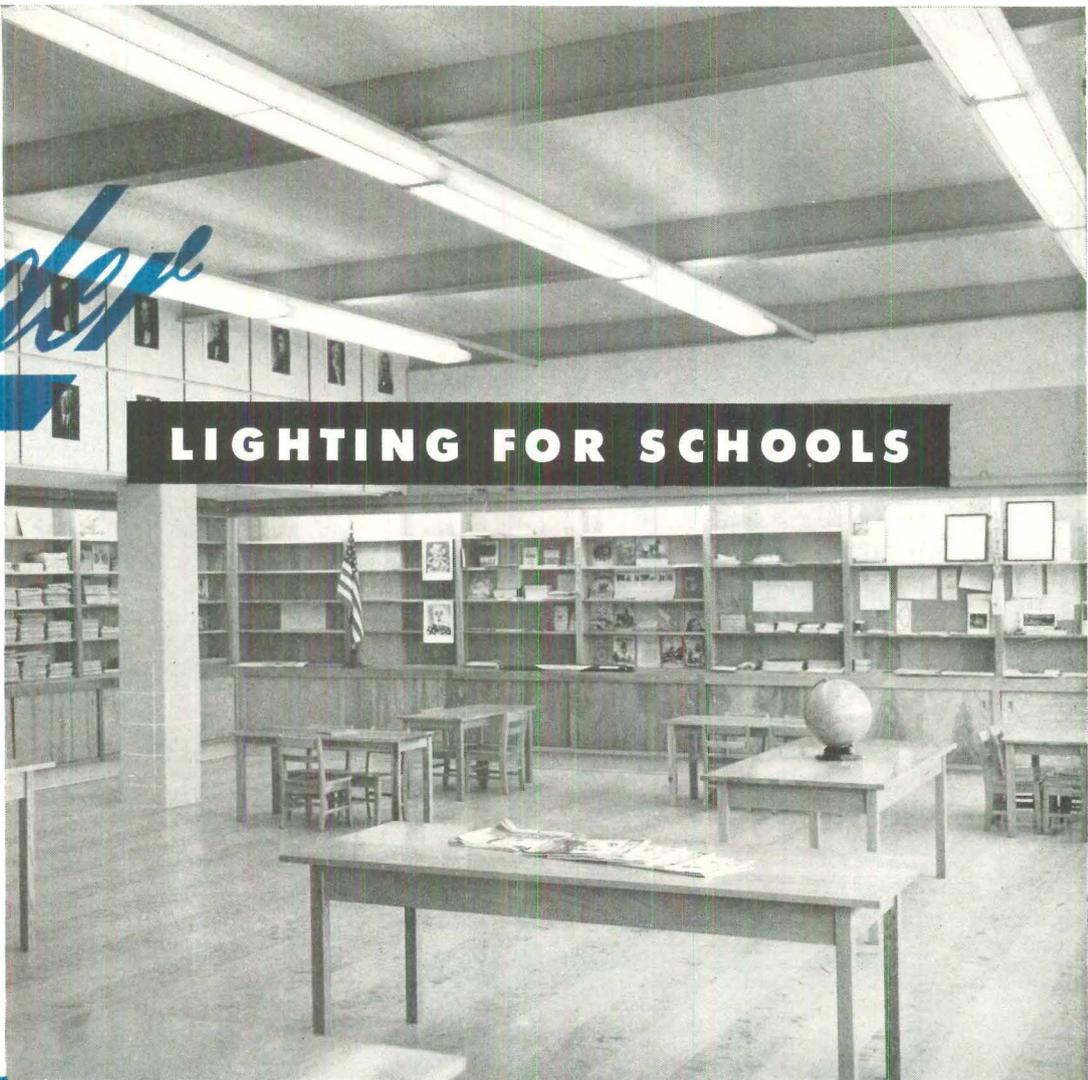
Established 1857

ELKHART, INDIANA • New York • Chicago

Leader

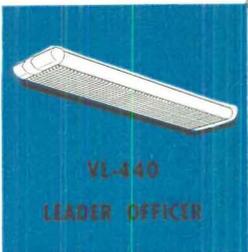
LIGHTING FOR SCHOOLS

- classrooms
-
- libraries
-
- offices
-
- lecture rooms
-
- gymnasiums
-
- corridors



Leader OFFICER installation, using 2-lamp 96" Slimline units. Translucent plastic side panels, 45° plastic egg-crate louver.

The first choice where the demand is for the finest! Available for 2, 3 or 4 lamps, either 40-watt or Slimline in 48", 72" or 96" length. Moulded plastic louver with 45° or 31° shielding. Choice of curved translucent plastic or steel side panels.



● FROM KINDERGARTEN TO THE POSTGRADUATE LEVEL . . . Leader stars in lighting for schools. Scientifically controlled light diffusion, minimum shadows, and absence of glare provide ideal seeing conditions. Leader fixtures are beautifully styled and superbly efficient in operation. Economical to install and easy to service, too.



Plentiful light for continuous close seeing! True parabolic reflectors of diffused Alzak aluminum combine with T-17 lamps to assure maximum light output, low surface brightness, and freedom from glare. Uses two 60" tubes.

The wide variety of correctly designed Leader fixtures assures the *right* light for every need, from top to bottom of the school plant. Three of the most popular Leader units for schools are shown and described at the left. Complete information on these and other Leader fixtures available on request to all who are interested in the best in school lighting.

Outstanding for general school lighting! Economical in cost, but a "luxury" fixture in appearance and performance. Baffle-type louver provides 25°-35° shielding. Uses two lamps, either 40-watt or Slimline in 48", 72" or 96" length.

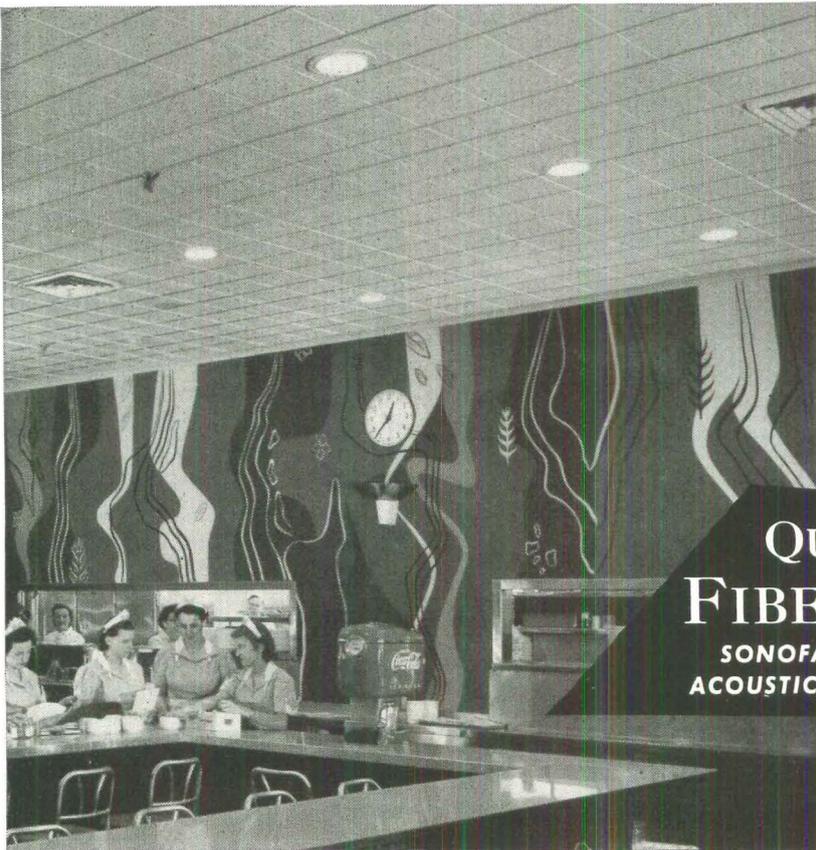


Sold and installed by the better electrical wholesalers and contractors



Leader America's No. 1 Lighting Equipment Manufacturer

LEADER ELECTRIC COMPANY • 3500 North Kedzie Avenue • Chicago 18, Illinois
 Leader Electric—Western • 800 One Hundredth Avenue • Oakland 3, California
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Customers' Restaurant



Employees' Lounge

QUIET by
FIBERGLAS
 SONOFACED
 ACOUSTICAL TILE

BUILDING: Wurzburg Department Store, Grand Rapids, Michigan.
 GENERAL CONTRACTOR: Fuller Construction Company.

ARCHITECT: Robinson, Campau & Crowe, Grand Rapids.
 ACOUSTICAL CONTRACTOR: Leggette-Michaels Co.

Beauty and Brightness Shine...

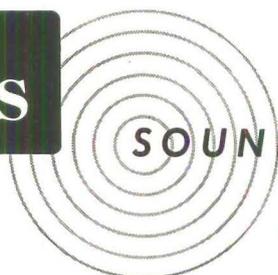
where it's **Quiet** and **Fire Safe**

For modernization, or new construction, Fiberglas Sonofaced* Acoustical Tile offers many design and acoustical advantages. This tile has new and interestingly different decorative possibilities. And noise reduction coefficients up to 70% can be obtained.

Maintenance properties of Fiberglas Sonofaced Acoustical Tile are unique, too. The smooth, un-

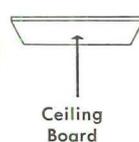
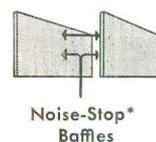
broken film surface affords extreme ease of maintenance and is highly sanitary.

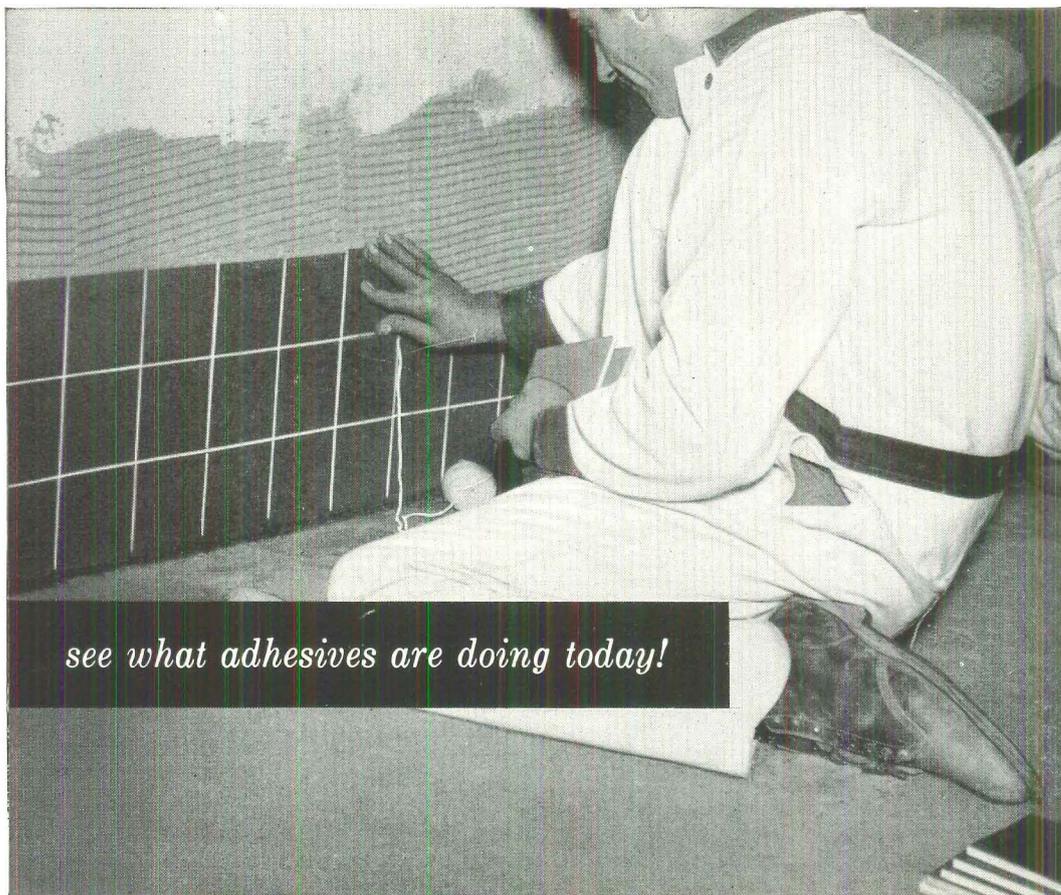
Where these important qualities are applicable, contact your Fiberglas acoustical contractor for complete details. He's in the local classified directory, or can be located by writing to: Owens-Corning Fiberglas Corporation, Dept. 67-L3, Toledo 1, Ohio.



SOUND CONTROL PRODUCTS

*Fiberglas (Reg. U. S. Pat. Off.) and Noise-Stop and Sonofaced are trade-marks of Owens-Corning Fiberglas Corporation.





Setting tile in thrifty style

Look *behind* clay tile for the big news in construction methods today! 3M Ceramic Tile Adhesive is showing builders how to set tile faster . . . at less cost!

In new homes, builders find they can build "dry wall"—eliminating heavy mortar and steel lath—and get a clay tile job with 3M mastic that will last a lifetime. Remodeling jobs are simplified because 3M Ceramic Tile Adhesive eliminates rebuilding walls. Tile can be easily and rapidly set on existing surface.

3M Ceramic Tile Adhesive is tough, resilient and durable, resisting cracks, moisture and settling. It is clean and easy to handle. Reports from all types of building jobs show it can *cut costs up to 20%* on tile setting.



FREE SPECIFICATION AND DATA SHEETS:

Whether you are a builder, architect or tile contractor, 3M Ceramic Tile Adhesive is money-making news to you. Write 3M, Dept. 1512, 411 Piquette Ave., Detroit 2, Michigan, for latest information.

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Adhesives and Coatings Division • 411 Piquette Ave., Detroit 2, Mich.
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MAKERS OF "SCOTCH" • BRAND PRESSURE-SENSITIVE ADHESIVE TAPES • "SCOTCH" BRAND SOUND RECORDING TAPE • "SCOTCHLITE" BRAND REFLECTIVE SHEETINGS • "3M" ABRASIVE PAPER AND CLOTH • "3M" ADHESIVES AND COATINGS • "3M" ROOFING GRANULES • "3M" CHEMICALS

LETTERS *continued*

Sirs:

Your article on the livestock judging pavilion . . . was most interesting. . . .

E. H. PRAEGER, *engineer*
New York, N. Y.

Sirs:

Your article on the stock-judging pavilion on the fairgrounds at Raleigh is interesting and gives a very good conception of the structure, its design and arrangement. . . .

However, the \$1.5 million total cost quoted in your article does not include many items required to make the project complete and usable. These items include movable spotlights and floodlights for the arena area, an intercommunication system, a public address system, roads, walks, parking areas, landscaping and electric service from the source of supply to the building. . . .

F. B. TURNER, *engineer*
State of North Carolina
Raleigh, N. C.

ALUMINUM VS. STEEL

Sirs:

Congratulations on the article "Aluminum for Building" in the September FORUM. It should be both interesting and instructive to architects and structural engineers.

However, an error is made in stating that the modulus of elasticity of aluminum is three times as great as that of steel. This was undoubtedly an inadvertent error, for the modulus is correctly stated as being $\frac{1}{3}$ that of steel . . . in the article's table of physical properties.

Several times you refer to "mild" aluminum, apparently in an effort to compare it to "mild" steel. This designation is likely to be misleading to architects because aluminum is specified, and sold by all producers, by definite alloy designations.

J. GORDON AINSWORTH
Kaiser Aluminum & Chemical Sales, Inc.
Oakland, Calif.

STEEL VS. CONCRETE DOMES

Sirs:

In your interesting treatment of economies in dome construction (AF, Sept. '52) . . . you described the steel dome in Framingham, Mass. We had prepared an alternative solution to this structure in prestressed concrete, but anticipated unequal settlement of columns supporting the dome ring prevented the use of prestressed concrete in this case.

The design we prepared for the architects and engineers would have required 1,088 cu. yds. of concrete, 68 tons of standard steel and only 19.5 tons of high tensile strength wire to prestress the dome abutment ring. [As built, the Framingham dome used 440 tons of steel, excluding the steel decking.—Ed.]

On a square-foot basis the above steel quantities show . . . 4.3 psf of total, steel

continued on page 74

EGGERS & HIGGINS
IRWIN CLAVAN
architects

MEYER, STRONG
& JONES, INC.
consulting engineers

STARRETT BROS.
& EKEN, INC.
general contractors

C. H. CRONIN, INC.
plumbing contractors

AMERICAN RADIATOR
& STANDARD SANITARY
CORPORATION
plumbing fixtures

NEW YORK PLUMBERS'
SPECIALTIES CO., INC.
plumbing wholesalers



Pittsburgh's "Golden Triangle," formed by the junction of the Allegheny and Monongahela rivers, was so named when fabulous coal and steel fortunes were made there. Through the years the area at "The Point" became a commercial slum, but today it is a preview of the Pittsburgh of tomorrow.



FROM SQUALOR TO SPLENDOR

GATEWAY CENTER, being erected by the *Equitable Life Assurance Society* in Pittsburgh's Golden Triangle, is the largest single project in the transformation of an area of ugliness into one of great beauty and increased business housing. Three stainless-steel-clad office towers on 23 landscaped acres facing the new Point Park are the first of eight to be erected. Occupants of these three modern struc-

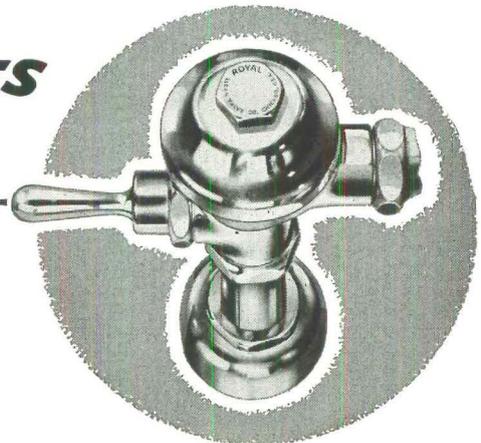
tures are served by the largest air conditioning system in the world. More than 6,000 room units provide cooling equal to that produced by melting 9 million pounds of ice daily. This system is typical of the many efficiencies. To have had its Flush Valves chosen for installation throughout all these buildings is a source of pride to SLOAN, and another preference that explains why . . .

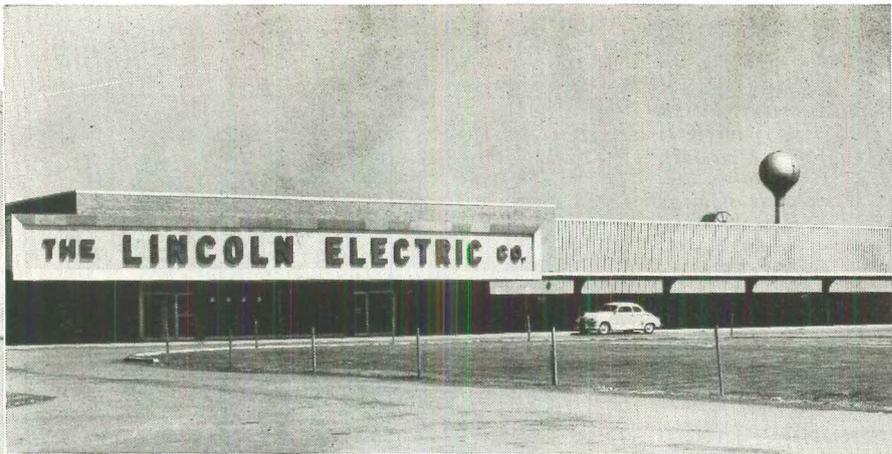
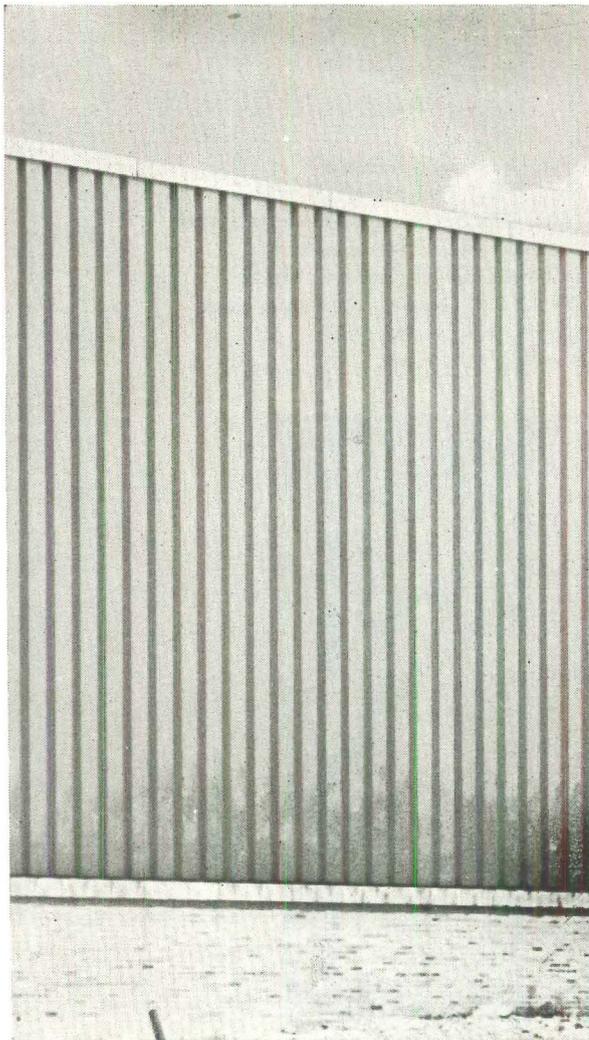
more **SLOAN** Flush VALVES
are sold than all other makes combined

SLOAN VALVE COMPANY • CHICAGO • ILLINOIS

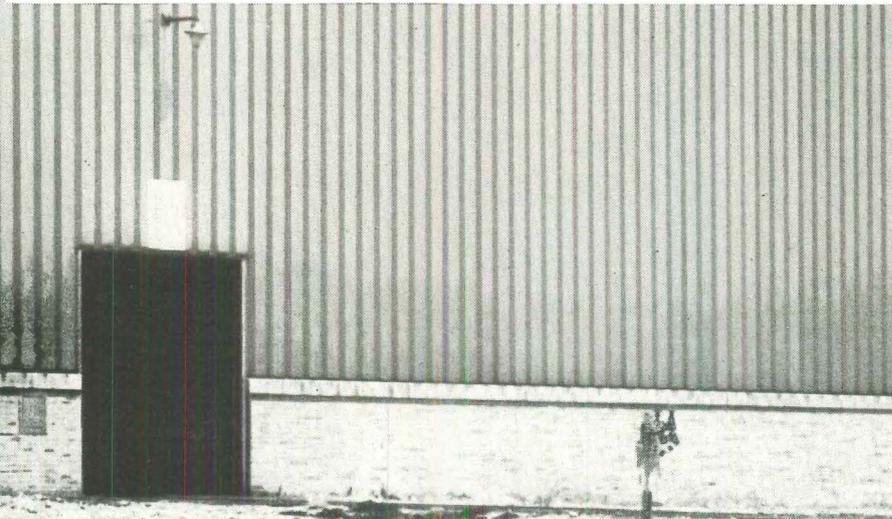
Another achievement in efficiency, endurance and economy is the SLOAN *Act-O-Matic* SHOWER HEAD, which is automatically self-cleaning each time it is used! No clogging. No dripping. When turned on it delivers cone-within-cone spray of maximum efficiency. When turned off it drains instantly. It gives greatest bathing satisfaction, and saves water, fuel and maintenance service costs.

Write for completely descriptive folder

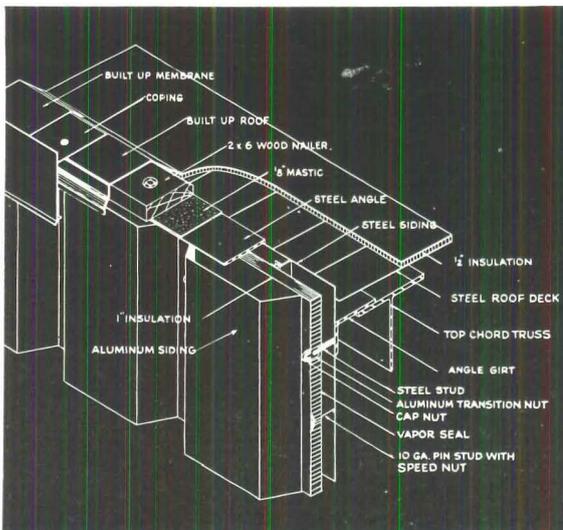




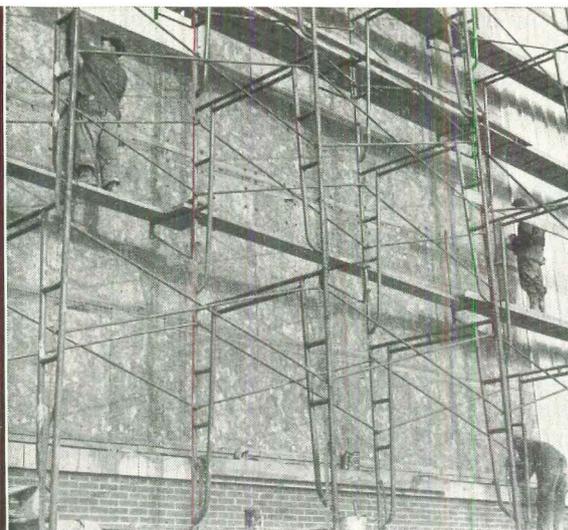
Lincoln Electric Company plant, Cleveland, Ohio. Designed and built by The Austin Company. Exterior walls of Alcoa Aluminum fabricated by Truscon Steel Company. Ornamental aluminum by Ornamental Metal Company.



BUILT TO SAVE MONEY



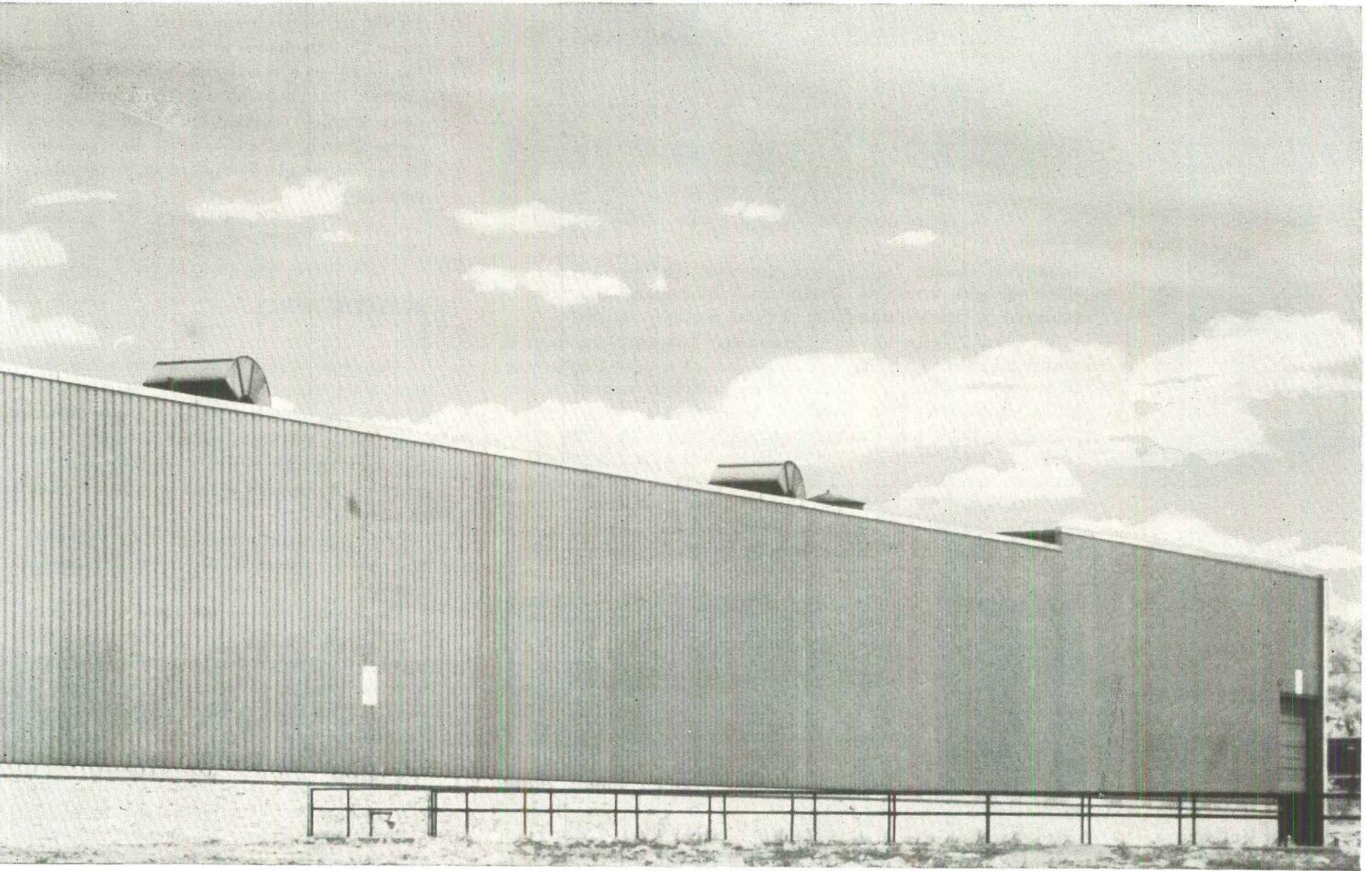
Detail of wall panel. Completed wall has heat-transfer coefficient of .25 BTU per sq ft, is 6 1/4 inches thick, weighs 3 3/4 lbs per sq ft. Compare with .50 BTU for 8 inch brick wall weighing 50 lbs per sq ft.



Speed clips over ten gauge, headless pins welded to inner wall hold Fiberglas insulation in place. Aluminum exterior panel then is fastened to studs with aluminum transition and cap nuts.



Twenty-five foot, inner (Ferroboard) panels fit on studs fastened to girts at sill line and parallel to top and bottom chord of trusses. Fourth girt, carry additional row of studs is arc welded to inner panels.



. . Inside and Out

Dedicated to a policy of constant cost reduction, Lincoln Electric Company built a complete new plant designed to slash or eliminate materials handling, storage, maintenance and other indirect production costs of manufacturing welding equipment.

Insulated, aluminum-faced panels were used for exterior walls because they were, "faster to put up, lower in cost for equal insulating value, require less maintenance."

Alcoa engineers worked with the builders of

this plant as they have with the designers of nearly every pioneering use of aluminum in the building field. They will be glad to work with you. Nowhere else will you find so many men who know so much about aluminum. For information on any application of aluminum call your local Alcoa sales office or write:

ALUMINUM COMPANY OF AMERICA
1887-M Gulf Bldg. • Pittsburgh 19, Pa.

ALCOA

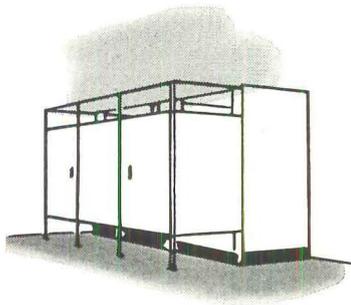


FIRST IN ALUMINUM

Weisway Cabinet Showers

WITH

Weisteel Dressing Compartments



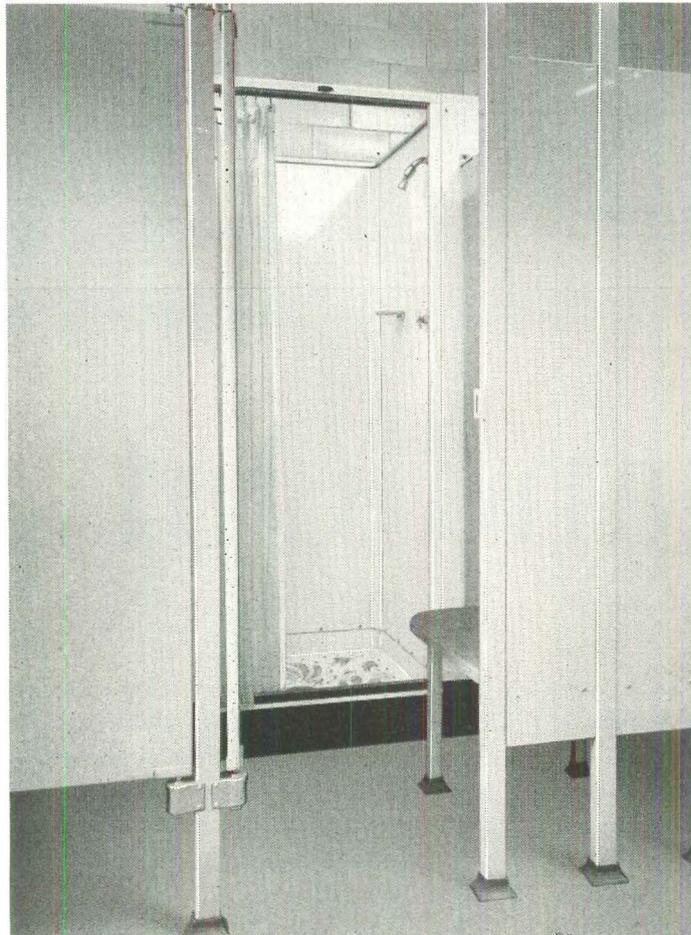
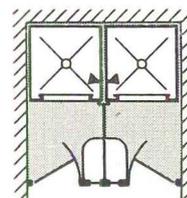
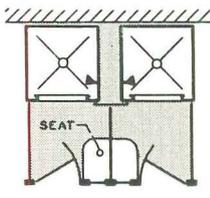
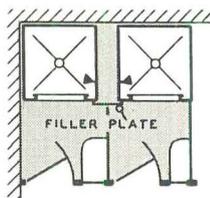
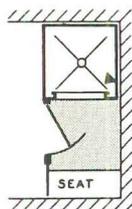
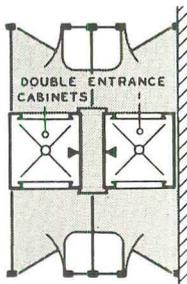
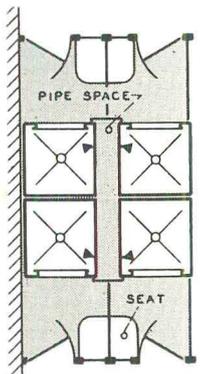
Individual shower bathing facilities, plus complete privacy for dressing, with economy of cost and floor space — all this is achieved by the combined use of these quality products!

Weisway Cabinet Showers, guaranteed leakproof, are built to withstand hard usage through long years of trouble-free service. Foot-Grip, No-Slip floor of vitreous porcelain enamel is safe, sanitary, positively non-absorbent, easy to keep clean.

Smooth flush panels and doors of Weisteel Dressing Compartments have triple protection. Galvanized surface is smooth as furniture steel... Bonderized for additional corrosion resistance... high baked synthetic enamel finish available in wide range of colors.

Write for details about Weisway Cabinet Showers for all classes of construction and Weisteel Dressing and Toilet Compartments.

FOR
SCHOOLS
CLUBS
INDUSTRIAL PLANTS
INSTITUTIONS



Floor plans suggest various combinations of Cabinet Showers with Dressing Compartments.

HENRY WEIS MANUFACTURING CO., INC., 1202 Weisway Building, Elkhart, Indiana

for the proposed design for the Framingham dome. . . . In domes whose abutment ring is supported on a continuous wall, we have reduced this ratio to 1.8 psf. The Framingham dome required support on columns spaced approximately 22' apart, which increased the amount of standard reinforcing in the abutment ring.

J. J. CLOSNER, *vice president*
The Preload Co., Inc.
New York, N. Y.

GEODESIC DOMES

Sirs:

Aluminum alloys may be more efficient than steel where the ratio of dead load to live load is small, but in the case of domes (AF, Sept. '52) constructed to carry large live loads, materials like steel with a higher modulus of elasticity should prove to be more economical.

From our structural studies the Framingham dome appears to be excessively uneconomical.

The triangle grid is not inherently redundant. The grid might be considered as made up of three separate hexagon grids with common vertices. Each vertex in each grid is positioned by three members only. The superimposition of the three grids is purely to stabilize the individual hexagons. However, if that stabilization was not required, the hexagon grid could be used separately.

Buckminster Fuller's 49' diameter triangle grid (Geodesic) dome shown in your article was designed and calculated by this office. There is a 20% difference in length between the longest and shortest member. The system permits continuous triangle subdivision. The maximum number of different lengths is 50 — at this point a ± 5 mil. fabrication tolerance accommodates any further lengths of member required. In this way it becomes possible economically to reduce the size of the individual triangle to the point at which shell mechanics can be applied.

Economical lightweight long span Geodesic domes can be stamped out of strip material (members being about 15" long) and then pinjoined together with retaining caps on a jig to form manageable spherical sections for site erection. All members have the same great circle radius. . . .

JEFFREY LINDSAY, *director*
Fuller Research Foundation
Montreal, Canada

INDUSTRY EDUCATION

Sirs:

The article on industry education by Tyler S. Rogers in the September FORUM is excellent. The scheme proposed could certainly come to fruition in the larger universities where the potential already exists. However, it will take a "merging" of ideas and efforts rather than a "submerging" of any one group.

continued on page 78

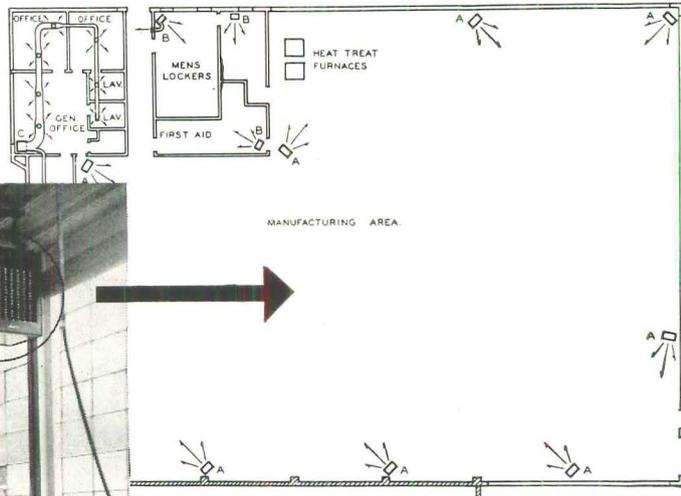
SAVE HALF* THE INSTALLATION COST - *Get Better Heating!*

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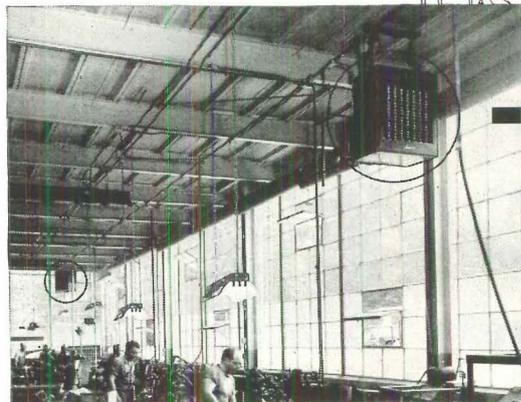


Vahl Engineering Company. Plant, Brooklyn, N. Y.
Brown and Matthews, Inc., Contractors.

Twelve Janitrol Unit Heaters and one Winter Conditioner, installed by Frisse Plumbing Corporation, meet the plant and office 1,120,000 Btu/hr. requirements.



Part of manufacturing area. Suspended unit heaters amply compensate for heat loss from large glass areas.



Janitrol GAS UNIT HEATERS PROVIDE IDEAL WORKING CONDITIONS

In addition to important dollar savings made possible by the original Janitrol Unit Heater installation, prime consideration was given to efficient heating to assure the best possible working conditions.

While the large glass wall areas provide excellent natural light for precision manufacturing op-

erations, heat loss is high. However, unit heaters are located and heat is directed where heat loss is the greatest, so that temperatures remain even throughout the entire manufacturing area.

When you specify gas unit heaters for plant, store, or any type of industrial or commercial building, it pays to find out why Janitrol's

advanced design and construction make these units the first choice of "men who know heating best."

WRITE TODAY FOR YOUR COPY OF BUSINESSMAN'S BLUE BOOK OF BETTER HEATING

It gives numerous examples of correct unit heater installation practices to assure efficient heating with real operating economy.

SURFACE COMBUSTION CORPORATION • TOLEDO OHIO



**Piedmont Sanatorium
consolidates facilities
in buildings of firesafe**

Architectural Concrete

For many years the architectural concrete building shown in the lower photo has housed an infirmary for tuberculosis patients at Piedmont Sanatorium, Burkeville, Va. This building provides space for about 120 beds plus operating and utility rooms. Other facilities were scattered in frame buildings.

The Sanatorium wanted to consolidate all facilities in modern, firesafe buildings so they built the new addition shown in the large photo above. Again the choice was architectural concrete. The new structure provides space for approximately 200 beds and houses kitchen, dining, administrative, medical, laboratory, dental and surgical facilities.

Joseph H. Saunders, Jr. of Alexandria, Va. was the architect for the new section. Fred N. Severud,

New York, was structural engineer. Virginia Engineering Co., Inc., Newport News, was contractor.

Whether building new or extending existing facilities, architectural concrete is the ideal construction material. It provides maximum protection against fire and the elements. It has great strength and unusual durability yet can be molded economically into bold or delicate ornamentation of any style or period. And architectural concrete is easily adaptable to hospitals, schools, apartments, churches, factories, stores and commercial buildings.

Architectural concrete is moderate in first cost, requires little maintenance, gives long service. Result: **low annual cost.** Write for free, illustrated literature, distributed only in the U.S. and Canada.

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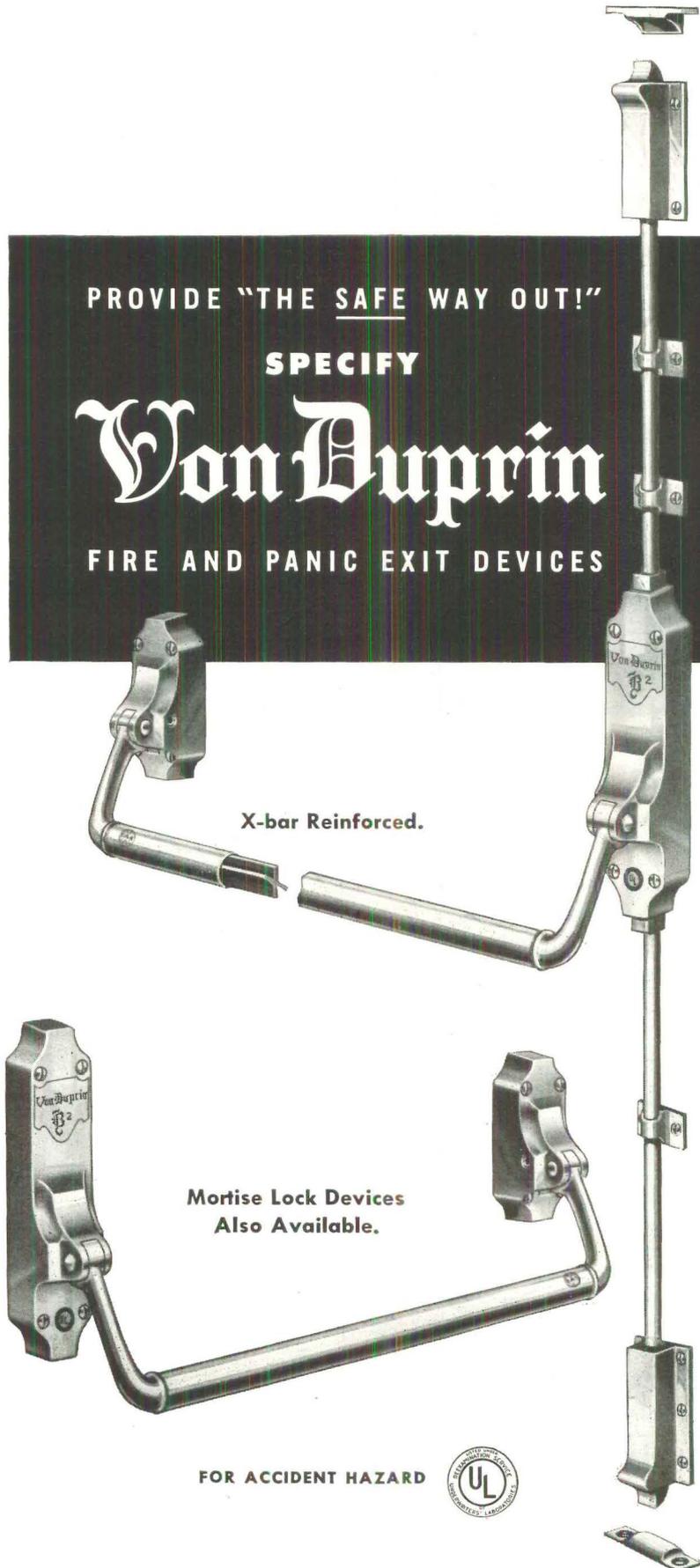
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

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● When you specify Von Duprin exit devices, you can rest assured that the "once in a lifetime" emergency escape will open as readily as the door used thousands of times daily.

You will be recommending a precision-made and foolproof mechanism. Any kind of pressure anywhere along the crossbar of a Von Duprin device instantly releases the latch and opens the door.

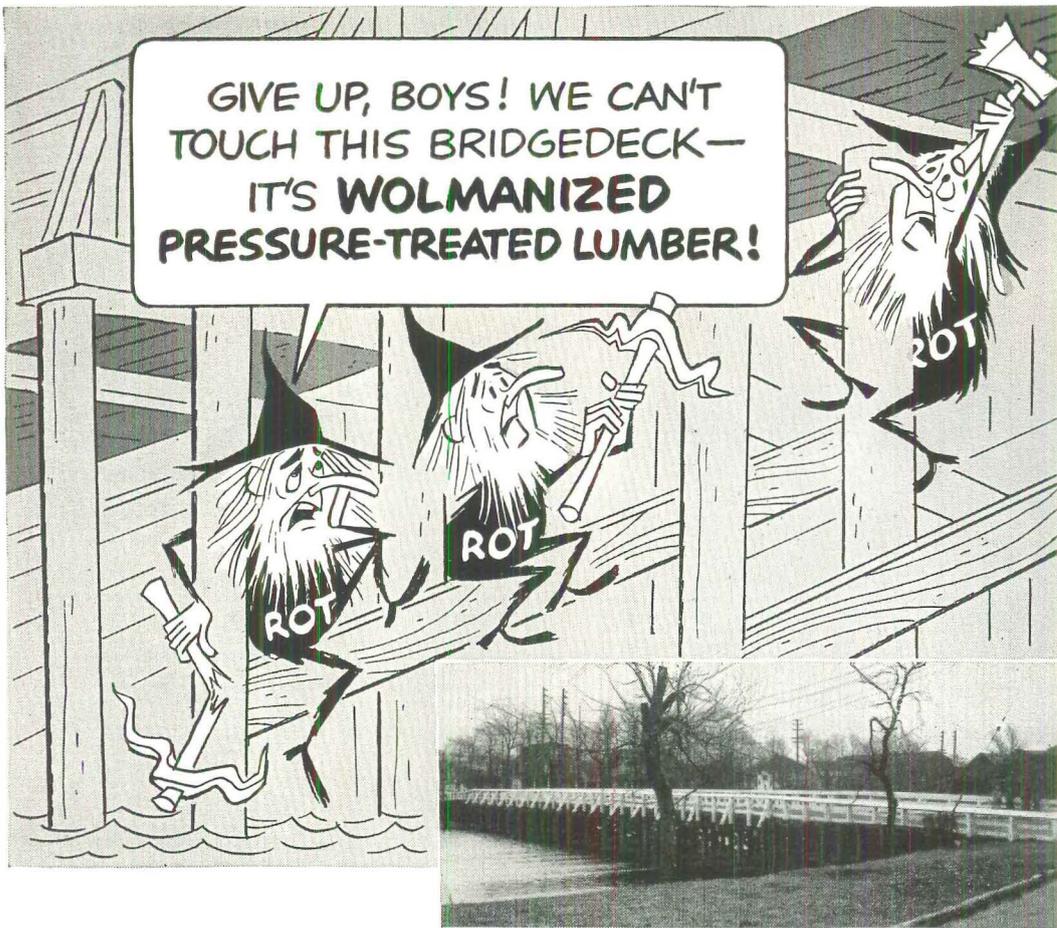
Von Duprin devices are easy to install . . . require virtually no maintenance . . . are quality constructed to last a lifetime . . . and approved by the Underwriters' Laboratories, Inc. for accident hazard.

Remember: when you specify Von Duprin exit devices, you can be sure you have provided . . . "the safe way out!"

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- Accepted as the finest available vertical rod type exit device, incorporating every known refinement.
- Completely drop-forged device of architectural bronze with interior parts of bearing metal to assure lifetime quality, never-failing performance and harmonious design.
- Double acting crossbar is X-bar reinforced its full length. Pressure either up or down will release latches and open door.
- Dogging features at each end of crossbar have direct drive into lever arms. Phosphor bronze compression springs used throughout.
- Top and bottom pullman type latch bolts with independent action, 3/4" throw bolt pivoted on monel metal axles, ball compensating vertical rod connections, and steel bushings on cam pins.





New Jersey highway bridge of wood costs the county $\frac{2}{3}$ less . . .

• The 300-foot bridge over Deal Lake in Monmouth County, New Jersey was built in 1941 of treated wood for two reasons: (1) the treated timber structure costs less than a third of what a similar concrete bridge would cost, and (2) the treated lumber resists rot, rust, corrosion and termites. This bridge has now given 11 years of maintenance-free service.

Composite deck construction was chosen for durability and economy. Wolmanized* lumber is a natural in composite construction where direct contact is made between the nail laminated wooden deck and the bituminous concrete roadway surface.

Wolmanized lumber is clean, odorless, paintable, non-leaching. Hundreds of millions of feet of it have been used and have given decades of satisfactory service. The ability of Wolman preservative salts to prevent decay or insect attack makes any lumber last longer in the presence of moisture and termites. There are Wolman preservative treatment plants in all parts of the country. Our representatives will be glad to discuss specific applications. For further information, write:

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Wolmanized
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Lumber



Perhaps a redefinition of the need and role of the architect, the builder and the manufacturer would lead the way toward a solution and eventual integration.

Heavens knows the entire industry needs this vital shot in the arm.

ELLIOT L. WHITAKER, *director*

*School of Architecture & Landscape Architecture
 The Ohio State University*

Sirs:

Regarding the article in the September FORUM, "Education for an Integrated Building Industry," I wish to point out similarities between the idea you presented and the department of architecture at Virginia Polytechnic Institute. Housed and administered together are three curricula: 1) architecture, 2) architectural engineering and 3) building construction.

The curriculum in architecture is for expecting to practice architecture. At VPI, in addition to proficiency in design, an understanding of engineering, building processes and materials, and building economics is required of graduates. Part of this understanding is gained in class problems and part from close association with students in the other two curricula. Some collaborative problems are given.

The curriculum in architectural engineering is for those seeking to become professional engineers with special interest in building. Some become partners in architectural firms, some consulting engineers and a few go into heavy building contracting. By association with students in architecture they become accustomed to thinking of all aspects of building design, and their association with students in building construction induces them to give consideration to the operating aspects of building construction.

Students enrolling in the curriculum in building construction have a wide choice of technical electives to enable them to bear down heavily on building economics, building materials and appliances, or building management and promotion. . . .

Your emphasis upon research deserves special commendation. The architectural schools should become research centers to which the entire building industry will look for unbiased advice.

C. H. COWGILL

*Head, Department of Architecture
 Virginia Polytechnic Institute
 Blacksburg, Va.*

ERRATUM

Sirs:

The Grand Union supermarket in your September issue is not in Elmwood, N. J. It is part of the Elmwood Shopping Center in East Paterson, N. J.

HAL SHERMAN

*Kelly & Gruzen, architects & engineers
 New York, N. Y.*



WARDROBEdoor

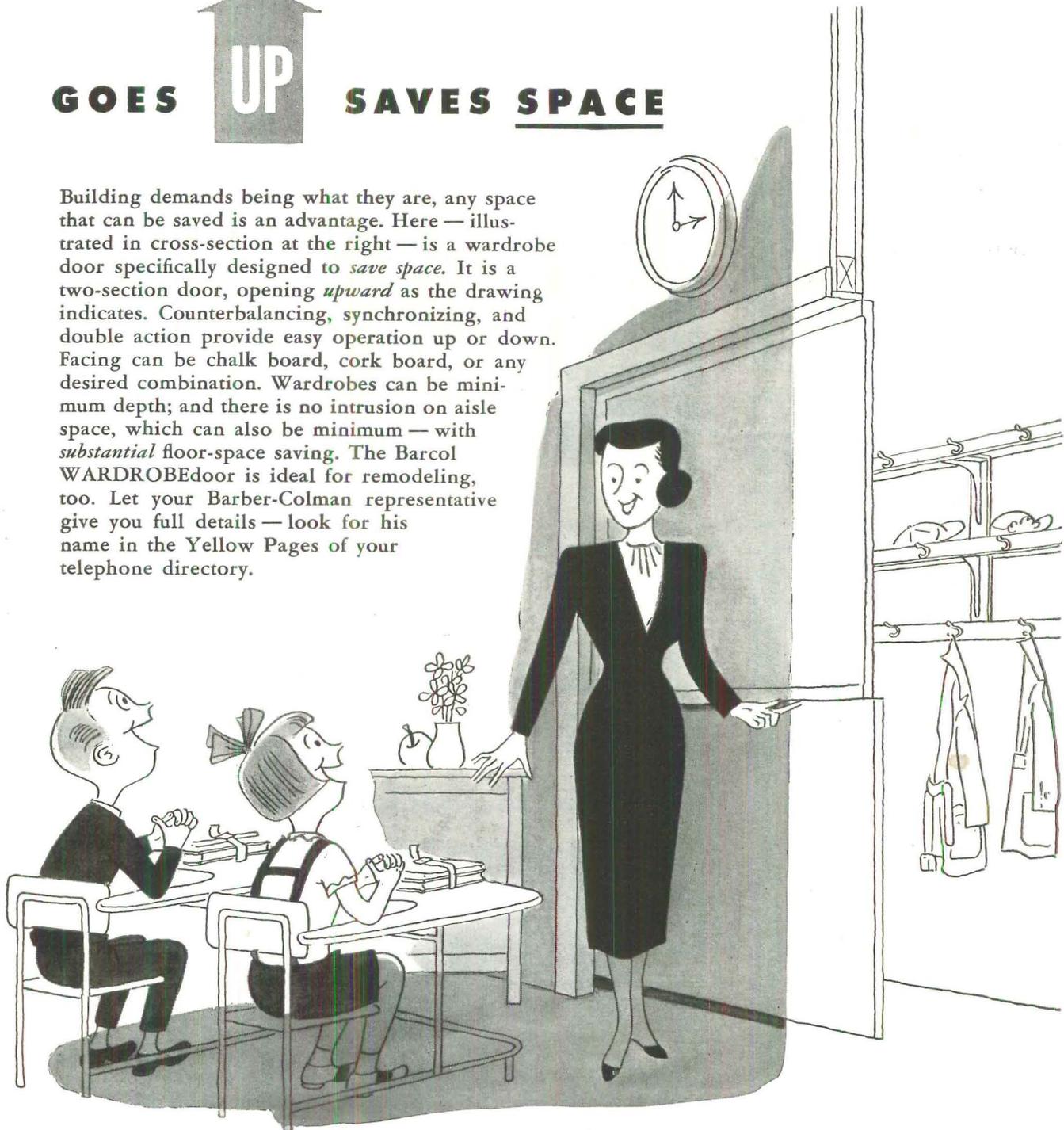
FOR SCHOOLS

GOES



SAVES SPACE

Building demands being what they are, any space that can be saved is an advantage. Here — illustrated in cross-section at the right — is a wardrobe door specifically designed to *save space*. It is a two-section door, opening *upward* as the drawing indicates. Counterbalancing, synchronizing, and double action provide easy operation up or down. Facing can be chalk board, cork board, or any desired combination. Wardrobes can be minimum depth; and there is no intrusion on aisle space, which can also be minimum — with *substantial* floor-space saving. The Barcol WARDROBEdoor is ideal for remodeling, too. Let your Barber-Colman representative give you full details — look for his name in the Yellow Pages of your telephone directory.



SALES AND SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

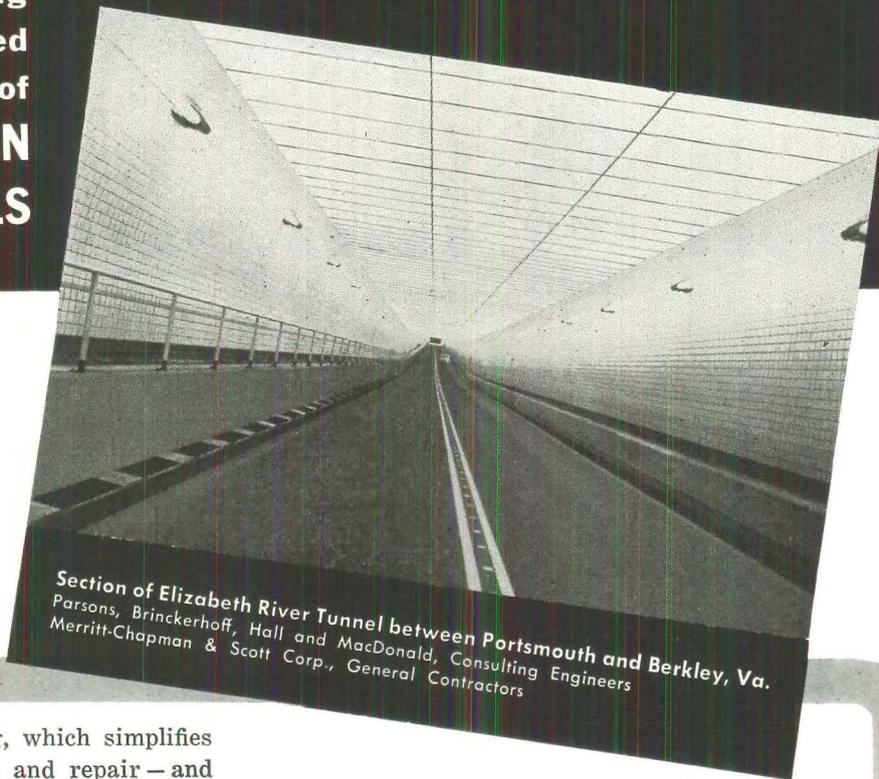


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NEW PROOF OF SEAPORCEL ADAPTABILITY

Improved Tunnel Ceiling
Constructed
of
**PORCELAIN
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This is another example of SEAPORCEL architectural porcelain enamel adaptability ... of engineering ingenuity ... to make better use of better materials ... for today's expanding needs for greater efficiency.



Section of Elizabeth River Tunnel between Portsmouth and Berkley, Va.
Parsons, Brinckerhoff, Hall and MacDonald, Consulting Engineers
Merritt-Chapman & Scott Corp., General Contractors

This new type of ceiling, which simplifies installation, maintenance and repair — and offers important safety features — is composed of 4000 individual porcelain enameled panels measuring 7½ by 2½ feet, with a thickness of only 3 inches.

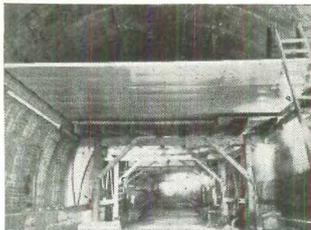
Engineered and erected by Seaporcel's own erection crews, installation was by simple

and fast method and resulted in reduced field labor costs. This Seaporcel porcelain enamel ceiling is highly resistant to rapid change in temperature and remains unharmed up to 1600 degrees Fahrenheit.

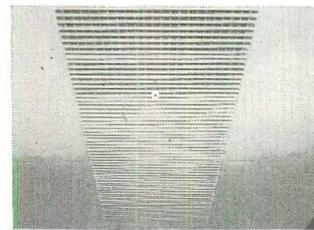


Almost one mile of Seaporcel Porcelain Enamel Flush Type Patented Handrails line the tunnel. Designed with concealed internal fastenings, completely prefit, readily installed and eliminating on-the-job welding.

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View of construction detail.



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October 25th, 1951

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Gentlemen:

During the past five years we have built four hundred homes in the greater Cincinnati area. I have to admit, and most builders will, that water is one of our greatest problems. We have had our share of dampness and troublesome leaks as most builders do, until we were at our wits end as to know what to do.

The past winter and spring was about the coldest and dampest ever recorded in the state of Ohio. Having tried just about every waterproofing on the market without the best results, we decided to try Thoroseal.

We have built sixty-five homes so far this year. Each of these homes were given a two brush application of Thoroseal. To date we have had but one complaint, which was minor and easily stopped with Water Plug. I am thoroughly convinced and sold on Thoroseal and Water Plug. I believe it is the best waterproofing on the market today. It is superior to anything we have ever used.

Yours very truly,

Grower L. Stueck Supf.

*Noted home builder
claims Thoroseal
and Waterplug best
material on the
market--*

Here's a contractor who won't be annoyed with customer complaints again. To be sure that all his homes are dry, he uses the 40-year-old Thoro System Products, a name top on the list with famous contractors the world over.

Thoroseal comes in beautiful pastel colors and can be applied also to the interior surfaces of your basement walls to seal and beautify.

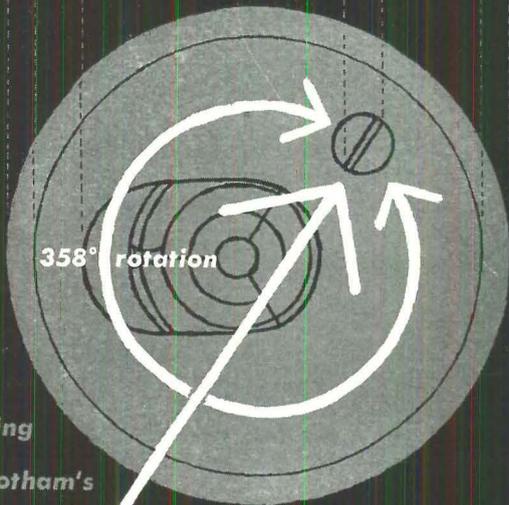
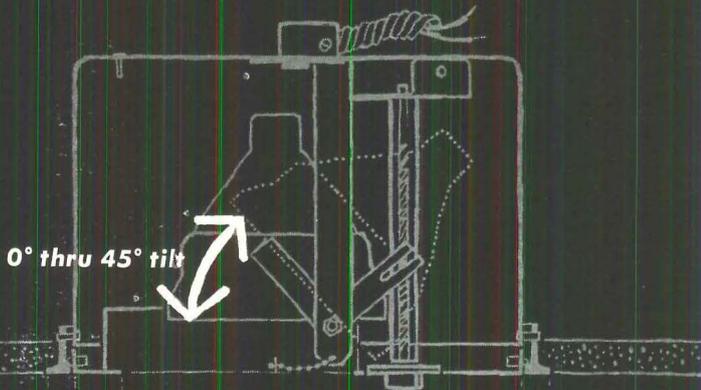
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Basement exterior of all 65 homes given
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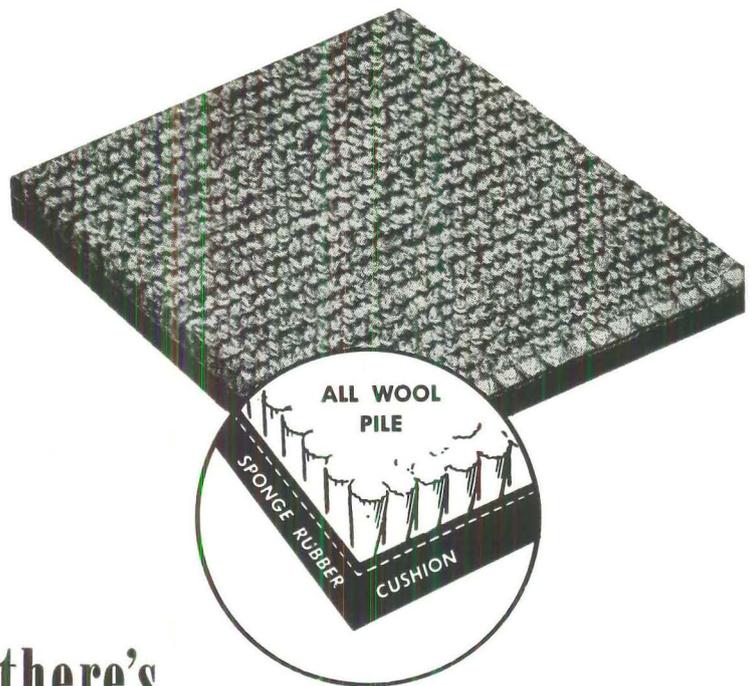
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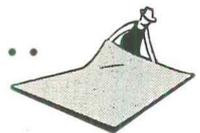
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that's EASY
and ECONOMICAL
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"LOMA LOOM" carpet, with the built-in sponge rubber cushion, is easy — and economical — to install. Just lay it down — no base or underlay is needed. Because of the sponge-rubber back, "LOMA LOOM" carpet moulds to any type of flooring.



the carpet with the
BUILT-IN SPONGE RUBBER CUSHION

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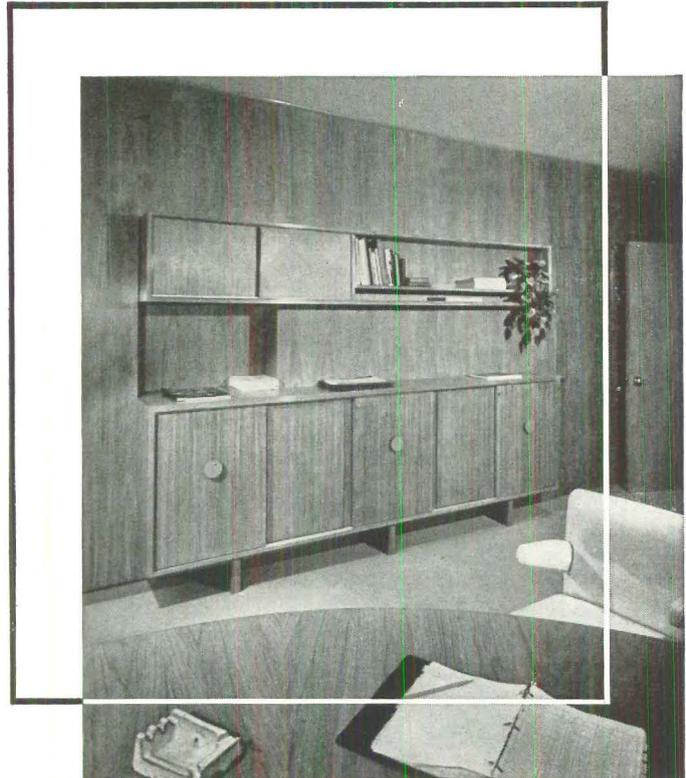


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At Botany,

BEAUTY is GOOD BUSINESS

... And Weldwood® Paneled Walls
Provide Beauty in Good Measure



Executive office in Women's Fabric Division of Botany Mills, Inc., Bergen County, N. J. Furniture and Weldwood walls and cabinets were especially designed by the architect, Louis Hatkoff, New York.

This executive office in the Women's Fabric Division of Botany Mills is more than beautiful. It is a *demonstration* of the practical, eye-catching sales appeal of Weldwood paneled walls, built-ins and cabinets.

Botany executives and architect Louis Hatkoff, like thousands of other businessmen, have found in Weldwood Plywood the perfect combination of durability, luxurious beauty and moderate cost.

Because it is real wood, the natural charm of Weldwood paneling grows more beautiful with the years. Its great versatility and the wide selection of woods from which to choose . . . including walnut, oak, birch, mahogany and Korina® . . . make it easily possible to create any architectural or decorative effect desired.

For example, all the Botany sales offices are custom designed. Individual needs of each showroom and executive office determine the treatment of walls and furniture.

In this Women's Fabric Division executive office, see how Walnut Weldwood, in antiqued, pickled finish, keys in with smart, modern styling.

When you are planning offices, sales room or display rooms, keep in mind the many and varied kinds of woods available in Weldwood paneling for walls, ceilings, and built-ins.

Should you be called on to design furniture, too, remember that Weldwood Hardwood Plywood can be obtained in thicker panels in the same woods which are available in Weldwood wall paneling. A harmonious, matching interior is thus assured.

WELDWOOD® Plywood

Manufactured and distributed by

UNITED STATES PLYWOOD CORPORATION

World's Largest Plywood Organization

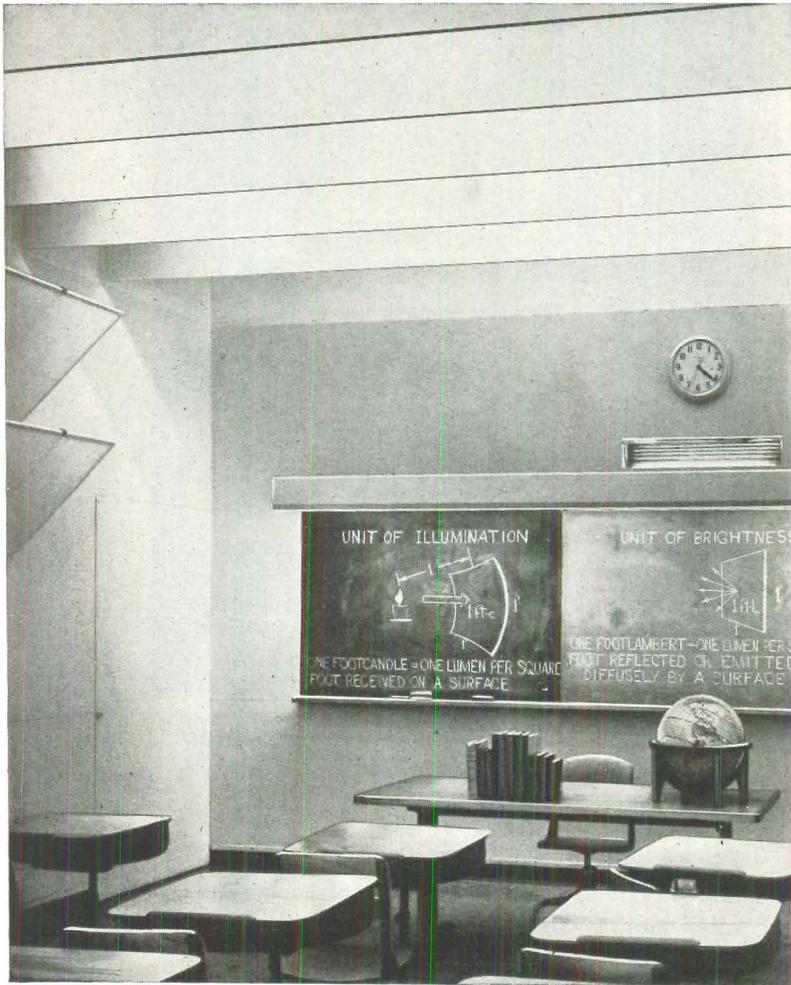
55 West 44th Street, New York 36, N. Y.

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NOW 480Y/277-Volt Lighting Approved for Schools, Stores, Office Buildings



Stores, Office Buildings

Save dollars and copper with higher voltage. Have safety and convenience with G-E remote control switching.

A new amendment to the National Electrical Code extends the use of 480Y/277-volt distribution to include supplying ballasts of fluorescent fixtures in large schools, office buildings, stores. This means that the economies of higher voltage for lighting are no longer limited to industrial uses.

For example

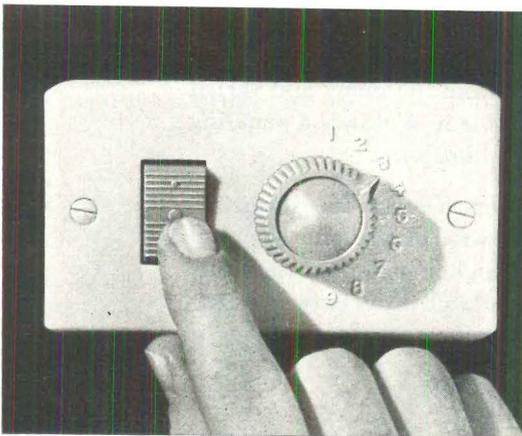
In many larger buildings, power at 480 volts, 3-phase, is already used to operate heating and air conditioning systems and other heavy-duty electrical equipment. In a "Y" connected system, the phase to neutral voltage is 277 volts which can be used efficiently with standard fluorescent lighting fixtures. Original installation costs for a 480Y/277-volt lighting system can be as much as 40% less than a comparable 120-volt system—copper needs can be cut up to 50%.

G-E Remote Control for Switching

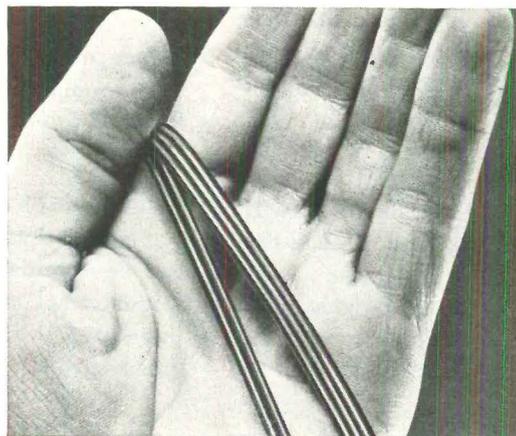
The G-E remote-control, low-voltage wiring system eliminates the higher voltage at the wall switch. The remote-control switch requires only 24 volts. The switch actuates a relay which can be installed in any convenient location. The relay does the actual ON-OFF switching of the higher voltage.

Investigate 480Y/277-volt distribution

Higher-voltage fluorescent lighting can mean big savings for many of your clients. For a copy of General Electric's Remote-Control Manual, write Section D56-124, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.



An Extra Feature of G-E remote-control wiring is that you can have master selector switches to control *nine* circuits from one switch.



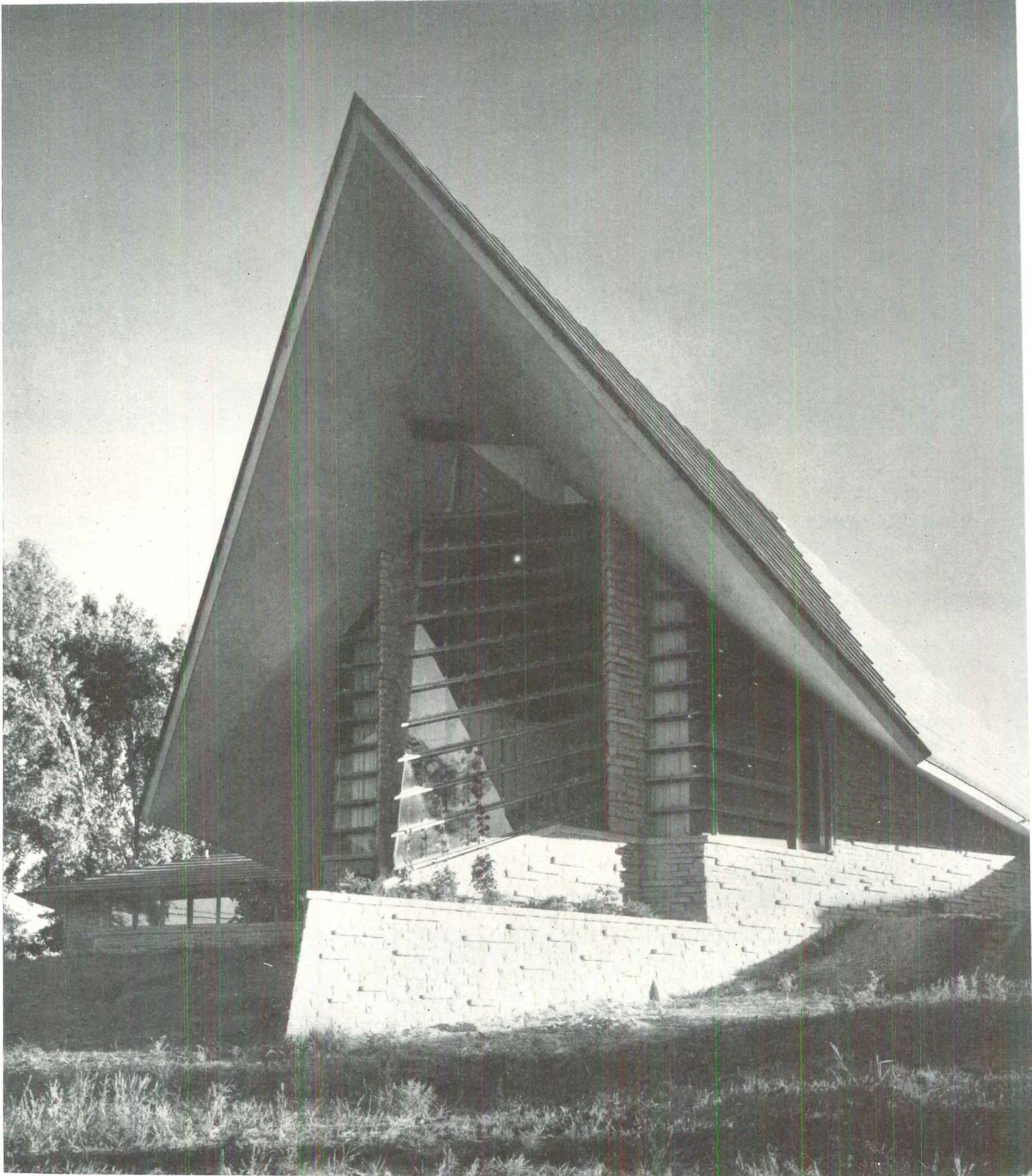
Small, Lightweight Control Wire connects switches to relays. The small wire saves copper—and switches are less costly to move.



Remote-Control Relay operates on 24 volts—does the actual switching of the higher voltage. Rated 10 amps at 277 volts. U. L. approved.

You can put your confidence in—

GENERAL  ELECTRIC



Photos: © Ezra Stoller

A CHURCH DESIGNED AND BUILT IN THE ATTITUDE OF PRAYER...

A FORM THAT SERVES AS CHAPEL, SPIRE AND PARISH HALL IN ONE...

MEETING HOUSE OF THE FIRST UNITARIAN SOCIETY OF MADISON, WISCONSIN BY

FRANK LLOYD WRIGHT

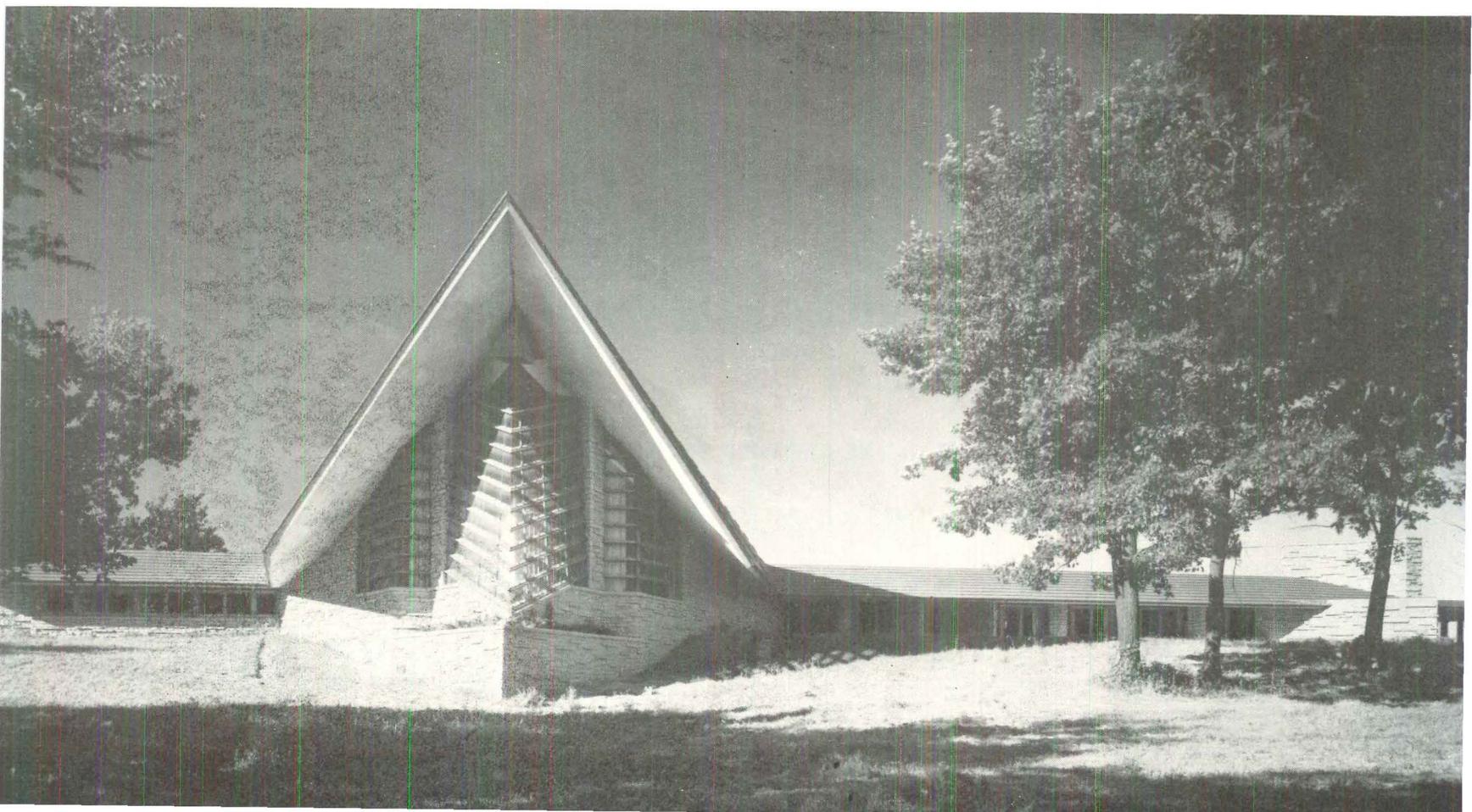


FRANK LLOYD WRIGHT, architect: "As the square has always signified integrity and the sphere universality, the triangle stands for aspiration. . . . Here is a church where the whole edifice is in the attitude of prayer. "Instead of excluding the outside prospect which is beautiful, we have allowed it to come in facing the audience to become part of the background for music and preacher."

MAX D. GAEBLER, minister: "Inside the church, as one faces the prow, the powerful focus upon the pulpit and the strong vertical thrust of the prow create a feeling of unity and elevation which surpasses description. Yet when one faces the hearth room, there is by contrast a warm and intimate feeling which suggests the flux of daily life. "The utter simplicity of the assembly room is friendly, not austere. The large,

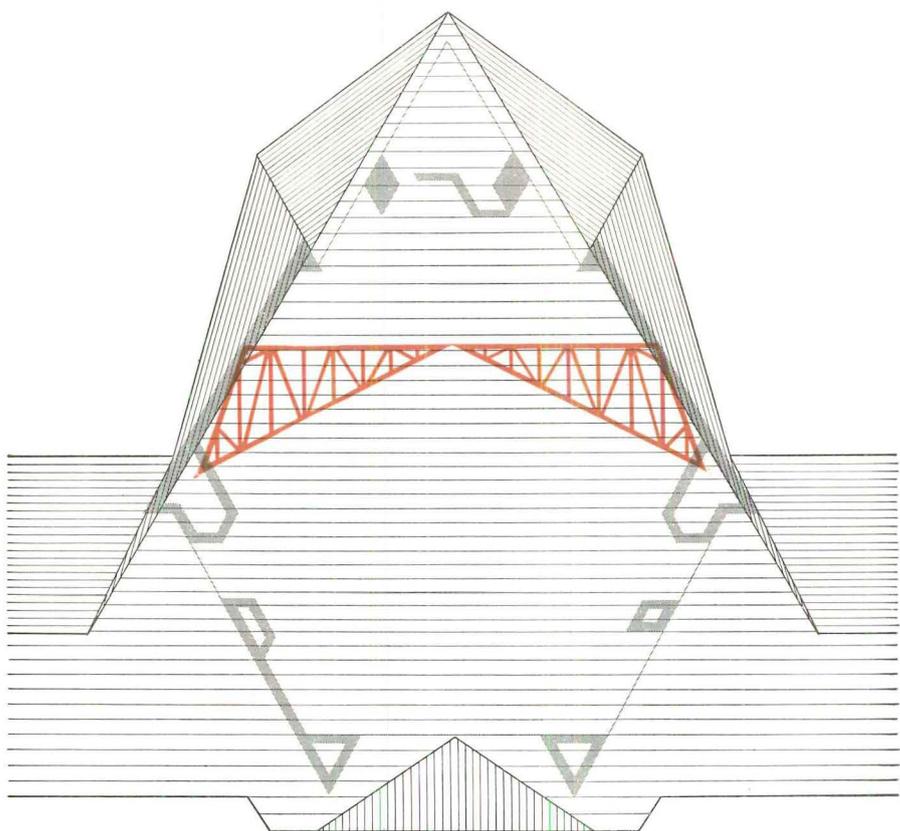
clear glass areas, the warm colors, the closeness of the congregation to the pulpit — all this helps to create an atmosphere of directness and honesty, with no barriers of false formalism interposed between minister and congregation. It would be difficult to speak or think anything but the truth in such a setting. Mr. Wright has caught the spirit of liberal religion and has given it architectural embodiment."

THIS IS THE PROW: OUTSIDE, IT IS A 40 FOOT SPIRE; INSIDE, IT FORMS THE BACKDROP FOR PREACHER AND MUSIC

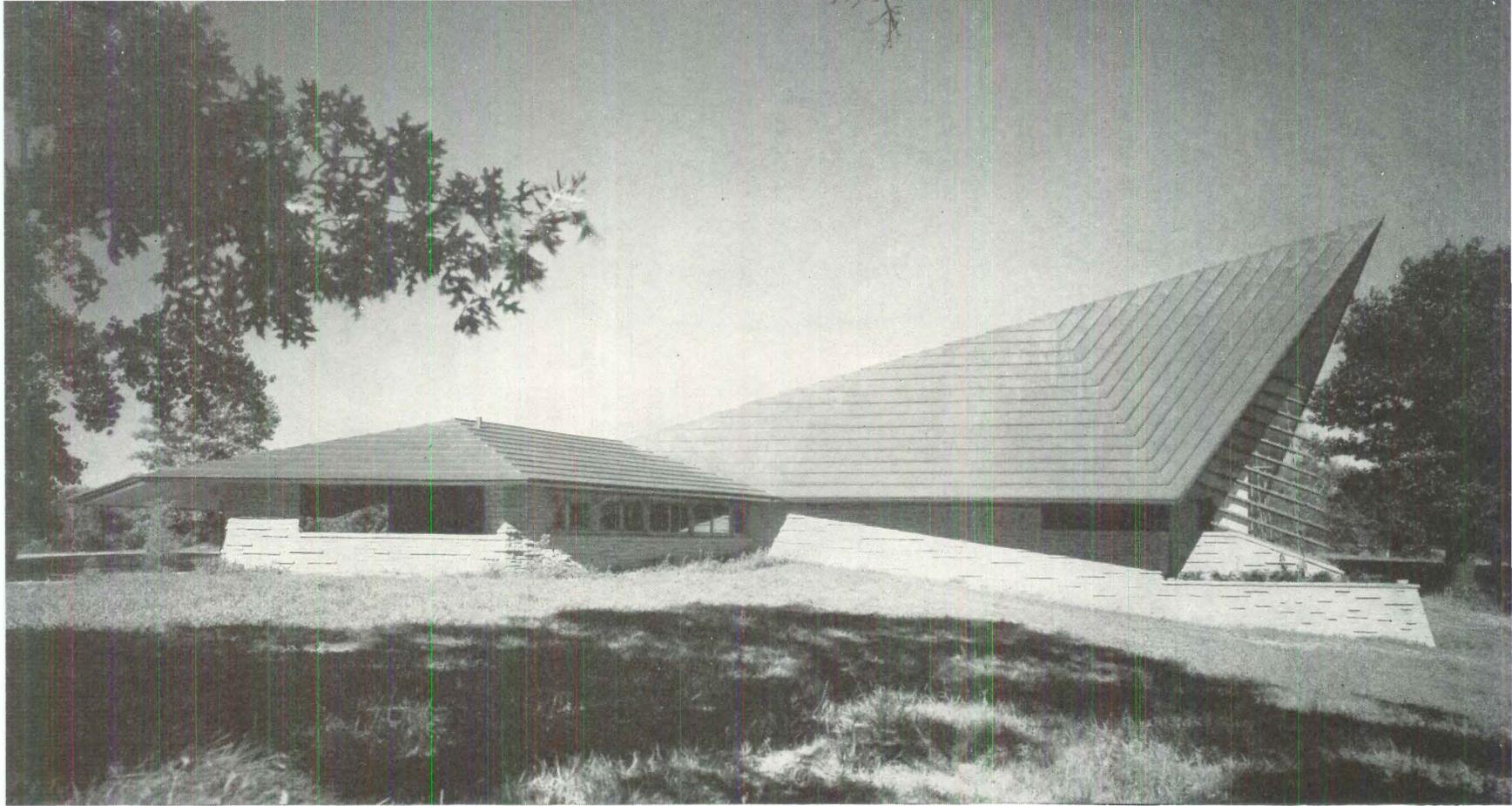




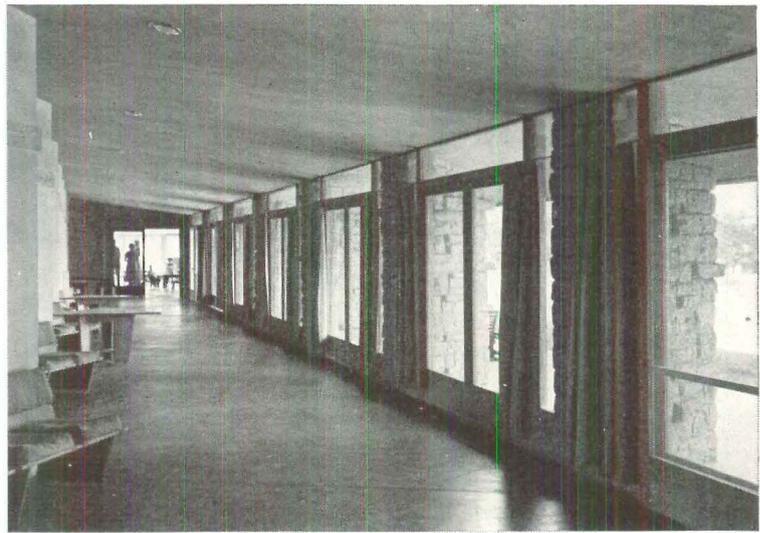
PEWS ARE GATHERED CLOSE TO THE STONE PULPIT, ALMOST SURROUND IT. CHOIR LOFT AND SOUNDING CANOPY RISE ABOVE



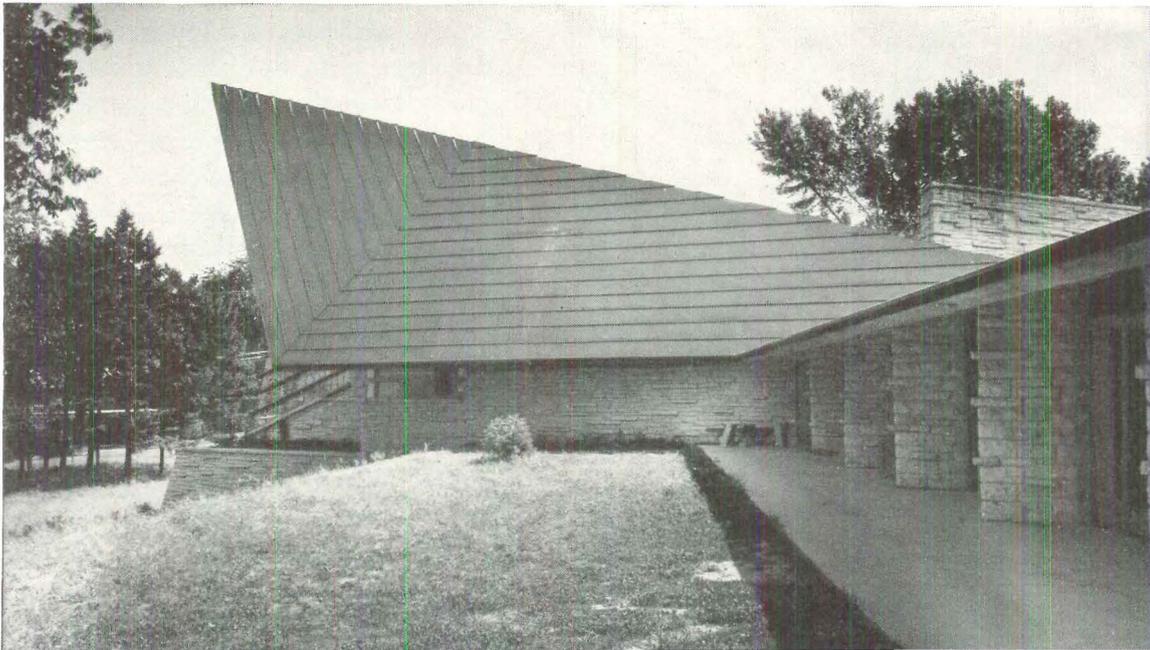
Wright's "triangle," the thrusting roof, is an astonishing structure. Exterior appearance of a center ridge is illusory; actually two ridges converge at the prow (see diagram). The roof is supported by a series of trusses built entirely of nailed 2 x 4's and 2 x 6's, "a sort of hammer-and-saw artist's field day," according to Taliesin people. Each pair of trusses acts like a center-hinged arch. Top chords, progressively shortening from base to prow, are in the same plane. Lower chords are in a warped plane nearly horizontal at the base and nearly vertical at the prow. This creates an interesting warped ceiling shape. At the prow the three leading trusses rest on a steel beam cantilevered forward from sidewalls and rostrum piers. These trusses in turn extend outward to form an overhang at the sides.



ROOFING IS GREEN COPPER LAID IN STRIPS TO EMPHASIZE SHELTERING LINES



ABOVE, INTERIOR OF LOGGIA; BELOW, VIEW LOOKING EAST ALONG LOGGIA WING



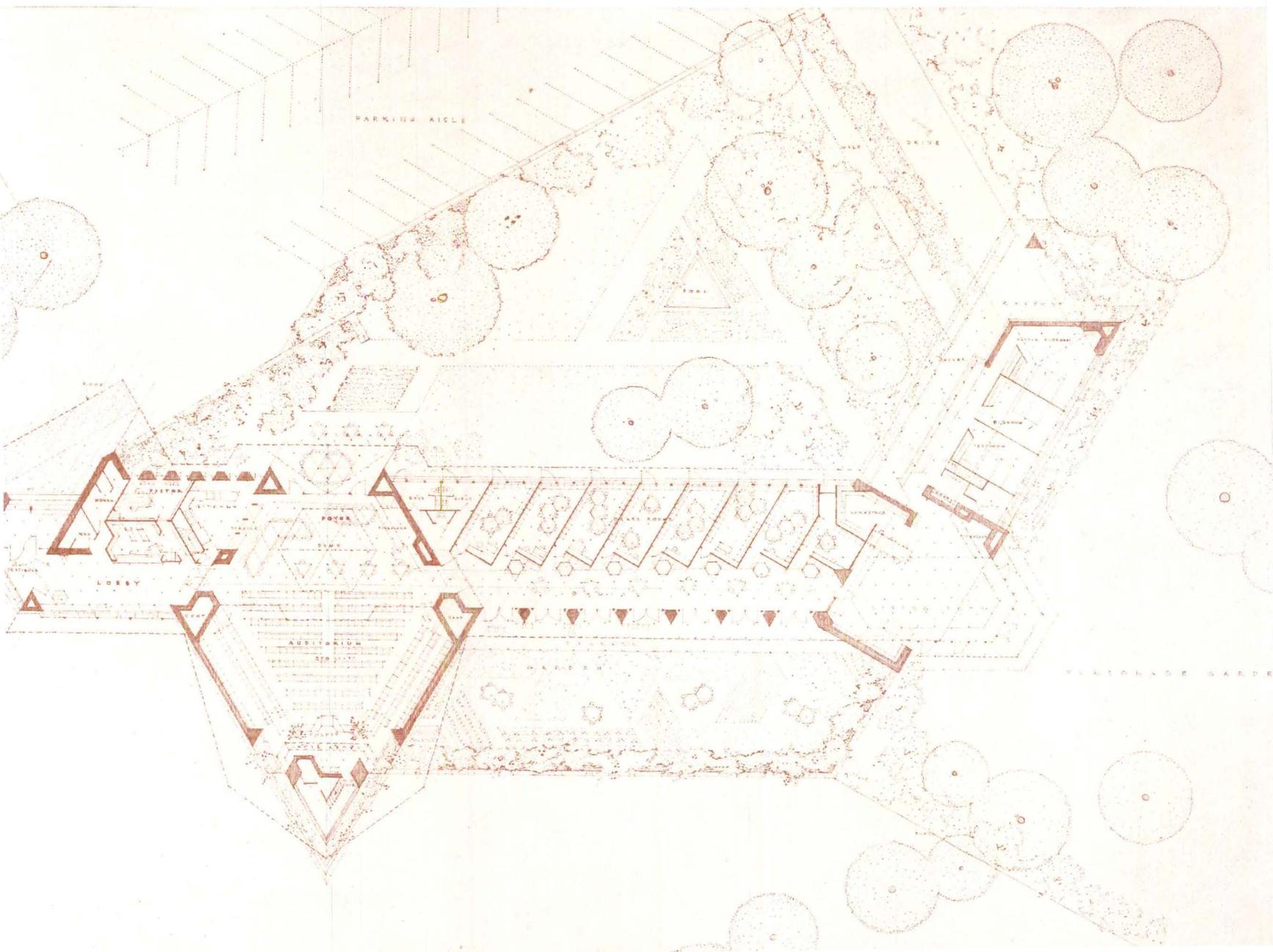
Design of this church began with an abstraction, "unity," which Wright chose as the appropriate theme for a Unitarian building. Translated into tangible terms, the result is an extraordinarily happy combination of function and symbolism.

Wright has taken three customarily separate parts of a church and gathered them into one unit which serves as spire, chapel and parish hall in one. Here is how this dramatically roofed assembly hall works: For worship, movable pews are faced toward the prow; for concerts, movies, plays and lectures, the light plywood pews are turned toward the informal hearth room; for dinners, socials and dances, pews are folded and shifted aside or arranged "living-room style." For small gatherings, the hearth and pulpit ends of the

room are divided by a great red, purple and copper green drapery. (This curtain is a story in itself. It was woven by women of the parish from flax, rayon, banana rope, metal ribbon and sisal after a sample worked out by Mrs. Wright. Object: an atmosphere of "well-mannered gaiety.")

Unity of the interior as a whole is made implicit by the consistent use of 60° and 120° angles for all walls and by repeating these angles in the floor scoring and even in the furniture; it is made explicit by the dramatic 270' interior vista from the lobby along the east-west axis. Glass doors between the assembly hall and wings are only the slightest of interruptions to the flow of space. And of course unity of building and land is handled with the Wrightian master touch.

Success of the building goes a great deal deeper than neat translation of a verbal concept into stone and wood. Minister and congregation are unreservedly enthusiastic about how it functions. Says one parishioner: "This building is not just a place in which we meet. It is a creative participant in all that this Society does and is." Another reports, "Undoubtedly the auditorium [chapel] and hearth room are our favorites. The auditorium with its glimpse through the windows of the trees and sky makes the Sunday-morning service a double pleasure. The hearth room is especially delightful for the coffee hour after services and for evening gatherings. The large entrance foyer which gives people plenty of space to stand around before and after services is also much appreciated."





VIEW TO SOUTHWEST IN HEARTH ROOM, CENTER OF PARISH SOCIAL LIFE

ASSEMBLY HALL ARRANGED FOR SERVICES; HEARTH ROOM IS AT REAR



The multipurpose auditorium-hearth room frees the rest of the building for specialized use. Cubicles off the loggia were planned for both Sunday-school classes and for nap rooms during week-day nursery school.

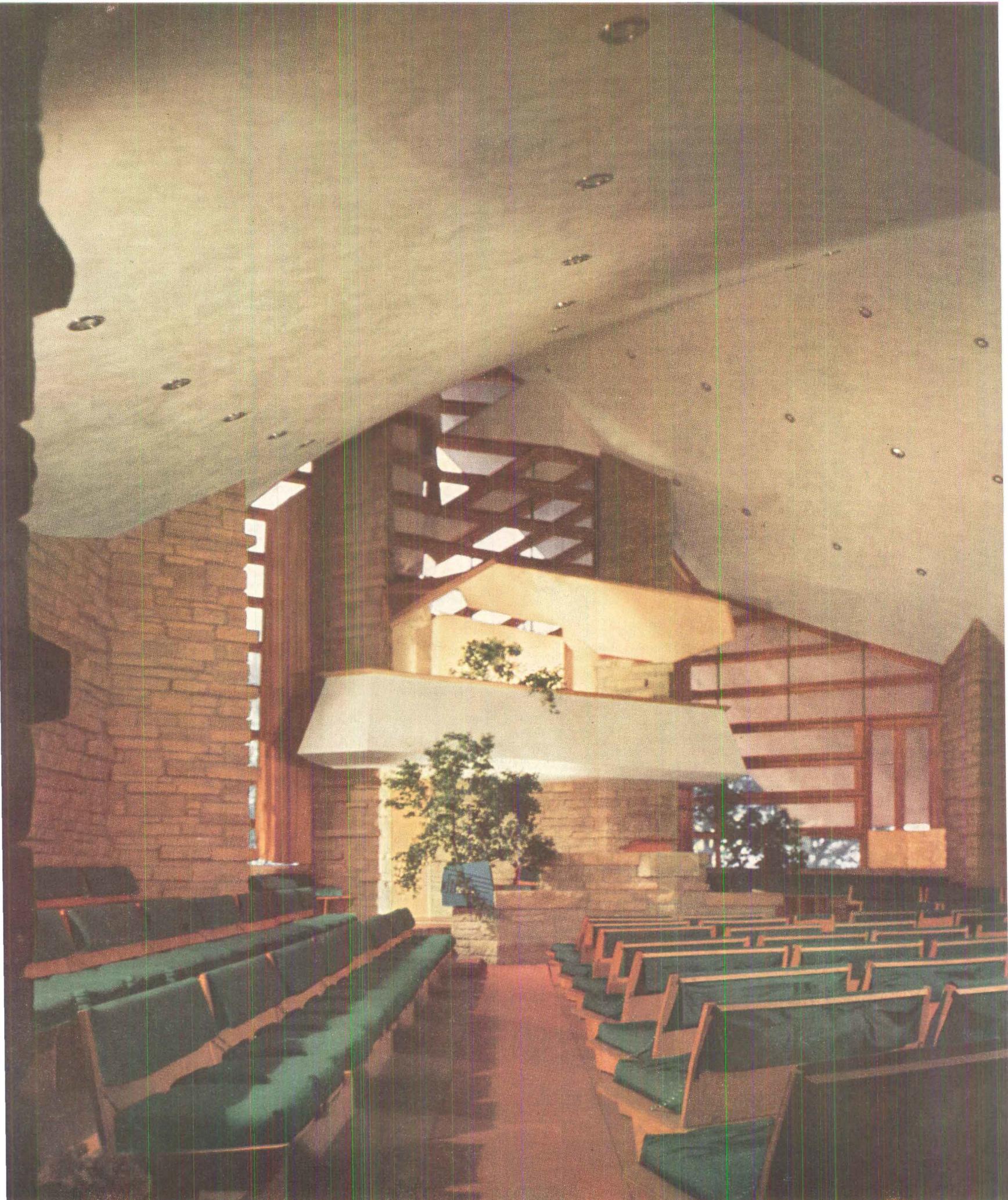
The west living room is ultimately intended for the minister and his family after the parsonage bedroom wing has been added. The congregation may be forced to reconsider this scheme, however. The only miscalculation in the program seems to have been that the popularity of the building and its activities was underestimated. The Sunday school, planned for an ultimate attendance of 100, already exceeds 150 and has overflowed into the living room.

An increase in the adult congregation from 125 to 200 active members within two years even calls into question the future adequacy of the assembly room. Let any who call Wright's work "too visionary" or "impractical" note that, just as his Florida Southern College campus has paid off in enrollment and endowments (AF Sept. '52), so has Wright's art in this church already paid off in strictly practical terms of membership and institutional vitality.

Originally the parish planned to build in the center of Madison. On Wright's advice, a 4-acre lot overlooking a lake and the University of Wisconsin farmlands was selected instead. "Here's a story in decentralization," says Wright. "By the time construction was finished the town had grown out to us."

Exclusive of land, the building and contents cost \$165,000 (\$660 per seat). Added to the cash outlay is an indeterminate value representing volunteer work. All the 1,000 tons of stone in the 16-19" thick masonry walls was loaded and hauled from a quarry 30 miles distant by members of the parish. Working at night, parish members plastered the wings, finished walls, woodwork and floors. Members of Wright's Taliesin group landscaped the site, plastered and inscribed the assembly room, made furniture, laid the stone slabs of the pulpit. Incidentally, Wright's father was one of the organizers of the parish in 1879 and Wright has himself been enrolled as a member for many years.

DENSITY AND TRANSPARENCY: AT THE PROW ONE BECOMES MOST AWARE OF MASSIVE MASONRY STRATIFIED AS IN NATURE





A LAST, CLOSE LOOK AT THE PROW. GLASS ENCLOSING THE APEX IS HELD BETWEEN 2" x 12" LOUVERS AND IS PLACED AT 25% SLANT TO SHUT OUT GLARE



ANARCHY IN OUR CHURCHES

"In our generation the church is contributing little if anything to architectural progress, and contemporary architecture is contributing very little to the church. Seldom, if ever before, has this been true. . . ."

"In quantity and dollar expenditure, ours is probably a great church-building age. But very little of that money is being spent to utilize the new tools and techniques unknown to our forefathers which might make possible a contemporary architecture more moving and more spiritually satisfying than that of any age. . . . The overwhelming number of inferior contemporary churches proves how involved the problems are. . . ."

"Can today's church contribute importantly to today's architecture, as did the church in ages past? Has contemporary architecture lost the power to create churches that will satisfy the spirit as well as the mind? . . ."

In the three years since FORUM posed those questions (AF, Dec. '49), the most nearly typical US church has been a cheaper imitation of an earlier perfection, in a vain attempt to keep pace with building costs rising faster than church budgets.

Among those who have aimed higher, Frank Lloyd Wright has completed the masterpiece shown on the preceding pages. Pietro Belluschi has given Portland two more charming examples of his taste and inventiveness (AF, Jan. & Dec. '51). Bruce Goff has proposed his crystal tent (AF, Jul. '50). The Mies van der Rohe chapel for Illinois Tech. (AF, Nov. '52) has been translated into brick and glass in all its precision and perfection. Barry Byrne, in his fish-shaped churches at St. Paul and Kansas City, found a fresh symbolic interpretation for Catholic ritual in today's materials (*Architectural Record*, Feb. '51).

The elder Saarinen lived to see his ecclesiastical masterpiece, that fine combination of up-to-the-minute technology and timeless spirituality for Christ Church in Minneapolis (AF, Jul. '50). And the younger Saarinen has designed a chapel of extraordinary originality and power for MIT, which will be previewed in FORUM next month.

But each of these lovely churches stands apart and alone. They still set no pattern for a coherent religious architecture to reflect our times as the Gothic reflected the 13th Century or the Wren churches reflected the 18th. They still provide no fresh, firm authority for the guidance of lesser architects—no

authority as gave excellence even to architectless parish churches in earlier times.

Frank Lloyd Wright is always inimitable. The Belluschi churches seem as different one from the other as from the work of other architects. Few will follow Bruce Goff in his fanciful flights, and the very perfection of the Mies chapel marks an end as well as a beginning. Only the Saarinen churches seem likely to develop a prototype even for the Saarinens themselves.

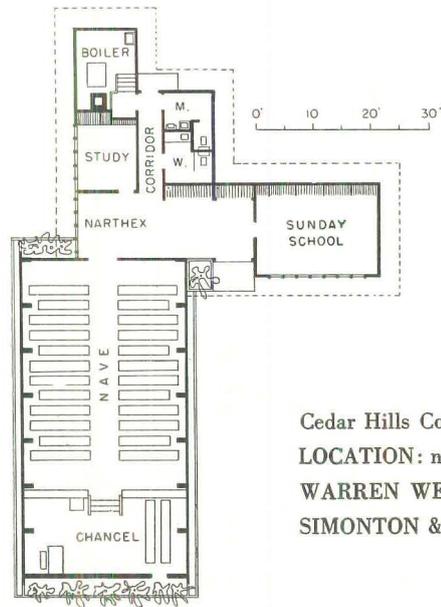
No more do the fine churches presented on the next 18 pp. show any clear line of development for religious architecture. They shed more light on the problems of church architecture today than on their solution.

For example, the rejection of Ernest Born's fine design for a seminary chapel (p. 102) dramatizes the problem even the best church architects face in the atavistic attitude of many ecclesiastical clients today. The inexpensive Schweikher & Elting chapel (p. 99) questions whether a church should be designed primarily for worship on the sabbath or for its community-center activities the other six days of the week. The Unitarian church in Minneapolis (p. 106) suggests a completely "secular" approach; the Alden Dow church (p. 95) takes as strong a stand for mystical values. The church in St. Louis (p. 108) emphasizes the importance of other arts—in this case stained glass. And the two little chapels (pp. 94 & 98) remind us that some of the nicest church design today is in small parishes.



Photos: Dearborn-Messer

*This church is all roof, needs no steeple, seats 120 people
Chancel is lighted from sloped windows between exposed laminated fir beams*



Cedar Hills Congregational Church
LOCATION: near Portland, Ore.
WARREN WEBER, architect
SIMONTON & STEELE, contractor

DOUBLE-DUTY ROOF

**eliminates walls,
converts nave into a steeple**

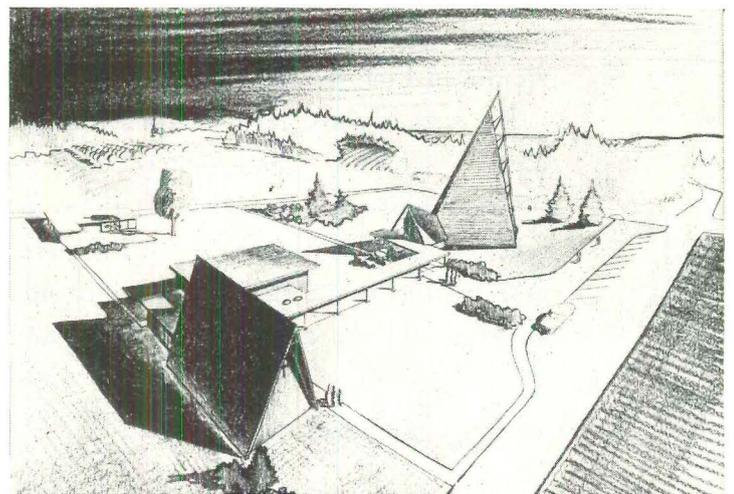
In this chapel the walls are also the roof, the roof is also the walls and the nave is also the steeple. Result: a lot of tall church for very little money. But, for all its novelty and economy, the interior effect is quite traditional.

Whatever suggested the solution to Architect Weber, two things were uppermost in his mind as he looked for an answer: 1) the low-lying site in a new suburban development on which his church must not be visually lost, and 2) the knowledge that a costly, useless tower to give it dominance would cut into the budget and probably have to be abandoned later.

Within the 40' high form, Weber used several devices to further its striking singularity. All wood was given either a natural finish or no finish at all. Rough-sawn redwood siding on end walls inside and out and on the flat-roofed Sunday-school wing was placed vertically.

Laminated fir beams (8' o.c.) supporting the building were left exposed inside. The exposed 2"x 6" T & G hemlock roof decking was kerfed 1 1/4" o.c. to hide joints, act acoustically and present a homogenous textured surface to show off the beams. Beams of the end bay adjoining the narthex are joined by a system of crisscrossed rods for wind bracing. Sloped skylights flank the chancel, have obscure wire glass lights divided by mullions of 2" x 10"'s that act as louvers. Cost: \$46,000, about 90 cents per cu. ft.

Eventual development: present church (foreground) is to be future chapel with dining room and kitchen attached; covered walk will lead to new church.





Bill Hedrich, Hedrich-Blessing

Sky-lighted chancel is focus of 1,200-seat church

WARM MATERIALS AND DETAILING

breathe emotional atmosphere into a simple church form

First Methodist Church
LOCATION: Midland, Mich.
ALDEN B. DOW, architect

Within the large simple form of this church Architect Dow has used a wealth of rich, warm detail. Its net effect is to suggest that, within the framework of simple truths, religion is an emotional experience.

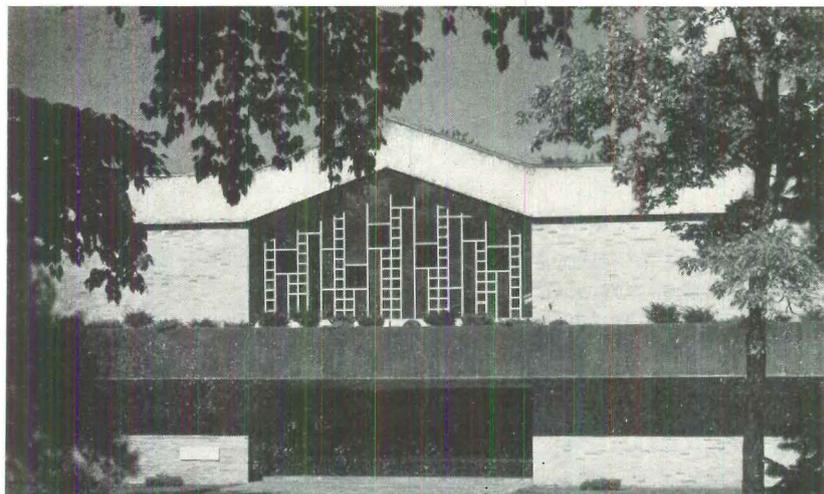
Extensive use of brick on columns flanking the nave and chancel sets the warm natural tone of the room. Cork floors, the rich wood of the pews and doors and the lush planting around the chancel all contribute to that warmth. To further enhance it, Dow has provided plenty of natural light through an irregular pattern of clear and colored glass in the generous windows flanking the nave. (In time Dow hopes church members will replace the plain-colored glass with stained-glass panels.)



Fluorescent lights behind translucent screen in roof extend skylight effect through church. Brick columns, woodwork and cork floor give warmth to building.

Photos: (above & bottom of opp. p.) Bradford-LaRiviere, Inc.; (others) Hedrich-Blessing

Irregular pattern in window over narthex adds interest to simple building lines.



Dow believes the chancel should be the brightest spot in the church so he placed a skylight over it. Even at night it remains the focal point of the room for it is then lighted by incandescent lights and reflectors near the roof. Effect of the skylight, says Dow, "is to make the sky the steeple." Echoing the skylight design are panels of translucent plastic that run the full length of the nave. Although it is not a skylight, fluorescent lights as well as air-conditioning outlets are housed behind it.

To add interest to the service, Dow made the choir loft accessible by stairs from balcony aisles. During the processional, the choir uses not only the center aisle but the balcony aisles as well, animating the entire room. Another unique treatment: the choir is placed behind the altar table and a planting box so it is not visible when seated. But when the choir rises to sing it becomes a living part of the altar.

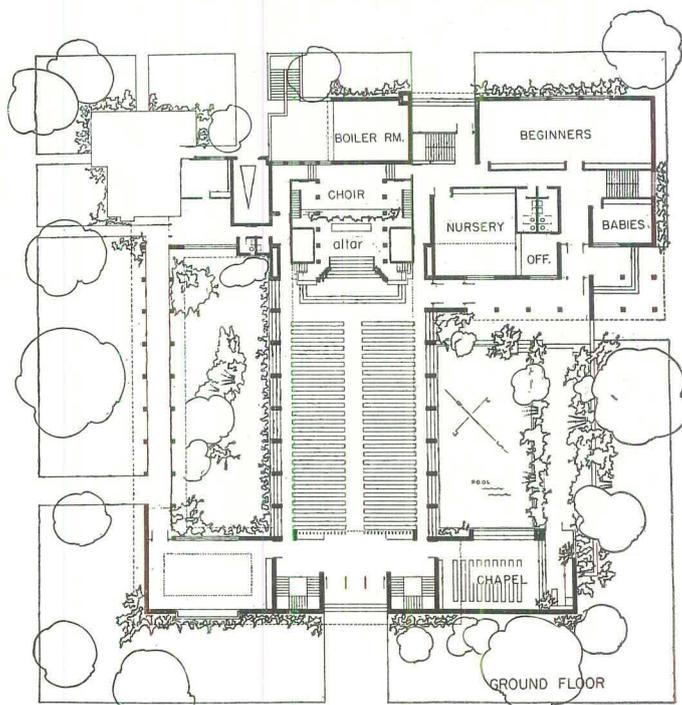
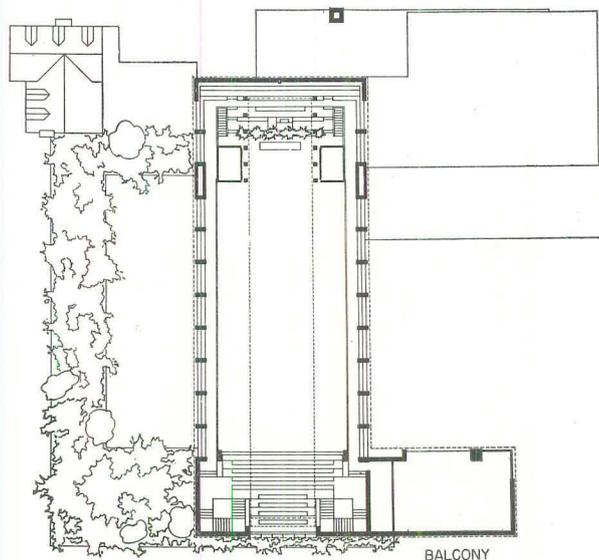
The church plant occupies an entire block, was designed to serve 1,400 people. Nave and balcony seat 1,200 but the church appears comfortably full when 500 people are seated in the nave.

Full basement beneath the church is used for Sunday school, banquet hall and mechanical services. Nursery and beginner departments are on the ground level so children kept in the nursery can be reached easily at the end of the church service.

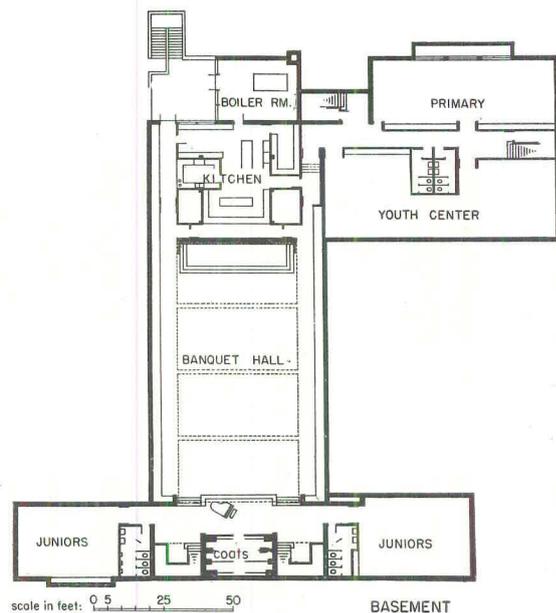
Exclusive of landscaping, cost was \$455,000, or 63¢ a cu. ft.



At night, the chancel's skylight effect is maintained with system of reflectors and incandescent lamps.



Choir loft is behind altar-table planting box. When seated the choir cannot be seen; on rising it becomes part of altar.



Warren Memorial Chapel
 LOCATION: Monteagle, Tenn.
 EDWIN A. KEEBLE, architect
 N. D. INGLE, contractor

SUMMER CHAPEL

**of rustic design costs little,
 serves all sects well**

This nonsectarian chapel has the appeal of genuine rusticity in keeping with its location among the hills of Tennessee.

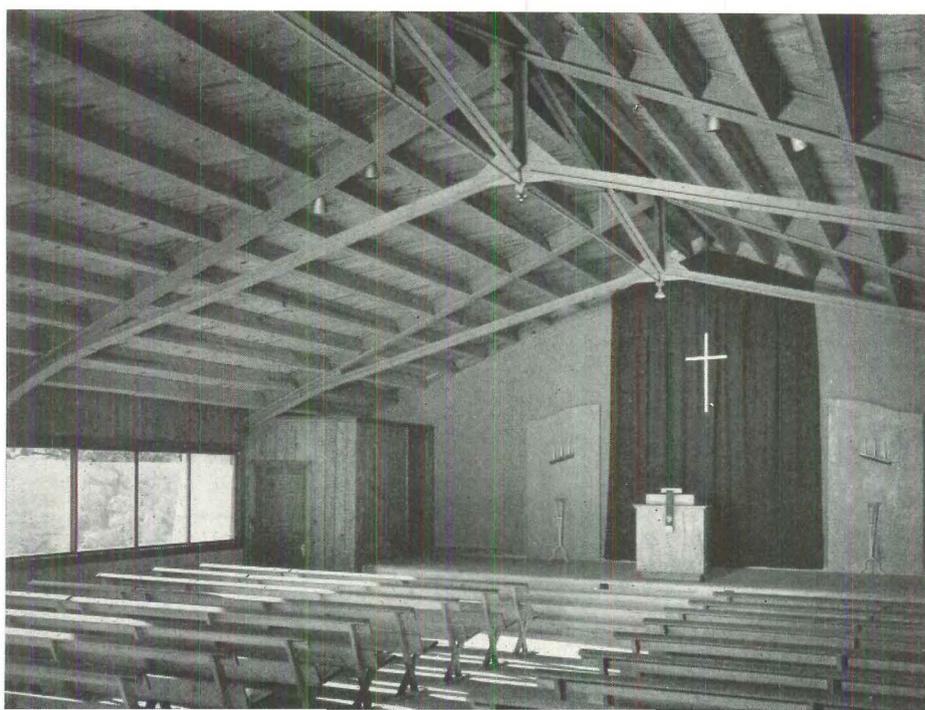
Its gently pitched roof reflects the slope of these surrounding hills. Its deep eaves protect the open windows from summer showers just as the extended roof protects the porch. Its concrete block buttresses are as directly descended from England (by way of early southern Angelican churches) as are many Tennesseans of undiluted Anglo-Saxon stock. Its louvered front door—a cliché elsewhere—is natural here in the southern climate where it evolved.

To keep costs down, side walls were kept low and simple steel scissor trusses support exposed wood perlins and the broad roof. Trusses and the rear wall are painted blue, woodwork left natural. Simple candelabra and a rich red curtain behind the pulpit complete the decoration.

Designed to serve a 200-home summer colony, the chapel had to be nonsectarian in character while suggesting worship, and had to cost less than \$20,000. It does both: All elements of the community like the chapel—and its cost, which was \$17,000 or about 38¢ per cu. ft.

Traditional louvered doors of South set the tone of this 300-seat chapel

Blue painted steel scissor trusses span 42'-wide room. End wall of block is also blue with all wood finished naturally. Windows have horizontal sliding sash.



Photos: Rodney McCray Morgan—Photolog

Small cupola serves as steeple, contains a set of chimes



MULTI-USE SPACE

created with flexible partitions
in an open single-level plan

Should the architecture of a church be suited primarily to its use as a house of worship on Sunday morning? Can the average congregation afford to spend most of its building fund for space used only 1 hr. a week?

Here is a small church which suggests that the auditorium must be designed for flexibility and multi-use with primary emphasis on the community-center functions which may keep it busy all through the week. Located in a small town of 300 (and serving an additional 1,000 rural neighbors), this community church cost only \$67,000—a sum for which Architects Schweikher & Elting gave their clients these facilities:

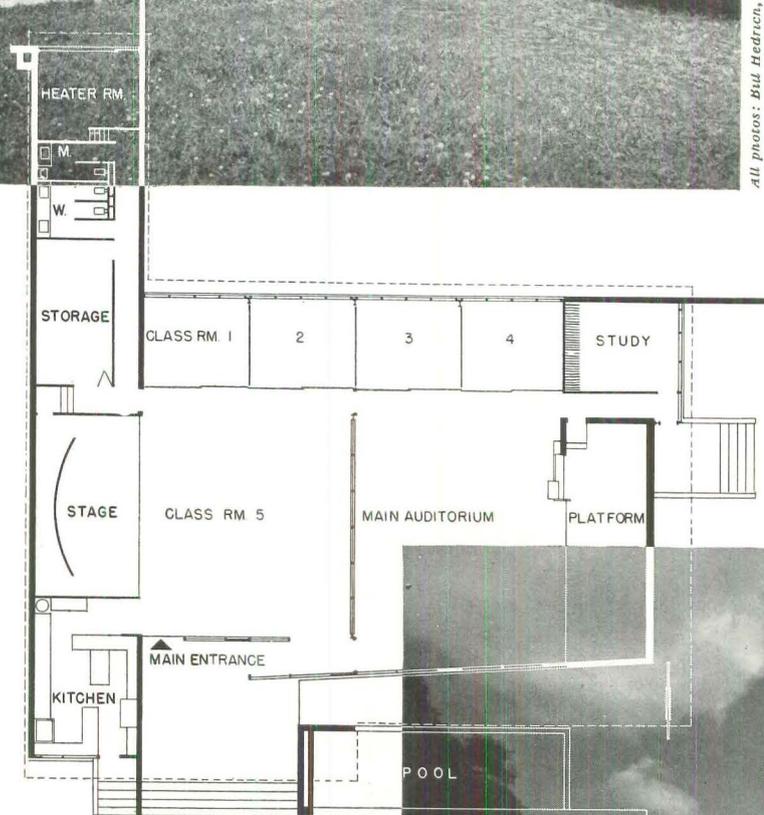
- ▶ a church assembly room for 140 worshippers;
- ▶ a secondary auditorium with stage that will seat an overflow of 50 at special services, can take 90 when used separately as a social hall or as a Sunday school and can take 200 when assembly room and auditorium are used together as one social hall (sliding screens separate the two spaces);
- ▶ a 350 sq. ft. kitchen that serves the social hall;
- ▶ four distinct classrooms which, however, can be thrown together and/or opened up to the main assembly room through sliding walls to provide space for an additional overflow of 70;
- ▶ plus all the storage office and service space required in a small community building.

Clue to this generous solution within so tight a budget can be found in one word: flexibility. The architects saw at once that *multi-use* of space was the only way they could hope to accomplish all the things the congregation needed. This, in turn, made them reject the conventional two-level solution (in which spaces are almost impossible to merge) and produced an open, one-story plan surrounded by concrete block and glass, and covered by a steel-supported, 3"-thick mill roof. Under that roof, partitions slide or swing up to make 100% of the building useful 100% of the time.

Bell tower screens entrance to 140-260 seat church, is reflected in shallow pool. South facade (below) is 14'-high glass wall shaded by deep overhang. North exposure was impossible for site reasons. Bell for tower was made by Petit & Fritsen, in Holland.



All photos: Bill Hedrich, Hedrich-Blessing



First Methodist Church
LOCATION: Plainfield, Iowa
SCHWEIKHER & ELTING, architects
R. A. STOLTZ CONSTRUCTION CO.
general contractor

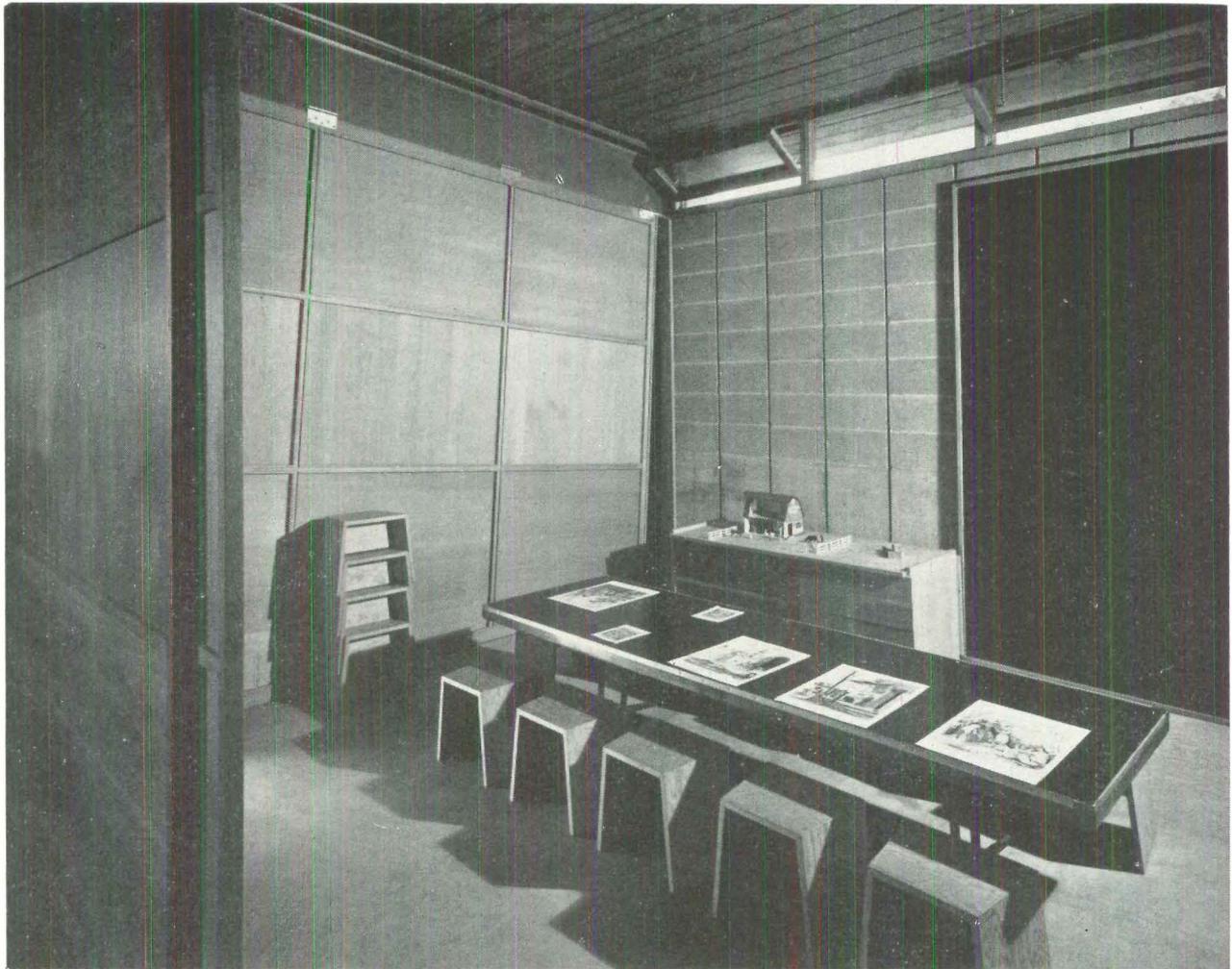




*Stone altar, pulpit and cross.
Roof on steel girders
rises from low 7'-6" height on north
to full 14' at the south.*

THE ART which Schweikher & Elting put into their design is as important as the space they got out of it. This church derives its dignity from careful and precise understatement: Nothing could be simpler than the bell-tower construction with reflecting pool outside—and nothing could be more dignified; nothing could be cleaner than the stone altar and the plain cross—and nothing more serene.

In the work of Schweikher & Elting, this church represents a turning point. For many years their designs, conceived in the "prairie region" outside Chicago, continued the Chicago tradition of the first decade of this century. Recently, however, their work has been marked by an increasing simplicity: the simplicity of the rectangular steel frame, the simplicity both of Chicago's first steel-frame buildings around 1880 and of the new developments initiated by Mies van der Rohe. This is a very conscious change in direction; and future issues of FORUM will further document this change in Schweikher & Elting's work.

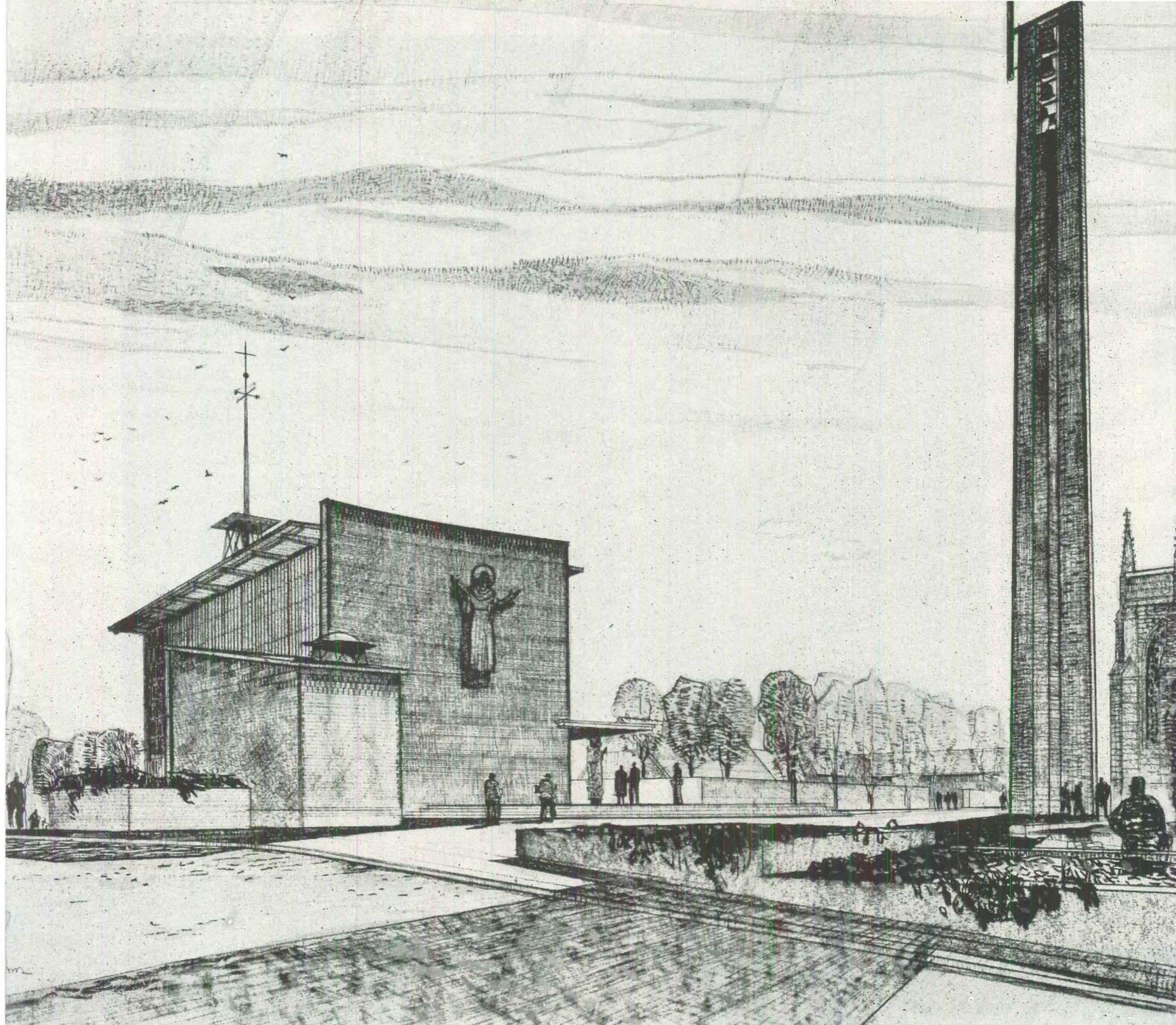


View of typical classroom used as nursery school. Partitions between classrooms (left) can be swung up like garage doors.

Glass wall of assembly room faces sunken gravel and flower garden. Pool and bell tower are beyond.



Classrooms are along north side of assembly room, can be used for overflow seating when sliding walls are drawn back.



View from the east shows 400-seat chapel at left, proposed campanile and existing neo-Gothic library at right. Site is in Berkeley, Calif.

CAMPUS CHAPEL: It is traditional to be modern—but it is not modern to ignore tradition

This fascinating church design of unexpected freshness will not soon be translated into brick and steel and glass—not because it seemed too expensive to build, not because it would not function properly, but because the architect, San Francisco's famed Ernest Born, ran smack up against the belief that only a neo-Gothic church could fit the neo-Gothic campus of the Pacific School of Religion.

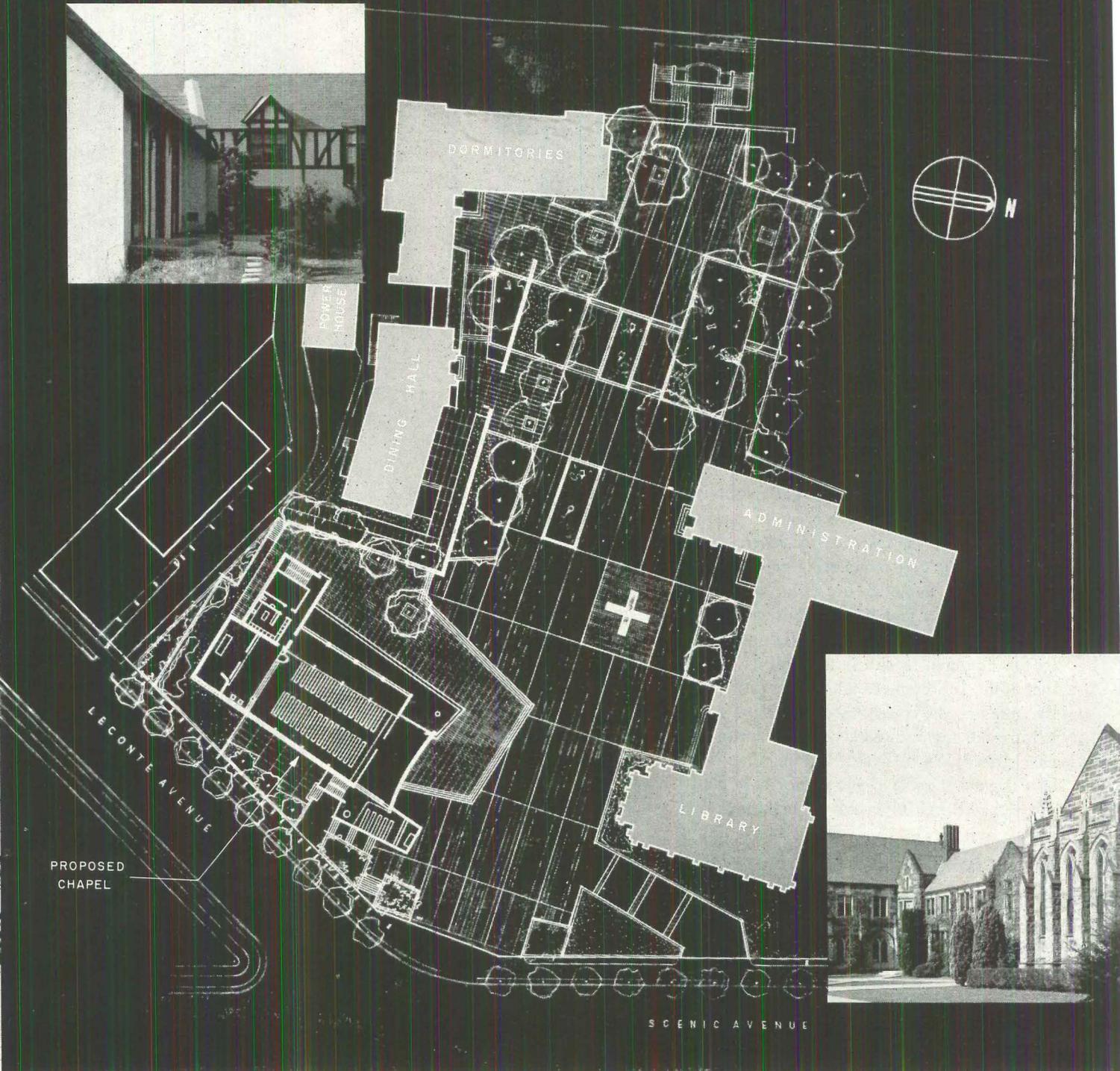
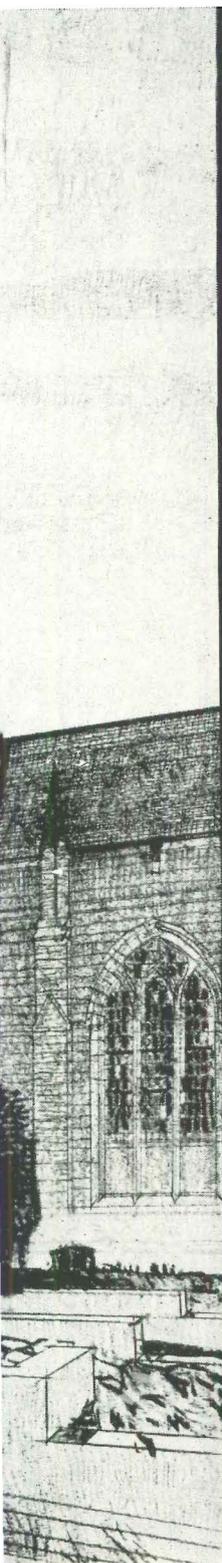
Because this is such a dramatic example of what many a good architect may face when he proposes anything but a conventional church scheme, and because few architects have ever made a more convincing case for putting a modern building into an eclectic setting, the thinking that went into Ernest Born's chapel is well worth studying with care, regardless of whether or not the chapel itself is ever built.

Most modern architects, faced with the problem of building a new structure in a traditional setting, are likely to dismiss the old quickly with the words of Britain's Edward Maufe, who said, "it is traditional to be modern."

After which, they would simply go ahead and do as good a contemporary building as they could.

Now it is true that in the past people always built in the style of their time. But Maufe's bright remark does not face the issue altogether—for while it is traditional to be modern, it is not modern (or polite) to ignore tradition. At least, that is the way it seemed to Architect Ernest Born.

Born is the sort of artist who cannot help knocking himself out every time he starts work on a problem: when the Pacific School of



Photos: Rondal Partridge

Master plan as prepared by Born. Picture inserts show existing campus architecture, which vary greatly in "style." Why Born's proposed chapel should be more "out of character" was not explained by trustees.

Religion asked him to make a *study* for a chapel, Born went far beyond. Before he even began on the chapel, he studied the neighborhood of the Berkeley campus as well as the site itself; he prepared a master plan for the school (it had never been done before); he went to extraordinary lengths to find a solution that would give the campus a harmony and coherence it had never before had—without compromising his own architectural credo; and *only then* did he develop a complete building with space for future growth.

Born spent more than nine months on this job and after he had also spent many times his microscopic fee, he lost track of his costs. He presented a comprehensive and thoughtful proposal on subjects ranging from neighborhood, through site, to landscaping; from pertinent references to the spaces around *Santa Maria in Aracoeli* (Rome) to a discussion of the interior finishes (teak) on the copper-clad, vertical louvers, meant to keep the sun out of the nave.

Considering the extent of this comprehensive study, it is amazing

that the trustees needed less than an hour to throw the whole thing out the window. They saved time by not really studying Born's designs, and they saved additional time by not bothering to ask him any questions about the job. They just decided that the chapel was "too modern." Says Born: "The design is as far as I could lead my client (the very cooperative President of the School) and as far as I could retreat from my own principles and ideals and still live with myself. Perhaps I couldn't back up far enough. . . ."

The site plan on this page shows Born's concept of a mall, big enough for large, formal outdoor gatherings, small enough for informal strolling about. Next, he faced the two major problems of this chapel:

How to achieve harmony between dissimilar buildings, and how to design a truly contemporary chapel within this harmonious setting.

How Ernest Born tackled the job is discussed on the next page.

First problem: harmony by contrast

Ernest Born had no intention of ignoring architectural tradition, however “mock-Gothic.” From the very start, he suggested to his clients that there should be a harmony in exterior finishes between his new chapel and the existing, generally neo-Gothic or nondescript structures on the campus. He went still further: to satisfy both himself and his clients, he made an analysis of the pros and cons of having a pitched roof similar to the 45° roofs on adjoining buildings. His conclusions: a 45° pitch would be much too expensive; an in-between pitch would make his chapel look “dinky” and unimpressive, would have no reference to anything existing on the campus, and would be indistinguishable from a flat roof.

Granting that a flat-roofed building would be in contrast with the rest of the campus, Born explained that a) the chapel had to be the most important structure of the group; that b) it was physically, economically and esthetically impossible to make it the most important by just making it the biggest; and that c) there was such a thing as “harmony by contrast.”

What does Born mean by “harmony by contrast?” Here are his own words: “Repeating roof lines is a geometric device which sometimes helps to achieve a pleasant relationship of building masses. . . . Harmony may be achieved by such an analogy of relations; *but it may also be achieved by contrast.* The harmony of contrast is the stronger one, stimulating and vital. The harmony of similar forms can be monotonous; only the harmony of contrast can stir the imagination and lift the spirit. . . .” It was obvious to Born that inasmuch as this was a religious seminary, the chapel should be the dominant architectural feature. It was also obvious to him that if he followed, roughly, the forms of the existing buildings, the only way he could make his chapel dominant would be to make it big—too big for the seminary’s purse and too big for the seminary’s needs. So he decided to do what Wallace Harrison did when he designed the UN General Assembly Hall (FORUM, Oct. ’52): he made the chapel important by making it different.

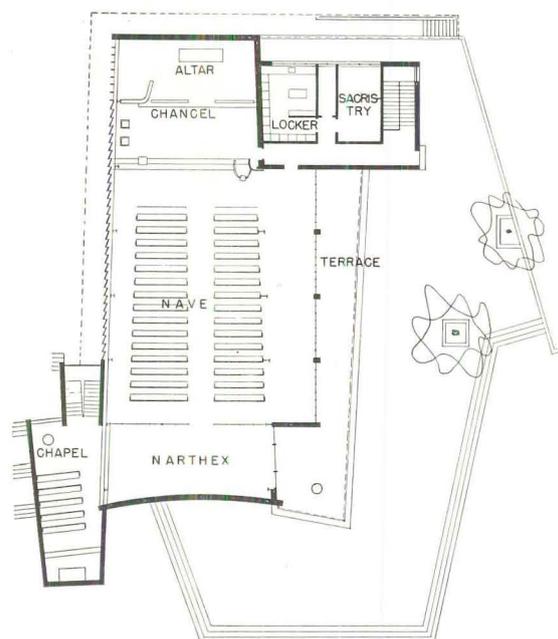
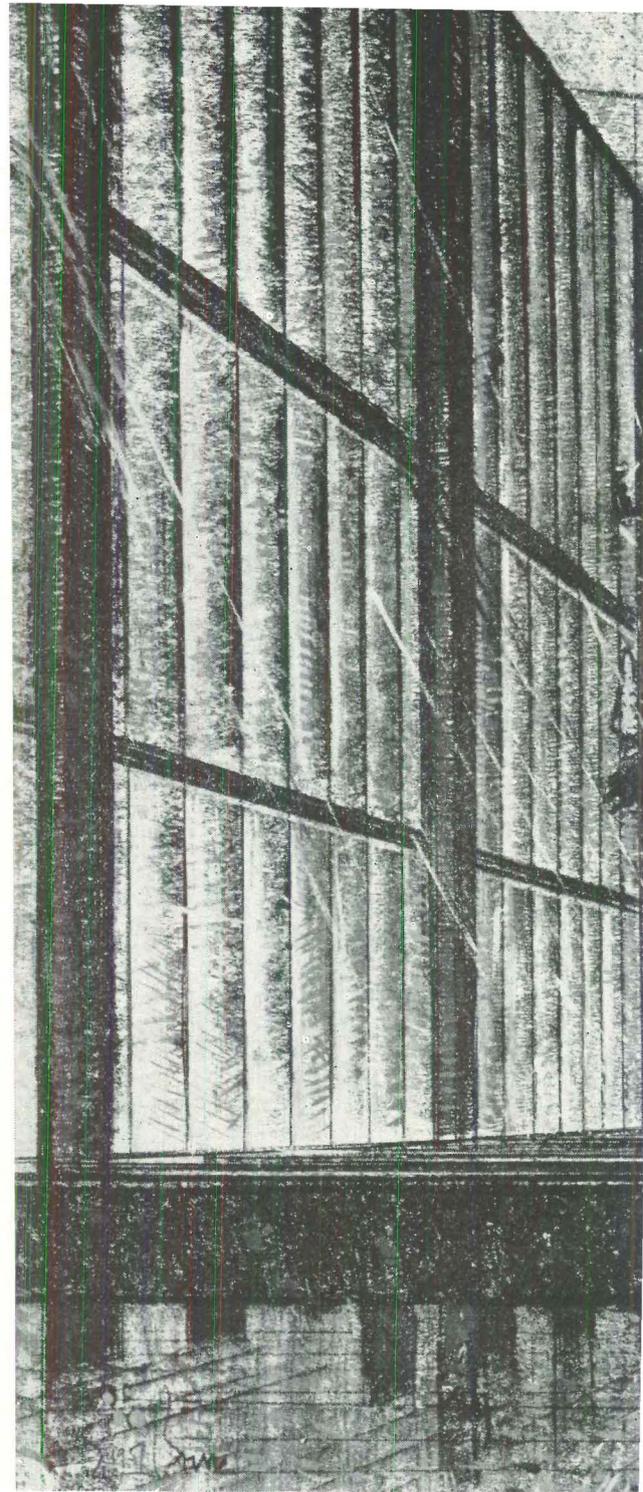
Second problem: architecture of Truth

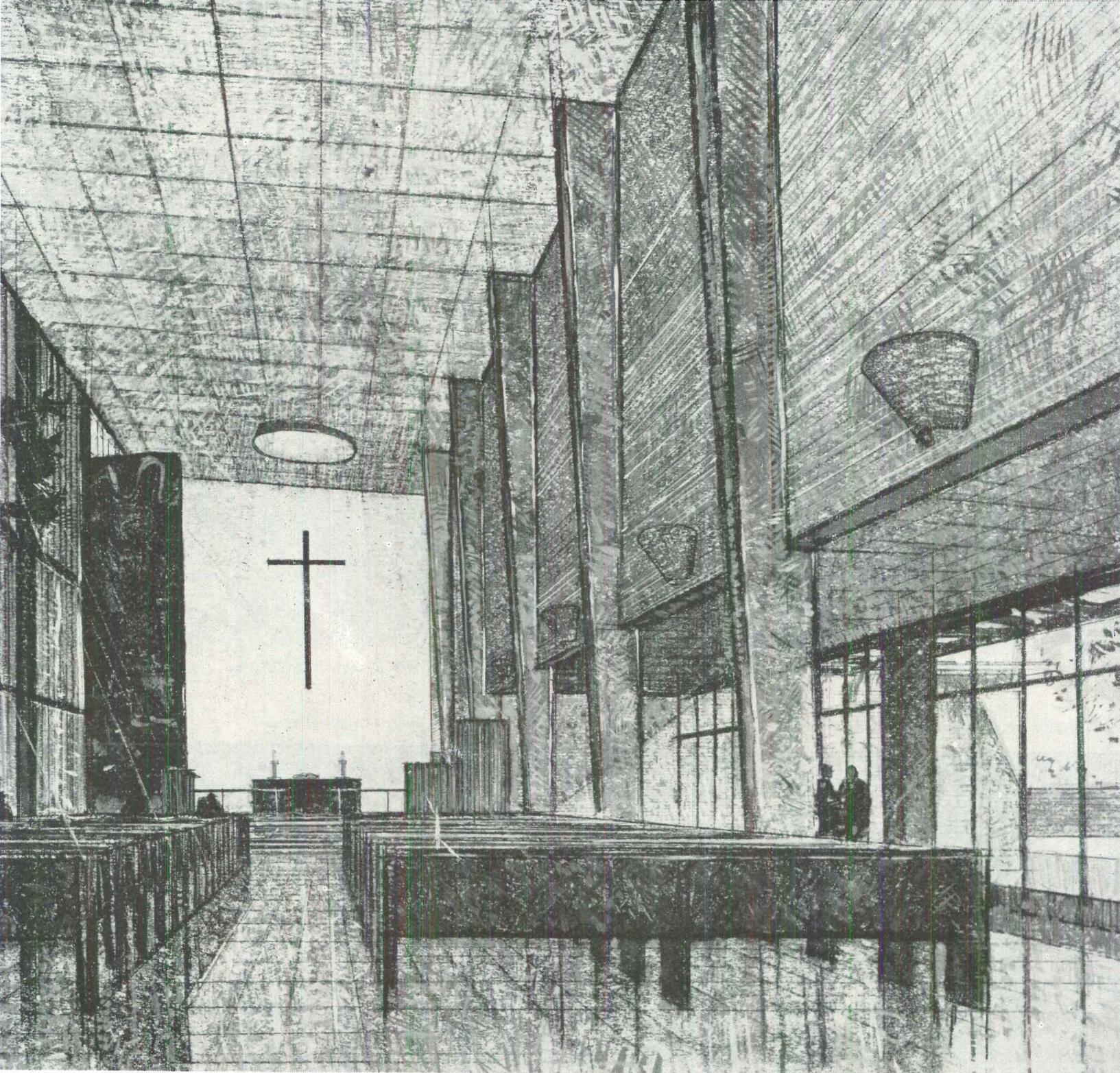
“From the position of the artist,” says Ernest Born, “it is a terrible hypocrisy for the church to preach the divine nature of Truth and yet build structures of deceit and fakery.”

Born’s Chapel is simple and expressive—a big nave for about 205 worshippers, a very small chapel for special purposes adjoining it and seating about 36, overflow space in the narthex and aisles for another 200. The space is enclosed by a structure of inverted, L-shaped steel girders anchored into the hill against firm soil along the west side, “balanced” (to use Born’s term) on slender columns along the east. Walls are tapered in plan to improve acoustics and to enhance the interior perspective. Main access is from the west, over a slablike terrace; principal illumination is from the east through a louvered glass wall. The steeple on the roof is actually a lantern that projects a glow of light into the chancel below.

The bell tower, cross-shaped in plan, placed far off to the north of the chapel, does several things: First, it is the *campanile* in the mall, the element that will give this *piazza* a center. Second, it will pull together all the styles represented on the campus—just as the strong campanile in the Piazza San Marco makes you forget the great variety in architectural expression represented in that beautiful city center. And, finally, its distant location *from* the chapel, combined with its stylistic identity *with* the chapel, will make this tower a kind of gesture of conciliation between opposites, a “hand across the mall.”

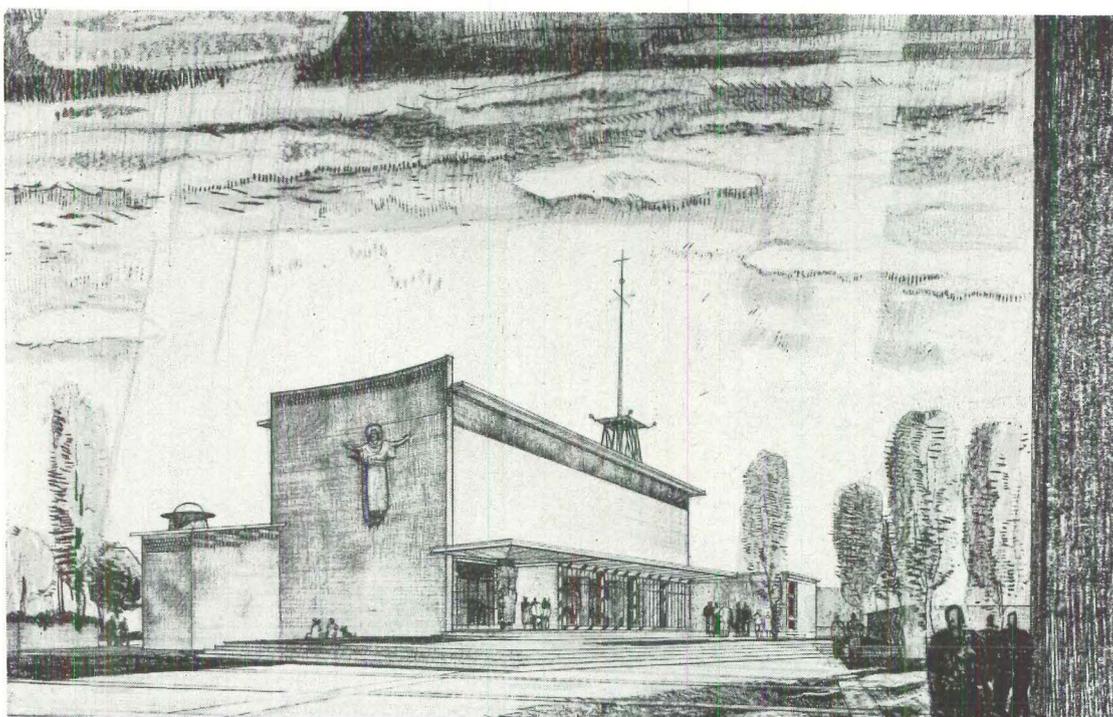
Born’s prospects at present may not be bright, but they cannot be hopeless; for this is a building that carries great conviction; a building that has already established a rightful claim in many minds to a place on Berkeley’s skyline.





L-shaped steel frames at right are anchored on hillside, balanced on light columns at left. Steel frames are blue, louvers at left are sheathed in copper, finished with teak on inside. Note skylight over chancel.

Photos: Gabriel Moulin



View of chapel from campanile shows main entrance. On downhill side are well-lighted spaces for crypt and services between foundation walls.



Simplicity of structure kept costs low for a brick, fireproof church in a city zone: about 83 a cu. ft. or \$700 per seat for 725 seats

Double-glazed window creates no particular heating problem, and late morning services eliminate difficulty of sunlight control

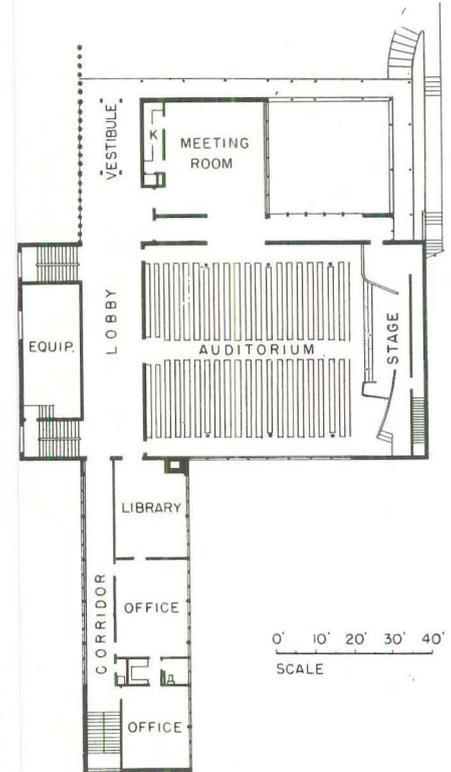
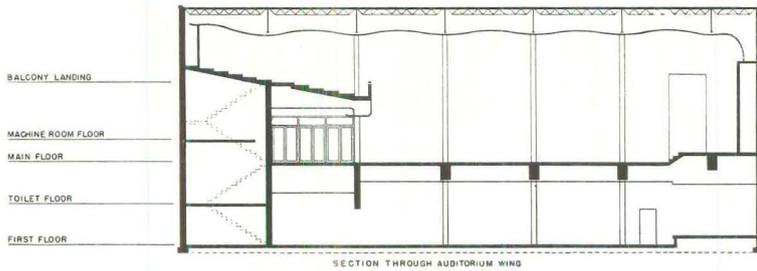
Allen Downs





Classrooms and offices occupy jutting three-story wing which takes full advantage of sloping site.

First Unitarian Church
 LOCATION: Minneapolis, Minn.
 THORSHOV & CERNY, architects
 RALPH, THOMAS & ASSOCIATES, engineers
 NAUGLE-LECK, INC., general contractor



RATIONAL ARCHITECTURE
on a hillside site pays off with better
acoustics, lighting and visibility

Is religion an intellectual quest or a mystic experience? Is a church a place for clearer thinking or for deeper feeling?

Seldom have a congregation and its architects taken a firmer stand for reason instead of mysticism than in this new building for the Unitarian Society in Minneapolis. The result is a perfect articulation of the modern and inquiring faith it serves. This is a place in which to study and learn. It is more a school than a house of prayer. It looks like a school, and it is as full of practical good sense as it is restrained in its emotionalism.

Focal point in design is the main auditorium, which features new solutions to three old church problems: the high ceiling, the balcony, the fenestration.

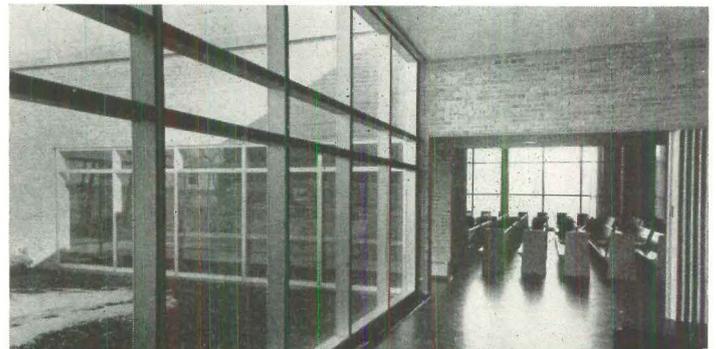
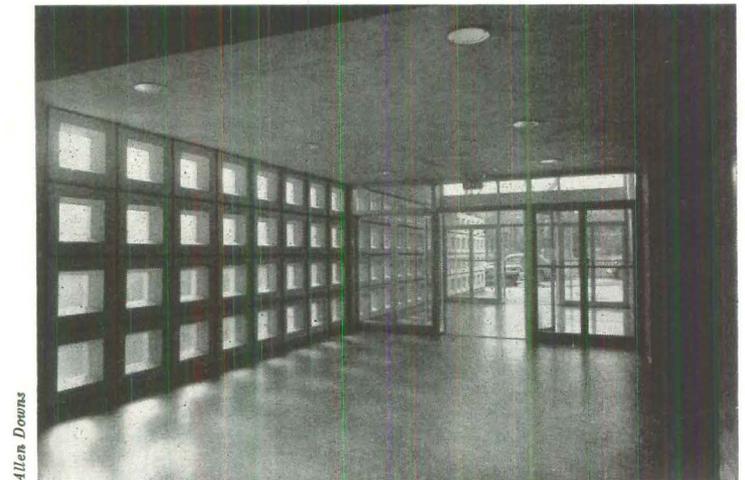
1. Curving upward 10" between trusses is an undulating plaster ceiling painted pewter blue. It contributes immeasurably to the fine acoustics, also increases the ceiling height.

2. The balcony (see section) is shoved back over staircases and lobby and does not overhang the auditorium; a major acoustical problem has thereby been side-stepped. Scarcely noticeable from the floor, those seated in the balcony are, in turn, unable to see those seated below and are thus not distracted from the service.

3. A single wall-high window extends almost the length of the northwest wall, replacing the usual series of high vertical windows. It relates the auditorium intimately and forcefully with the out-of-doors, symbolizing the Society's search throughout the works of man and nature for all that is good and inspirational.

Ingenuous use of a site's 32' drop produces conveniences and economies. The main auditorium is on street level: a boon for aged and invalid parishioners—"as well as for pallbearers at funeral services," adds one experienced trustee. At the same time, the auditorium window (on the opposite side) offers a spectacular view of woodlands and city from an elevation of 32'.

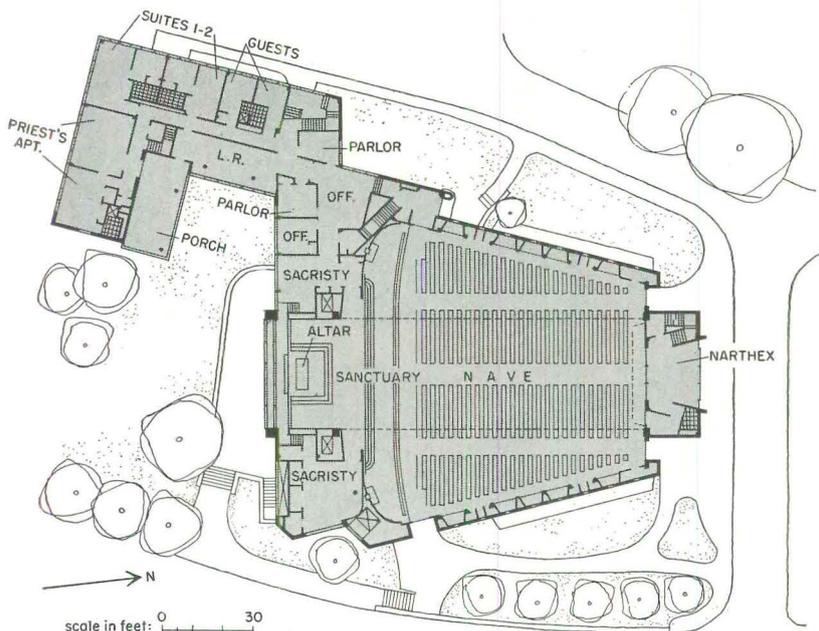
Cast concrete squares specially fabricated by contractor bring handsomely patterned light into lobby and vestibule (below). Overflow crowds can be accommodated in meeting room (bottom). It has separate entrance, however, and may be used independently.





North facade with sculpture above main entrance is quiet prelude to south window-mural. Church seats 925

PICTURE-FRAME NAVE with skylighting adds richness to modern stained-glass mural



One goal was dominant in the design of this handsome Catholic church: to make the sanctuary its richest, its most emotional element. To this end Architect Joseph Murphy used the entire sanctuary wall as rich, emotional background for the altar, then treated all other areas as a frame for the sanctuary. As a work of art—and incidentally as a technical achievement—the huge sanctuary window is the church's greatest glory; but the clear, light serenity of the nave provides an indispensable contrast for the window's tumultuous evocation of the time when "the sun and the moon stood still."

The window presented a brand new problem to Emil Frei, whose family has been making stained glass as far back as memory: how to treat so big a glazed area, faced directly by the congregation? Light glass would blind viewers and minimize the altar. Dark glass would operate only in brightest daylight. Murphy and Frei, after first planning to cut light intensity by exterior louvers or textured protective panes, decided to eschew "crutches" and solve the problem with materials directly embodied in the work.

Their answer was to combine opaque and translucent "panes" in

St. Ann's Church

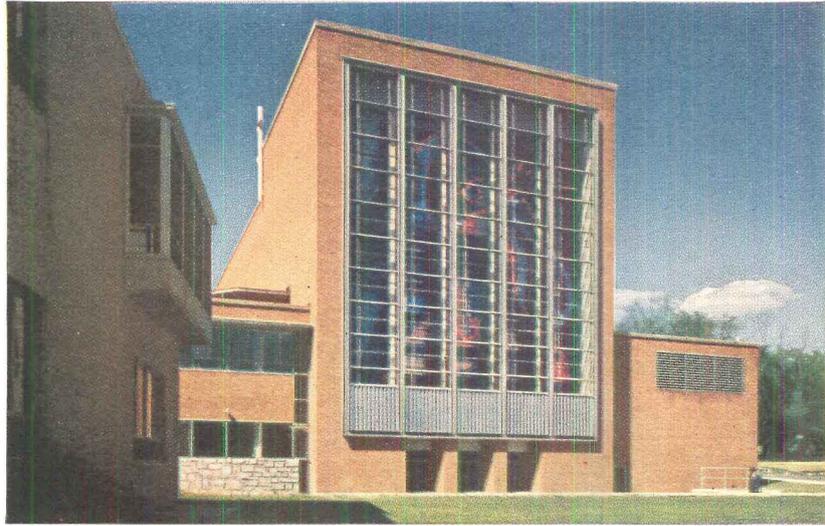
LOCATION: Normandy, Mo.

JOSEPH D. MURPHY, architect

EMIL FREI and ROBERT HARMON, stained glass

HILLIS ARNOLD, sculpture

SCHNEIDERMAN CONSTRUCTION CO., general contractor

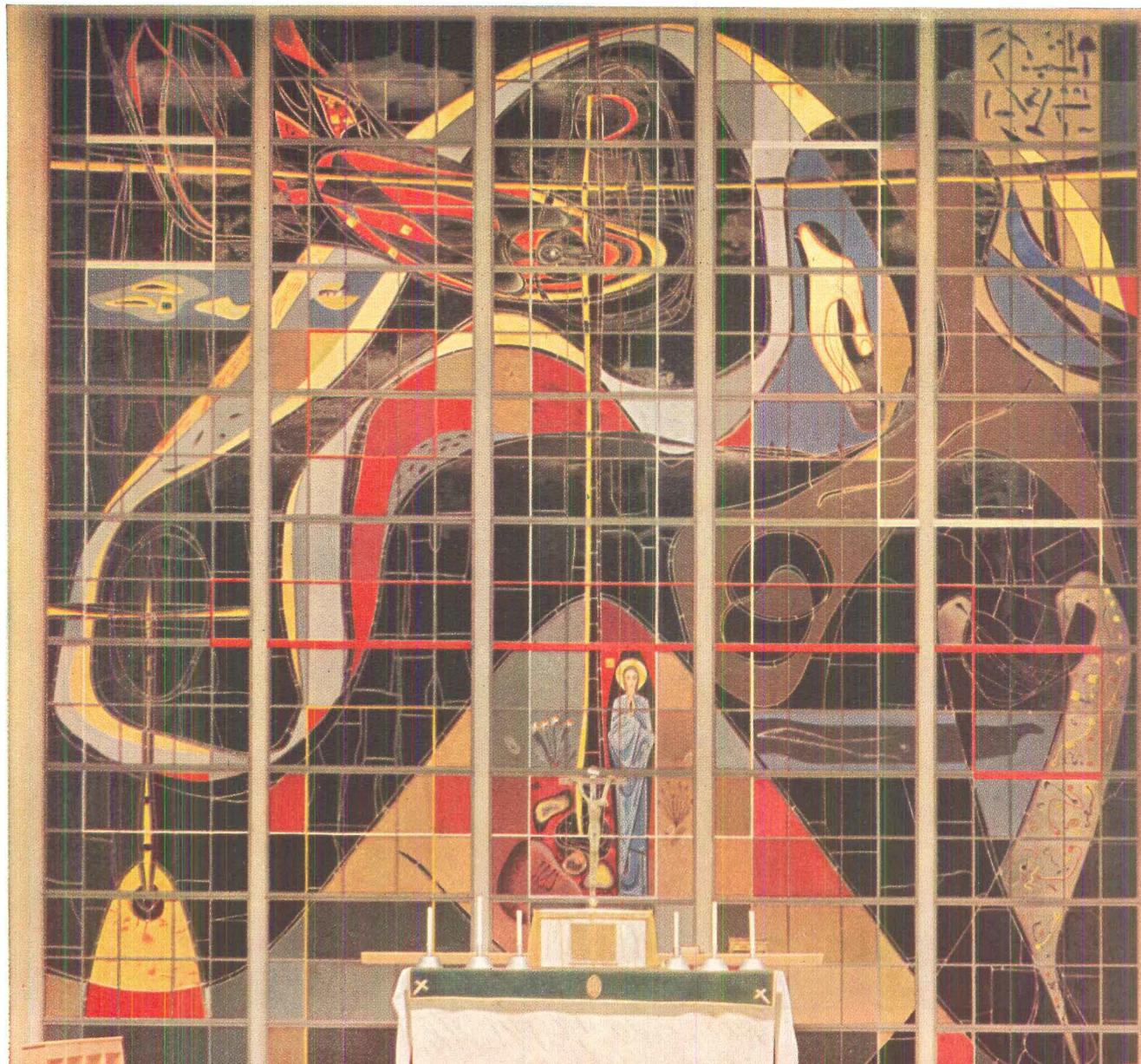


Mural is framed with stamped aluminum spandrel and brick. Steel columns and clear glass are 3' outside mural.



Rich window-mural filling entire sanctuary wall demonstrates a new church window technique. It combines opaque areas of painted wood with prismatic glass. In bright daylight opaque portions are silhouetted against intense glass color (above). At night when the glass is darkened, opaque areas form brilliant mural (below). Relatively equal interior and exterior light creates interplay of media.

To left of composition's central cross is the Holy Spirit, represented as a dove, above cross of repentant thief. To the right is the Hand of God reaching toward void suggesting unrepentant thief. Mary stands alone on hill of Calvary. Artists' intent was to communicate message of cataclysmic events not only through mental process of allegory but—more strongly—by emotional effect of abstract line and mass.



free, bold sweeps. Biggest opaque area, for obvious reasons, is directly behind the altar. Opaque material is pressed wood painted with oil and wax on both the interior and the clear-glass protected exterior. Besides solving the technical problems of light intensity, this device created an exciting "live" mural responsive to all relative gradations of interior and exterior light.

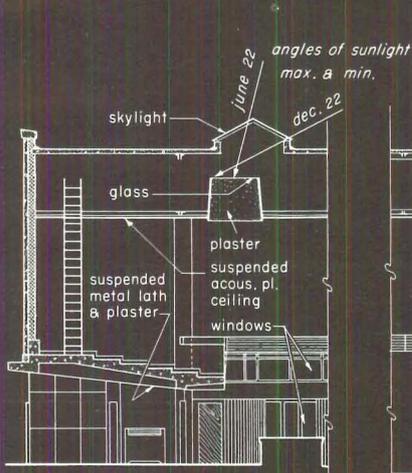
The nave discreetly heightens the drama by its long horizontal lines leading to the sanctuary and also by its lighting. In fact Murphy has depended entirely on lighting to create the sense of exaltation traditionally imparted by great height. Skylights are offset to the south above diffusing glass-ceiling domes so maximum sunlight may pour through (see section). A concentration of top light above the sanctuary illuminates the mural and hints of high space beyond the ceiling break. The low side areas are lighted by a continuous band of windows over confessionals and shrines. Again, use of a ceiling break—together with diffusion of light through vertical grilles—gives an illusion of height and openness. At night, artificial lighting reproduces the effect of daylight through ceiling and side openings.

The exterior as a "frame" for the great window comes off less happily, partly owing to over-all use of one material. Original elevation schemes called for stone facing to set off the tall central portion from the brick wings, a nicety abandoned for economy.

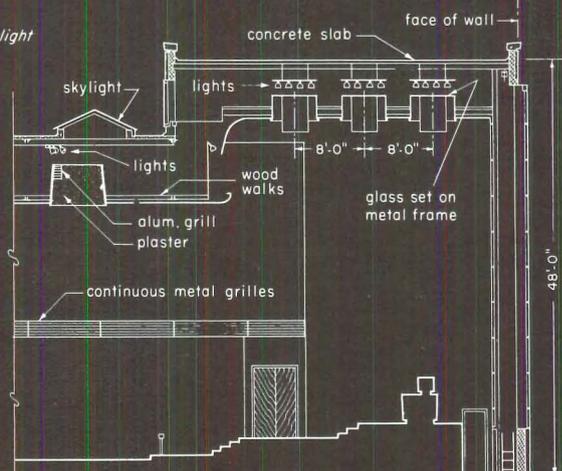
Construction cost of church (seating 925), parish hall beneath (seating 900) and rectory was \$518,360, or 74¢ per cu. ft. Complete cost, including \$33,500 for sanctuary window and exterior sculpture and \$28,179 for furnishings, was \$580,000, or 83¢ per cu. ft., gross cost per seat was \$627.



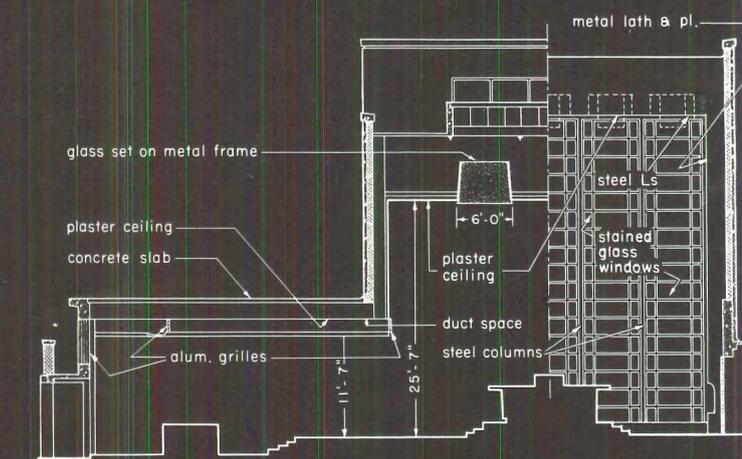
Sections show how natural and artificial lighting effects are achieved



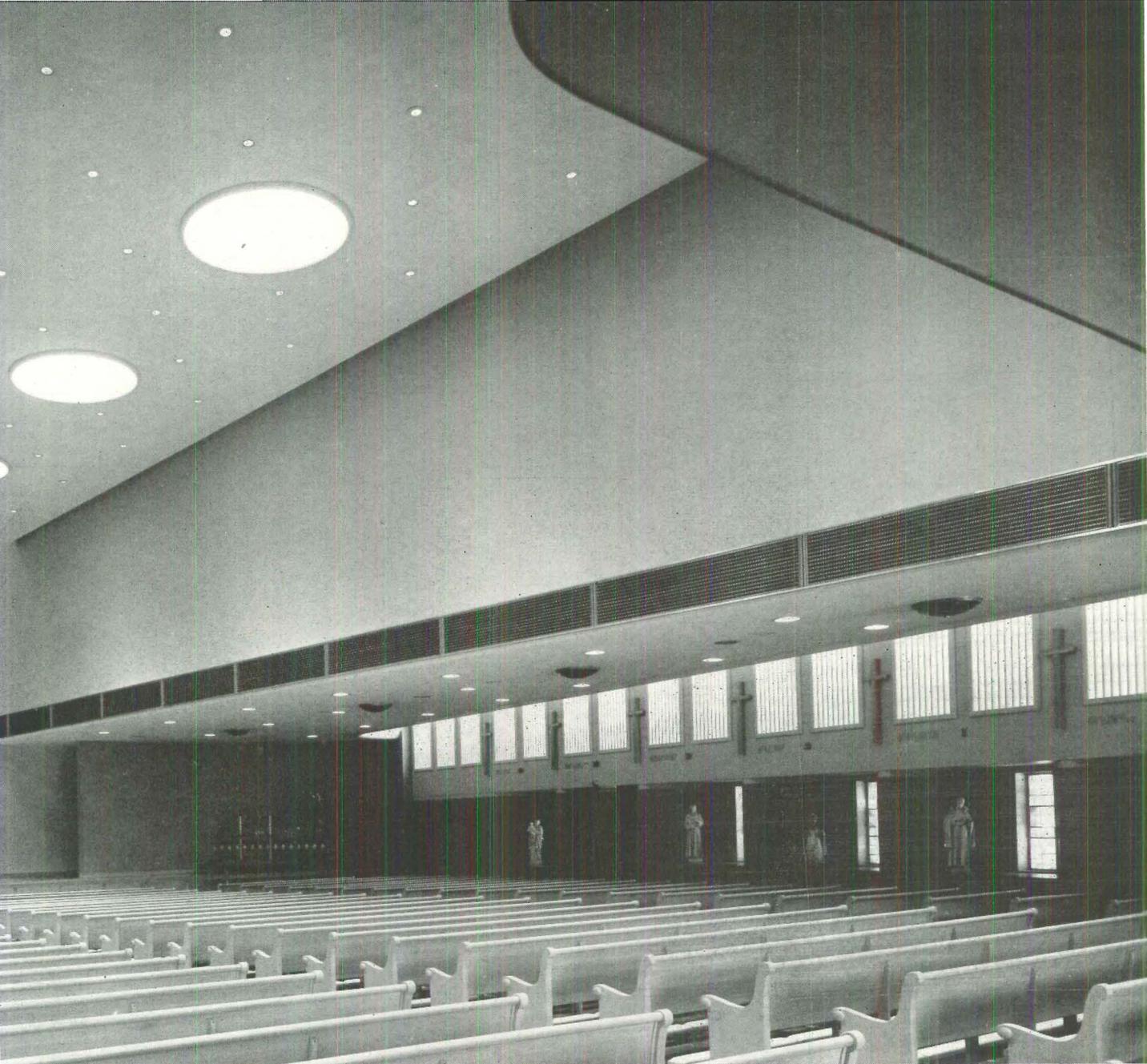
LONGITUDINAL SECTION THROUGH NARTHEX (looking east)



LONGITUDINAL SECTION THROUGH SANCTUARY (looking east)



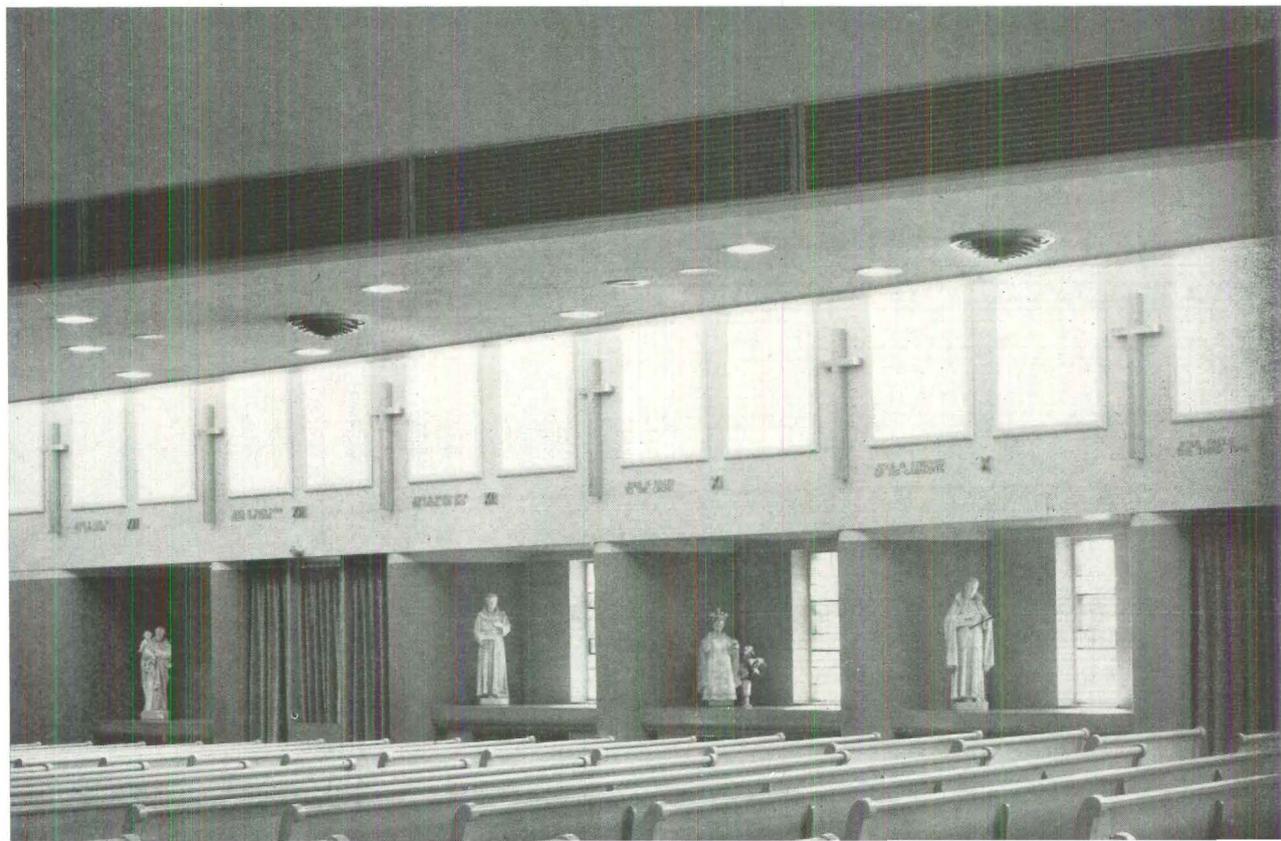
TRANSVERSE SECTION THROUGH NAVE (looking south)

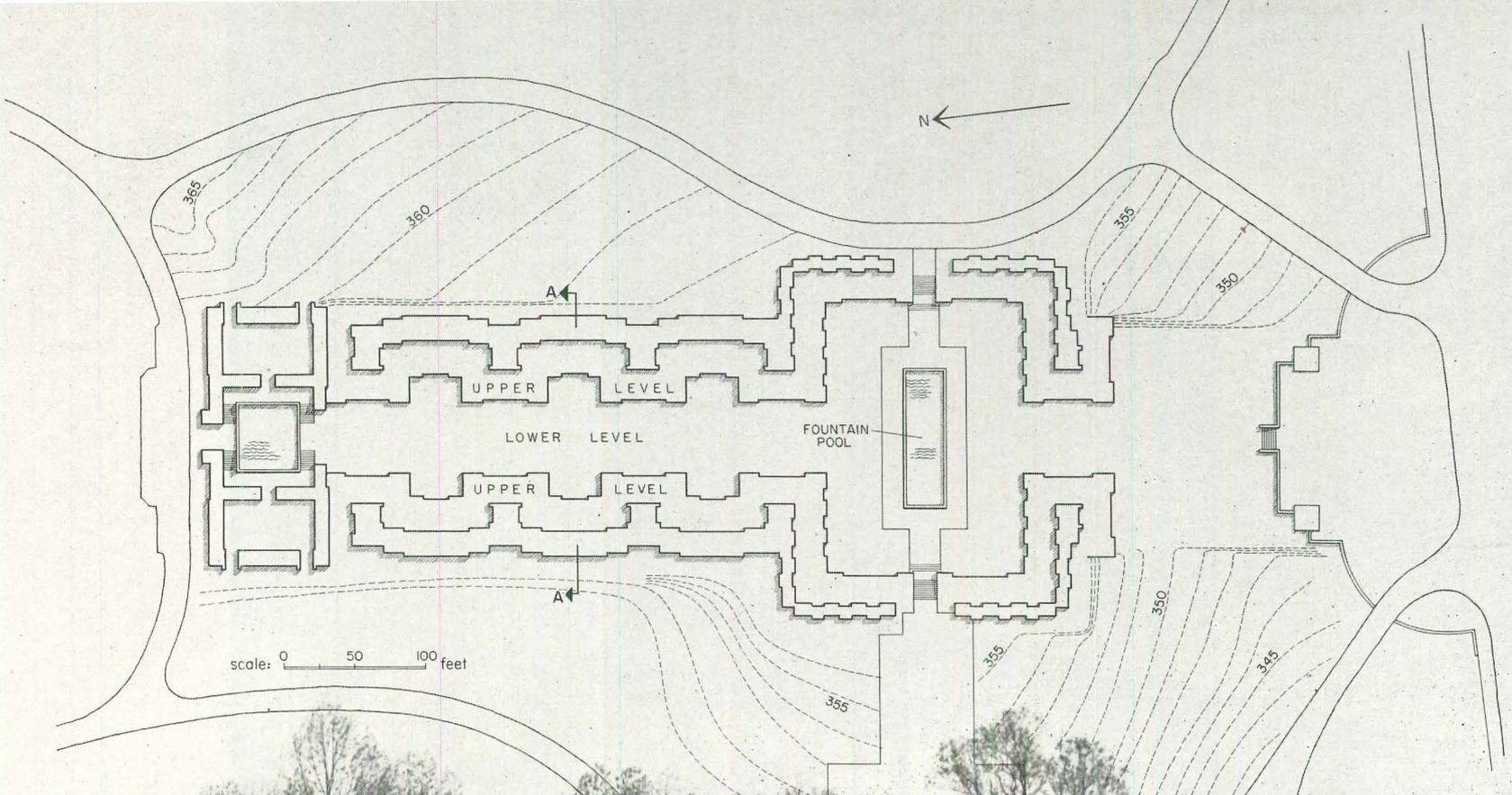


Lighting gives height to nave. Daylight pours through domes; sanctuary is artificially lighted above ceiling break.

The nave is constructed somewhat like a railroad bridge. Two steel trusses form the entire east-west upper nave walls. The low side ceilings hang from the lower chords of the trusses, the high central ceiling is supported on the upper chords. This yields the free 120' span all the way from narthex to sanctuary wall.

Sense of limitless unseen space is conveyed by ceiling break at window grilles above confessionals and shrines





HOVERING SCULPTURE

by Carl Milles provides an inspirational highlight for a new kind of cemetery

National Memorial Park
 LOCATION: Falls Church, Va.
 WALTER MARLOWE, architect
 CARL MILLES, sculptor

These 38 bronze figures set in a large (110' x 45') granite pool and washed by fountains are the latest work of 77-yr.-old sculptor Carl Milles. The \$250,000 sculpture is the focal point of National Memorial Park—a cemetery featuring above-ground entombment in the Washington suburb of Falls Church, Va. Called "The Fountain of Faith," the composition bears Milles' unmistakable trademark and reflects his belief in a joyous reunion and the happy continuity of life after death.

To one familiar with Milles' work, there is no mistaking these stylized figures, their gestures and stances. Quite similar ones mark his St. Louis group, "Meeting of the Rivers" (AF, June, '46) and his composition before the concert hall in Stockholm. And once again a fountain is used integrally in the design—a Milles specialty. "The Fountain of Faith," however, is more ambitious than the other two. More individual figures were involved, and this complicated the problem of composition. Also, the concept—of figures hovering between earth and heaven—depends to a great extent for its success on the mist from fountain streams obscuring the stalks that support the figures.

Milles' sculpture is complemented by its unique setting. For this cemetery by Architect Walter Marlowe has no cemetery look; it looks like a formal sunken garden. Its shape is cruciform with "The Fountain of Faith" located at the junction of the 1,000' long mall and the 300' "transept." Around the sunken mall is what appears to be a 5½' retaining wall of polished marble panels. But behind the panels are the burial vaults. A well-kept lawn on top of the vaults stretches back beneath a row of clipped pines to the second-level vaults. Six shallow bays break the long lines of the walls and form semiprivate vault areas. At the foot of the mall on either side of a small pool are two enclosed areas, called cloisters, that house more secluded vaults. Extensive planting of evergreens and flowering trees adds the finishing touch to the garden atmosphere.



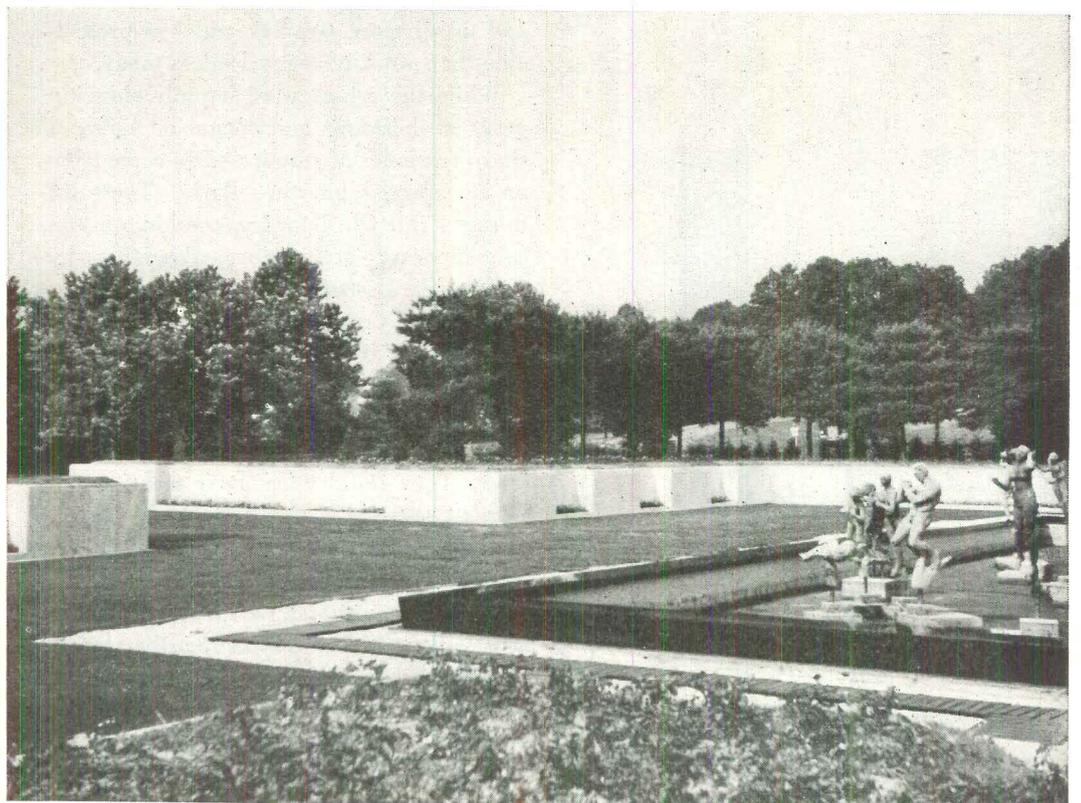
Section through cruciform cemetery shows lower-level mall flanked by retaining walls of vaults and upper-level vaults.

Milles' bronze figures watched over by lively angel (left) are of people he knew. Composition has 38 figures.

Court of Georgia marble (right) surrounds pool of Minnesota granite, is itself surrounded by vault wall of smooth marble panels.

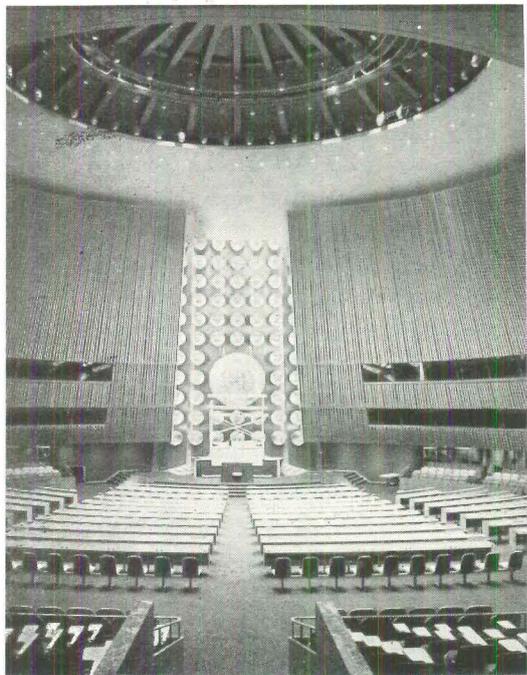
Detail of mother and child (who died at the child's birth) shows Milles' familiar stylization, characteristic of all the figures.

Photo (p. 112): Robert Phillips



UN ASSEMBLY How do architects like it?

First reaction: most of them don't



Photos: © Ezra Stoller

... eclecticism turned modern

FORUM's premonition that the UN General Assembly Building might shock many leaders of contemporary architecture (AF, Oct. '52) proved a wild understatement.

Most comments echoed the reaction of Architect **Paul Rudolph**, which FORUM published alongside its own commentary, and the hue and cry was louder and fiercer than anything heard since the first unveiling of UN plans in 1948 brought such epithets as "a sandwich" and "a match-box."

Not satisfied with tearing the architect and his work to pieces, many critics went on to a bitter attack on FORUM's suggestion that there might be two sides to the argument and it might be well to "lay aside hasty judgment and try to see exactly what Harrison did and how he came to do it."

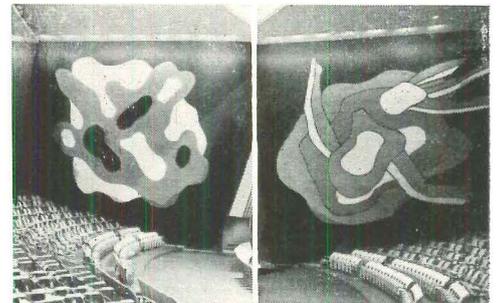
Only a handful of the critics seemed willing to recognize that perhaps Harrison, a man of many notable accomplishments, might have had some good reason for deviating so far from canons of contemporary architecture. FORUM's article said the building represented Architect Wallace K. Harrison's approach, that this approach is personal and different in many ways from current modes, being more empirical and experimental, less systematic; setting more reliance on personal judgment and taste; more popular and less predictable than work of many leaders today.

While the critics were happily slugging away at building and magazine alike, a sharp reminder of responsibility came from an unexpected quarter—Paris. There an unregenerate Old Guard was seeking to stop contemporary architecture altogether by vetoing the Breuer-Zehrfuss-Nervi-Gropius-LeCorbusier-Costa-Markelius-Rogers design for the UNESCO building, which the Old Guard linked with the UN in New York (see News). This left the happy US critics with a sobering decision to make sooner or later. They could bang away merrily and without restraint if they felt that the object of their attack must be demolished at any cost. But they must be aware that in the process they would give great comfort to those who would destroy all that they loved. Might a more judicious temper not be prudent as well as wise?

A few architects responding to the article were more balanced from the start. Letters are here reproduced in a graded scale, from

those of utter condemnation to those of qualified analysis and those of support.

George Howe, director of the School of Architecture at Yale, was witty as ever in picking up—and denying—FORUM's suggestion that the UN Assembly has elements of modern "popular baroque." Said he, "I should prefer a more analytical adjective. One might call this interior, for example, the legislative phase of modern architecture. It seems like a well-meaning social statute adopted after long debate and many compromises not always consistent. Then there is the last-minute 'joker' proposed by the Devil, always lurking in the back benches [referring to the Léger murals] . . . But perhaps I give M. Léger too much stature."



... the last minute 'joker' proposed by the Devil . . .

Then Howe disallowed FORUM's contention that the building might represent an architectural phase or change of attitude: "I consider FORUM's fashion-style commentary as empty as a blown egg. Paul Rudolph's critique based on unchanging architectural principles is as full of meat as an unblown egg."

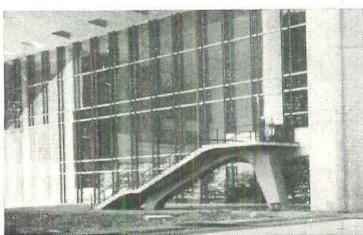
Pietro Belluschi, dean of MIT's School of Architecture and Planning, was as certain of standing on eternal ground: "I will not hide my feeling of nausea at FORUM's commentary. How much rot can one contrive to serve up as a dish? New empiricism indeed! Your slick semantic exercise tried not very successfully to make a case for Hollywood. If this is the fruit of 50 years' trial and error in architectural thinking, there is reason to be discouraged. How can we speak to future generations of architects if our standards lack integrity? With so much yet to be said in poetic forms, why use the voice of deceit?"

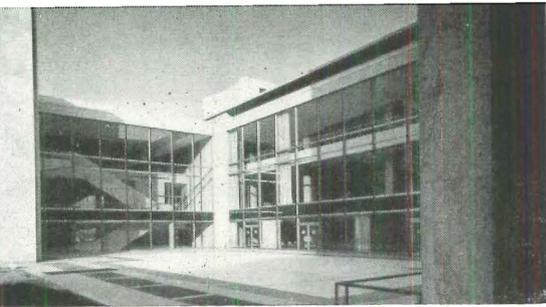
Architect **Robert Woods Kennedy**, a younger critic, was sure a new element had come in—only a different new phase from that suggested by FORUM. Said he, "It is eclecticism turned modern."



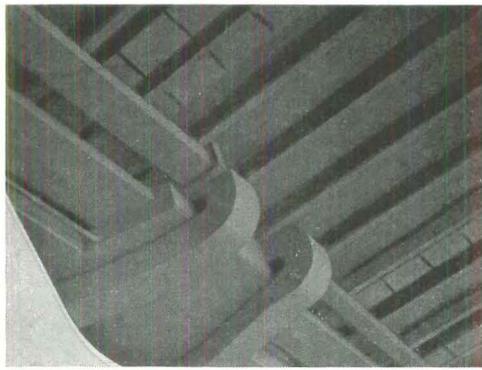
... a ramp on a fragment of the Eiffel Tower . . .

... a stairs on Noguchi table legs . . .





... the so-called 'link' is heavy, awkward ...



... ducts and beams exposed like entrails ...

As ingredients he listed "a little each" of the following: "Le Corbusier cum Niemeyer . . . architectural school circa 1935 [but not 1952—Ed.] . . . New York skyscraper . . . international style circa 1930 . . . store fixture art." And then, as further elements of "showmanship"—"tin-knockers art painted gold, a ramp on a fragment of the Eiffel Tower, a stairs on Noguchi table legs, ducts and beams exposed like entrails, bilious green desktops with baby-blue chairs—glitter, gilt, cute tricks, warm vulgarity. Faith, strength, dignity? No: the mere men assembled within will find little to remind them of the transcendent importance of their task."

To make it complete, Kennedy went further. Denying to architecture the quality Herbert Read ascribes to art, of being "the expression of the uniqueness of a personality," because architecture, involving physical and social sciences, was more complex, Kennedy said the UN Assembly made visible neither a guiding personality nor "that refined, impersonal, impartial quality" typical of a creative team's production. Here was an expression of "leaderlessness, disintegration."

Yet as if to demonstrate that an opinion, even when held with most assurance, might not be unanimous, a wholly different answer came from Architect **Nat Owings**, pre-eminently one of the heads of a "creative team," Skidmore, Owings & Merrill. Owings called the Assembly a "very interesting and successful building, with nothing about it that wasn't a logical development of a reasonable research program." Owings expressed as his only reservation that "some of the details run the risk of being dated later."

Here then was a suggestion that "fashion-style," abhorred by Howe, might after all play some role in a building's acceptance.

With few exceptions, all other comments received dealt with the building in some detail, were criticisms which some of the authors referred to as "eternal principles" and others, more modestly, as personal opinion or taste. Architect **Henry Hill's** reactions were wholly negative:

"The so-called 'link' to the Secretariat is heavy, awkward, emphasizes the crowdedness of the two buildings. And where is the Assembly approach? The open south end invites, and it is the 'back door.' The closed north forbids and shuns as the 'front door.' The exterior announces a space of one shape: but the interior becomes a series of

confusing conflicts. There is not an attenuated curved room, there is not a circle, there is no dome, there is no form; nothing is created or defined and nothing is the result." And, again on the familiar tense note: "The integrity and hope of men, embodied in the concept of *united nations*, must and will overcome this one more obstacle."

Architect **Philip Goodwin** found a few pluses as well as minuses: "The Assembly Building represents an attempt to soften the rigidity, the T-square feeling, of its neighbor and to create interest without ornament. This has been only partially successful—the curving wall certainly has no functional reason. The north lobby is definitely too narrow and unfortunately gives a vague impression of . . . prison. My chief objection is to the clumsy, over-heavy metal arch supporting the upper section of the staircase."

Yet: "The blue-painted open ducts, arranged to give an interesting ceiling, are novel and effective." (These were the ones that affected Kennedy like "entrails.")

"The Assembly Hall itself is the most successful single item. The fact that the dome does not seem to be supported but to float on another part of the ceiling does not bother me in the least." (This to Rudolph and Belluschi was a prime example of "deceit.") "The proportions are excellent, the colors all harmonious; and the sloping walls take away from the pompous rigidity of other such assemblies. Although Léger's decorations [Howe's works of the Devil] are perhaps oversimplified, they are so much better than the other works of art already installed and so much more in scale that they add greatly to the room. Minor details throughout this room are suitably handsome and well studied."

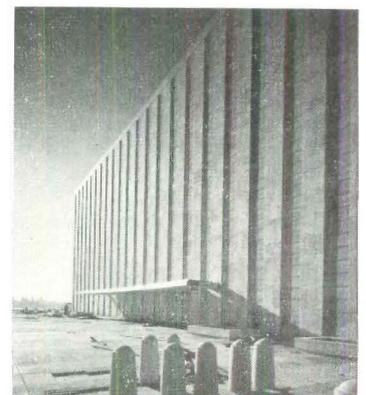
With Goodwin's comments there reentered the discussion some measure of balance and good nature, some recognition that perhaps the architect, a man of notable accomplishments hitherto, might be something other than a charlatan for acting out of concert with opinions now firmly held.

An exceptional letter came from **Joseph Hudnut**, dean of the Graduate School of

Design at Harvard. Between Hudnut's opinions and those of FORUM's editors there has often recently been a wide gap. Yet here was a clear recognition of the constructive purpose which FORUM's editors in this case (and always) had tried to serve.

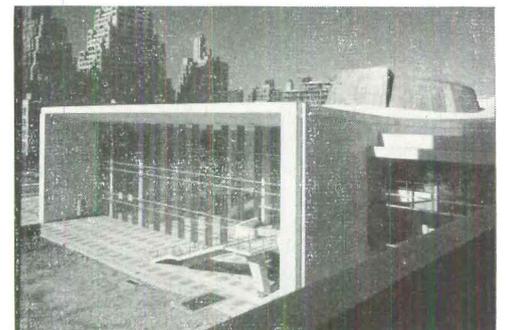
Said Hudnut, "I do not think I ought to make any comment on the building since I have seen it only in pictures. Certainly it is one of the most important works of architecture of our time, and one should be reasonably conservative in making an estimate of it.

"I think that the analysis which you print is admirable, both in spirit and in method. You have granted the architect the right to be free and have not measured him either by a traditional standard of excellence or by some esthetic dogma. The important thing in all criticism is to determine first the intention of the artist and then, if possible, the extent to which he has realized his intention. In my own opinion no other standard is admissible." And **William Wurster**, dean at the University of California, added, "FORUM's article is penetrating, just and tolerant. It does not attempt to praise or criticize but does a fine job pointing out the forces which shaped the building."

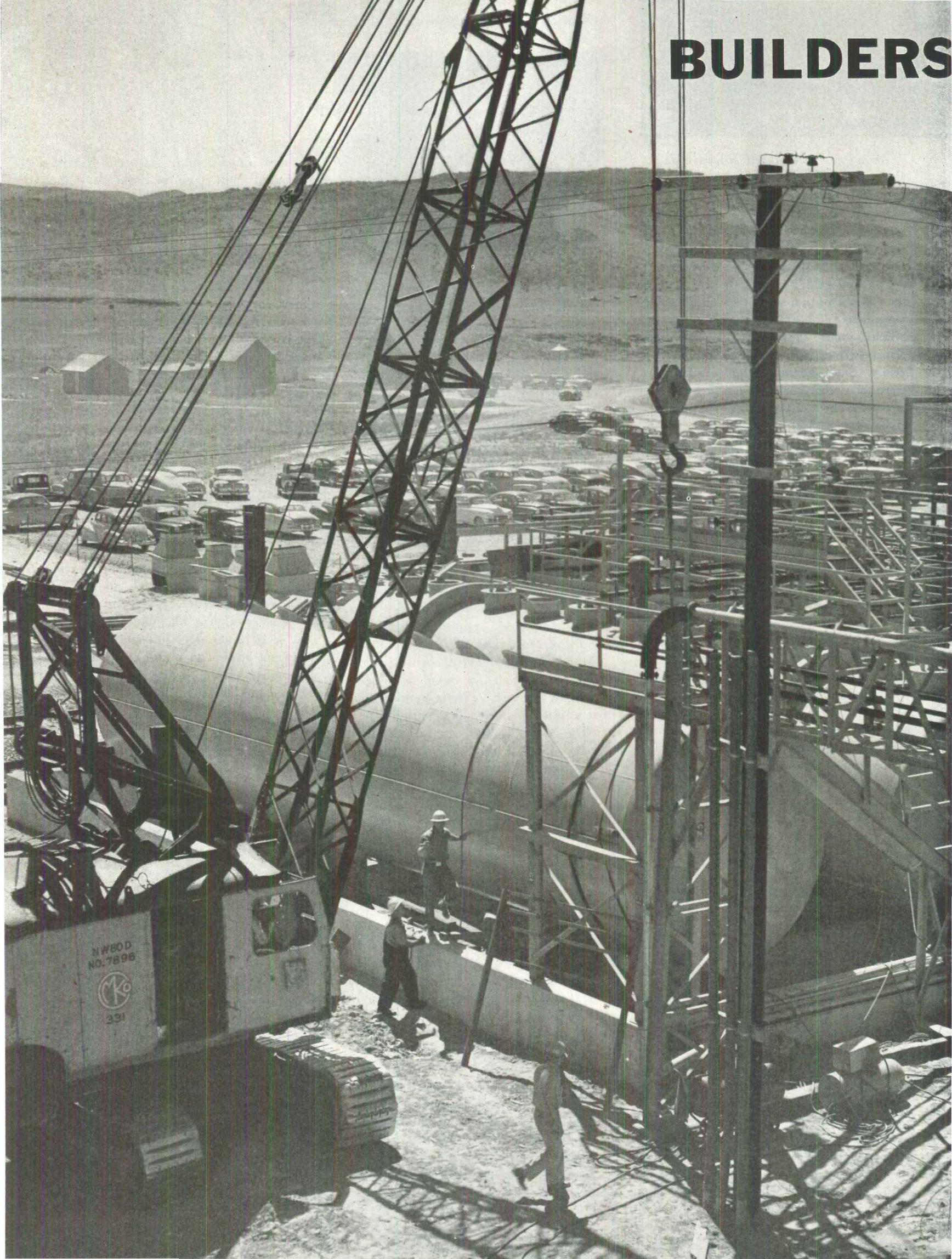


... the front door forbids and shuns ...

... the back door invites ...



BUILDERS



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331

FOR INDUSTRY

H. K. Ferguson Co. applies the analytic approach of

plant managers to plant construction, comes up with a basic

rule for factory economy: learn to see what you don't have to build

Today's industrial builders are borrowing from the factory managers themselves more and more of the cost-cutting planning methods of big industry. According to H. K. Ferguson Co., which last year erected \$66 million of industrial building, key to this new kind of design and construction is learning to see what you don't have to do.

Ferguson Co., famed for its work in the intricate process-plant* field, credits many of its advances in design and construction to an analytic method borrowed from its big customers, Procter & Gamble, who pioneered the scientific analysis of factory methods. Just as big manufacturers like P & G constantly restudy their production methods to cut time and motion by simplification of process steps, so Ferguson planners study and restudy every element of building design and construction for the same kind of simplification. In Ferguson's work, *learning to see what you don't have to do* has produced design economies all along the line. They range from the elimination of welded joints and fittings in certain types of stainless steel piping (Ferguson's method of pipe flanging not only eliminates the fire hazard of welding in explosive areas but also makes the piping more readily demountable) to the elimination of the very building walls themselves.

Here are some of the new ideas in Ferguson's recent work, all based on this new planning approach and detailed on the following pages:

Cost cutting. This can be a booby trap. Cost of a process plant is measured, not by dollars per square foot, but by *cents per pound of product*. Architects and engineers in this field must concentrate on *operating cost* rather than *first cost* and must help the owner carry this kind of thinking through for every element of plant design. Economies in first cost will, of course, result from bold design simplifications (see below) and from simplification of construction operations, but the architect-engineer who hopes to survive must show the owner how in many cases adding \$1 to the first cost of the plant may save \$2 a year in operating costs. In the rayon industry, for example, producers like Courtaulds, Ltd. are spending millions for the equipment and the kind of heating and air conditioning that will make rayon production on almost completely automatic, round-the-clock operation. Courtaulds expects to more than recoup its big investment by a cut in the cost of the product and a big boost in output. For details, see p. 120.

Standardization. While most factories must be custom designed, there is an important place in the industrial field for standardized steelwork. For light manufacturing plants and warehouses, Ferguson uses a standard steel frame for a 35' x 24' bay, a size offering maximum flexibility for equipment layout or pallet storage at minimum cost. For the story of how Ferguson has designed this steel frame to make big savings in both shop and site fabrication and for Ferguson's conviction that reducing steel tonnage is not always the way to cut the cost of steel in place, see p. 123.

* A "process" plant converts raw materials to useful products by a basically chemical process, whereas a manufacturing plant is essentially a shelter for machine tools. Process plants are increasing in number, a great increment of the chemical revolution of the interwar years.



Executive Vice-President Otto F. Sieder

Flexibility means provision for production changes and expansion. The modern course of US industry has repeatedly proved that almost every plant not frozen by site boundaries must expand sooner or later. Combined with the recent shortage of bricklayers, this need focuses attention on lightweight curtain walls and on a variety of new materials, some of them plastic with the added advantage of admitting daylight. Panel walls like these with simple connections can be easily demounted and moved out as the plant itself moves out. Even where process-plant operators have customarily insisted on concrete walls, Ferguson architects are now promoting the light panel wall which can be easily shifted. For useful details for this kind of wall construction, see p. 125.

Making one building element work for two. A new trend in today's industrial work is to merge separate building elements into an efficient whole. Insulation may become part of the wall panel; lighting fixtures or ventilating units may be integrated with supporting steelwork. Sometimes this is the result of redesign by an equipment manufacturer; sometimes it is a simplification by the architect-engineer. One example of this trend is Ferguson's demountable laboratory partitions, designed in light steel sections to provide both support for service piping and ducts for electrical wiring (see p. 124).

Methods preplanning. Ferguson's methods engineers plan each part of the construction operation in advance and further break down every major step into its component parts, each of which is planned for maximum economy of time and motion. For details on how this preplanning produced a fast new system for pouring a huge concrete floor, see p. 118.

Piping prefabrication. Shop fabrication of the vast amount of piping used in process plants can cut thousands of dollars from construction cost. Ferguson believes few builders have pushed this economy as far as it can go by basic simplification of assembly design and efficient shop fabrication (see p. 119).

Open construction. Ferguson's recent work fully exploits the growing trend toward completely automatic process operations by dropping the plant walls themselves and providing only minimum shelter for the huge machines, vats and pipes (see p. 122).

METHODS STUDY AND REPLANNING uncover new ways to build economically

The principle of *learning to see what you don't have to do* has paid off spectacularly in Ferguson's program of methods study and preplanning. Executive Vice-President Otto F. Sieder calls the program the "organized application of common sense." This systematic planning on paper replaces the traditional scene on the job site where foreman and mechanics pore over blueprints, argue about alternative methods, disappear in all directions to get the necessary equipment and materials.

Says R. L. Cashen, vice president in charge of operations: "Rugged individualism is traditional in the construction industry. Six different building supervisors may build six different ways, although they are doing an identical construction operation. I wonder what would happen to the cost of refrigerators if General Motors let each plant manager use his own special system of assembly? We hope by precise methods of study and planning to bring construction more in line with industrial production methods.

"Suppose, for example, the problem is how to hoist concrete to the third floor of a building. We no longer leave this decision to the experience or judgment of the job superintendent. We explore alternative methods and we put a dollar-and-cents value on each. Our conclusions are matters of fact, not opinion.

"This is not a speed-up, but a method by which we can give the worker the tools and materials so he can get better results. The whole program is intended to make work easier—by putting materials and equipment where they will be easy for the worker to reach and by analyzing and reducing the worker's unnecessary motions."

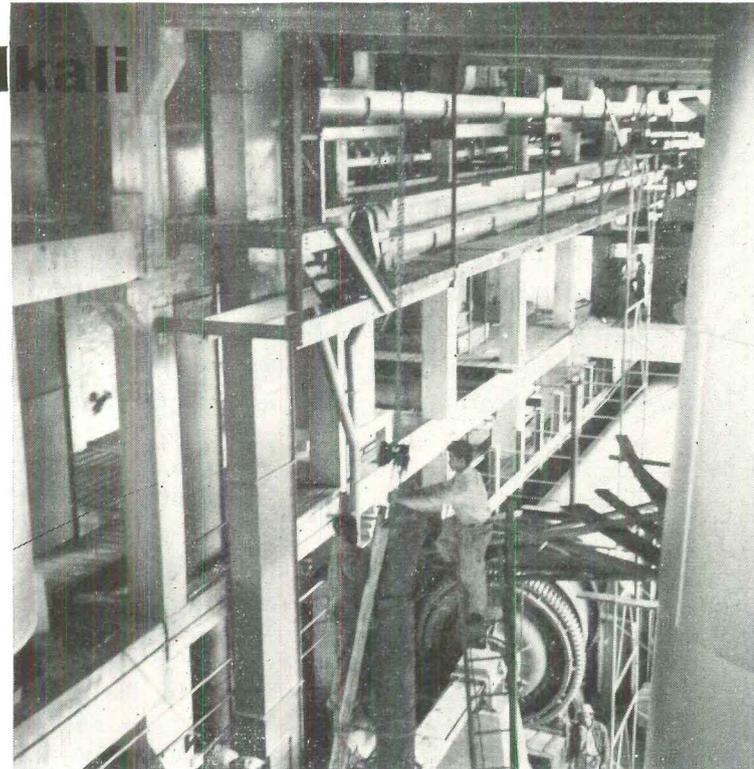
How to pour 19,000 sq. ft. of floor a day

Here is an example of how methods study has paid off on Ferguson jobs. At the new Chrysler tank plant at Newark, Del. (designed by Albert Kahn Associates and built by Ferguson), a 22-acre floor had to be poured with some 22,000 cu. yds. of concrete. In the average job, the pouring method would have been left to the job superintendent. Ferguson planning engineers began studying pouring methods three months in advance of the pouring date. After analyzing all feasible alternative methods, they selected pumping and set up the following system:

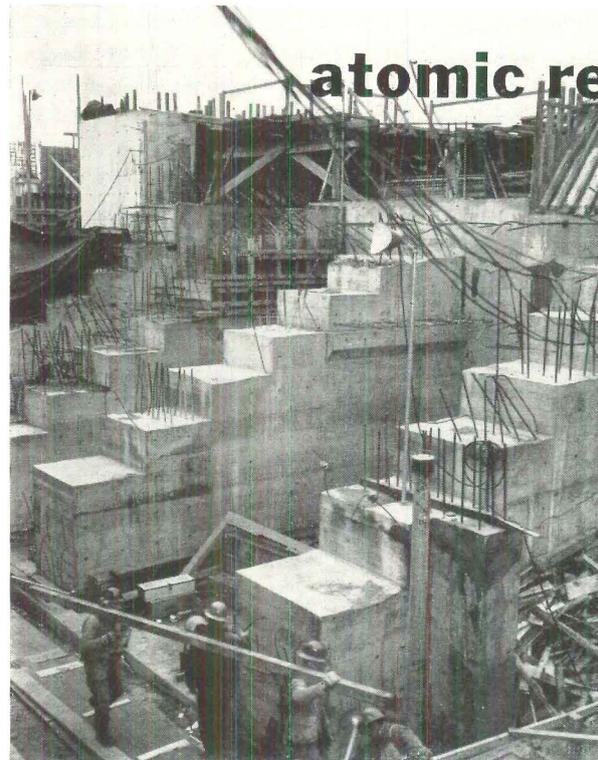
- 1) A single pump was located centrally in the plant, where it could serve an area of about 19,000 sq. ft. daily.
- 2) Concrete was delivered by transit-mix trucks to the pump from a batch plant in the rear of the building.
- 3) An 8½" pipe line supported on sawhorses carried concrete from the pump over a maximum distance of 1,200'.
- 4) A wheeled dolly was used to elevate the discharge end of the pipe line about 12', making it possible to chute concrete over the entire width of a 40' bay.
- 5) The dolly rode sectional timber runways on a 3' ga. Five 10' lengths of runway were provided so that sections could be leapfrogged as the pouring progressed.
- 6) The pipe line was periodically shortened by removing two 10' pipe lengths directly behind the dolly.
- 7) As the pipe line was removed in one section, it was set up in the next to be ready for the next day's pouring.

This system was arranged so that the pumping machine had to be stopped only a few minutes while three joints were broken, two pipe lengths and their supporting horses taken out, and the dolly pushed back 20' to have its discharge pipe reconnected to the main line. Systematic methods planning like this made it possible for

alkali



atomic research



titanium



Chrysler Corp. to deliver the pilot model of the army's newest heavy tank just ten months after the start of plant construction.

All this careful study does not mean that Ferguson was committed to the pumping method of pouring concrete. Vice-President Cashen emphasizes that methods established by preplanning can seldom be carried over from one job to another, and that each job must be reanalyzed in terms of local conditions, equipment and materials. For example: on another job where pumping machinery would have had to be shipped some distance, methods planners decided it would be more economical to run transit-mix trucks right into the building and pour the concrete floor in long strips directly from the trucks, with joints on either side.

How to simplify construction procedure

Ferguson recruits young, imaginative engineers for its preplanning program. "The fundamental requisite is a *questioning* attitude," Cashen says. "We have taught ourselves to question each job and each motion that is part of the job. Our planners are trained to keep an open mind, to study all possible alternatives, to withhold decision on the best method until all facts have been studied."

Ferguson methods planners work roughly in this sequence: 1) They study the blueprints to find out what the job is; 2) They picture each step necessary to do the job; 3) They ask the following questions about each job, and again about each step:

What is being done, why is it done, what else could be done to get the same result?

Where the job is being done, why, and where else could it be done?

When the job is being done, why, and when else could it be done?

Who is doing the job, why, and who else could do it? (A question asked within the limits of the appropriate craft.)

How is the job being done, why, and how else could it be done? Ferguson planners point out that the *how* question is always placed

at the end of the methods analysis. This is important, because if the study is immediately focused on *how* to do a given job, the essential *why* and *what* questions—whose answers may actually eliminate the job itself—may never be asked.

How to cut the cost of piping

Another big way that the preplanning program has paid off is in the precutting and fabricating of the enormous amount of process piping used in typical Ferguson jobs. Transferring a major part of the fabrication of piping assemblies from the point of installation to a well-organized central job shop has made a big cut in the cost of piping. Shop fabrication saves the time lost in the field because the installing mechanic lacks equipment and space, suffers interference from other trades and must work from scaffolds and ladders. It provides the proper organization and equipment for such basic steps as cutting, beveling and welding (customarily done under more difficult erection conditions). And, it eliminates the customary extra step of hoisting individual parts into position before field assembly begins.

Ferguson planners estimate that a well-organized piping fabrication shop saved about 40% of an estimated labor cost of \$300,000 on a recent piping job. Says Engineer Charles Lopinsky, one of Ferguson's senior methods engineers: "No definite point can be fixed at which shop fabrication should cease and field erection should begin. This can only be determined for each job by a close scrutiny of the piping drawings, a study of field erection conditions, and judicious preplanning of the shop fabrication and field erection procedures."

Here is how Ferguson planners organize their process piping prefabrication (a system which in general would be applicable to any kind of piping preassembly):

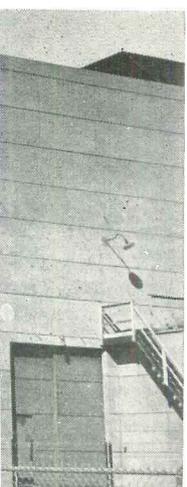
- 1) Drawings of piping assemblies are made in the field by piping draftsmen of shop drafting room.
- 2) Shop foreman checks drawings.
- 3) Drawings are duplicated and sent to all workers concerned.
- 4) Warehouse man receives drawings and assembles welding fittings required for the assembly.
- 5) Shop worker cuts and bevels nipples (number and length of nipples required are listed on the drawings).
- 6) All components are wired together and placed on the fabricating table.
- 7) Fabricator or tacker assembles the fittings and nipples into the assembly detailed on the drawings. He applies only enough tack welds to hold the assembly together. Drawing is wired to the assembly for identification.
- 8) Tacked assembly is inspected and, if necessary, returned for correction.
- 9) Assembly passes to welder who completes the welds. (This operation requires the most time; Ferguson usually uses two or three welders to one tacker.)
- 10) Completed assembly is given final inspection and transferred from the shop to erection or storage.

Ferguson planners offer these pointers to anybody planning to set up a piping fabrication shop:

- ▶ Job breakdown must avoid "walking delays."
- ▶ Materials must move through shop in a straight line.
- ▶ Space around fabrication and welding tables must be sufficient for workers' safety.
- ▶ Power tools and equipment must be the most efficient available.

ARCHITECTURE FOR CHEMISTRY

Twenty-five years ago the H. K. Ferguson Co. was a builder of machine shops like everybody else; today the company probably knows more about building plants to make certain basic chemicals (chlorine and alkali are examples) than anybody else in the US. The firm probably owes its present eminence to the fact that its executives were among the first to recognize that chemicalization was transforming US industry. Way back in the booming twenties, when nobody had to stay up nights to make a living in building, H. K. Ferguson and some of his engineers decided to make themselves masters of the emerging new science of process design and building. C. P. Stohlberg, at that time one of the firm's mechanical engineers, recalls: "We decided that if you can pump water, you can pump sulphuric acid or anything else. So we simply learned the specific gravity and the corrosion properties of whatever we were dealing with and plunged into the equipment design job." Today Ferguson is one of the few firms which can start with a blank sheet of layout paper and deliver a completely equipped antibiotic plant or detergent plant or a powder plant (to name only a few) about ten months later.



RAYON PLANT IN HALF THE SPACE—a case study in building as little as necessary

In this 50 million-lb.-a-year rayon plant, process redesign cut the building area to half what has been normally required for this much capacity. This cut-staple plant, typical of Ferguson's integrated approach to design, procurement and construction, shows several innovations spectacular in the rayon industry:

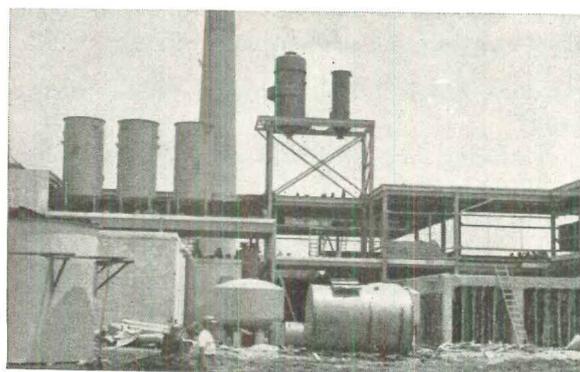
- ▶ Almost completely automatic operation, which permitted certain parts of the process to be located in open construction.
- ▶ Greatly increased size of process equipment. This cut floor-area requirements in half, for it eliminated most of the room usually needed for transfer and handling of the cellulose in various process stages.
- ▶ Greatly reduced cost of air conditioning.
- ▶ Use of direct gas-fired driers instead of steam. This equipment innovation meant enormous reductions in the space normally required for boilers and piping.
- ▶ Comprehensive provision for future expansion and for future process changes.

This huge Alabama plant is located within a day's journey of the wood pulp which it turns into cut-staple rayon (Ferguson studied 40 alternative sites before recommending this one to the client). It will increase US rayon staple fiber-producing capacity by 25% and represents the comeback of a British firm, Courtaulds, Ltd., who disposed of their American Viscose Corp. to obtain dollar credits for Britain before Lend Lease was set up during World II. Courtaulds' men worked with Ferguson engineers to develop what comes close to realizing a 25-yr.-old dream of rayon producers—and almost completely automatic round-the-clock process.

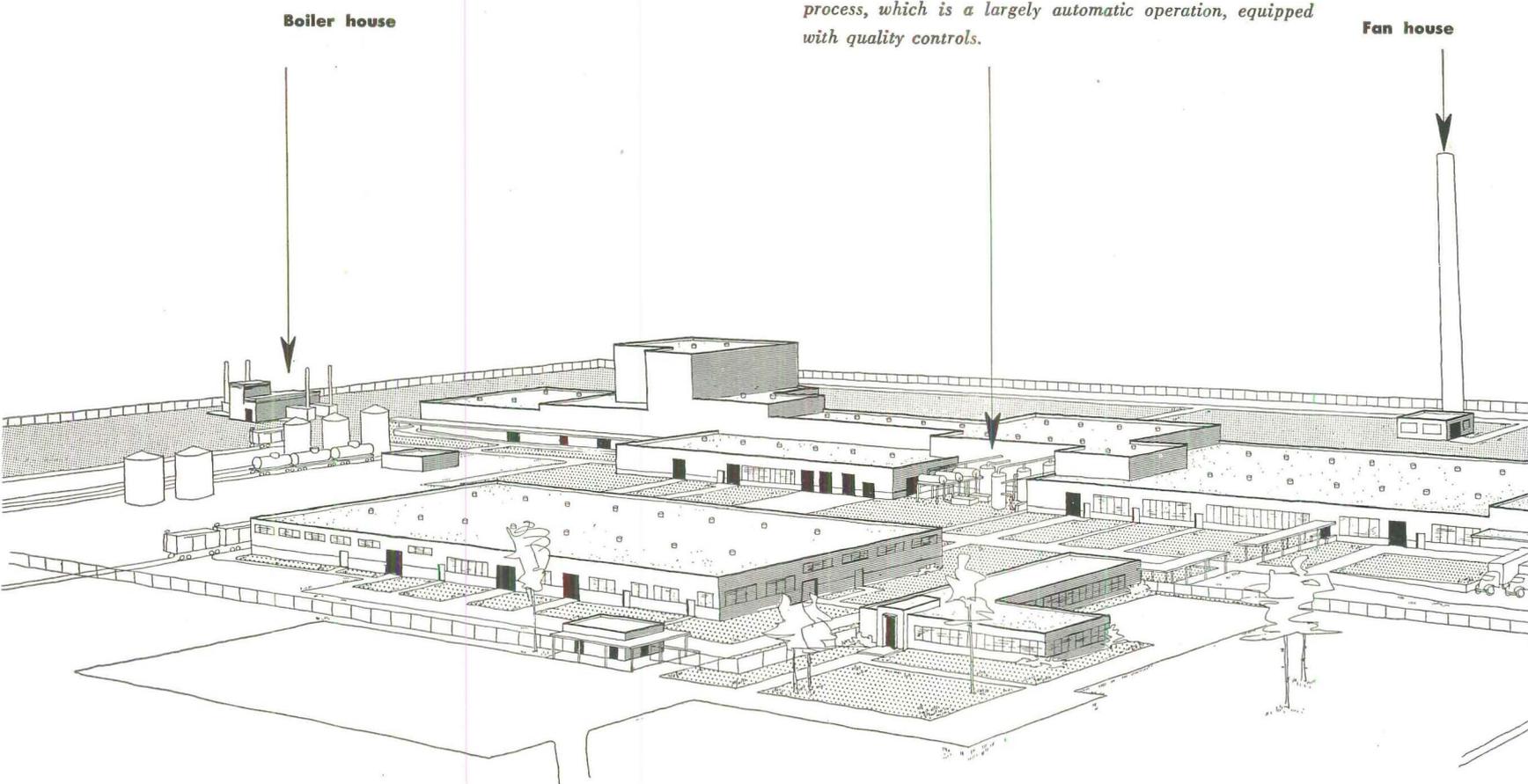
Open Construction. An acid recovery process, highly instrumentalized and equipped with special mechanisms for quality control, is located in open construction, saving the cost of building walls and roof. Careful restudy of materials was necessary; process lines, for example, had to be protected against sun load and freezing. The boiler house is also an open construction, with only the firing aisle covered.

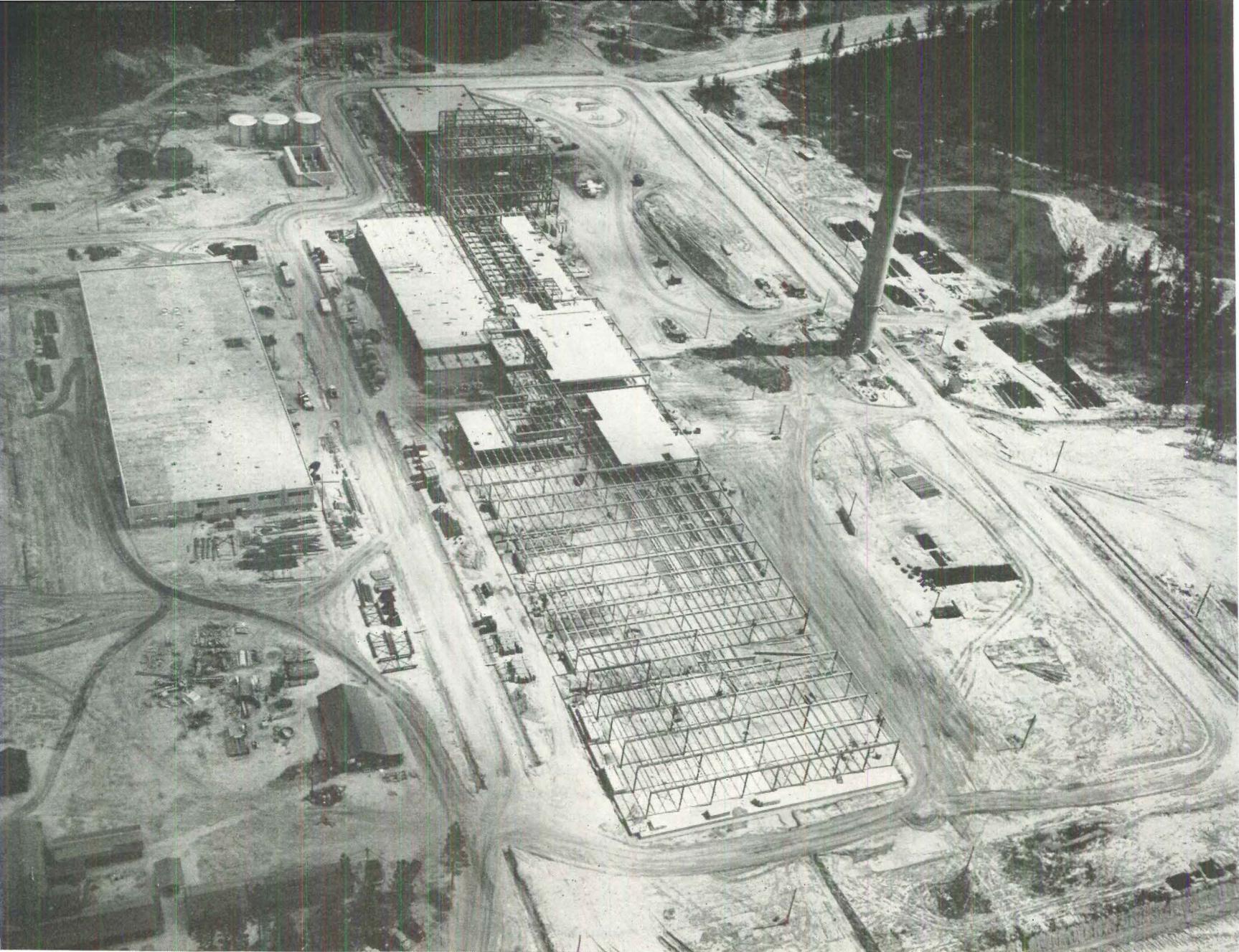
Air-conditioning cost has been cut to a fraction by 1) the increased size of process equipment and the increased amount of automatic operation which eliminated space air conditioning in most of the plant, and 2) Ferguson's skillful use of 70° F. constant-temperature well water. The presence of abundant constant-temperature water was an influential factor in the selection of this site. The air-conditioning and heating equipment has been decentralized for economy of space and operating flexibility. At unit points, the same coils are used for both heating and cooling. Running through these coils, the well water cools summertime air and heats wintertime air. Only a small amount of additional treatment is needed to bring air to the desired temperature.

Direct gas-fired driers are used in this plant for the first time in the industry (these dry the cut-staple fibers after chemical treatment). Ferguson engineers restudied the cost of coal to generate steam, decided it would be cheaper to burn gas direct, and, working with the equipment manufacturer, designed a new kind of drier in which the gas flame burns directly in the air stream instead of in an adjoining air-heating unit. This greatly reduced the floor area normally required for this process, eliminated the usual vast amount of steam piping, even cut truss height because gas driers are 1' lower than steam driers.



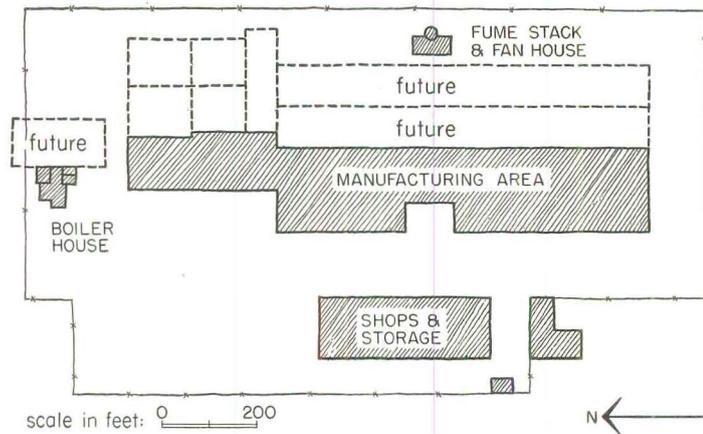
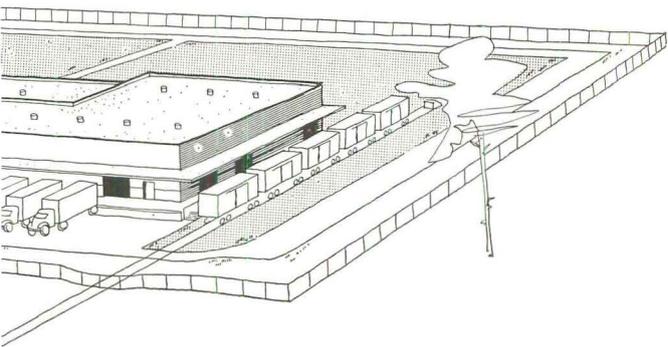
Open construction was used for part of the Courtauld's rayon plant. Walls were dropped around the acid recovery process, which is a largely automatic operation, equipped with quality controls.

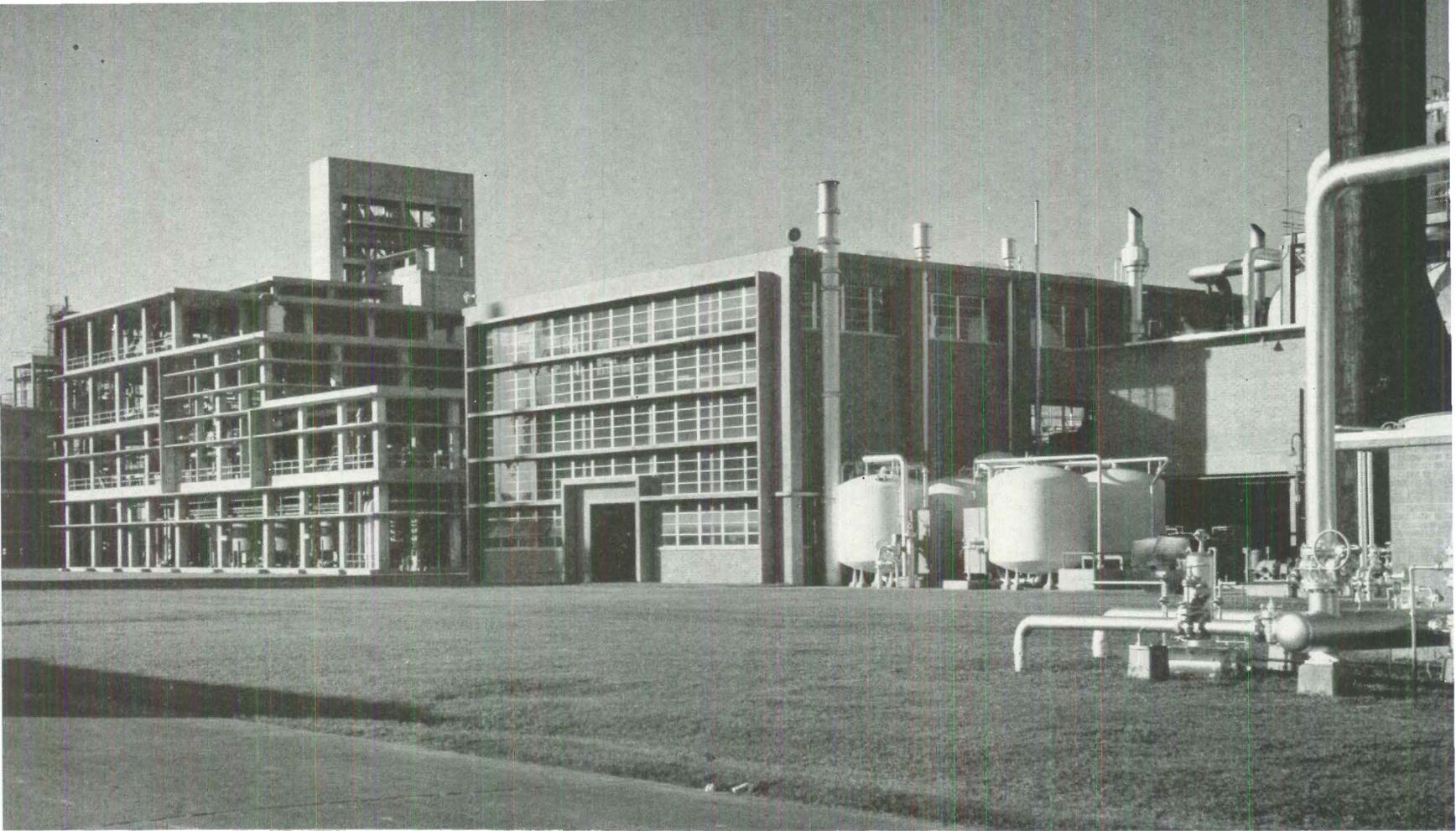




Thigpen Photo

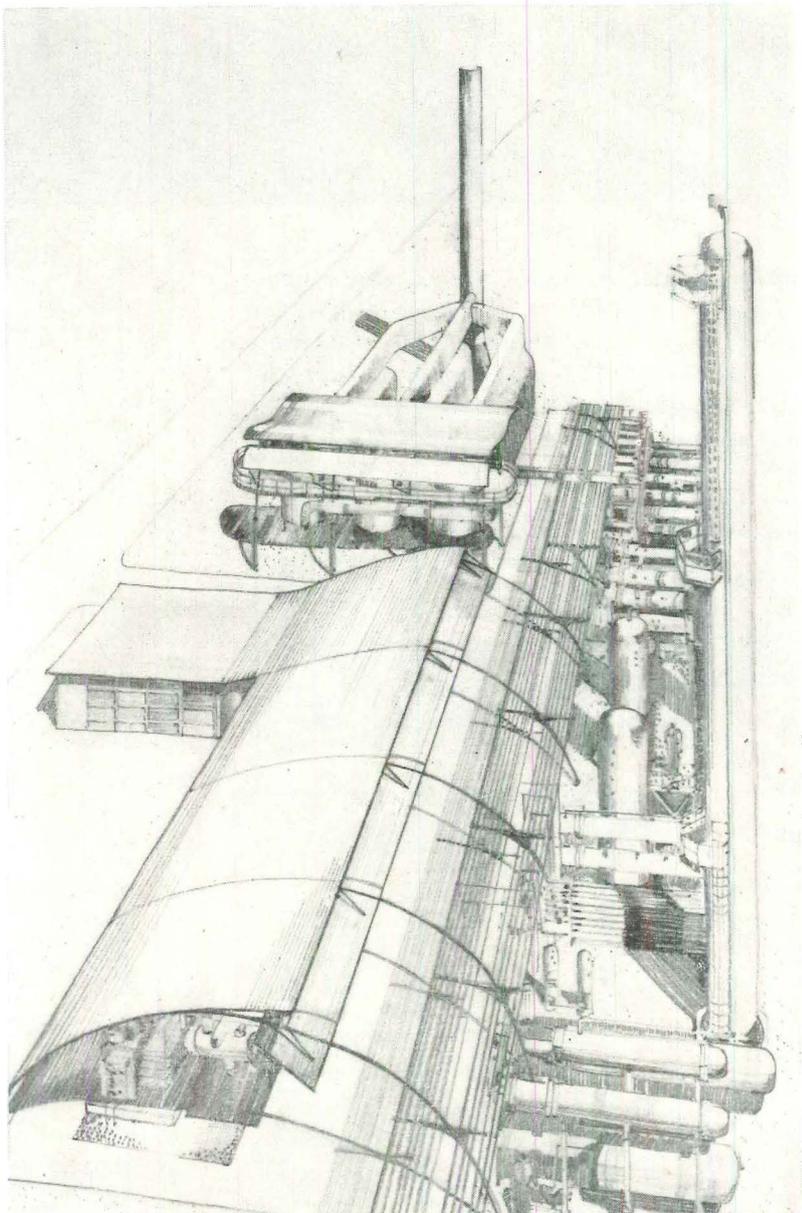
Room for expansion was a primary consideration in locating and planning this rayon plant for Courtaulds, Ltd. Note how present building was placed to leave room for later addition of two manufacturing buildings between the present building and the widely separated fume stack and fan house. Power plant, rail lines and docks were also placed where they would not block additions to the present building.



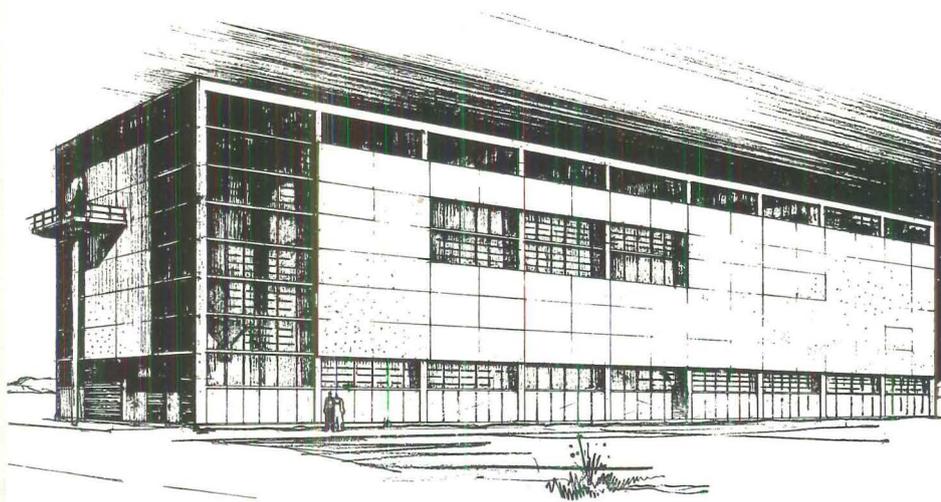


LIFE photo by Joe Scherschel

Corn Products' refinery at Corpus Christi, Tex. is pioneering example of open construction applied to chemical process plants. Its open floors solved the problem of how to handle the explosive dust-laden atmosphere.



Design study of curved shelter for process equipment (left) is part of Ferguson's exploration of the feasibility of adapting curved structural forms to the round shape of pipes, tanks and stacks.



Panel walls on the facade of this caustic building for an electro-chemical company fully express the easy detachability of the panels for reuse or replacement. The design gives the feeling that these walls are merely protective curtains for equipment, which is what they are.

OPEN CONSTRUCTION: new kind of industrial structure provides only support and shelter

Ferguson's recent work fully exploits an important new trend in the design of industrial buildings: open construction. This trend began decades ago in refinery building when designers began taking advantage of favorable climate conditions to drop the building walls and provide little more than a support and roof shelter for the personnel. Ferguson architects were among the first to extend this idea to process plants, and in the Corn Products Refining plant (left) dropped the walls to permit the mild Gulf winds to blow straight through the building, sweeping out the potential explosion hazard of a dust-laden atmosphere. Its design proved so successful that Ferguson has since recommended open construction for many other plant types.

Back of Ferguson's enthusiasm for open construction lies the recognition of two important facts:

1) A new kind of process plant is being built today: it is not an enclosure for machinery, but a sheath for a chemical process—a sheath so closely linked to that process as to merge with it.

2) Chemical production is moving from batch operation toward continuous automatic operation.

Both these facts mean that the process building is no longer predominantly a horizontal enclosure but a vertical support. They mean that its scale is no longer the human being, who is being supplemented by the automatic control, but the strange new shapes of process equipment.

Frank Whitney, architect responsible for the Corn Products plant and for the new designs shown in study form on the opposite

page, is now exploring a departure from the rectangular shapes into which industrial building has been frozen by its steel skeleton. Curved shelter, Whitney says, makes more sense in many cases; it provides a little better protection against wind and rain and wastes less space around the enclosed equipment. Whitney argues that the rectangular patterning of most architectural work is foreign to the curved shapes of tanks, tubes and spheres of most processes. For these reasons, he is studying the economics of switching from rectangular framework to curved steel sections. However, the latter have one big strike against them: they are not readily available in the sizes required.

Whitney's work also shows a welcome contrast to the monumentality evident in factory facade design in recent years. He urges clients to accept lightweight panel wall construction which can be easily moved and reused as the factory expands. And his designs fully accept and express the lightweight character and easy demountability of the wall panels (see rendering of enclosed process plant on opposite page).

Perhaps Whitney's ability to see these new design needs grew out of his experience. An architect who admires the work of Frank Lloyd Wright, Whitney was forced by the depression to go to work as maintenance engineer in an Ohio rubber plant. His job was to execute an endless series of process changes, at each one of which he found himself trapped by the surrounding building. Architect Whitney grew to hate the enclosing building and one day realized his feeling linked up with the shape of an industrial revolution.

STANDARD STEEL FRAME for universal use and easy construction

Many designers believe the way to cut the cost of steelwork is to reduce steel tonnage. Ferguson designers do not agree. After years of study, they have settled on the basic steel frame shown in the accompanying drawings as an economical solution in cases where a standard bay size can be used. This is the simplest kind of post-and-girder frame and uses about 5 lbs. of steel per sq. ft. While it would be easy to reduce this weight, Ferguson engineers believe 5 lbs. is the point beyond which reduction adds excessively to the cost of shop fabrication.

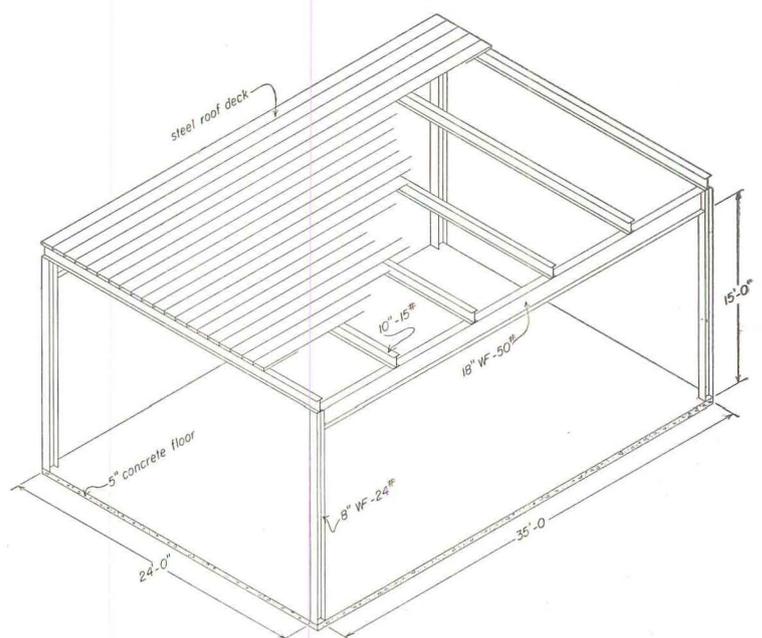
This steel frame is detailed on the basis of standard mill shapes stocked by any fabricating shop. Standard shop drawings for many common bay sizes are always available and cut three to four weeks from the time usually required for shop fabrication. The simple clip-angle connections could also be redesigned to save a small amount of steel but to do so would mean additional expensive fabricating labor.

Ferguson's standard bay is 35' x 24', adequate for most light manufacturing purposes, big enough for lift truck maneuverability, and the right size to accommodate 4' x 4' pallet storage with no waste space. This bay size is also carefully keyed to other building elements. It provides for 7' purlin spacing, which in turn makes use of 7' wide prefabricated roof sections the maximum size available in prefabricated roof decking. The 7' wide panel between purlins provides an economical sprinkler spacing within the limits set by insurance companies.

Ferguson's standard frame will carry a concentrated load well above the weight of its uniform load—in other words, reserve load capacity is available for hanging such added pipes and heating

and electrical equipment as may be required by changes in process and normal plant expansion.

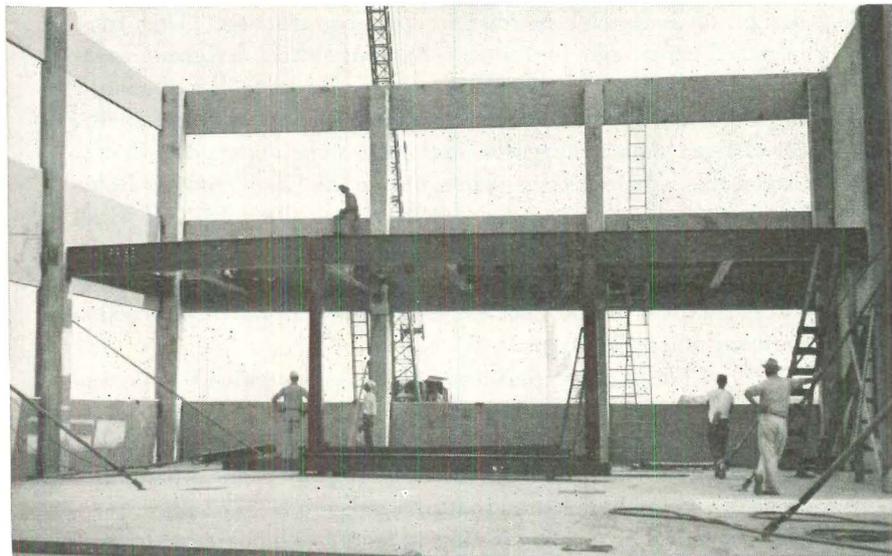
While this highly simplified steel frame is useful in most parts of the US, it is not economical on the West Coast where the cost of steel is high enough to counterbalance the extra fabricating costs required by a more intricately designed frame.



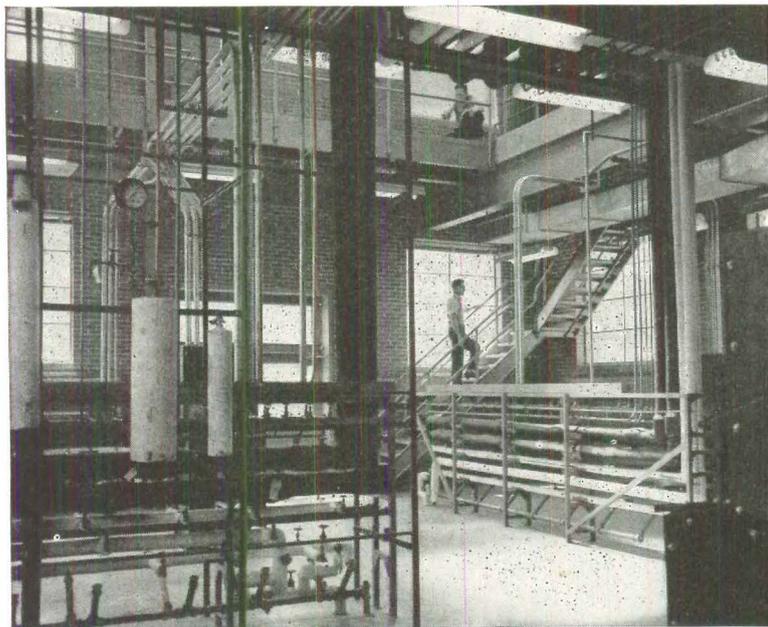


PRECAST CONCRETE WALLS, used more and more by industrial builders, are designed by Ferguson to make possible the use of continuous steel sash. To provide clear column-to-column window openings, the concrete columns (precast in the field) are recessed, and the precast wall panels are attached both above and below the sash banks. Continuous sash is clipped directly to the columns. Thus the concrete wall panels above the continuous windows are supported only by the columns. This support was worked out by embedding matching steel weld plates in the columns and wall panels, and making field welds for rigid connections. Edgar A. Griswold and F. Thomas Collins, Los Angeles, were consulting engineers on the concrete work on this job.

CONSTRUCTION DETAILS: precast walls with upside-

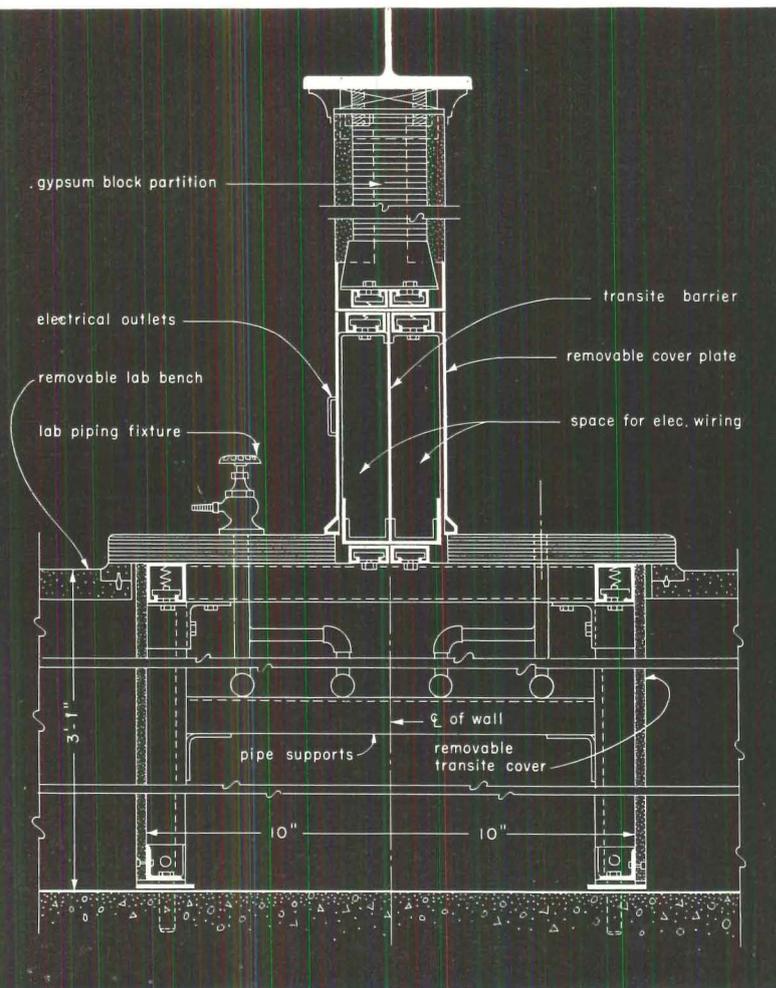


Precast columns and wall panels provide column-to-column windows. Like the roof (right), floors are steel framed. This is the Los Angeles plant for US Rubber's Naugatuck Chemical Division.



FLEXIBLE LABORATORY PARTITIONS, which can be disassembled with a wrench and quickly moved to another location, provide support for the vast amount of laboratory service piping and provide ducts for laboratory electrical needs.

The partitions are built of standard light steel sections bolted together. Sections are bolted in pairs to the steel beams supporting the floor above. Top of the partition frame is enclosed with gypsum block. The center portion contains the electrical ducts and supports the service shelf with its service outlet fixtures. Access to the electrical wiring is provided by removable metal plates as shown on the drawing. Lower section houses the piping which is easily accessible through removable panels.

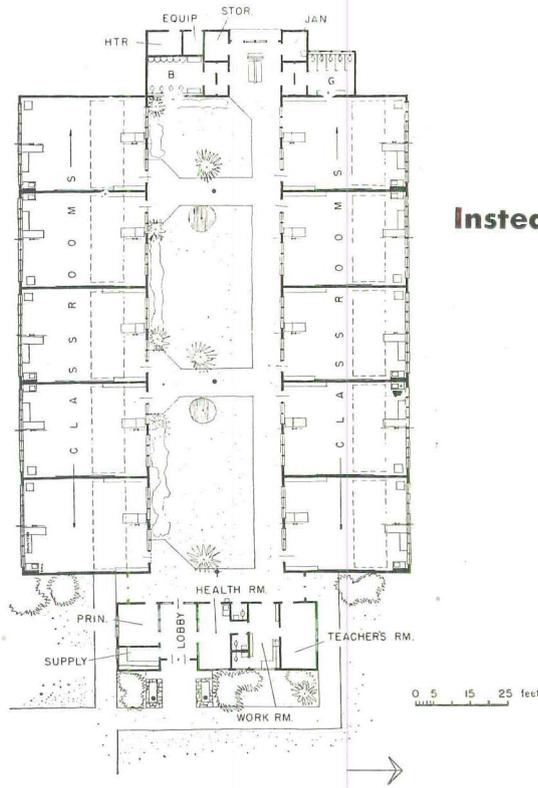


Flexible service partitions in Carbide & Carbon Chemical Corp.'s research lab at South Charleston, W. Va. permit any bench to be removed without disturbing service piping.

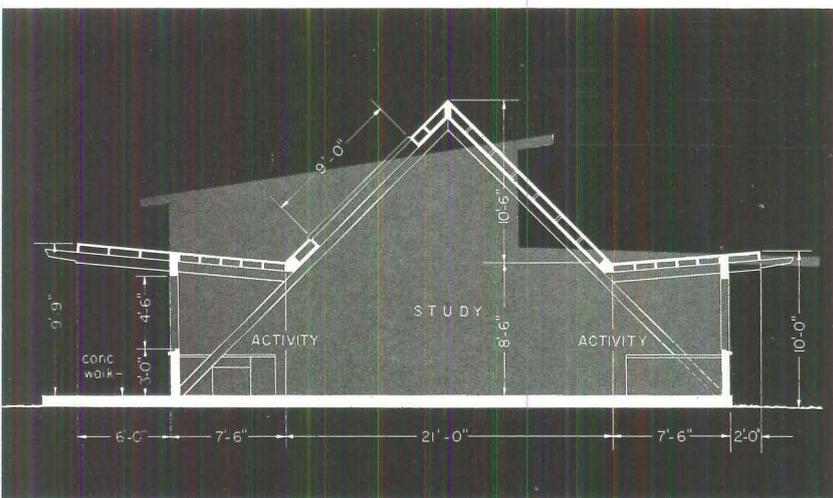
TENT-SHAPED SCHOOL

Instead of walls, a skylight roof.

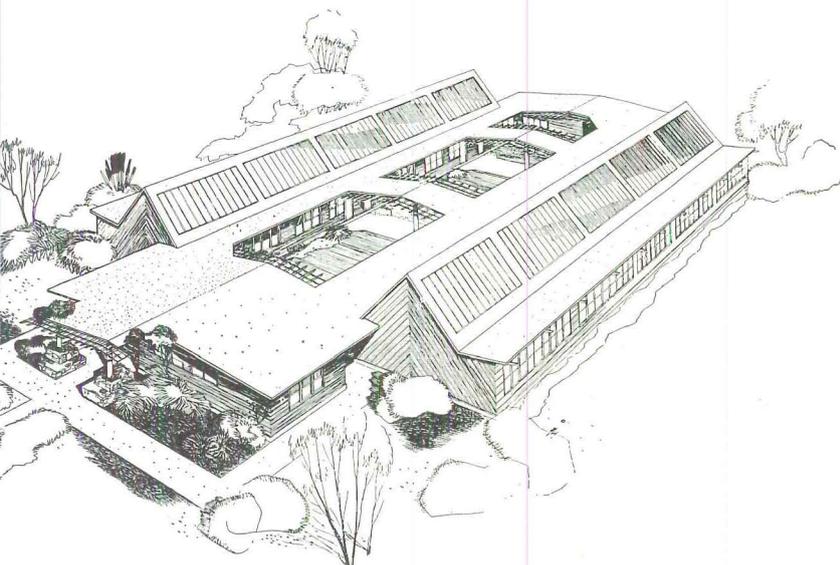
Result: excellent daylighting, low cost



South window overhang is only corridor.
Fire drill empties school in 45 seconds.



Section above is north wing superimposed on typical classroom outline. Cubage of the "A" frame classroom is 11,038 cu. ft., compared with 12,143 cu. ft. for the same room with conventional clerestory.



Here is a simple, obvious way to cut school costs: omit the walls. Architect Stanton had a school-board request all too familiar to school architects everywhere: "Give us those nice things like acoustical tile, panel heating, built-in cabinets, lots of chalkboard and pinning space, light from everywhere, classroom activity space. . . . But give it to us cheaper!"

Stanton was already doing bedrock-priced schools and the only way he could see to go below bedrock was to eliminate exterior walls. In effect, that is just what he did by putting his roof on the ground, then lifting its lower edges like a tent flap. As a result, Morgan Hill got a quality school with all the nice things it wanted, including exceptionally fine lighting, for less than \$10 a sq. ft.

While the structure looks strange and the architectural handling of adjuncts like the porch could be more coherent, Stanton took care to see that actually the construction is not strange at all. Once the steel was up (in less than three hours), there was not a material or construction method unfamiliar to ordinary wood-frame housebuilding nor a span longer than 13'-6".

The only structural steel is that of the ten "A" frames—one frame at the center of each classroom. Classroom cross-partitions are 2" x 6" studs spaced 16" on centers. The 2" x 6" roof purlins span between these load-bearing partitions and the "A" frames. Outer supports for the "tent-flap" roof decks are 4" x 6" structural posts built into the 2" x 6" stud wall at the lines of each cross-partition and "A" frame.

Head bumps for children from "A" frames are a hazard unless the room is set up as planned with desk or casework as a protective obstruction beneath the beam. Robert Rice, district superintendent, reports no accidents.

"We consider the lighting the most satisfactory feature of all," he reports. "On the darkest days, a minimum of artificial light is used. On bright, sunny days, the rooms have a most pleasant diffused light." Stanton considers this his best school lighting job.

Classrooms are 35'-6" x 27' with short side on the exterior. Besides yielding the obvious economy of shorter corridor and exterior walls, this proportion concentrates activity area at one side, which many of Stanton's clients prefer to the side-and-rear activity area of the square room. South windows of south wing are shaded with blinds. Court is 37' wide, too narrow for use except as garden but ten-acre site affords ample play space.

Note also the way Stanton has eliminated toilet-room congestion and facilitated supervision by providing space outside toilets, at playfield entrance, for students to wash their hands.

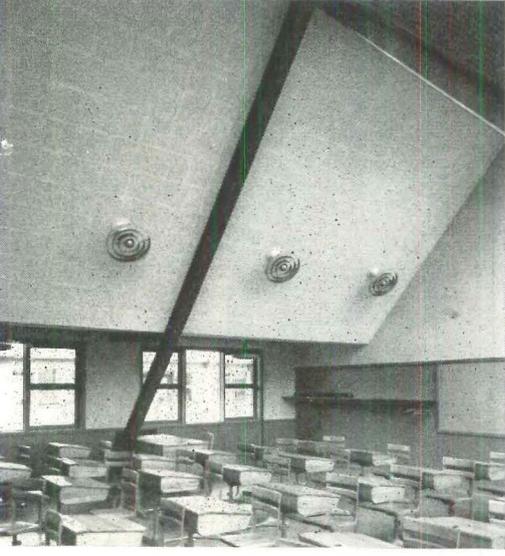
For California, where the question of instituting stock plans for schools is coming to a boil in the legislature and where some communities are combating high first costs with cheap, high-maintenance materials, Stanton's school points a pertinent moral: Here is the kind of successful design and cost experimentation that stock plans would make impossible. Here is below-bedrock cost that stems from ingenious construction, not shoddiness.

Cost data:

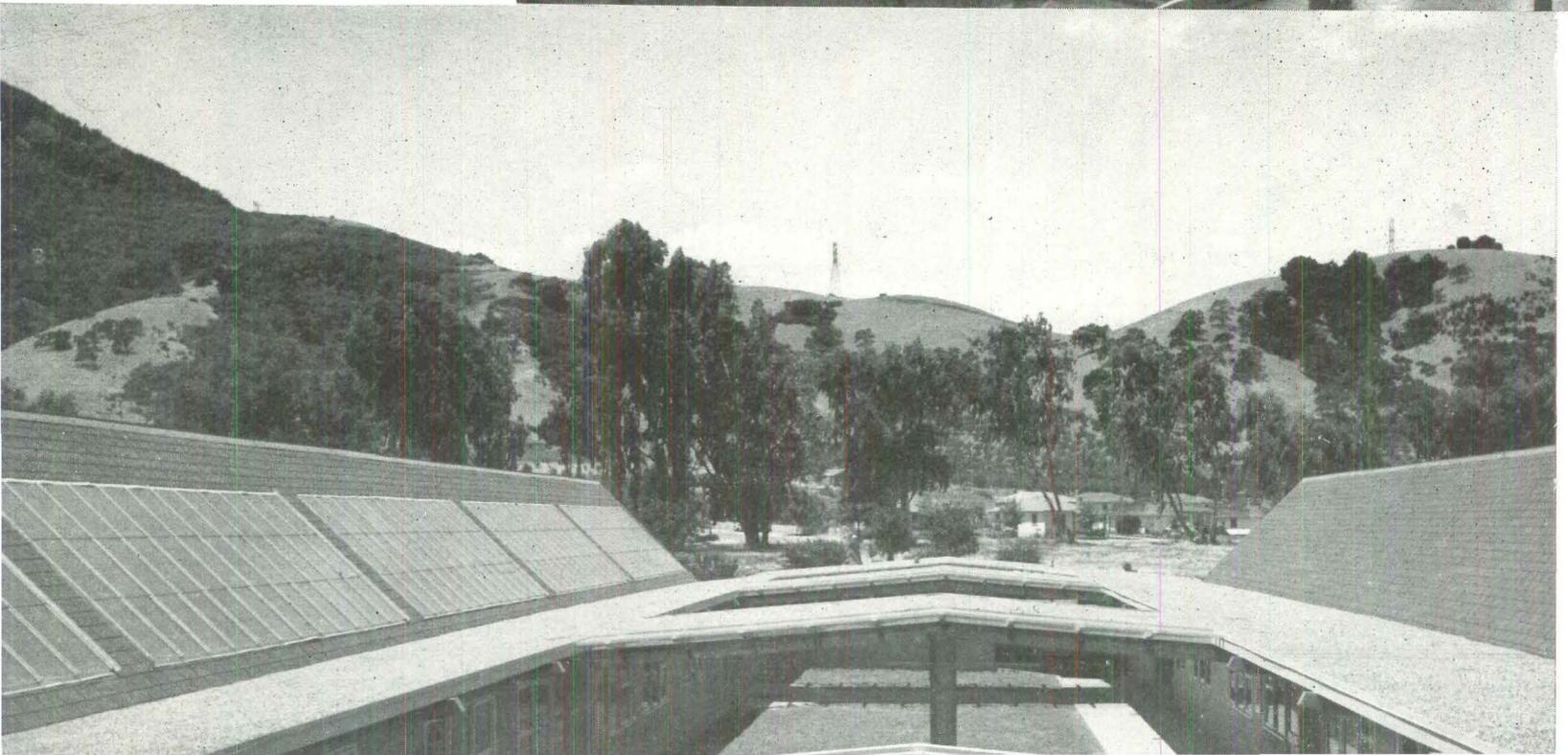
Construction, excluding \$12,728 architect's fee..	\$160,847.00
Per sq. ft.	9.80
Per classroom	16,084.00
Per pupil	536.00

P. A. WALSH INTERMEDIATE SCHOOL
LOCATION: Morgan Hill, Calif.
ROBERT STANTON, architect
GEORGE C. LENZ CONSTRUCTION CO.,
general contractor

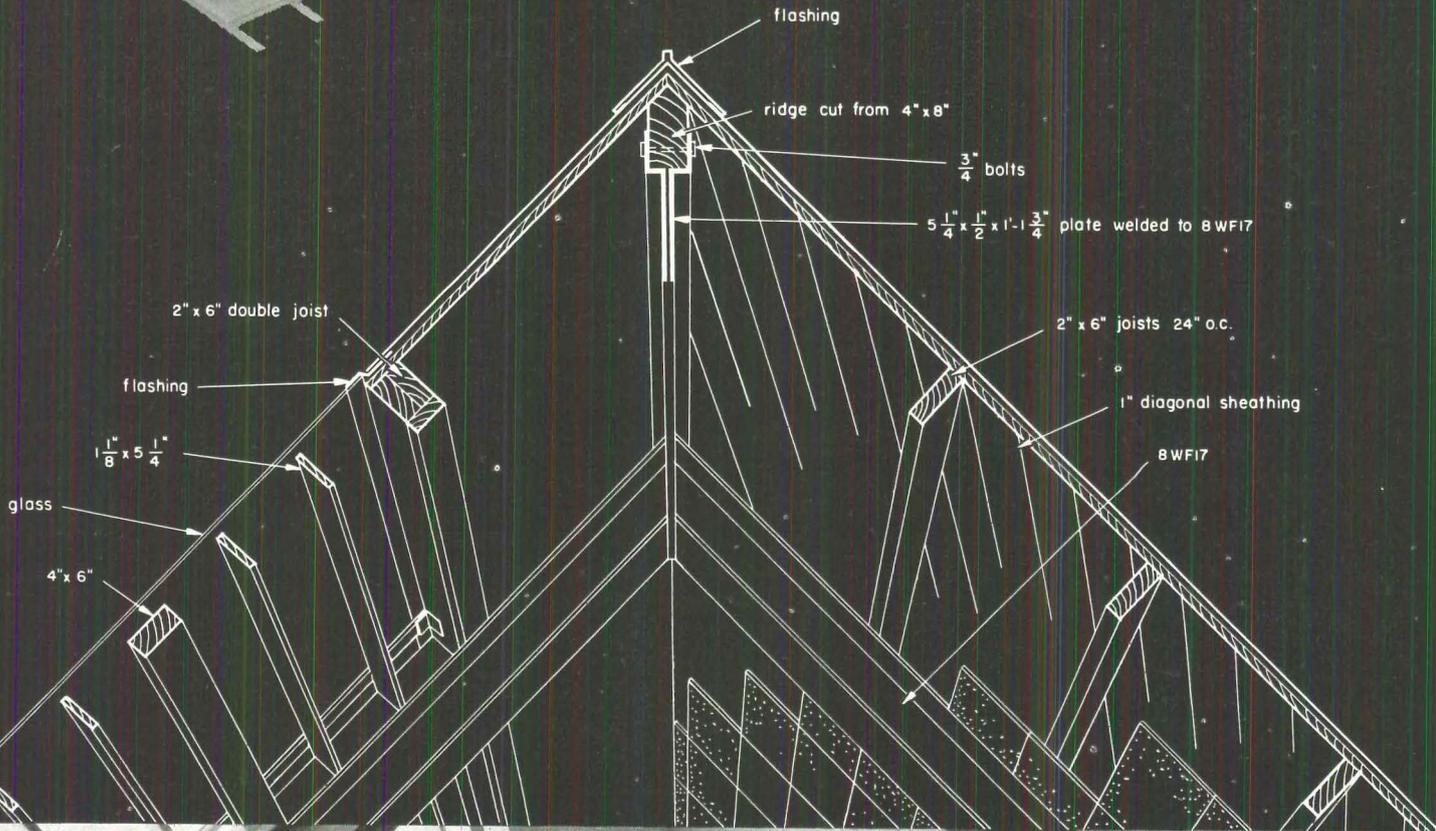
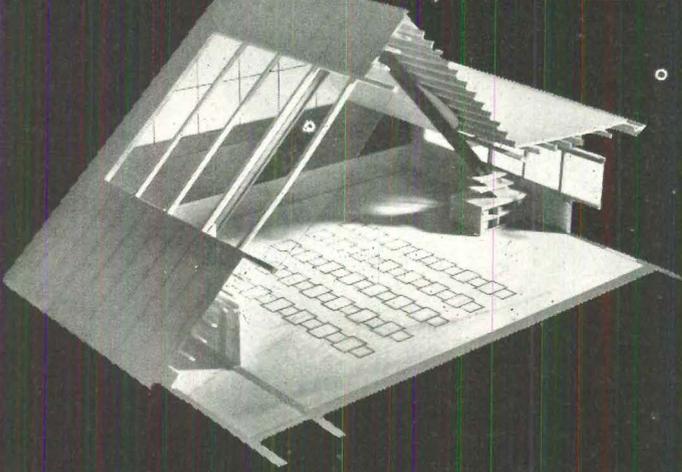
Photos: j. dale healy



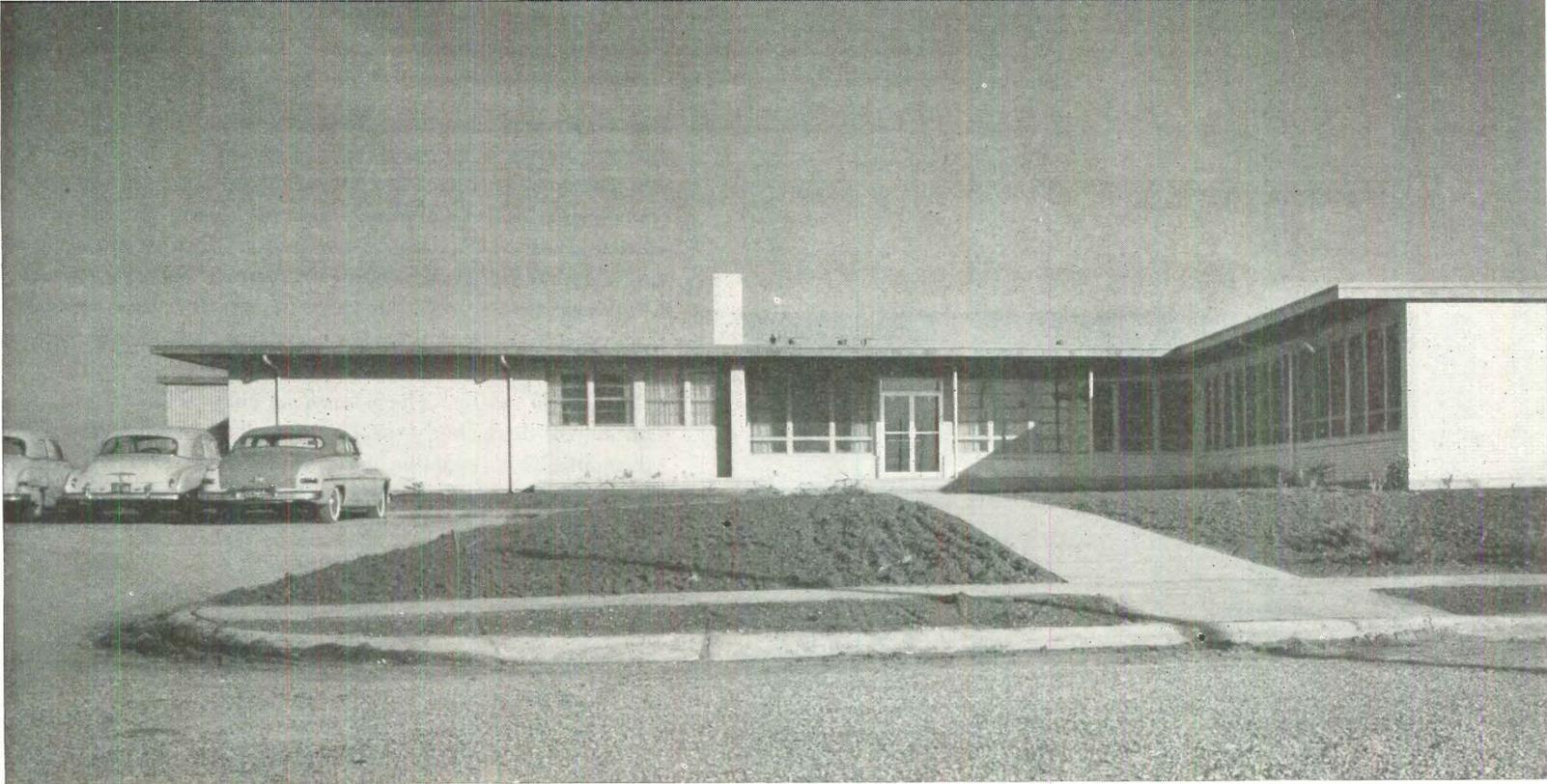
Economical tent construction gives lighting bonus: toplight through north roof slope of each classroom. Foot-candle and foot-lambert readings are almost identical in two wings. Concentric fixtures on slant work well. Side windows provide ventilation; heating is hot water radiant in floor panels.



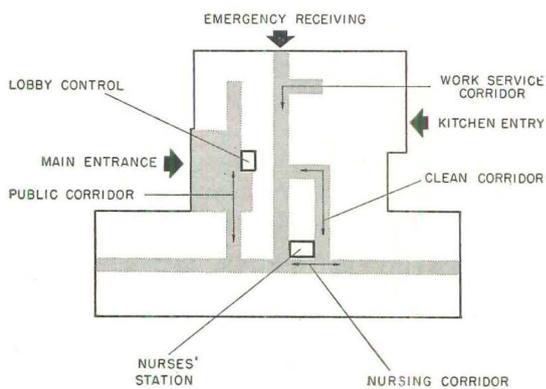
In original scheme roof was carried to the ground on noncourt sides of classrooms as in model at left; triangular niche at floor was filled with counters and cabinets. In final scheme wall was pushed out for more windows, greater cubage. Roof structure is 2 x 6" rafters spanning from "A" frames to cross-partitions.



Photos: (top) Maynard Parker; (below) J. Dale Healy



\$7,737 PER BED HOSPITAL: a case study in cost cutting



LOCATION: Anson, Tex.
 CITY OF ANSON, owner
 DON W. SMITH, architect
 ROBERT L. KING, planning consultant
 BALFANZ CONSTRUCTION CO., general contractor

This 30-bed hospital (expandable to 72 beds) merits attention for two big reasons:

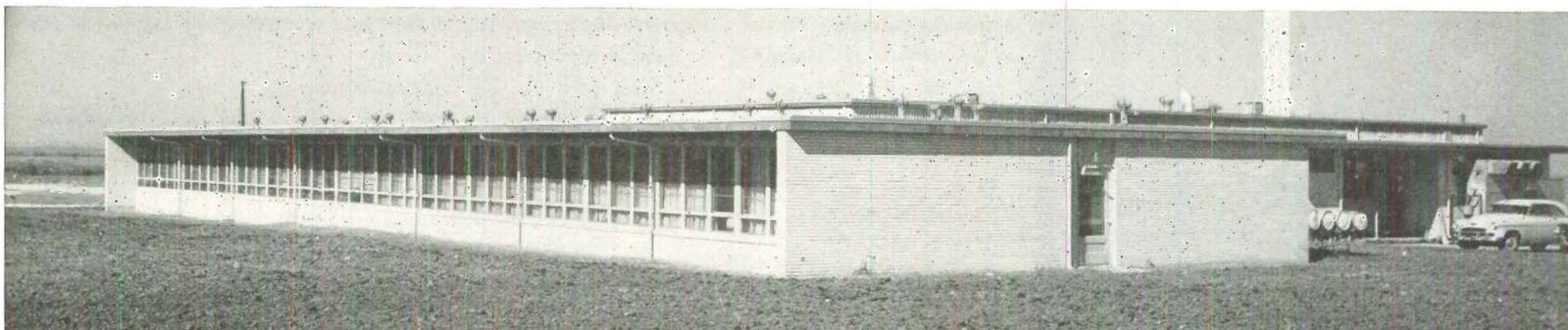
1. Its floor plan—excellent for separation of circulation, placement of control points and use of economical interior space. The fundamental economy of a short-perimeter area is handled so interior space is not a necessary evil but a positive advantage.

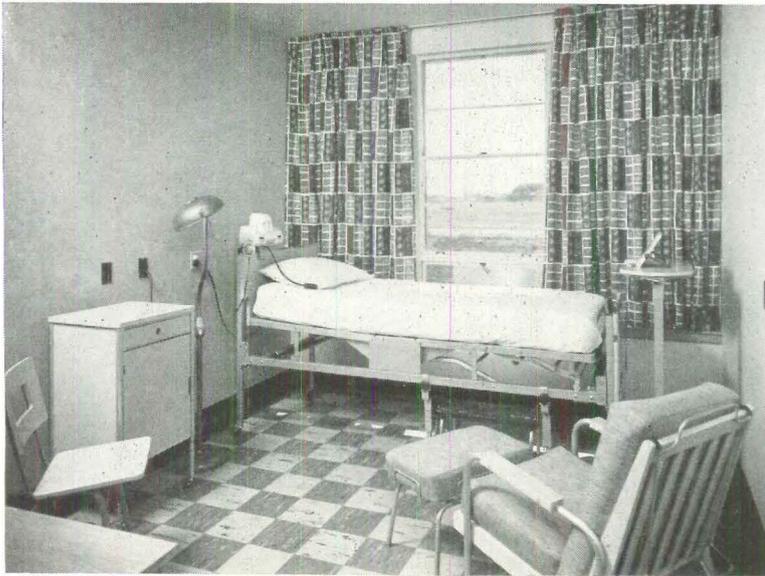
2. Its cost—low to begin with, and then trimmed a spectacular one-third. Planner Bob King and Architect Don Smith cut a 1950 construction bid of \$350,000 to a 1951 bid of \$232,000 during a period when average hospital building costs increased 10%. They did it without changing interior finishes one iota, without sacrificing the plan's virtues and with the laundry the only real casualty. Revision of the floor plan (see p. 131) demonstrates how much can be done with design therapy instead of amputation.

The way the city of Anson, in thinly settled west Texas, tackled its hospital problem provides a third moral. The city fathers hired King (now busy on country-wide social plans in South America) to do a complete consulting job from beginning to end—starting with a survey and the writing of a program right down to purchase of the last piece of equipment and instruction of the administrator on how to get the most efficiency out of the plant. One result of this "luxury": a total per-bed cost \$4,600 under the national average.

These are the areas where Smith and King cut 35% off costs:

Nursing wing; kitchen entrance is at right. Photo at top of page shows pleasant, unpretentious main entrance





Typical patient room. Furniture is rift oak on anodized aluminum frames. High proportion of single rooms gives 44-bed emergency capacity.



Operating rooms and other facilities used for relatively short periods are in interior space. Laboratory (left) is typical of more steadily used perimeter rooms. Air conditioning plus attractive furnishings and finish are calculated to win peak occupancy during competitive times.



▶ Structure—14% saving. Wall structure was changed from steel frame with brick masonry to wood frame with brick veneer; roof was changed from steel frame and lightweight aggregate to wood frame with built-up roofing. Concrete floor slab, metal lath and plaster partitions remained the same. Elimination of steel was advisable in any case because of shortages, King reports.

▶ Air conditioning—8% saving. Individual room controls were eliminated in favor of a three-zone system; full summer and winter air conditioning was retained.

▶ Plan—13% saving. The interesting point about these changes is that none of them singly was dramatic; but together they add up to a dramatic 15% reduction in square foot area and, King thinks, to a revised plan at least as good as the original and in some respects better. To see how it was done, look at the two plans and note the following revisions:

1. one patient room eliminated (but 30-bed total retained);
2. fathers' waiting room (beside nursery) eliminated;
3. therapy bath eliminated; sitz bath moved to examination-treatment room;
4. floor pantry reduced in size;
5. drug room reduced to drug closet and relocated by nurses' station;
6. toilet in obstetrical suite eliminated;
7. nurses' lockers moved across the corridor;
8. central sterilizing and supply slightly reduced;
9. emergency suite moved closer to emergency entrance, replacing laboratory;
10. laboratory moved to corner, replacing administrator's office;
11. administrator's office included in general business area;
12. kitchen rearranged and scullery relocated;
13. basement stairs moved near emergency entrance and provision made for crank-type lift (used for loading bombs on military aircraft);
14. (not shown) basement laundry eliminated and central storage enlarged, reducing basement from 2,329 to 1,497 sq. ft.

What Smith and King retained is more suggestive and significant than what they chose to eliminate. Circulation remains unusually well separated into nursing, work-service, clean and public corridors. Nursing station is placed to control the first three of these; clerk at the lobby control point supervises records and handles doctor's dictation. Administrator of this hospital serves as radiologist; hence the proximity of his dual offices.

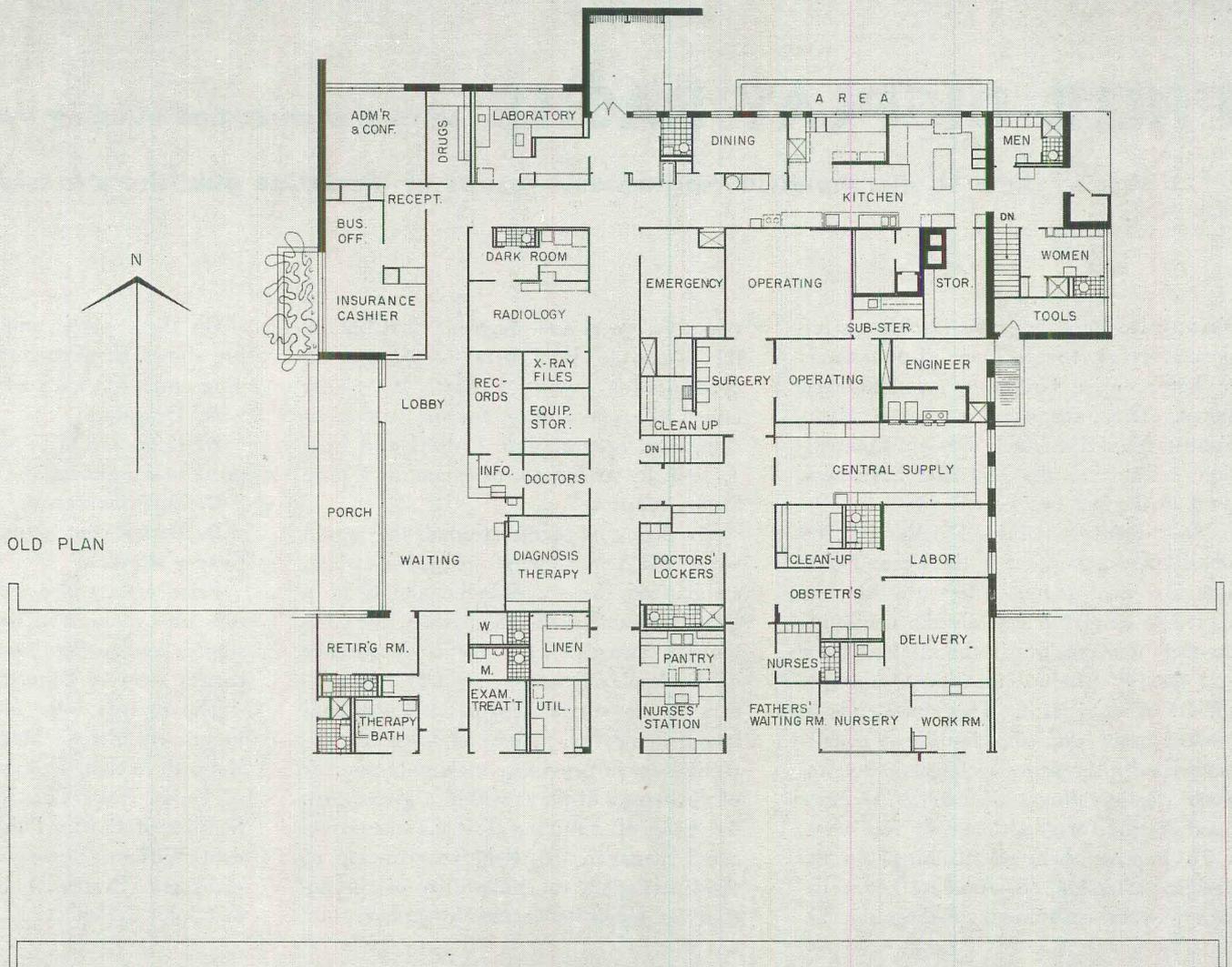
Lack of daylight in some parts of the hospital is a decided drawback, but King has allocated to the interior only those rooms used for short periods.

Present expansion plan is to increase bed capacity first by adding two or four rooms on the first floor, then by adding a second story to the nursing wing. The retiring-waiting room can be converted to a stairway, the lounge toilets replaced by a hydraulic lift. Similarly, additional business space, plus offices for public health and community welfare, can be added by second-story expansion in the administrative-laboratory-emergency area, extending southward to meet the second-story nursing-wing expansion, if need be. However, because of cheap land and frame construction, it may prove more economical and less disruptive to expand horizontally instead of vertically.

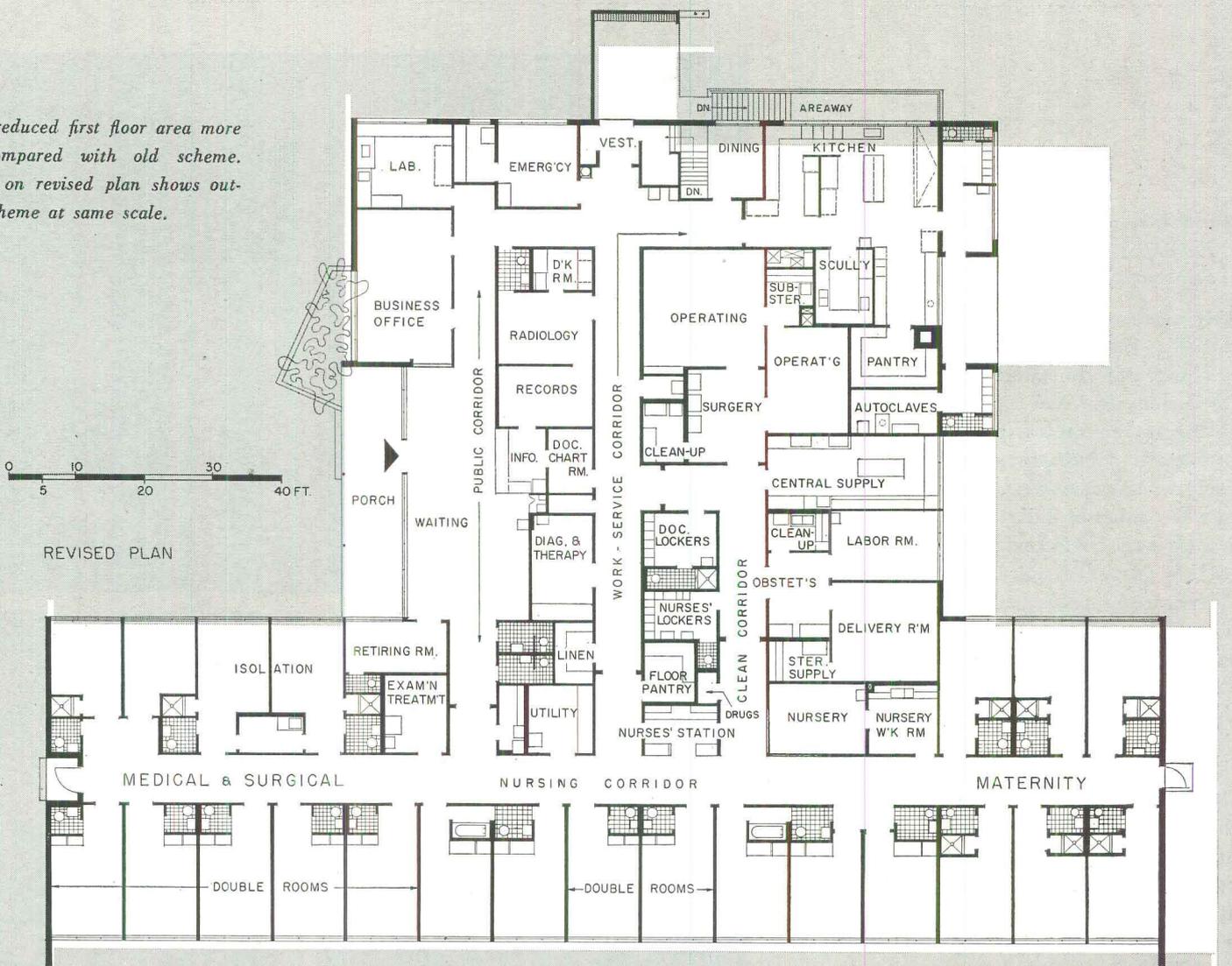
Cost data (1/2 Hill-Burton funds):

Construction total	\$232,125
per sq. ft.	15
per bed	7,737
Complete total*	326,000
per sq. ft.	20
per bed	10,867

* including fees, site survey, all equipment



Revised plan reduced first floor area more than 11% compared with old scheme. White overlay on revised plan shows outlines of old scheme at same scale.



PRIZE DISPLAY RACKS show designers and building owners

how to merchandise magazines—results of magazine publishers' design competition

These prize magazine racks teach some important lessons for designers of newsstands in hotels, office buildings, terminals and stores. They are winners of the MPA-FORUM Magazine Rack Design Competition, selected as the best that have been built in the last two years.

Most display facilities for the 100,000 retail magazine outlets in the US and Canada are inadequate. They are not designed to display effectively the maximum number of magazines in the allotted space and thereby produce maximum sales per sq. ft. of floor area. The newsstands in modern hotels and office buildings, usually designed by the same architects who produce the buildings, frequently sacrifice good display for good looks, or vice versa.

To impress these shortcomings on the design profession, to stimulate better design and to encourage collaboration be-

tween designers and magazine distributors, the Magazine Publishers Association in collaboration with FORUM last year launched a competition for the best racks completed between Jan. 1, 1951 and Nov. 1, 1952 by architects, designers and store fixture makers.

To 600 contestants around the world went MPA's 12-page program which emphasized the six essential points of a good magazine rack—the basis of the competition awards: 1) Esthetic appearance of the display fixture in itself and in relation to its surroundings. 2) Functional layout in relation to surroundings. 3) Effectiveness in providing maximum number of full cover displays within a given area. 4) Ease of handling for the magazine-stand manager. 5) Relative economy of the installation. 6) Suitability of the design for repetition in similar outlets.

On these pages and pp. 150 and 154 are shown the first and second prize-winning entries in each of four classes:

- A. Drugstores.
- B. Hotel and office-building lobbies, airports and railroad and bus stations.
- C. Supermarkets.
- D. Department stores, cigar and stationery stores.

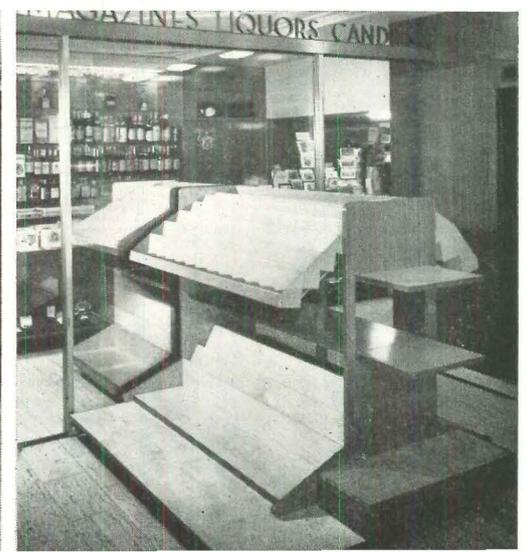
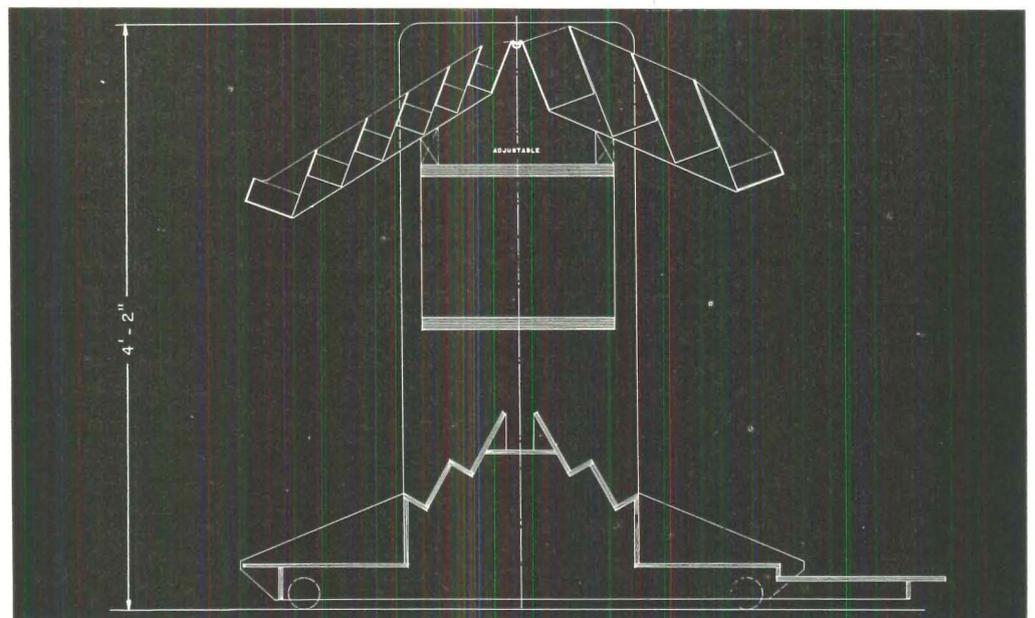
Prize money also went to the distributors who cooperated with the winning designers and to additional designers whose entries received honorable mention.

The awards were made by a five-man jury: Architects Morris Ketchum and Kenneth Welch, Designer Horace Foulkes of Union News Co., Vice-President S. O. Shapiro of Cowles Publications and President William Rogers of S-M News Co., chairman. Professional adviser was Architect John Callender.

Grand Prize and First Prize—Class B—\$1,000

*Frank F. Ehrenthal, AIA
San Francisco, Calif.*

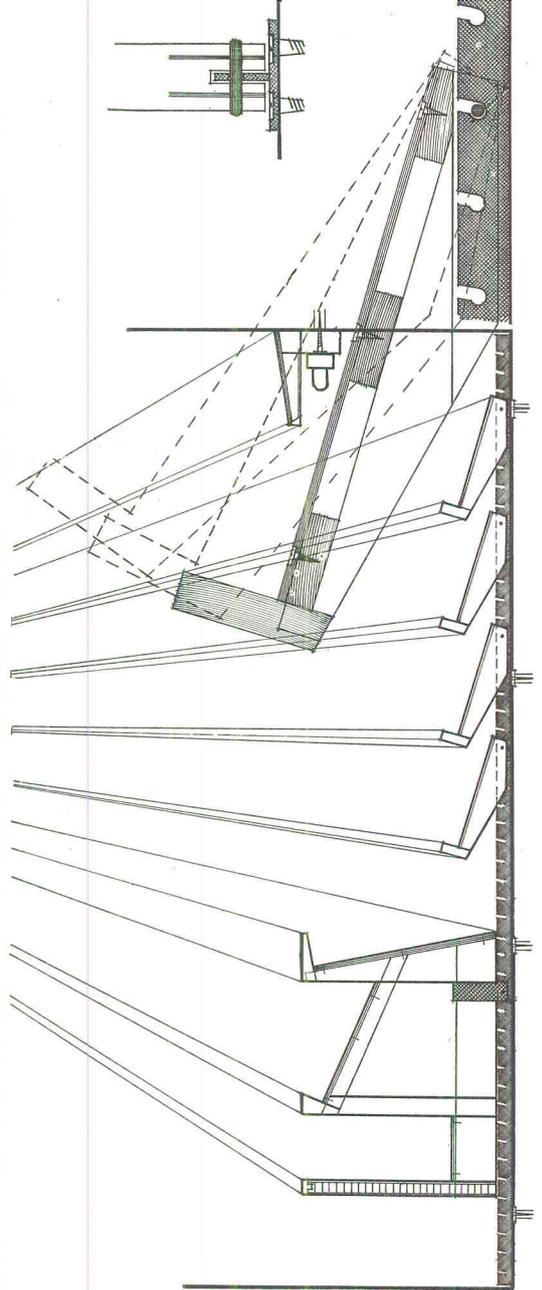
Jury comment: "A special requirement in this class (hotel and office-building lobbies; rail, bus and air stations) is some means for locking the rack up at night without having to remove all the magazines. This problem is solved satisfactorily and ingeniously in this island-type rack which rolls into the adjacent cigar store at night and is locked up behind glass doors. The rack itself is attractive and efficient. The upper shelves are adjustable, and in the dead (i.e., not readily visible) space immediately below them is a flat shelf which should be very useful for extra stock, especially for the big selling magazines displayed on the flats below. It received the Grand Prize on the basis of its over-all excellence as a design for selling magazines, rather than for the ingenuity with which its special requirements were met. The Jury felt that the rack design, quite apart from its roll-away feature, was admirable and could be adapted for use in many types of installations."



First Prize—Class D—\$500

*Aaro Mikkola
Helsinki, Finland*

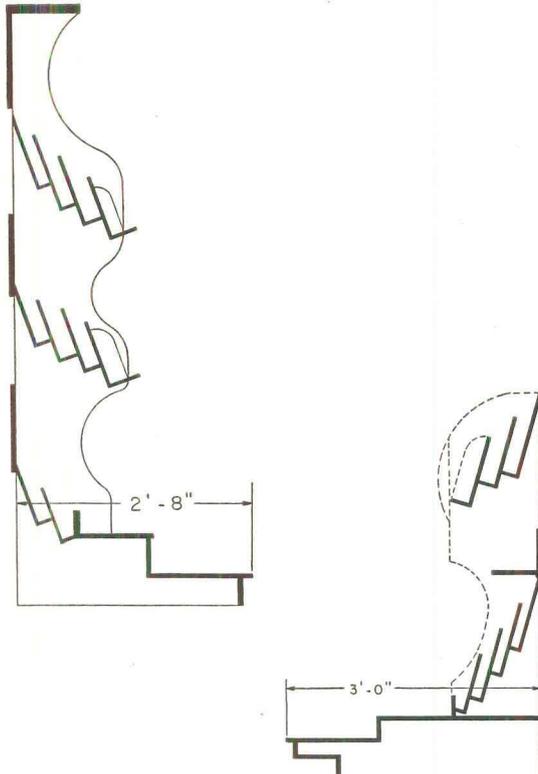
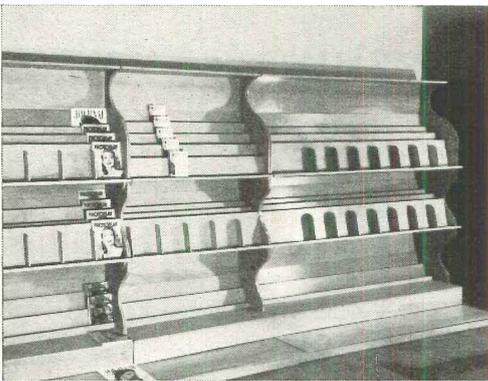
“ . . . a very attractive built-in wall rack, with shelves adjustable in both height and slope. This design was considered suitable for wide use in department stores and the larger stationery stores. The designer was also commended for an excellent presentation.”



First Prize—Class A—\$500

*Vagn H. Lange
Thornhill, Ontario, Canada*

“ . . . a wall-type (drugstore) rack—well located, adequately lighted and well designed. It has ample flat space essential for the display of the largest-size magazines and to accommodate the big stacks of those magazines which sell in large numbers. Sloping shelves for upright display are designed for full visibility and easy reaching and are deep enough to hold a considerable stock of each magazine. Sight lines have been preserved and all magazines are visible to a normal adult standing in front of the rack. From this position he can easily reach a magazine in the uppermost rack.”



First Prize—Class C—\$500

*M. L. Freed
Calgary, Alberta, Canada*

“ . . . a large, low island-type fixture, well located and well designed for its purpose as a supermarket fixture.”





THEATER ARTS CENTER

The way to solve a complex problem is to make it simple

This arts center for Sarah Lawrence College is the biggest building designed by Architect Marcel Breuer since he came to this country in 1937. It is a highly ingenious architectural achievement, full of innovations such as a stage, part of which is on a hydraulic lift, a stage-lighting arrangement that gives the operator visual as well as push-button control, and a new type of seating arrangement that equips the auditorium for any number of different functions.

Perhaps more importantly, the building is a dramatic affirmation of Breuer's belief that a good part of our architecture is too concerned with the refinement of inconsequential detail, and that architects could learn a lesson from unsophisticated building the world over and return to the unaffected beauty of simple materials simply used.

So this building is both a collection of sophisticated functional solutions and an exercise in down-to-earth building (with an awful lot of good taste thrown in with the concrete blocks).

The functional problems Breuer had to solve were complex enough. Progressive teaching techniques as practiced at Sarah Lawrence demanded—

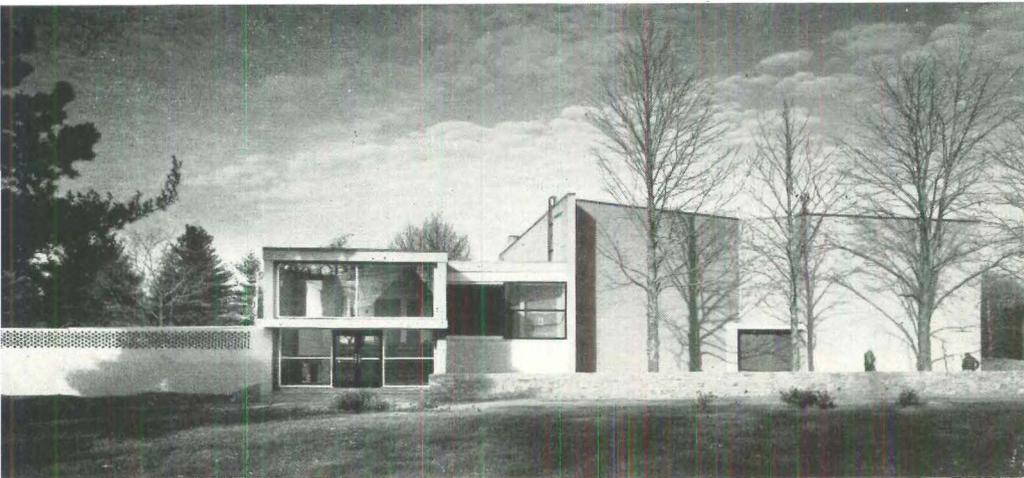
- ▶ A 500-seat theater so flexible that it could be used arena-style, or in the traditional manner, or as a nightclub, or as a lecture and discussion forum, or (when opened up on one side) to provide an outdoor stage.
- ▶ A theater foyer that could double as exhibition space.
- ▶ A common room with snack bar, supply store, terraces.
- ▶ A dance studio.
- ▶ A complete music department.
- ▶ Plus all the services, dressing rooms, storage and equipment areas that go with such a program.

A glance at these pages proves that Breuer's solution, within a characteristically tight college budget, is something more than a mere expression of these requirements. But in answering these requirements, the architect developed a handful of new ideas and devices that will make theater designers rethink some of their past solutions. For a discussion of some of these devices, turn the page.



Photos: Ben Schnell

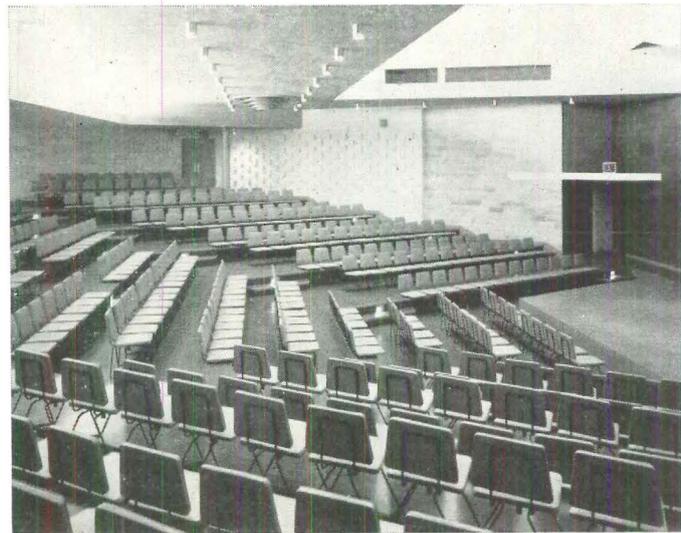
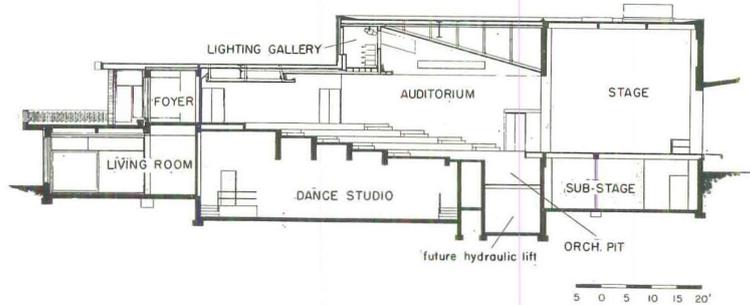
View from south shows upstairs terrace outside theater foyer, sliding glass walls of common room downstairs. Main entrance is at right.



Main entrance is at left, foyer above, theater at right



Common room seen from snack-bar level



Auditorium with seating set up for full, arena-style performance

Dance studio underneath auditorium is triangular, has mirrored wall to enable dancers to observe own movements.

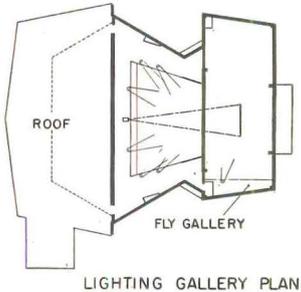


LOCATION: Bronxville, N. Y.
 MARCEL BREUER, architect
 PAUL TISHMAN CO., general contractor
 FARKAS & BARRON, structural engineers
 BERNARD F. GREENE, electrical engineer
 BENJAMIN L. SPIVAK, mechanical engineer
 PROF. EDWARD C. COLE, stage consultant
 STANLEY C. McCANDLESS, lighting consultant
 SIDNEY K. WOLFE, acoustical consultant

THE AUDITORIUM

Lighting gallery. In most theaters, the stage lighting is controlled from a switchboard located in valuable back-stage space where the operator cannot really see what he is doing and has to rely on a "lighting script."

In this theater Breuer introduced a pet notion he has held for 20 yrs.: A lighting gallery located above the auditorium at about mid-depth. From this gallery, the student-operators will see the effects they are producing just as the audience sees them. During rehearsals, lighting schemes can be worked out as the production is refined, and the producer onstage can call out to the lighting operators when he needs certain effects. The diagrammatic plan and section (below and above, right) show how the lighting gallery operates.



LIGHTING GALLERY PLAN

Seating plan. To take the place of the usual, heavy and inflexible theater seating, Breuer designed a light seat on a wrought-iron frame, set it in rows 42" apart (instead of the conventional 32") so that late-comers can reach their places without disturbing others. (But unlike "continental seating" the plan retains intermediate aisles.)

Alternate rows of chairs are bolted to a continuous floor rail (see cut), can be moved in complete units and stored away. Their space can be filled with tables that will turn the auditorium into a nightclub-cabaret. The remaining rows of seats are fixed in place and set directly upon the ascending steps of the auditorium floor.

Because of the different uses to which stage and auditorium will be put, all seats swivel to permit onlookers a 24° sideways adjustment in their positions (12° left and right) as they face the stage.

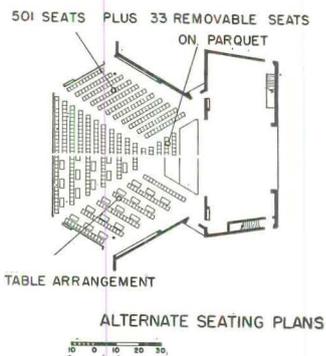
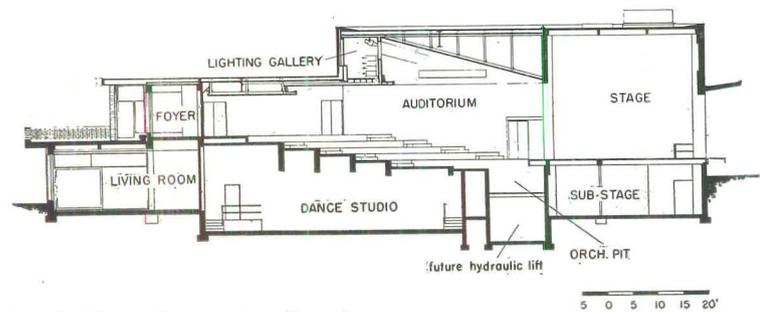


TABLE ARRANGEMENT

ALTERNATE SEATING PLANS

Stage. The hexagon plan (with forestage in place) produces close and intimate contacts between audience and performers or speakers.

The forestage was designed to be raised and lowered on a hydraulic lift. Money for this lift has yet to be found; but when completed, the forestage will do four things: it will, in its lowest position, form an orchestra pit; it will serve as an elevator to transport heavy props from workshops below; it will extend the parquet auditorium floor when level with it (and add space for 33 more removable seats to the capacity of the hall); and it will, finally, project the stage proper toward the center of the



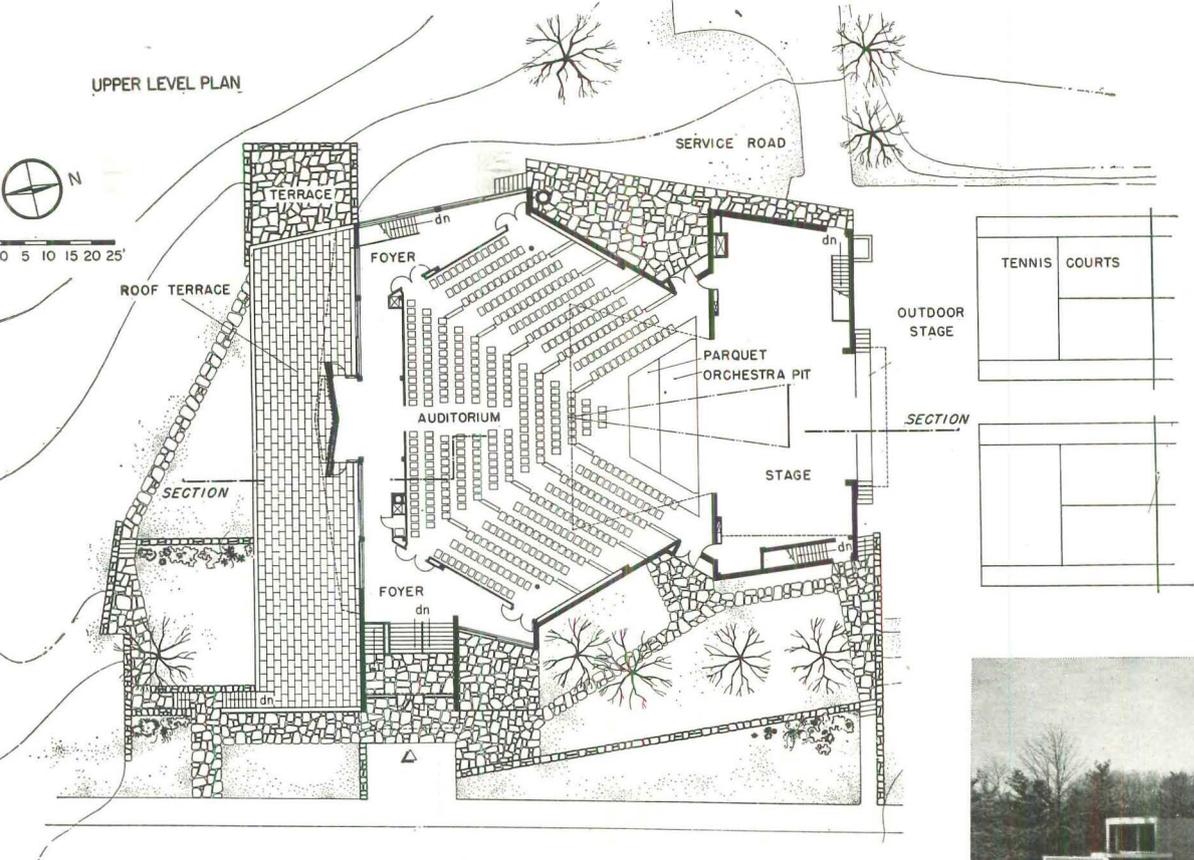
Section shows how lighting gallery works. Note deep concrete girders supporting auditorium floor; these are needed to keep downstairs dance studio unobstructed. Below: auditorium and lighting gallery; sliding panels will close off gallery except for light slots.



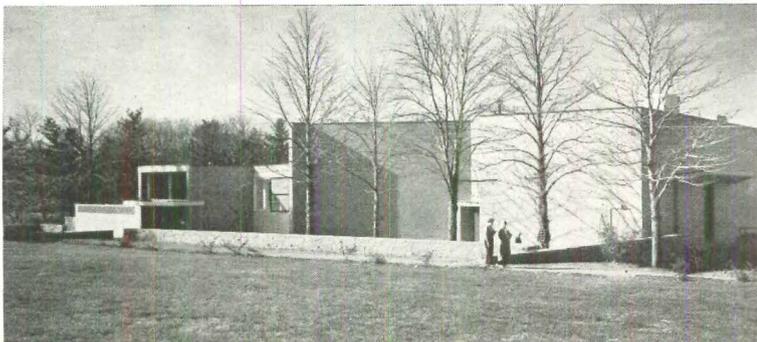
auditorium when raised to its highest position. For the present, two removable sections are used to form a deep or shallow forestage. To increase the auditorium's capacity, both sections can be removed.

During the summer months, the rear of the stage can be opened up through sliding doors to create an outdoor theater (with the audience seated on the tennis courts). These sliding doors also provide a wide service entrance to permit delivery or dispatch of very large props. The college decided against a tall stage house because of the high additional costs and because it seemed a little too elaborate for what is, in essence, a dramatic workshop.

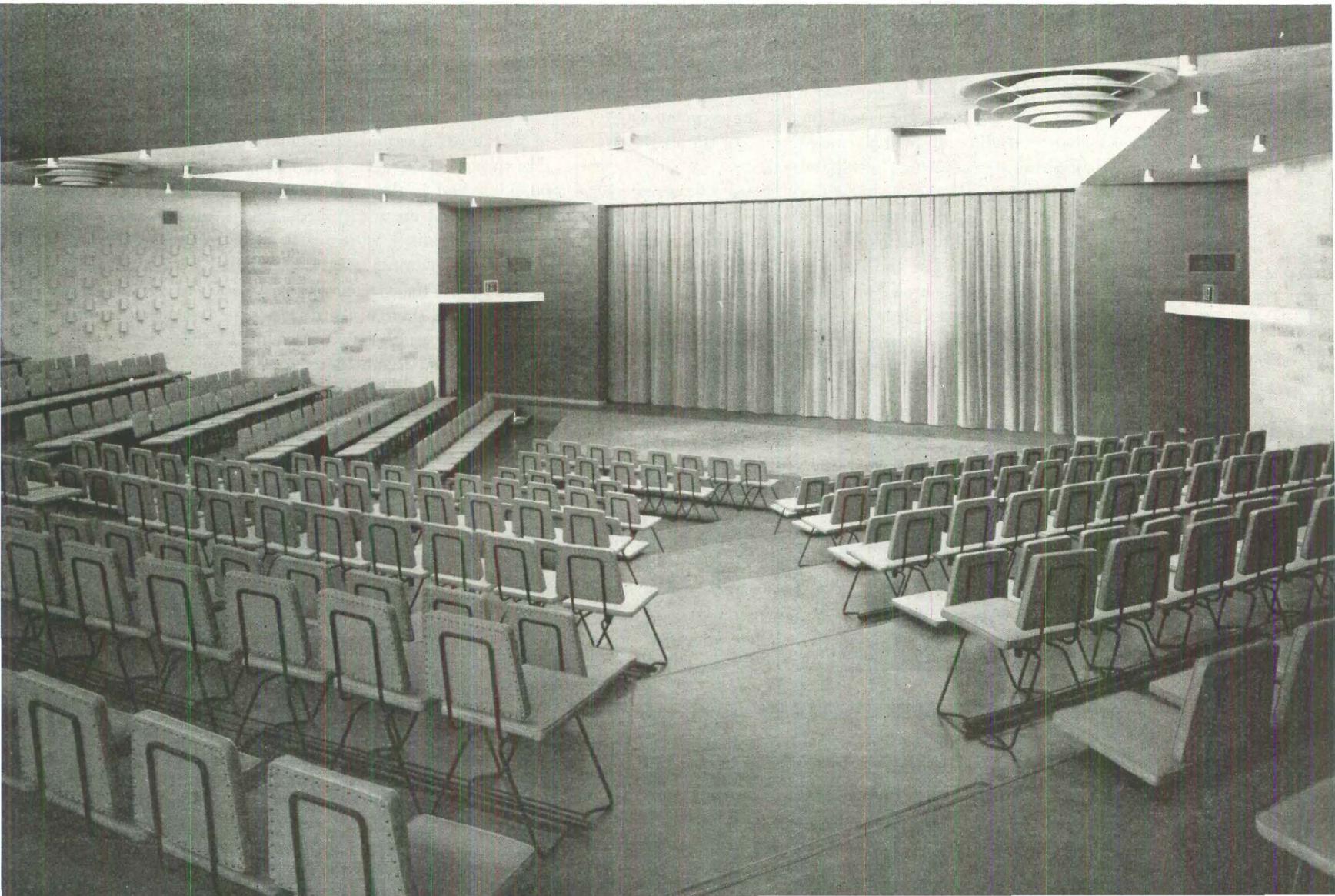
UPPER LEVEL PLAN

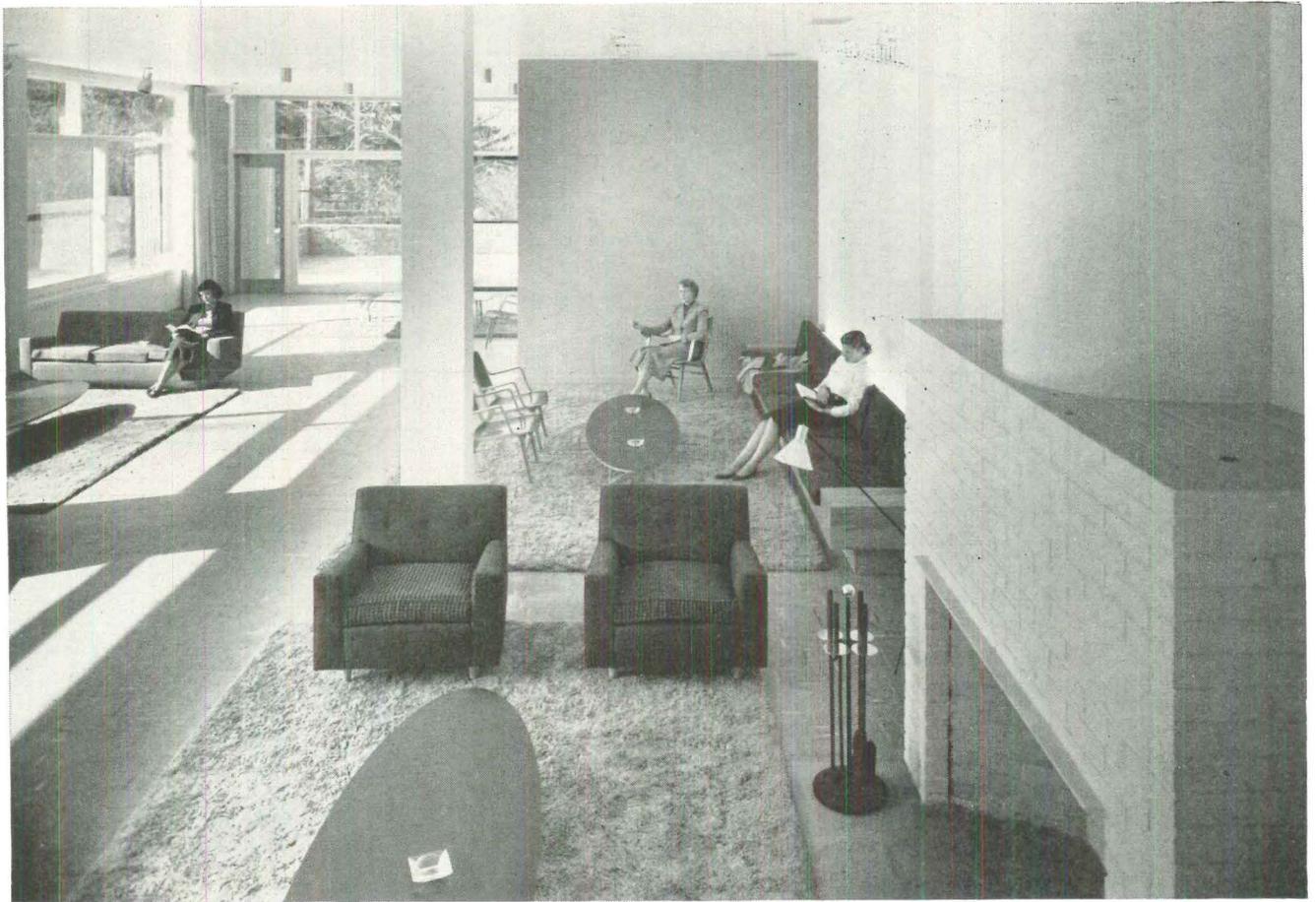


THEATER ARTS CENTER



Auditorium as shown in plan above has seats arranged for arena-style performance, with both removable sections of forestage in place. Lighting within auditorium is variable, a combination of downlights and light "washes" over concrete block walls. Note handsome block patterns; these are not merely decorative but also break up sound reflections.





Common room is furnished with long, upholstered benches and small groups of chairs and tables

COMMON ROOM AND DANCE STUDIO

The site called for a split-level solution: the auditorium-foyer is a half-level *up* from the main entrance, the snack bar is a half-level *down*; and finally, the common room, dance studio, music department etc. are another half-flight down from the snack-bar level.

The common room is that difficult space whose scale is *larger* than that of an ordinary living room and yet *smaller* than that of a monumental area for public assembly.

Breuer struck just the right note in this college living room: the sunken area (30' x 60') is furnished with very long, low, upholstered benches that pull together the large space; set against these are groups of domestic-scale furniture for more intimate gatherings. He has neither crowded the room with clusters of chairs and tables, nor made it coldly impersonal like a station waiting room.

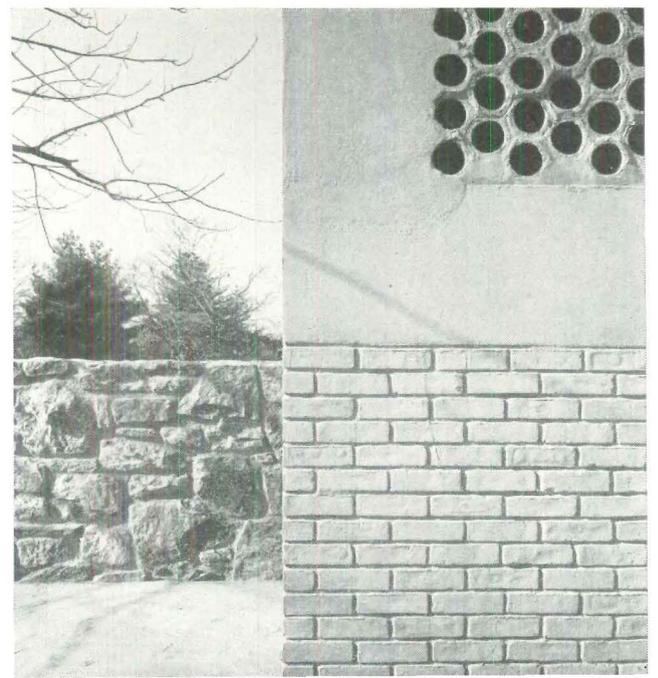
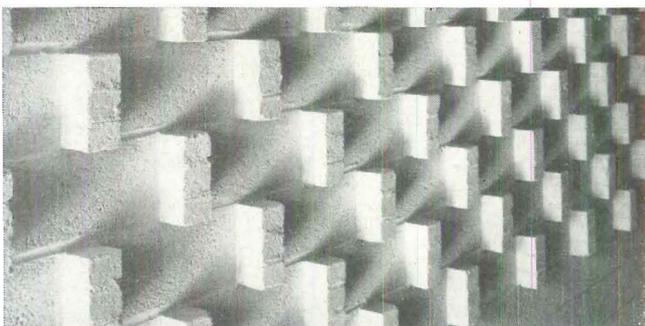
The rest of the lowest floor is devoted to a triangular dance studio ("the shape turns out to be excellent for teaching," Breuer says) and to other activities (see plan).

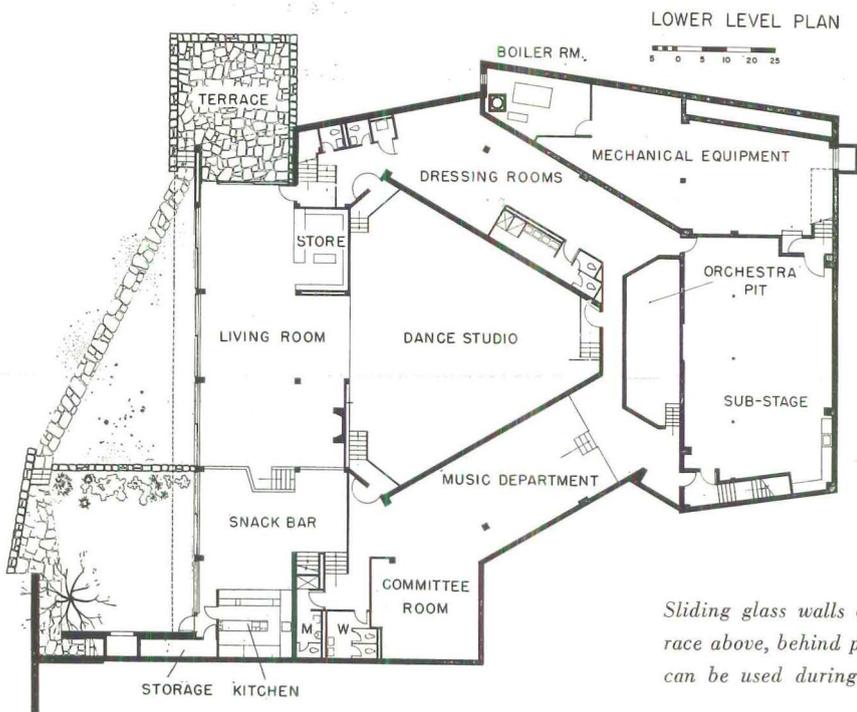
MATERIALS AND TEXTURES

Breuer feels that, so long as many of our building methods and materials are not industrialized, it is wrong to give a building the slick finish of a 1953 Cadillac. Some of the details he has used here are almost brutally rough, and very deliberately so. He has employed rough

stone, painted brick, and flagstone to give his building textural, as well as sculptural, excitement (see cuts). The parapets around the upper terrace are reminiscent of primitive Mexican peasant building: they are made of drainpipes set in cement and roughly stuccoed on the outside. And in the auditorium, the concrete block masonry is given an unexpected beauty (and an intended acoustical quality) with a pattern of projecting blocks.

All these patterns are supplemented with planes of bright color—the typical Breuer blues and reds. Used largely inside, these accents are visible from the campus through glass walls, help make this building a cheerful symbol of what Sarah Lawrence is trying to do.





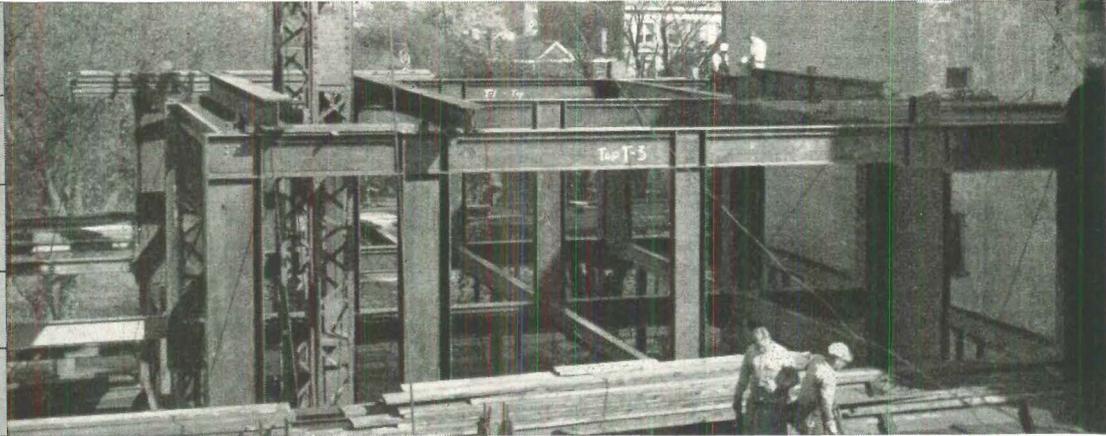
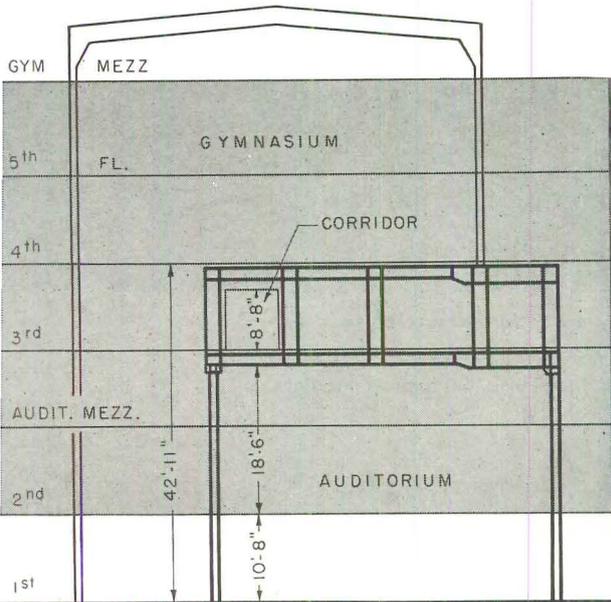
Sliding glass walls open up common room to surrounding grounds. Terrace above, behind perforated parapet, is direct extension of theater foyer, can be used during intermissions and for dances on summer evenings.

Dance studio (below) has ceiling made of rough 2" x 6" construction lumber and fluorescent-light inserts. Deep concrete girders were left exposed



BUILDING ENGINEERING

1. **Vierendeel trusses save steel and space**
2. **Loadbearing ducts for radiant floor heating**
3. **Two-faced stadium cuts costs in half**
4. **Cost analysis of prestressed concrete**
5. **Prestressed 60' girders 11% cheaper than steel**

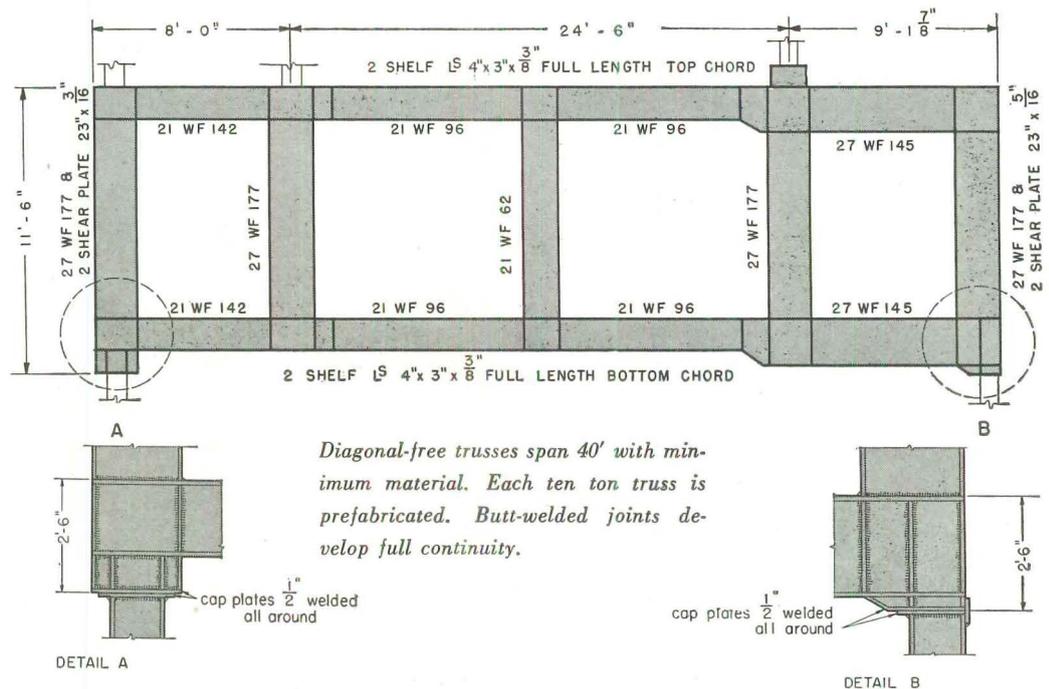


1. STORY-HIGH TRUSSES

Shop-welded vierendeel frames use 46% less steel than floor girders

Shop welding made vierendeel trusses both cheaper and quicker to erect than conventional floor girders spanning 41'-8" over a second-floor auditorium in this seven-story Flatbush Jewish Center, Brooklyn. It should arouse new interest in the rigid, diagonal-free vierendeel truss for framing over wide interior spans where the vertical members do not interfere with the floor plan (as in this case), and for framing exterior walls over widely spaced columns (as in the case of a building erected over railway tracks).

These story-height trusses each used only 10¾ tons of steel at \$207 per ton, or \$2,200 in place. Conventional design (33" WF 240 lb. girders plus columns between them) would have required 20 tons of steel and cost \$4,100, almost double. About two thirds of 46% saving in weight and cost was due to the greater depth and consequently lighter members in these 13' deep vierendeel trusses, the remainder due to the continuity of rigid connections achieved by welding. For this comparatively small job on-site welding would have been uneconomical because of all the equipment required and the difficulties of inspection. By shop welding these trusses they were built for the same per-ton erected cost as a riveted frame, indicating that outside rigid



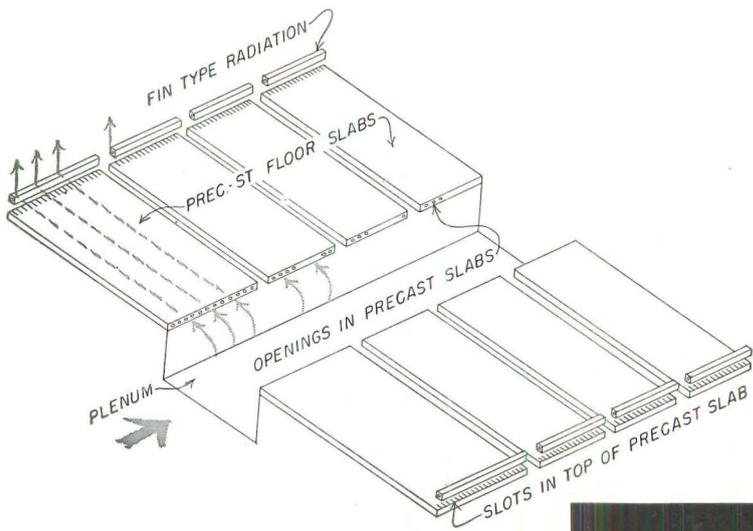
framing units can be built more cheaply and quickly off the job.

Savings in erection time were remarkable: the 13' high, 44' long trusses arrived at the site by truck and were hoisted and connected with dardelet bolts in less than 15 min. per truss.

Since the vierendeel truss has no diagonal members, high bending moments are developed at the joints that are difficult to control by riveting but comparatively easy by welding. In these trusses all members are rolled sections; top and bottom chords are continuous with 11½' vertical members butt-welded between them. Web

stiffeners welded between the flanges of the horizontal chords transfer moment stresses from the flanges of vertical members to the web of the chords. A lattice truss would have been only 10% lighter, and its diagonals would have interfered with the floor layouts.

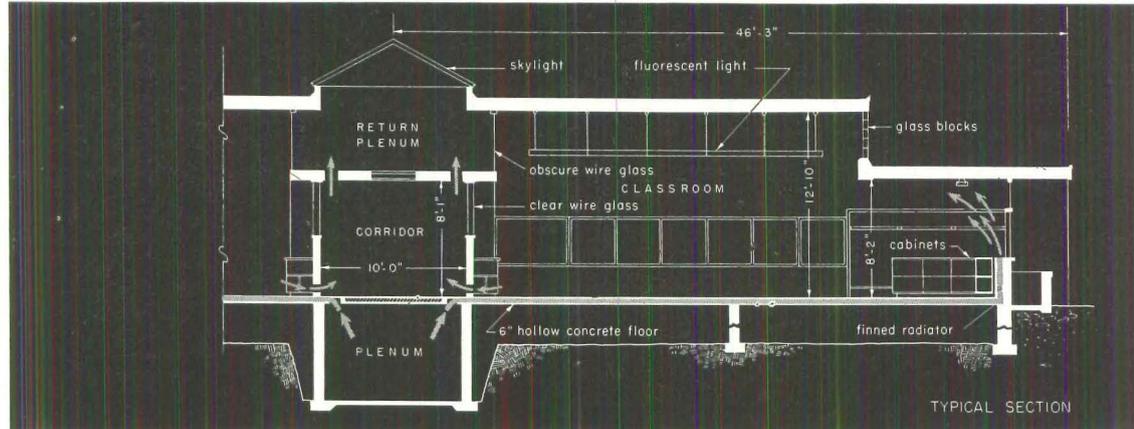
This addition to the Flatbush Jewish Center required two floors of 18' x 22' classrooms above the auditorium. Vierendeel trusses provide a full 11' floor-to-ceiling height and allow an unobstructed corridor 6' wide to pass through each truss. Architect: Maurice Courland, AIA; structural engineer: Raphael H. Courland.



Central fan blows heated air through bottom plenums into hollow precast floor planks, thence into classrooms at outside walls, where air gets secondary heating by thermostat-controlled finned radiators. Part of exhaust air is recirculated via clerestory plenum, part ejected through exhaust fans in roof.



Shaded classrooms have good bilateral and glare-free lighting. Short sides are along outside walls to cut heat loss.



2. FLOOR PLANK HEATING DUCTS

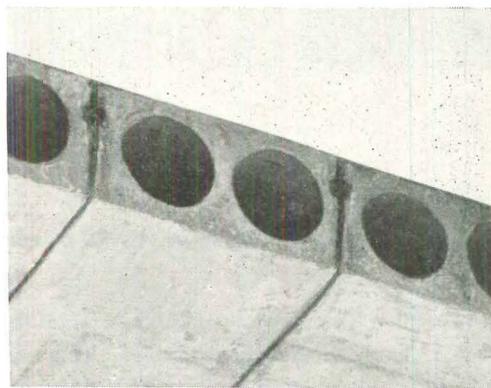
Hollow concrete slabs double as ductwork in three-way heating system

More and more designers achieve greater efficiency at less cost through integration of structure and mechanical services. Witness savings of \$15,000 in cost and a month in construction time on this Tewkesbury, Mass. school, whose precast hollow floor slabs double as warm-air heating ducts.

In this ingenious heating system warm filtered air is blown by a central fan into a 6'-8" x 10'-8" plenum beneath double-loaded classroom corridors. From the plenum warm air flows through damper-controlled slots into the 4½" diameter cores of the precast concrete floor planks and is discharged at low velocity into classrooms at the outside walls as a continuous curtain of warm air. Exhaust air is vented to main corridors then up to a skylit clerestory recirculation plenum which also helps to light classrooms.

For classroom comfort floor temperatures should be no greater than 88°. This limits the heat input to classrooms via floor radiation plus direct air circulation to 75% of peak winter requirements. Therefore a finned booster hot-water convection radiator is added to the outside wall with thermostat control in each classroom.

The wide duct area in the floor slabs achieves the uniform temperature characteristic of panel heating plus draft-free,



Precast concrete planks carry 60 psf floor loads. Warm air passing through them makes floor a radiating surface.

low velocity and therefore noiseless air at the outside walls. It permits complete flexibility of control both centrally at the fan room and at each classroom. Further, at the fan room the air is sterilized by passing it between germicidal lamps and can be filtered, humidified or cooled as required. During school hours the fan circulates both fresh air and recirculated air but at the end of the working day the ventilators and the fresh air intake are closed and the fan reduced to half speed.

Further economy is effected by placing the classrooms so their narrow sides are exposed to the outside walls, cutting both

the heat loss and the length of exterior wall required. Over the outer third of each classroom the roof drops 3½' below a clerestory roof deck. Thus the classrooms receive natural light from three sources—1) the conventional exterior wall windows, 2) an exterior 3½' high clerestory window, and 3) a clerestory window giving on to the skylighted recirculating plenum above the corridor. As a rain break the lower roof deck projects 4' beyond the outside walls, is supported upon masonry interior wall extensions.

Both floors and roofs are built of precast hollow concrete slabs; 24,000 sq. ft. of 6" deep slabs, 12" wide and 18' long, are used in the floors while 20,000 sq. ft. of 8" deep members, 16" wide and 26'-8" long are used in the roof. Floors are finished with plastic vinyl tile set in mastic while ceiling slabs have only two coats of paint on the inside plus the usual built-up roof covering. Live load on the floor slabs is 60 psf, on the roof 100 psf.

Total cost of the 14-classroom school was \$396,795. Cost of the precast floor and roof slabs was \$62,000 (15.7% of total cost). Architects for this school in Tewkesbury, Mass. were Ashton, Huntress & Pratt; manufacturer of the precast floor slabs, Flexicore Corp.

Dual-purpose stadium demonstrates efficient use of steel and concrete—tapered steel for light, cantilevered overhangs, concrete for slab foundations and precast upper tier seats.



3. TWO-FACED STADIUM

Unique design and construction keep costs down to \$16 per seat

Instead of building two separate stadiums at a cost of \$60,000 each, Grand Junction, Col. saved \$62,000 by building only one—a two-faced stand which seats 2,400 football fans on one side, 1,200 baseball fans on the other. By-products of this unique design are a 2,500 sq. ft. area for dressing rooms and concessions in space between the two stands, and summer shade for the baseball fans thanks to the cantilevered upper portion of the football stand. Including these by-products and a control and press box atop the upper deck to serve both fields, whole project cost only \$58,000, or \$16 a seat.

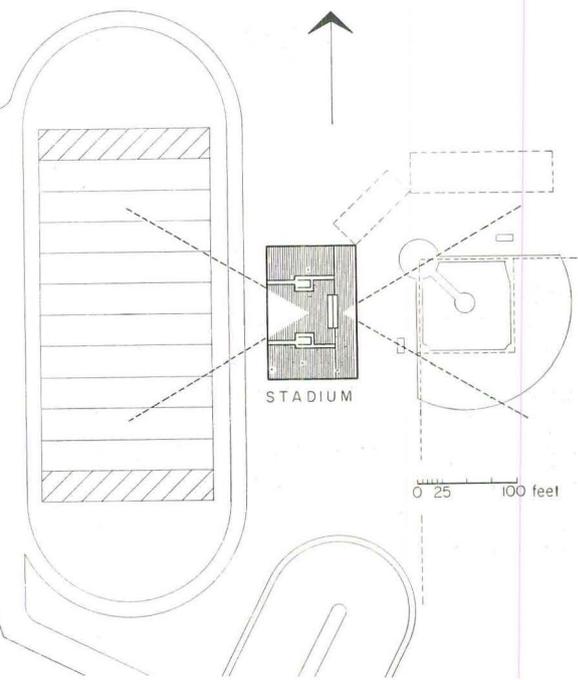
As unique as the dual-purpose design of the stadium itself is the detailing of the cantilevered beams which carry the upper part of the football stand. Their trim, tapered shape was fabricated from standard 12" steel I-beams. Each beam was

flame-cut diagonally down the web; one of the pieces was turned end for end; and the two rewelded along the web. This produced an elongated triangular web 15" deep at the supports and 5" deep at the cantilevered end. Extra reinforcing plates strengthen the web over the pipe-column supports.

Lower seats of the 129' long stadium are 8" concrete slabs cast on fill. Upper seats and risers, precast as units, are bolted to the cantilevered steel. By pre-casting the units while foundations were being prepared, construction time for the whole job was reduced to 90 days.

Spread footings were used because of poor soil structure. The soil is gumbo clay, very hard when dry but like soup when saturated.

Architects: Smith, Hegner & Moore.
Engineer: Milo S. Ketchum.



4. ECONOMICS OF PRESTRESSING

Bidding prices per cubic yard generally favor prestressed concrete—an analysis of the cost factors

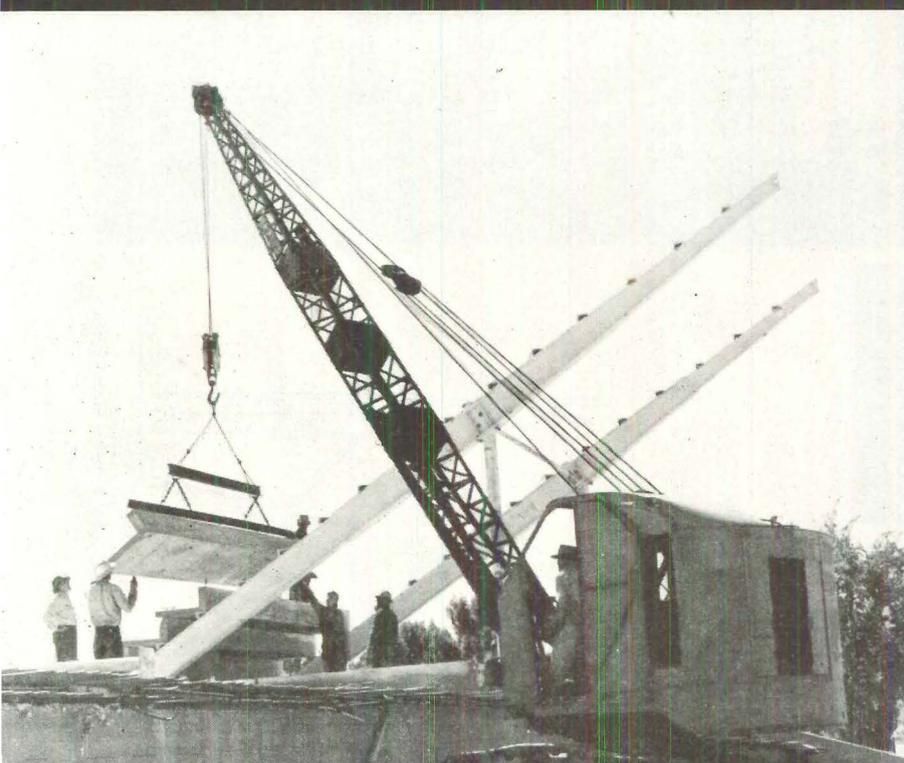
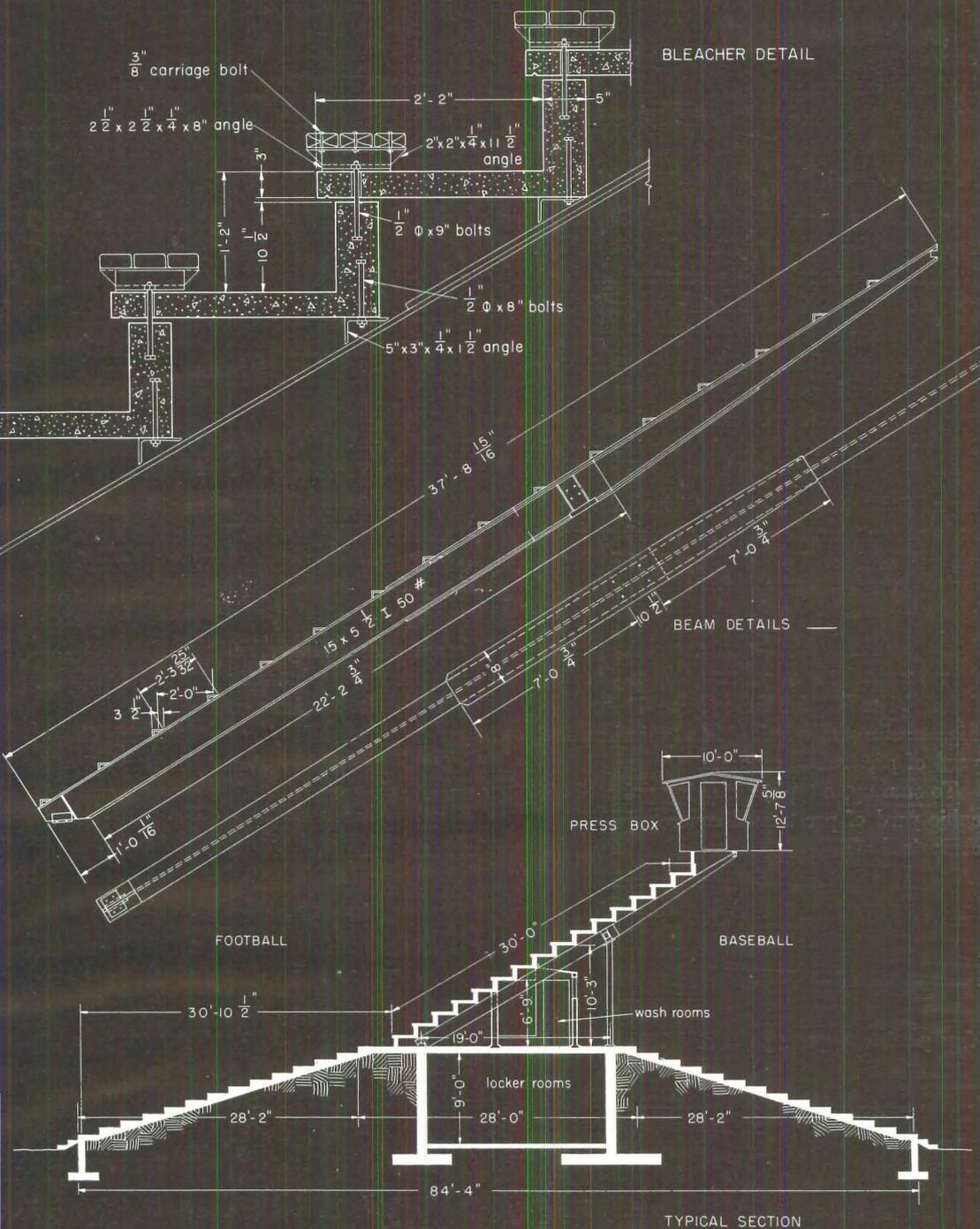
Is prestressed concrete cheaper than reinforced concrete or fireproofed steel? That was the No. 1 topic at last month's engineering conferences at both the University of Illinois and the University of California.

US engineers are now familiar with the techniques of prestressing but apprehensive about its alleged high cost. Consequently prestressed concrete has never yet been selected for reasons of economy pure and simple; its use has always been dictated by the need for shallower beam depths than are possible with reinforced concrete or by the need to reduce corrosion by the elimination of tension cracks. That prestressed concrete can now compete on price is indicated by comparable bids on a San Francisco garage (see below), where prestressed girders proved 11% cheaper than equivalent steel.

At the Illinois conference, Prestressed Concrete Engineer Cedric Stainer* discussed some of the basic costs of prestressing. Depending upon the type of structure, its location, and the method and quantity of prestressing used, he said bids for prestressed concrete generally run between \$100 and \$150 per cu. yd., compared with about \$75 for ordinary reinforced concrete. This appears to favor reinforced concrete *but* 1 cu. yd. of prestressed concrete will do the work of 2 cu. yds. of reinforced concrete. For instance, in the 65' span prestressed girders at Manhattanville College (AF, May '52) 1 cu. yd. of prestressed concrete (containing 120 lbs. of high tensile steel and 72 lbs. of mild steel) replaced 2.4 cu. yds. of equivalent reinforced concrete girders (containing 700 lbs. of mild steel). Equivalent steel girders (36" WF 300 lbs.) would have required over ten times as much steel as these prestressed girders.

Cost of concrete. Average cost of concrete used in prestressed girders is about \$50 a cu. yd. This figure includes \$16 for the concrete itself delivered on the site by a ready-mix company, \$24 a cu. yd. for casting the girders using forms with a limited number of reuses, and \$10 more to erect the girders when cast—total \$50.

* Cedric Stainer graduated at London University and worked for three years in France with prestressed concrete inventor Eugene Freyssinet before coming to the US. He is now chief engineer with Preload Corp.



Cost of mild reinforcing steel. Besides tensioning steel each cubic yard of prestressed concrete contains 30 to 80 lbs. of mild steel which might cost up to \$15, or 10% of the total cubic yard price of the concrete. This steel takes care of small local stresses and generally helps to support the prestressing members. Cost of mild steel is about 20¢ per lb. in place for small and medium-size precast constructions; in large-scale cast-in-place work the cost might be nearer 15¢ per lb.

Cost of high tensile steel. Tensioning steel may be in the form of wires, strands or bars and may be either pretensioned or post-tensioned. In wires and strands working stresses are 120,000 psi after all losses. With high-strength alloy bars of up to 1" diameter, lower stresses of 85,000 psi are employed. Thus 140 lbs. of bars is about equal to 100 lbs. of wires or strands. It is worth noting that 1 lb. of high-tensile steel in a prestressed girder does the work of 4 lbs. of mild steel in an ordinary reinforced girder.

High-tensile steel costs between 9¢ and 30¢ a pound. Wire, between 9¢ and 22¢ depending on size, physical characteristics

and heat treatment. High-strength bars having lower working stresses and complete with terminal threads cost between 16½¢ and 20¢ a pound. High-tensile cables, 20¢ to 30¢, again depending on diameter, quantity, etc.

Installation cost. To the cost of the steel must be added the cost of installing it. This includes labor and additional materials for some or all of the following operations: straightening and cutting wires, assembly and sheathing of cables, tensioning, anchoring and grouting of the completely stressed member. Reflecting the number of tensioning operations involved, installation costs vary widely between 10¢ a pound (in large scale precasting of pretensioned beams such as the assembly-line prestressing employed for New York's Pier 57, AF, Oct. '52) to 70¢ a pound for single post-tensioning operations. Thus total bidding price for a pound of high-tensile steel in place may vary all the way from 20¢ to \$1, or from \$16 to \$80 for the average 80 lbs. of high-tensile steel required in a typical cubic yard of prestressed concrete.

To sum up, a typical bidding price of a cubic yard of prestressed concrete is \$118, comprised of:

1 cu. yd. of 5,000 psi concrete	
(at \$50)	\$50
40 lbs. of mild steel reinforcing	
(at 20¢)	\$8
80 lbs. of prestressing steel	
(at 75¢ for 120,000 psi steel)	\$60

and a typical bidding price for ordinary reinforced concrete is \$150, comprised of:

2 cu. yds. of 3,000 psi concrete	
(at \$45)	\$90
400 lbs. of standard steel reinforcing	
(at 15¢)	\$60

These prices (for completed work in place) would favor prestressed concrete. On the other hand this differential is liable to be absorbed by higher labor costs if the prestressing work is handled by inexperienced crews.

With the great variation in cost between different prestressing techniques, it seems wasteful to use any but the most economical one. However, the least expensive method may not be suitable for the structure in question. Prestressed concrete is competitive with conventional steel or concrete construction provided the most favorable combination of techniques is used.

5. LOW-COST PRESTRESSING

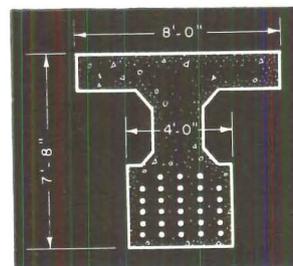
Huge 60' concrete girders for parking garage cost 11% less than fireproofed steel

For the first time in its brief US history prestressed concrete has proved cheaper than steel. This record was set in four wide span girders over the entrance of a multistory San Francisco garage. Original designs called for 180 tons of structural steel at an erected cost of \$54,000 (\$300 per ton) including fireproofing. On the outbreak of the Korean war permission to use steel was withdrawn and 465 tons of cast-in-place prestressed concrete were used at a cost of \$48,000 (\$103 per ton), a saving of \$6,000 or 11%. Ordinary reinforced concrete could not be used because of excessive girder depths.

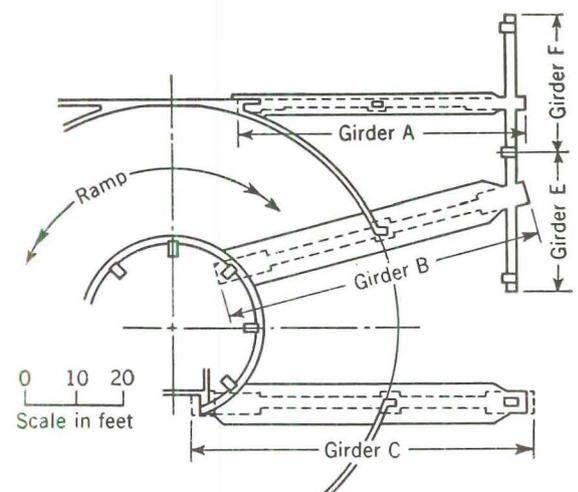
The heaviest girder weighs 120 tons, spans 62'. It is 7'-8" deep, T-shaped with top flange 8' wide, bottom flange 4' and web 2' to carry a total load of 1,430 kips (940 kips concentrated at midspan). Prestressing is by 28 cables 1½" in diameter with threaded anchorages. In the simple span girders the cables are post-tensioned from one end; in the continuous girder tensioning is done from both ends to reduce friction loss over the center column. Structural engineers: Elliston & King. Contractors: Barrett & Hilp.



Don Bosco



Prestressed girders span 60' over garage entrance. Girders A, B, and C are simply-supported; girder E-F is continuous over three columns. Cables have threaded anchor fittings (see AF Feb. '52, p. 135).



are these the
Finest

overhead type doors made?

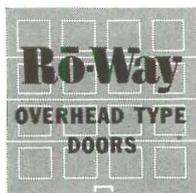
Whether it's for a commercial, industrial, or residential installation, every Ro-Way overhead type door is designed, engineered and built to be the finest of its kind.

Finest in appearance—with clean, simple lines that blend well with any style of architecture, perfectly complementing the design of the structure.

Finest in construction—with mortise and tenon joints not only glued but *steel* doweled as well . . . muntins, rails and stiles squared up with precision . . . sections rabbeted to assure weather-tight joints . . . millwork both drum and hand sanded . . . heavy gauge steel hardware both Parkerized and painted *after* fabrication.

Finest in operation—with Taper-Tite track, Seal-A-Matic hinges, smooth-running ball bearing Double-Thick Tread rollers, and Power-Metered springs individually matched to the weight of each door.

No matter how you look at Ro-Way doors, you see that finest quality is engineered right into every detail. If that's what you want, specify Ro-Way on every job.



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Nationwide sales and installation service. See your classified telephone directory for nearest Ro-Way distributor.

there's a Ro-Way for every Doorway!



NATIONWIDE SCHOOL BUILDING BOOM!

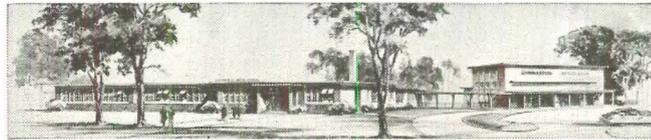
Architects--Builders Hail New Roof Construction Methods



East Side High School—Marietta, Georgia



Campbell High School—Smyrna, Georgia



South Cobb High School—Austell, Georgia

EACH OF THESE MODERN SCHOOLS, DESIGNED BY BOTHWELL & NASH, MARIETTA, GA., FEATURES ROOFS OF ZONOLITE CONCRETE USED OVER STEELTEX.

ZONOLITE® Concrete Roofs Combine Built-in INSULATION • FIRE SAFETY • PERMANENCE

All over the country, school construction is reaching new peaks. In the South, for example, the architectural firm of Bothwell & Nash recently selected ZONOLITE Concrete for the modern Georgia high schools above.

For any type of light construction, there are *two* important ways to get Zonolite benefits:

1. **For roof decks**—Here ZONOLITE Concrete provides insulation built right into the roof deck. Poured over paper-backed wire mesh, high-rib lath or other suitable forms, it eliminates the need for additional roof insulation.
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CASE HISTORY: How a modern hospital solves tough flooring problem

Fort Hamilton VA Hospital selects MATICO Asphalt Tile

Selecting a low-cost flooring that meets rigid hospital requirements for durability, sanitation, odor-free characteristics, quietness and comfort underfoot is a large order. But it's easily—and ideally solved with MATICO Asphalt Tile Flooring.

Quality controlled throughout manufacture, MATICO meets strict Federal specifications for flexure, indentation, curling and impact. It lasts for years, even under heavy traffic conditions . . . is easy to keep clean and sanitary . . . is quiet and resilient to walk on . . . and is the most economical type of flooring on the market.

In addition, MATICO's 27 rich clear colors offer unlimited design possibilities—right in keeping with the trend to more cheerful hospital decor.

Write for full details about MATICO Asphalt Tile today. The many advantages of this economical flooring make it ideal for virtually every type of installation.



Fort Hamilton Veterans' Administration Hospital,
Brooklyn, N. Y.

ARCHITECT: Skidmore, Owings & Merrill

GEN. CONTRACTOR: Cauldwell-Wingate Co.

FLOORING CONTRACTOR: Circle Floor Co., Inc.

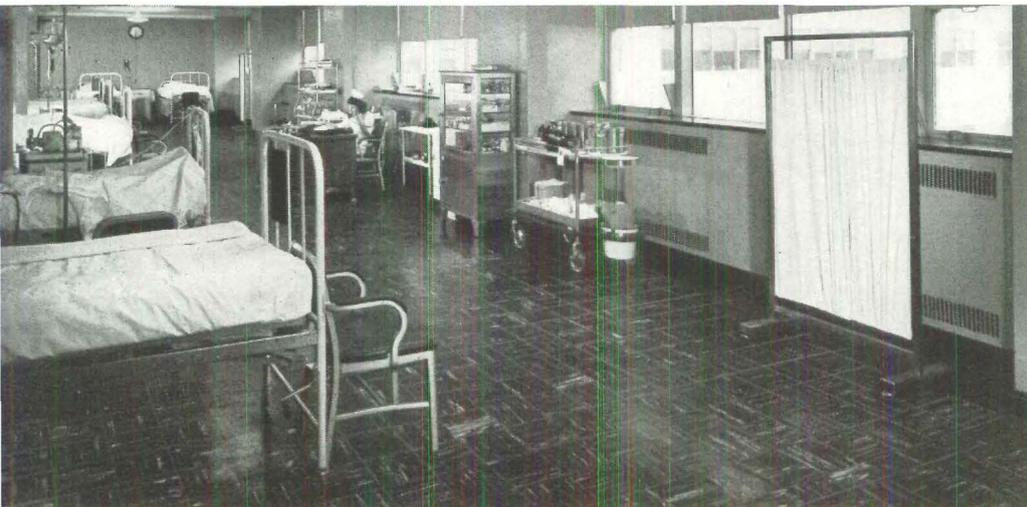
**MASTIC TILE CORPORATION
OF AMERICA** Dept. 6-12

Member: Asphalt Tile Institute

Joliet, Ill.

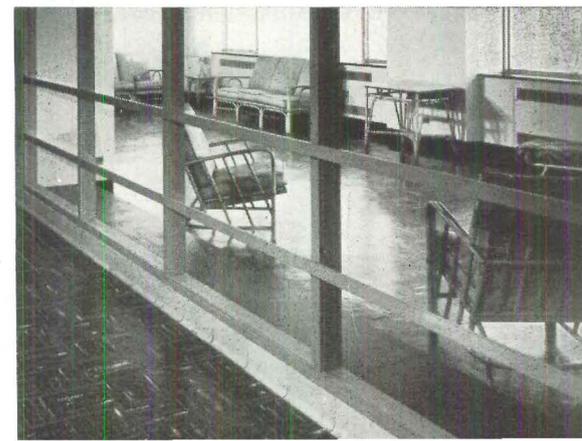
Long Beach, Calif.

Newburgh, N. Y.



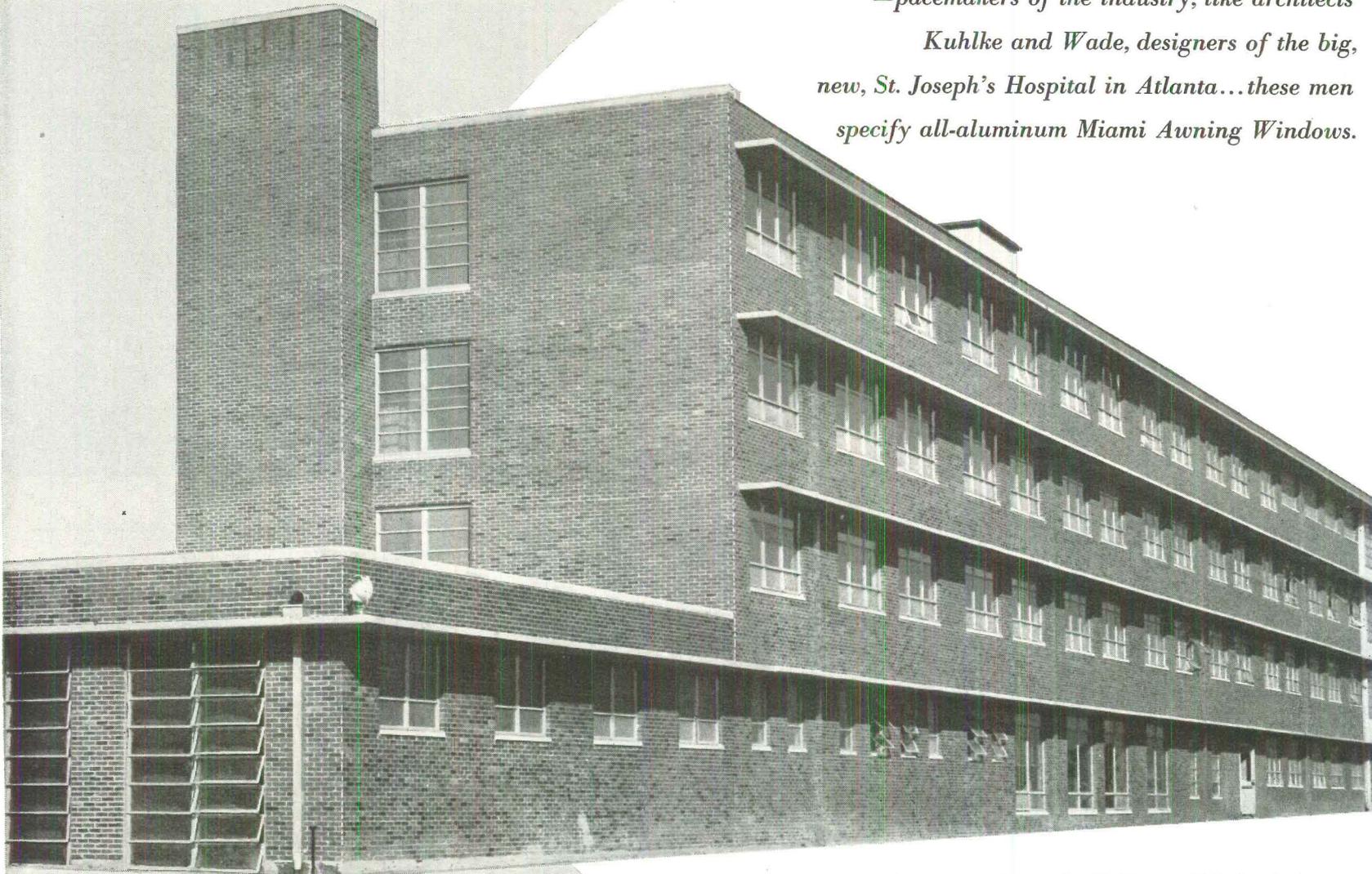
16-bed ward (shown above) occurs at either end of typical nursing-unit floor. MATICO floors in wards are easy to maintain, stay "new" looking for years.

Nurses' station is located at center of each of the paired nursing units. Solariums (far right) are placed at center of each floor. MATICO floors are especially desirable in these areas because they help keep underfoot noise to a minimum.



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—pacemakers of the industry, like architects
Kuhlke and Wade, designers of the big,
new, St. Joseph's Hospital in Atlanta...these men
specify all-aluminum Miami Awning Windows.*



*St. Joseph's Hospital—Kuhlke and Wade, Architects
Neergaard and Craig, Hospital Consultants
Gauger and Wallace, Consulting Engineers*



For further information, see Sweet's
Architectural File $\frac{17a}{MI}$ or write, wire
or phone Dept. AF-12

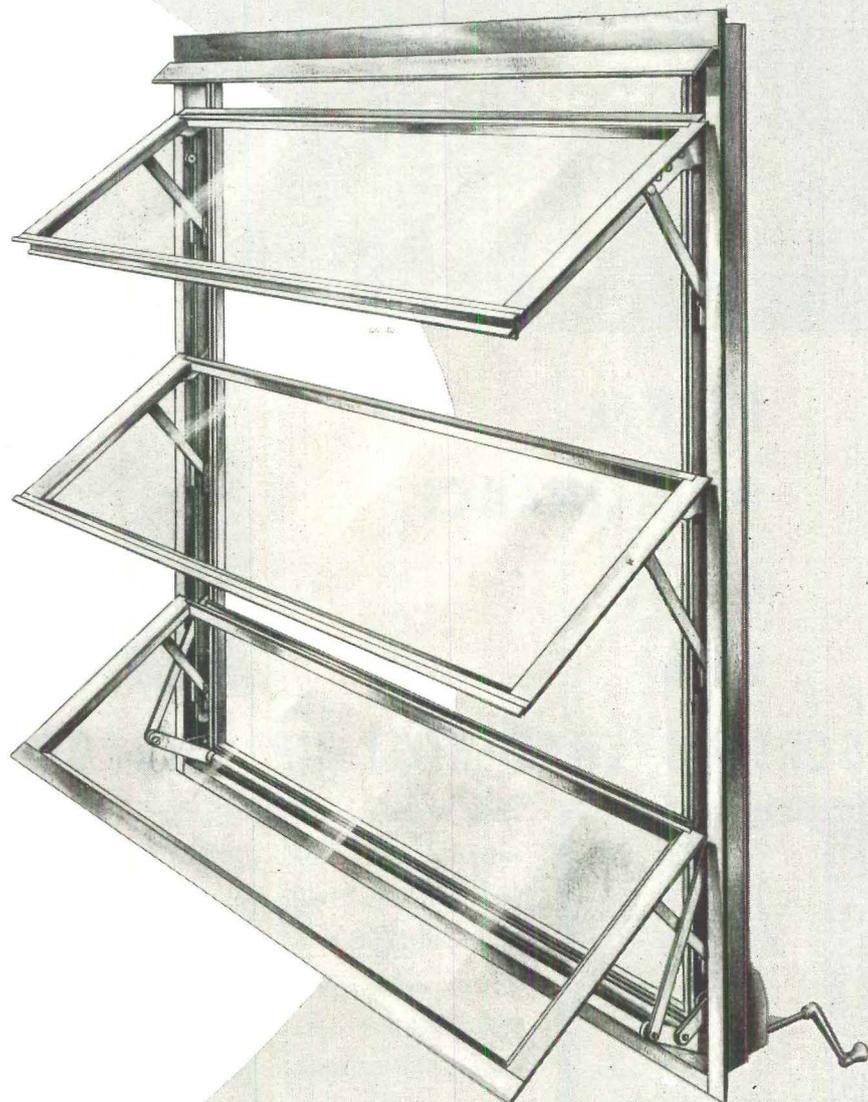


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THE ALL-ALUMINUM MIAMI AWNING WINDOW

Features:

- Constructed from 63-ST5 extruded aluminum alloy sections that require no painting—stay clean, bright and beautiful year after year. No maintenance except for occasional oiling of operator. Vents can't warp, swell or stick.
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- Made to fit any opening up to 6' 2" wide and to any height.
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*Air infiltration tests taken by
Pittsburgh Testing Laboratories*

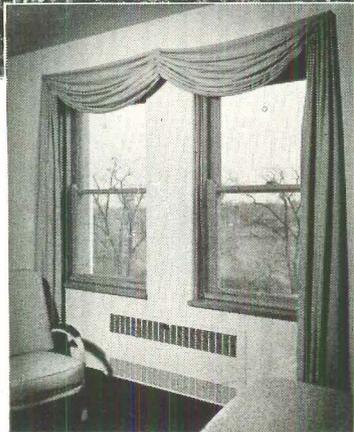


5200 N.W. 37th AVENUE • MIAMI, FLORIDA

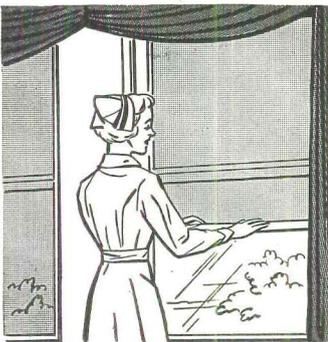


Columbus, Hospital
Chicago, Illinois
One of many institutions and commercial
buildings equipped with Pella ROLSCREENS
Architect: Leonard A. Gliatto
Contractor: Warner Construction Company

**REDUCE
MAINTENANCE
COSTS
with**



SCREENS THAT ROLL UP AND DOWN



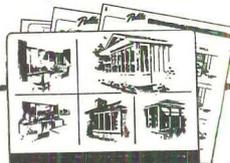
Rooms are more cheerful
because ROLSCREENS ad-
mit up to 20% more light.

Here is *the* window screen that soon pays for itself! Installed on the inside, Pella ROLSCREENS are lowered and raised with finger-tip ease. They eliminate the usual expense of putting up, taking down, painting, repairing and storing so many other type screens! ROLSCREENS speed up window washing and they require no valuable storage space!

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Pella ROLSCREENS are guaranteed for 10 years. This is your assurance of client satisfaction. More than 2 million ROLSCREENS have been in service for 20 years or more.

ARCHITECT'S FILE contains details showing how ROLSCREENS are adapted to different types and makes of windows. SEND TODAY!



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PRIZE DISPLAY RACKS

continued from p. 133



Second Prize—Class A—\$250

Thisis & Co.
Santa Clara, Calif.

“... a wall-type (drugstore) rack—well located, adequately lighted and well designed. It has ample flat space... sloping shelves for upright display... All magazines are visible and easily reached—even in the uppermost rack. (When the lower flat shelves come out too far or when the upper shelf is too high, customers are likely to step on the magazines on the bottom shelf in order to reach the top shelf.) Like the first prize winner in this class, this fixture allows space for a large number of full-cover displays.”

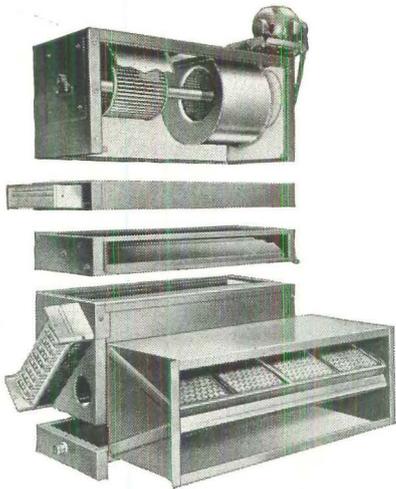


Second Prize—Class C—\$250

Taylor's Cabinet Shop
Sacramento, Calif.

“... a well-designed wall-type rack with integral lighting. However, the wallpaper pattern used on the wall above the rack is a distraction. Incidentally, designers might do well to avoid flat tops on wall-type racks since storekeepers are often tempted to use them to support other displays.”

continued on p. 154



Carrier System Weathermaker, showing sectionalized construction. Note accessibility of each functional component. Piping connections can be made from either side.

What goes into good air conditioning?

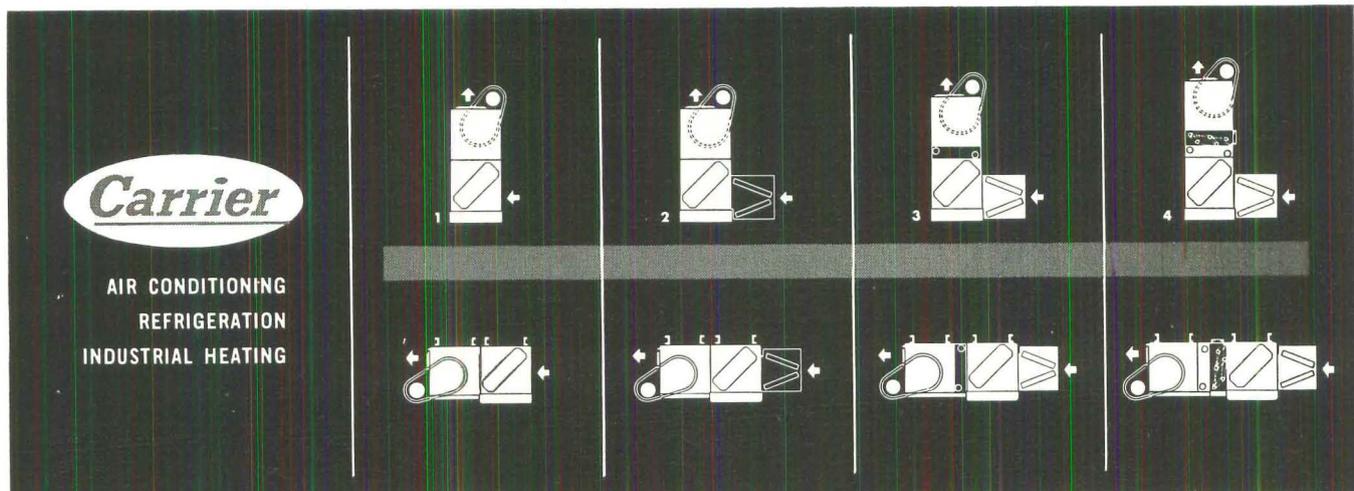
Good equipment, naturally. But we think that's only half the story. The other half is good dealer service.

For example, take our System Weathermaker. Its unique sectionalized construction (demonstrated below) permits a wide variety of unit combinations to meet individual job or space requirements.

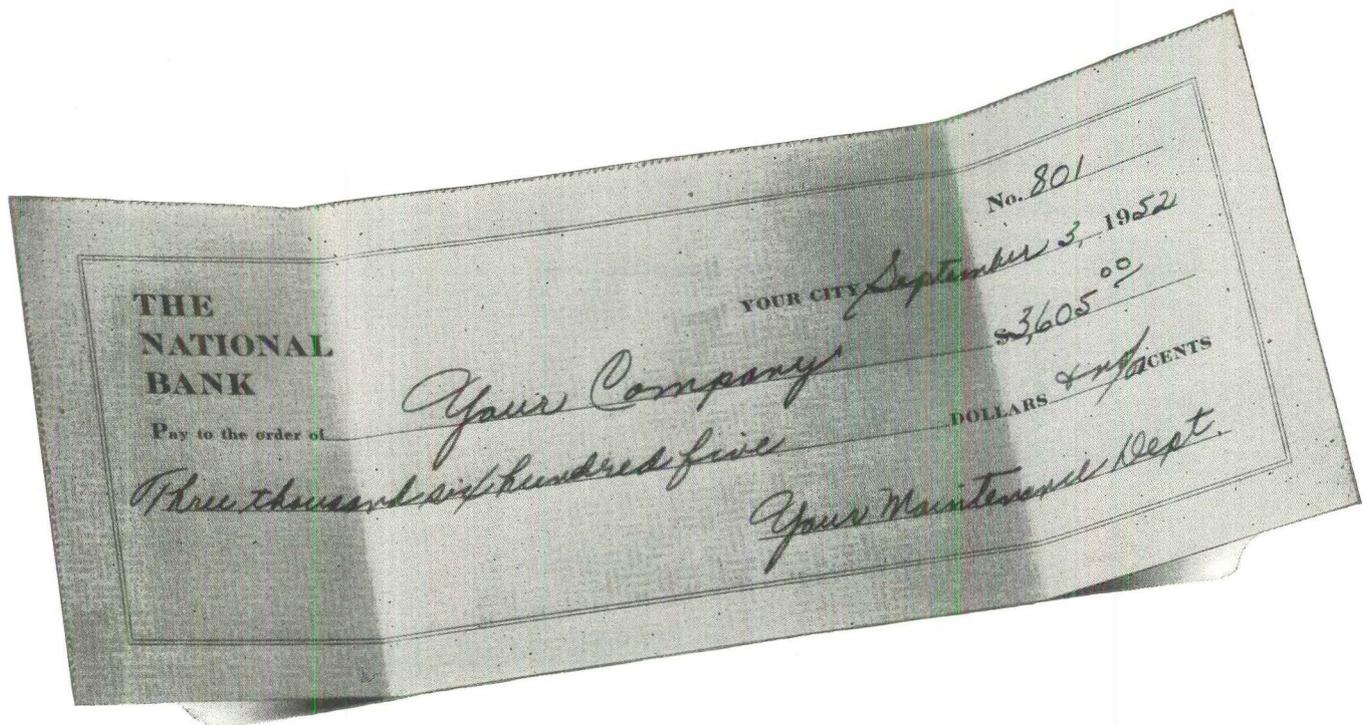
Good? There's nothing else like it for industrial air conditioning applications.

And here's where the Carrier dealer comes into the picture. He *knows* air conditioning. He knows how to use this sectionalized construction in terms of your needs. His experience plus our product give *you* the kind of air conditioning that's easily serviced and technically suited to the job.

Remember, there's a full line of Carrier products, all matched in size and performance to work together. So whenever your plans include air conditioning, call your Carrier dealer. He's listed in the Classified Telephone Directory. Or write Carrier Corporation, Syracuse, New York.



1. Arrangement includes fan section, cooling coil section, base pan section.
2. All sections from No. 1 with addition of filter section.
3. All sections from No. 2 with addition of heating coil section.
4. All sections from No. 3 with addition of a by-pass section.



Here's your check for \$3,605⁰⁰!

If you get Fenestra* Super Hot-Dip Galvanized Steel Windows for your new plant, you'll have windows that will probably *never* need painting.

And that will save you about \$3,600 . . . every few years . . . if yours is a typical plant.

\$3,600 saved is \$3,600 earned.

No other window is as strong and rigid as a steel window.

No other window will look and behave like new *longer* than a Super Hot-Dip Galvanized Fenestra Steel Window.

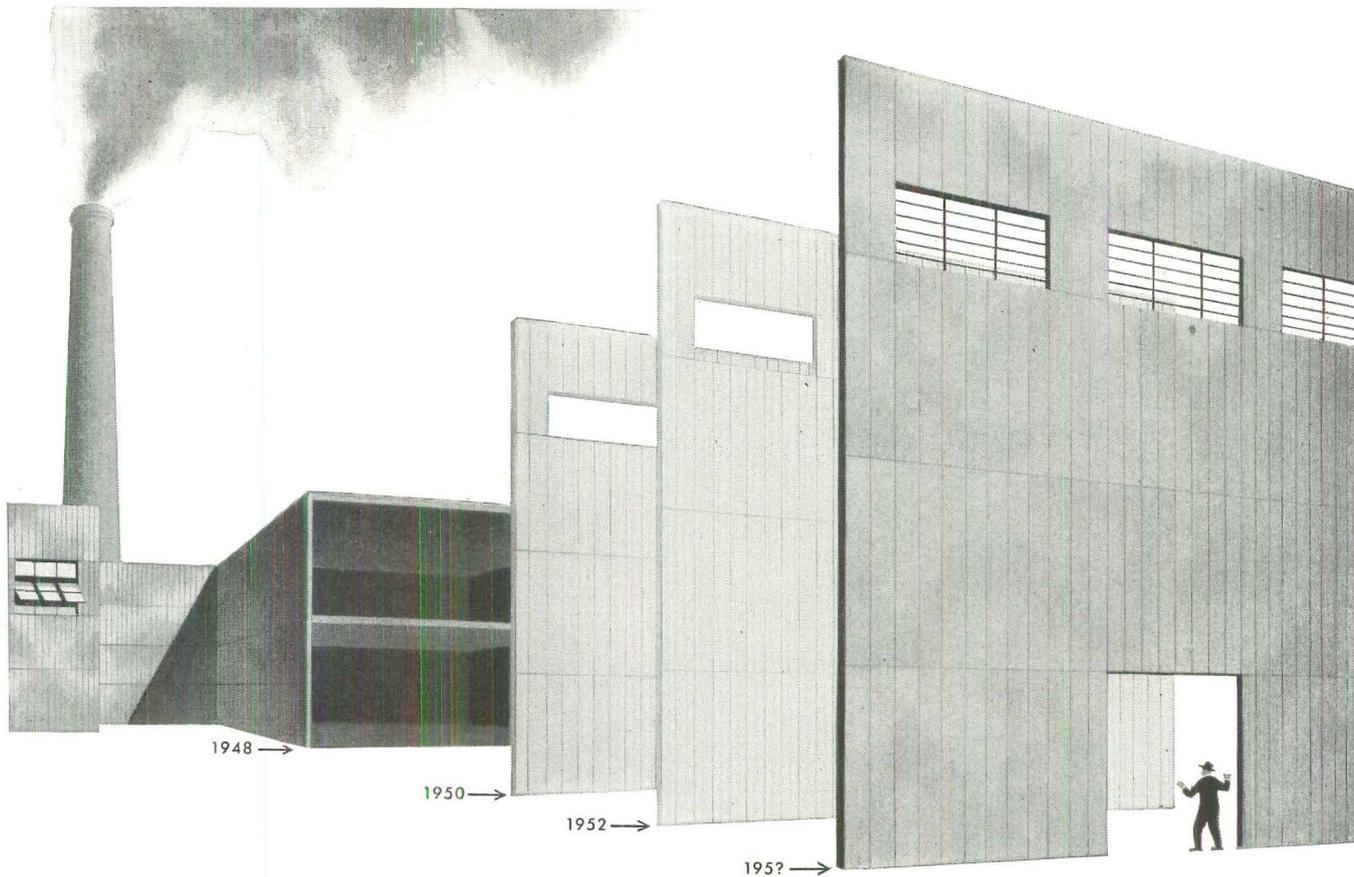
If you want to know the how and the why of these money-saving windows, call your Fenestra Representative (listed in the yellow pages of your phone book). Or write for your free copy of the Fenestra Galvanizing book. Detroit Steel Products Company, Department MB-12,2296 East Grand Blvd., Detroit 11, Michigan.

*®

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from the only plant in America especially designed to Hot-Dip galvanize steel windows



CASE OF THE WALKING WALL

Twice this wall stepped out to let the plant expand. It could just as well be twenty times.

You simply take the wall apart and move it further out, saving the materials and money involved in building a new one. That's what they did at Dayton Power & Light.

The walls of this building are locked-together Fenestra* "C" Panels . . . long, strong, steel metal units with glass fiber insulation sealed inside.

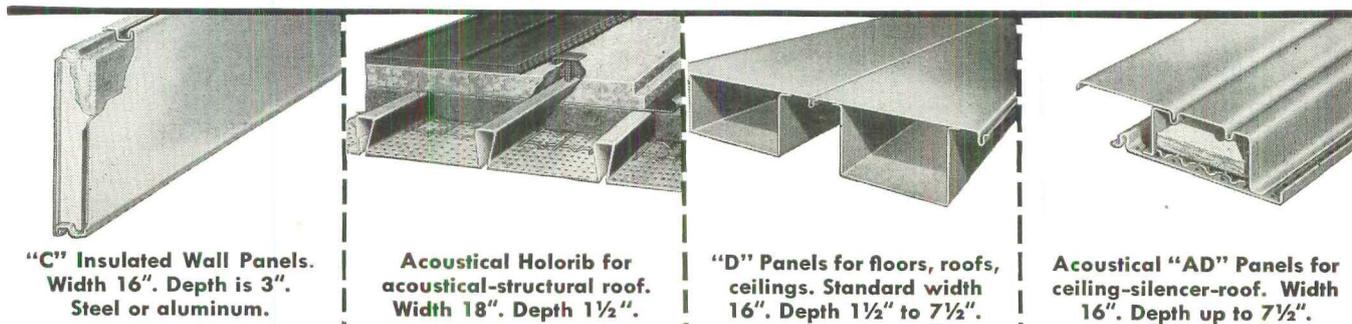
And, if you build *your* new building of Fenestra "C" Panels, you'll see it go up area by area instead of inch by inch.

You'll see your walls rise 16 square feet a leap . . . complete inside-outside, insulated walls. Fine-finished walls that are either prime-painted steel, or aluminum . . . so smooth that dirt and grease can't get a grip. Walls that are noncombustible. Walls that will *walk* when you need extra space.

Look at the close-ups of Fenestra Metal Building Panels shown below. Let us explain how they can help you speed the construction of your new building, save structural steel, cut the cost of labor. Write to Mr. Earle C. Hodges, Vice President, Detroit Steel Products Company, Dept. MB-12, 2296 E. Grand Blvd., Detroit 11, Michigan. *Trademark

Fenestra METAL BUILDING PANELS

. . . engineered to cut the waste out of building



"C" Insulated Wall Panels.
Width 16". Depth is 3".
Steel or aluminum.

Acoustical Holorib for
acoustical-structural roof.
Width 18". Depth 1½".

"D" Panels for floors, roofs,
ceilings. Standard width
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ceiling-silencer-roof. Width
16". Depth up to 7½".

For heavy traffic areas



This modern office building features floors of Wright Rubber Tile—both in the building and in the elevators.

nothing wears as well as **WRIGHT RUBBER TILE!**

Look at the floor of the next elevator you see. The chances are, it has a floor of rubber tile, because no other flooring stands heavy traffic wear like rubber.

And if you could tell the make of rubber tile used, you would be

surprised at how often it would be *Wright Rubber Tile.*

The next time you specify a heavy-traffic floor—remember the elevators! Then specify Wright Rubber Tile with complete confidence.

WRIGHT MANUFACTURING COMPANY
5205 Post Oak Road Houston 5, Texas

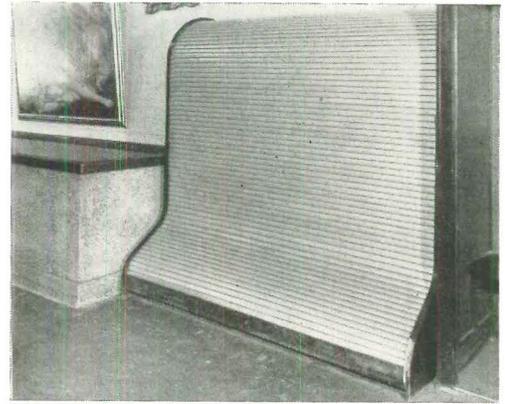


FLOORS OF DISTINCTION

- ♦ WRIGHTEX—Soft Rubber Tile
- ♦ WRIGHTFLOR—Hard Surface Rubber Tile
- ♦ WRIGHT-ON-TOP Compression Cove Base

3454

PRIZE DISPLAY RACKS *continued*



Second Prize—Class B—\$250

*L. V. LaFave
Grand Rapids, Mich.*

“... a small and effectively arranged wall-type rack equipped with a roll-down cover of aluminum for locking up at night. It was felt that this design was suitable for many small lobby stands. Like the grand prize winner, it makes excellent use of the space available in terms of displaying the maximum number of magazines effectively.”

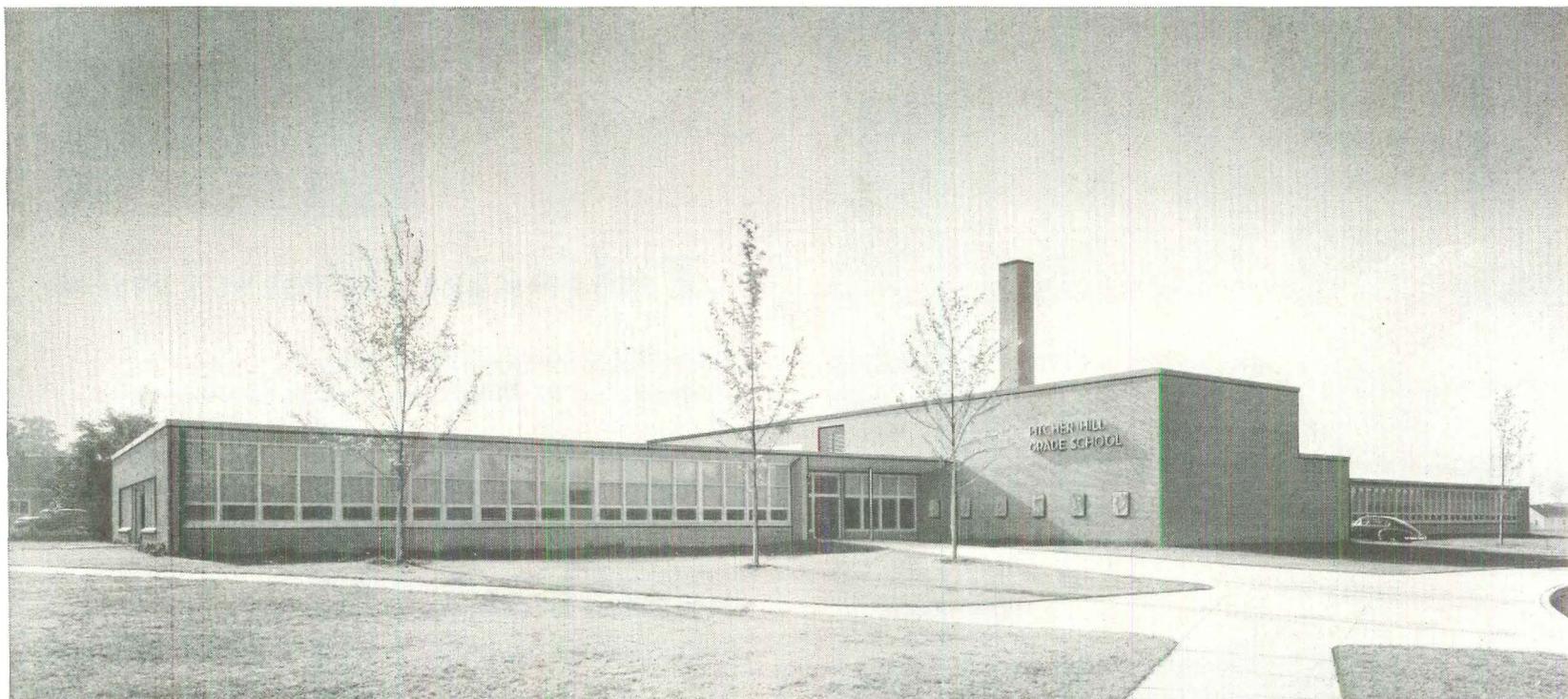


Second Prize—Class D—\$250

*Crescent Woodcraft
Winnipeg, Manitoba, Canada*

This rack is well designed for the display of many magazines of many sizes and, like most of the other prize winners, is simply constructed of plywood. However, the detailing of the design leaves something to be desired.—Ed.

MODERN GRADE SCHOOL equips cafeteria for planned lunch program . . . food-keeping facilities by Frigidaire



Pitcher Hill Grade School, North Syracuse, New York



Mrs. Charles E. Bradley, Director of School Lunch Programs, is shown at her 44 cu. ft. Frigidaire Reach-In Refrigerator, which dominates the well-equipped kitchen.

An outstanding example of functional grade school design is the recently completed Pitcher Hill Grade School, ideally situated amid spacious, rolling lawns in North Syracuse, New York. Modern to the last detail, the school provides up-to-the-minute facilities throughout for its student body and faculty.

As a case in point, the school's cafeteria is equipped with a roomy 44 cubic foot Frigidaire Reach-In Refrigerator that maintains the top nutritional value of the food it keeps, while helping to make possible the smooth, fast service a school lunchroom demands.

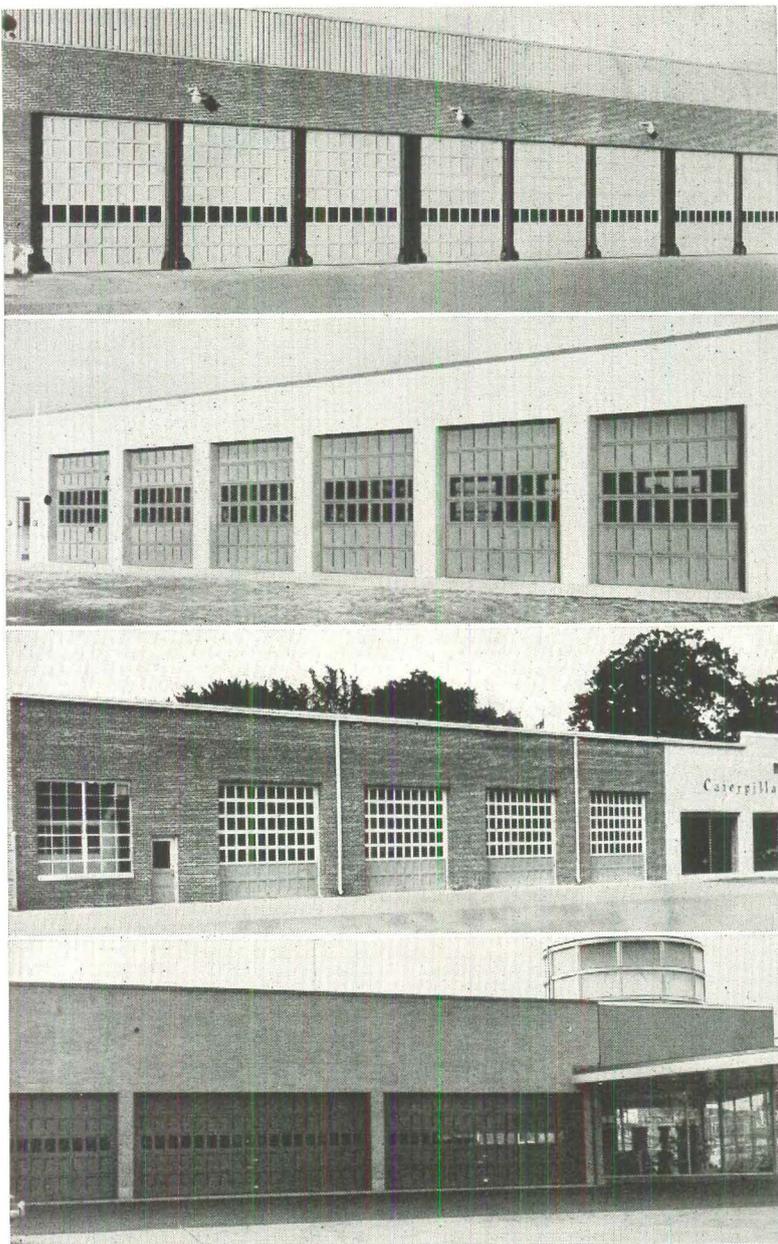
Frigidaire Reach-Ins, models from 17 to 62 cu. ft., provide large, accessible food storage capacity in minimum floor space. Flowing Cold refrigeration gives uniform food protection. Long life, dependability and economy are assured by all-steel construction, sealed Meter-Miser mechanism and all-porcelain interior.

For further information on Frigidaire equipment suitable for schools, hospitals or institutions, call the Frigidaire Dealer, Distributor or Factory Branch that serves your area. See Frigidaire catalogs in Sweet's Files, or write Frigidaire Division of General Motors, Dayton 1, O. In Canada, Toronto 13, Ont.

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Reach-In Refrigerators • Display Cases • Air Conditioners
Ice Cube Makers • Ice Cream Cabinets • Water Coolers
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● The installations illustrated in this advertisement are typical examples of Raynor Wood Sectional Overhead Doors, tailor-made to fit the opening.

These doors were made complete in the Raynor plant—assuring well co-ordinated, closely supervised construction. Many of the details pertaining to the individual installations were worked out by the Raynor Engineering Department—a service that is at your disposal for the asking.

These doors embody the finest in materials and construction and like all Raynor doors, large and small, are equipped with patented Graduated Seal that guarantees an efficient weather tite seal and smooth operation at all times.

● For full details on the Raynor complete line of Wood Sectional Overhead Doors and all accessories, see your Sweets file or write direct for the Raynor Catalog.

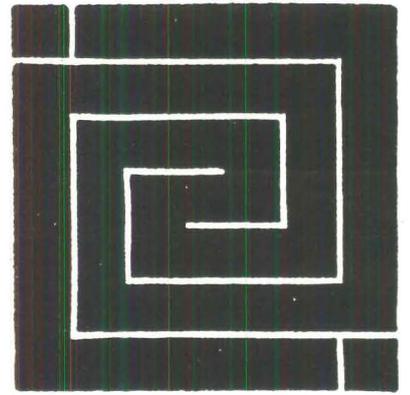


RAYNOR MANUFACTURING COMPANY

DIXON, ILLINOIS

Builders of a Complete Line of Wood Sectional Overhead Doors

Frank Lloyd Wright



Taliesin Drawings

Comments by Edgar Kaufmann, Jr.
64 pages. 57 illustrations, plans \$2.50.

19 structures, buildings, projects, the greater part hitherto unpublished (dwellings, bridges, theaters, self-service garages, amusement parks, etc.).

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GUTH WYTE-LINER

with AIRFLOW channel

a new idea in factory lighting as different as white from black

white inside and OUTSIDE

the white upside helps lift ceiling gloom, reduces strong shadows and improves brightness-contrast ratios

surface 300° Permalux or Porcelain Enamel
Airflow Channel circulates air for longer ballast life

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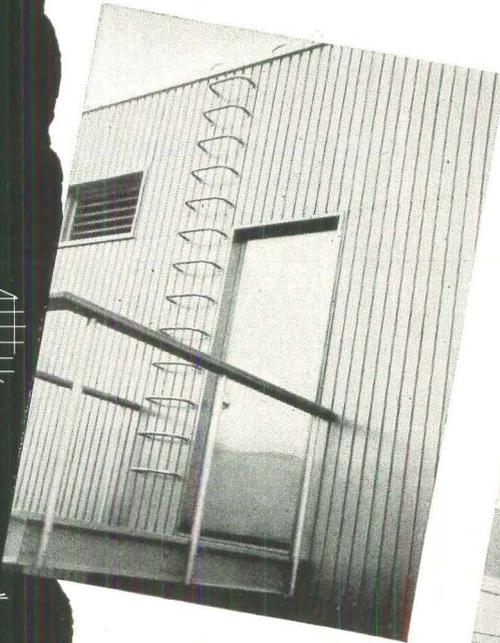
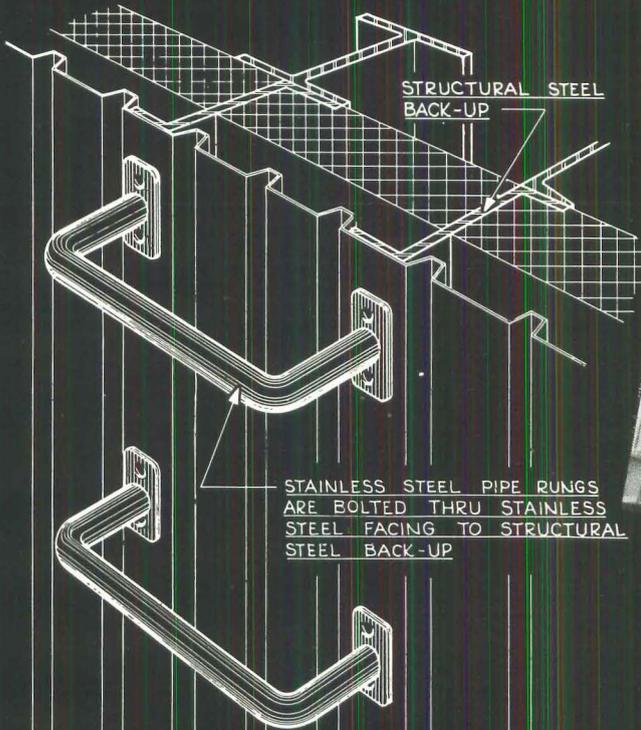
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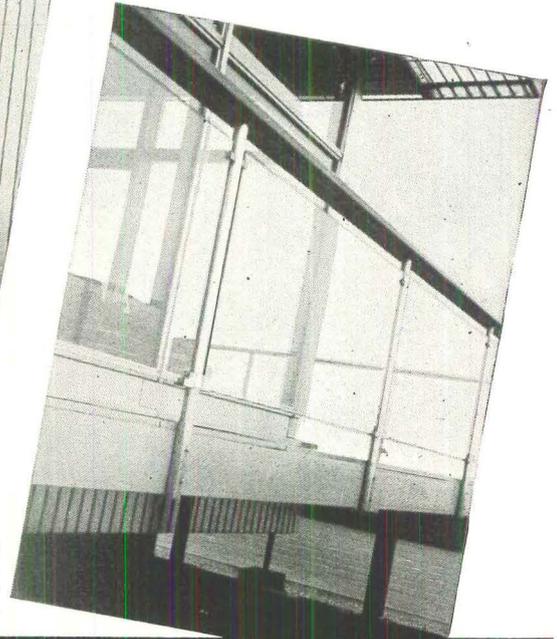
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Curtain-wall facing shown here is fabricated of ENDURO Stainless Steel sheets.



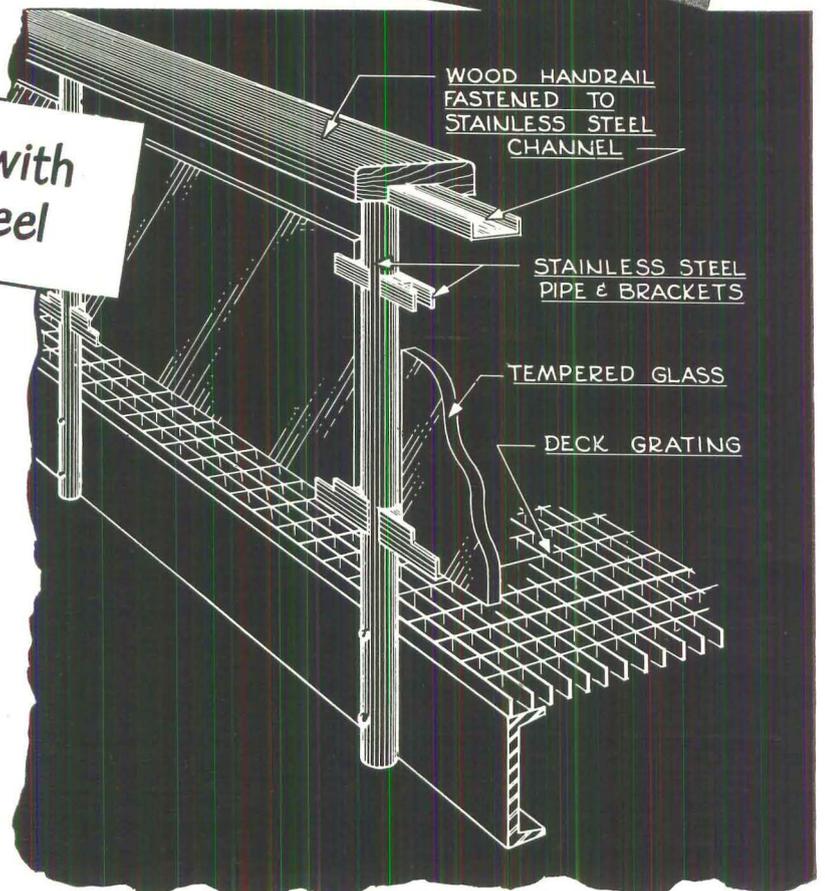
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REVIEWS

FRANK LLOYD WRIGHT—Sixty Years of Living Architecture. By Werner M. Moser. Buchdruckerei Winterthur AG., Winterthur, Switzerland. 100 pp. 8" x 12". Illus. Paper bound. \$4.50. Available through Museum Books, Inc., 48 East 43rd St., New York 17, N. Y.

Few American artists have been able to effect the rape of Europa. The complaint generally has been too much bullshiness and too little authentic drive. Always a bit more clever than the next fellow, Whistler was accepted because he could beat any European at his own game. Wright is accepted because he is playing his *own* game and has been doing so, as the title of this Swiss publication indicates, for 60 yrs.

That game is the provocative and profoundly absorbing one of a master spirit, fighting his civilization as he tries to create it. It is what the Italians call *terribilità*, the quality of a Michelangelo.

Sixty Years of Living Architecture is a profusely documented history of Wright's career with many color plates, photos and plans. Beginning with the famous "Romeo and Juliet" windmill of 1896, svelte and dynamic as it has always been, the book presents a fine panorama of the artist's work—his disciplined adventures in organic architecture.

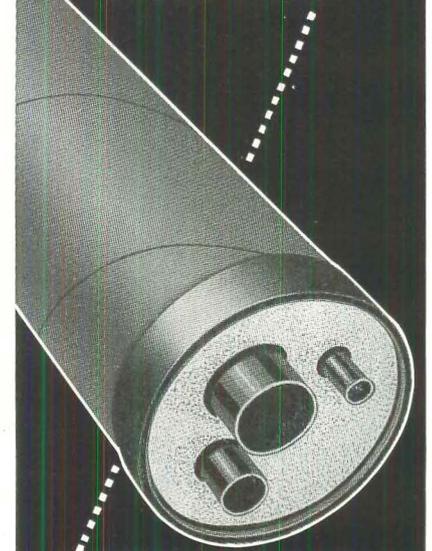
ARCHITECTURAL FORUM made many of its plates and drawings available for the book and most of the projects described have been covered in past issues of the magazine, but it is good to see them collected here in roughly chronological order. Wright's early works seem even now distinctive and modern: witness the superb Frederick C. Robie House done in 1909 with its bold cantilevered construction and handsomely accented stories; or the Avery Coonley House of 1908, with the photo of its living room showing an interior construction so convincingly modern as to make the furnishings appear displaced and Victorian.

One observes the gradual introduction into Wright's plans of unorthodox angles, as in the St. Mark's Tower (1929) which was never built. Plans on the open angle of the hexagon are developed, on the triangle and the lozenge. Finally, the semicircle (as in the Jacobs House), the circle (the Huntington Hartford Club House) and the fantastic "shell" shape (the Kaufmann Jr. House in Los Angeles) are brought into the artist's powerful working repertoire.

A note on the Huntington Hartford Club House cautions that "similar projects will hardly ever be in request in Europe, [but] we must be careful not to restrict the freedom of our creative thinking, . . ." as impressive a tribute, in its way, as an American artist ever receives from abroad.

The text, which is in German (lengthy *continued on p. 166*)

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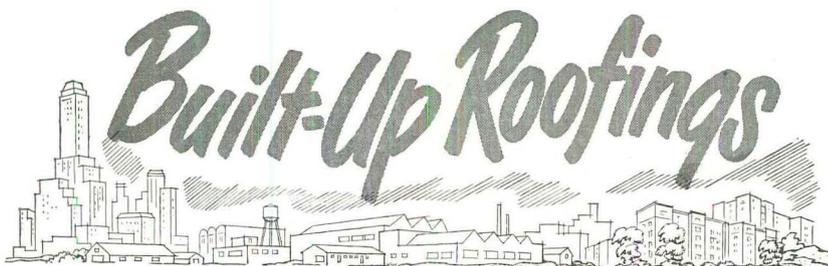
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a 200 car garage . . . and to top it all off, a Ruberoid Coal Tar Pitch and Tarred Felt Built-Up Roofing.

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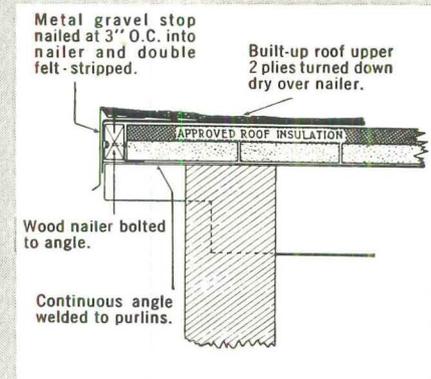
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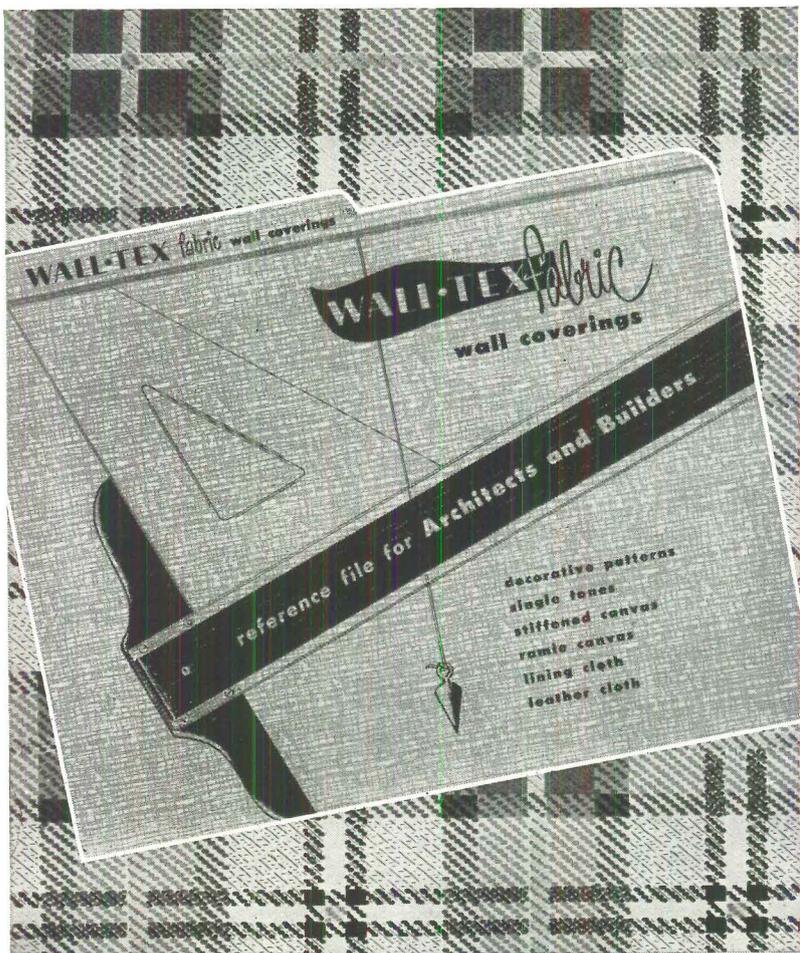
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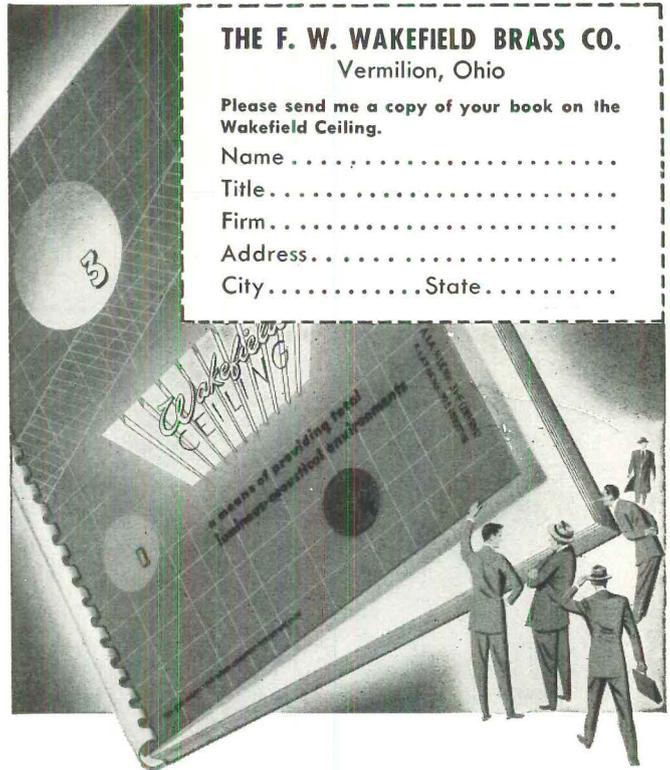
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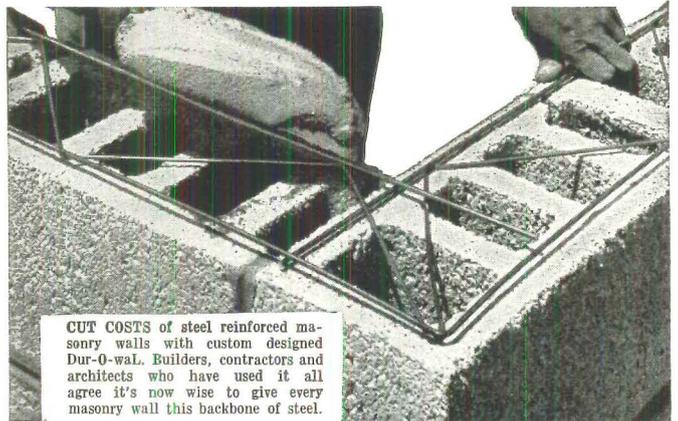
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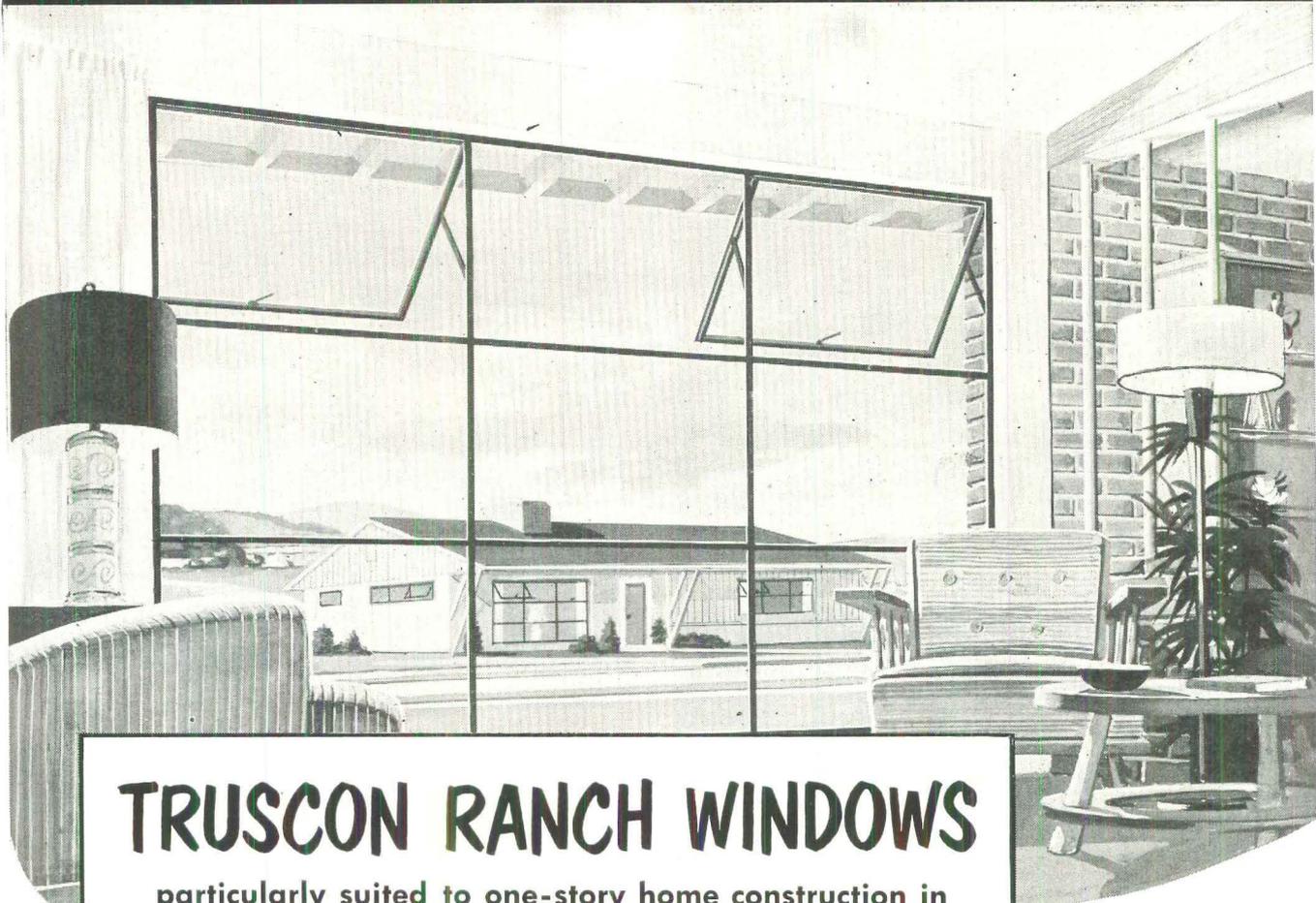
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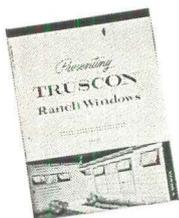
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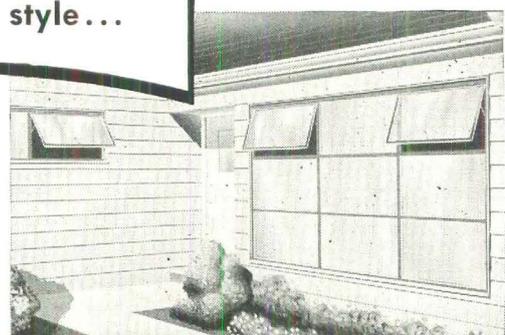
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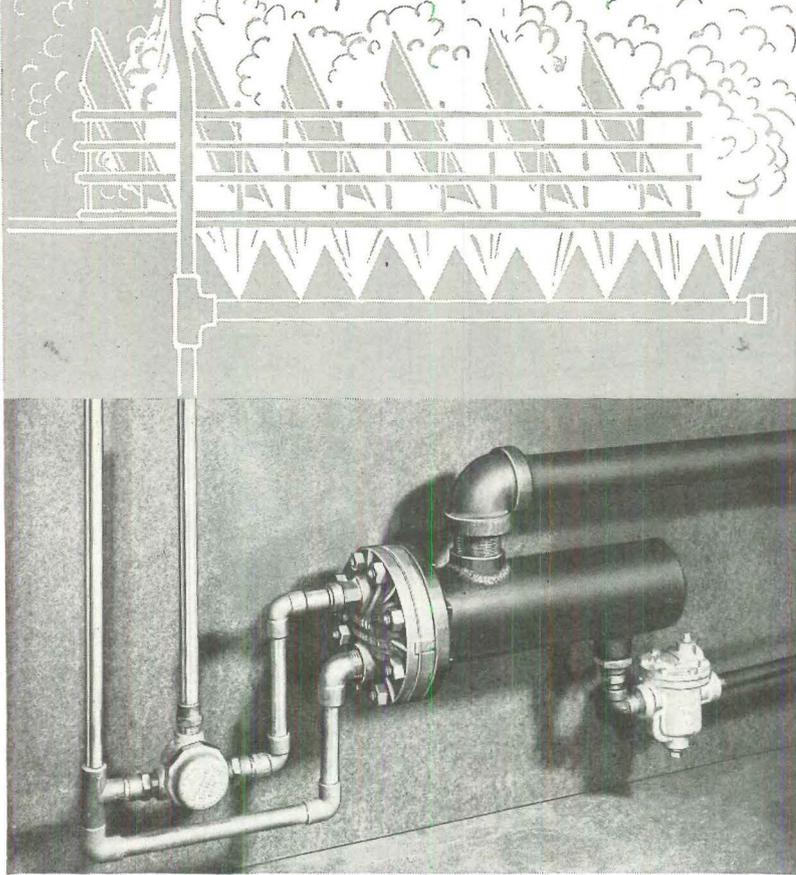
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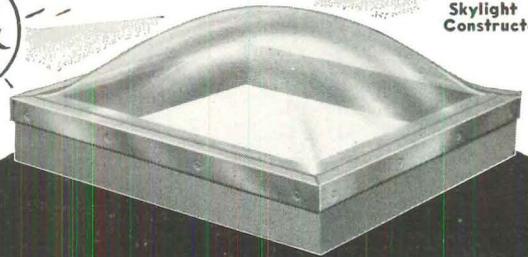
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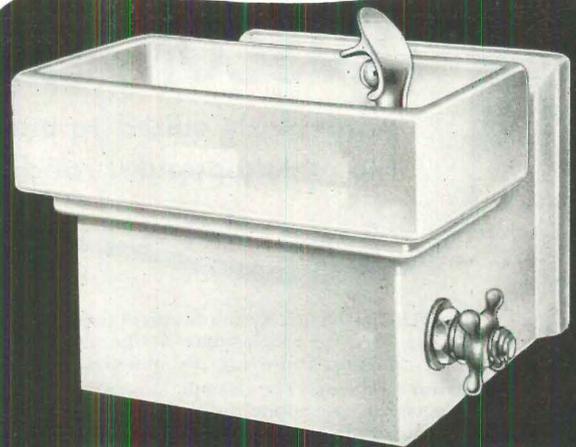
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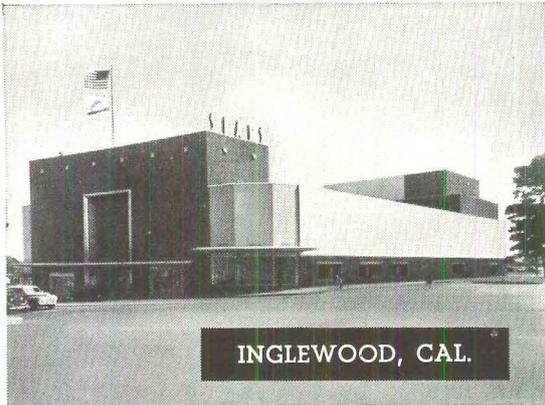
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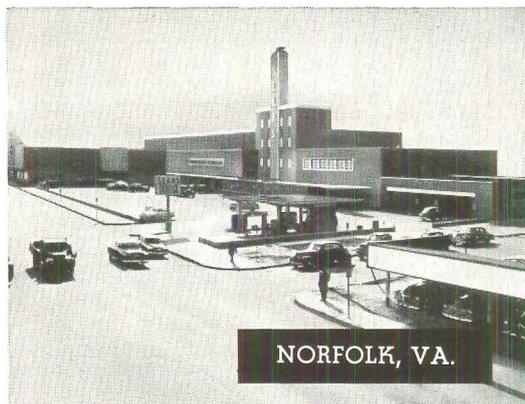
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captions are in English and German), traces Wright's spiritual descent from Ruskin and Morris in England, those bitter and losing opponents of a machine civilization, and from Thoreau and Whitman in our own country. It includes many passages from Wright's own books translated into German for a European audience—and how near his prose is to Whitman's poetry!—outraged, optimistic, and to the last, patriotic.

The paradox of the reactionary romantic (the Byron figure), who is at the same time revolutionary, has never been satisfactorily explained, but here again is the well-documented case history of such a man.

FIRE SAFETY IN THE ATOMIC AGE. By Horatio Bond. Chief Engineer, National Fire Protection Association, 60 Battery March Street, Boston 10, Mass. 1952. 72 pp., including a 7-p. bibliography. Illus. \$3

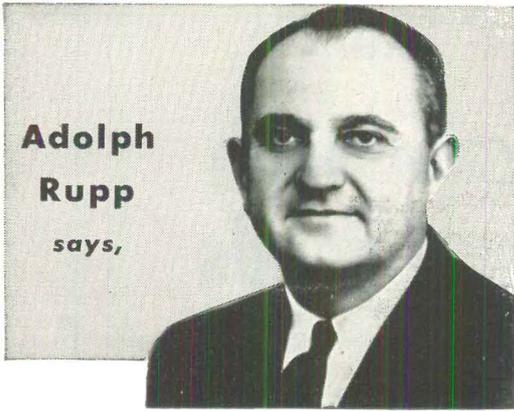
This valuable book details a comprehensive program of fire safety for architects, engineers and building managers concerned with existing and planned buildings in potential target areas.

Experience in World War II showed that four-fifths of the damage in bombed cities was due to fire destruction. Since the extent of fire destruction depends on the combustible objects within a city, the author's object is to reduce the fire danger by rigidly controlled top limits of fire loading. He recommends a top limit of 40,000 Btu (equivalent to 5 lbs. of wood) per sq. ft. for an unfireproofed structure and up to 240 Btu per sq. ft. for a completely fireproofed structure. Responsibility for keeping within these limits falls mainly upon the building manager, but the architect can help by employing a minimum of combustible materials in the construction. The author's conclusions are important in peacetime as well as in wartime.

STRENGTH OF MATERIALS. By Frank J. McCormick. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 177 pp. 6 1/4" x 9 1/2". Illus. \$3.75

Aimed at the student, this book presents an elementary account of the stress analysis of common building materials, notably steel and timber. It includes the analysis of beams and columns and describes the conjugate beam method in detail.

The author, who is professor of applied mechanics at Kansas State College, has perhaps weakened his study by not covering either the relative advantages of different building materials (steel vs. aluminum, for instance), and by not devoting more space to connections, particularly the importance of high tensile bolts vs. riveting or welding. Nevertheless this study may be read with profit by architectural students.



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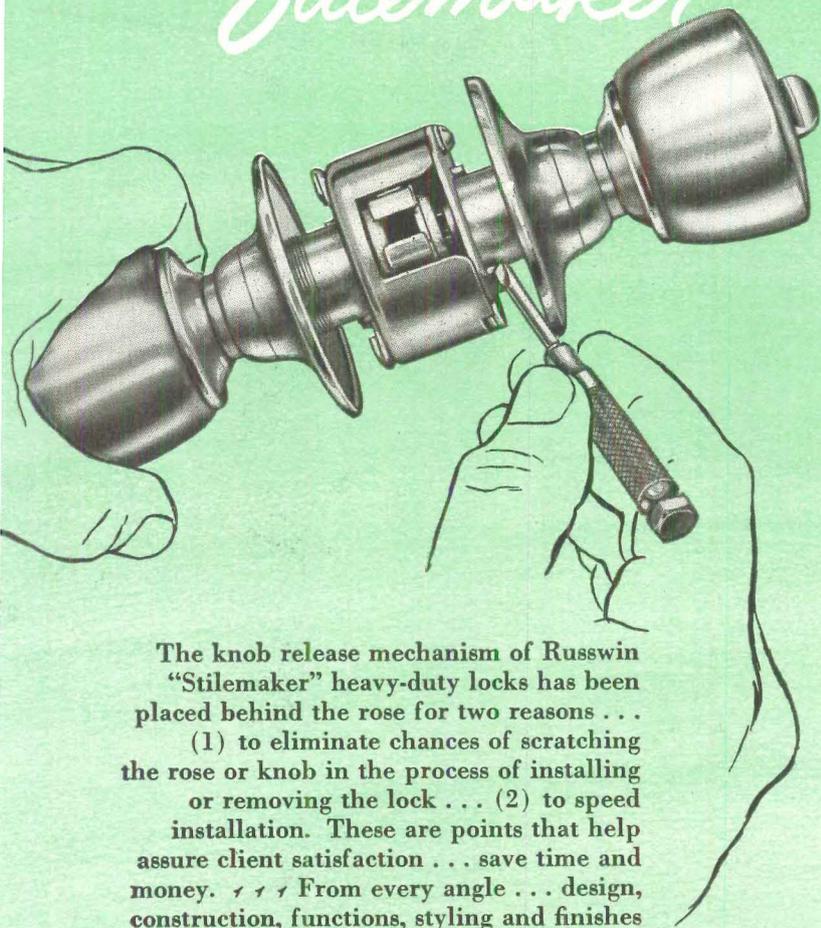


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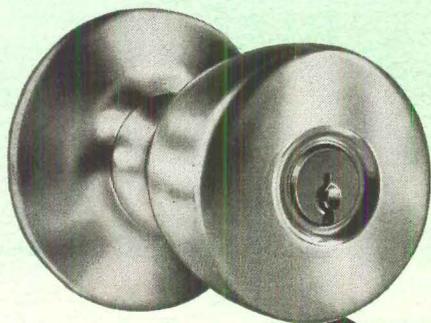


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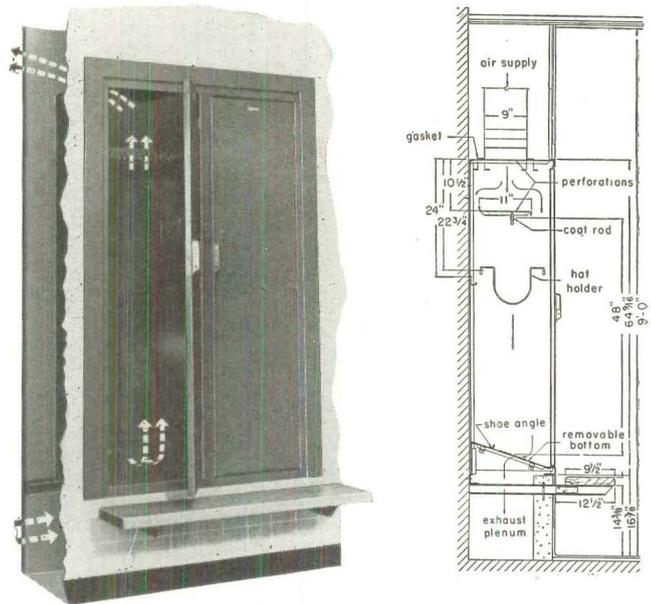
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PRODUCT NEWS



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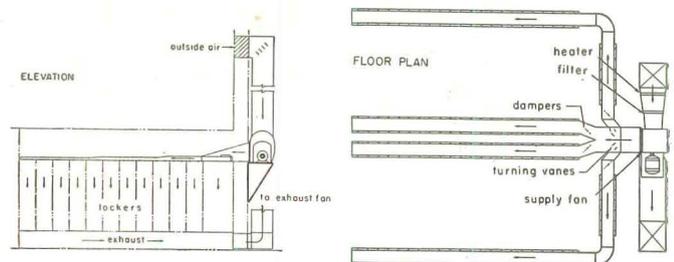
The *Air Flow* clothes cabinet portends a millennium in locker-room planning as well as an end to hosts of pungent similes. Clean, treated air is circulated through these steel lockers via a built-in ventilating system (see diagrams below) removing odors and keeping clothes fresher and drier than conventional metal closets. Assuring a more sanitary milieu, the new unit is certain to boost morale in factory, school gym and country-club dressing areas. Besides the long-needed ventilation feature, the *Air Flow* incorporates several other considerate details:

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▶ Flush fronts and cantilevered benches help give the room a neat appearance and facilitate housekeeping.

▶ Fittings such as hatholder, storage shelf, coat rod and hooks, and automatic lock are planned for the user's comfort and convenience.

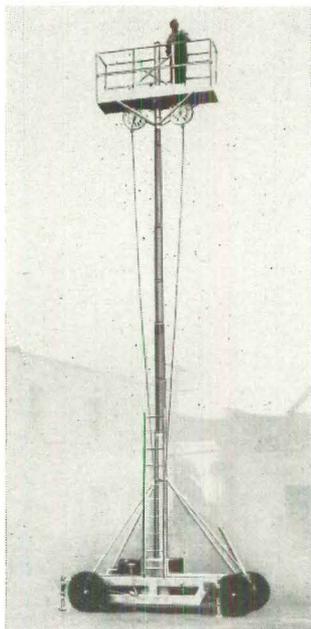
Air Flows may be wall-recessed or mounted in islands with ventilating ducts above and below. (Air travel can be directed



according to the system employed.) Each unit measures 15" wide x 18" deep x 9' high and comes in two standard colors—gray and green. List price per locker, knocked down, f.o.b. factory, runs from about \$20 to \$25 depending on grouping and arrangement. Cost does not cover ventilating equipment or ductwork. Discounts are made on quantity orders.

Manufacturer: Penn Metal Corp. of Pennsylvania, 50 Oregon Ave., Philadelphia 48, Pa.

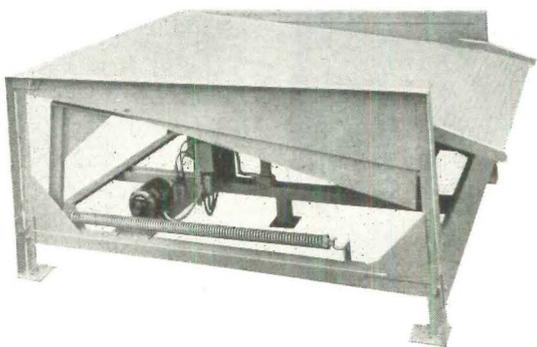




HYDRAULIC LIFT-ON-WHEELS raises men and material 38' above ground

Performing a somewhat sophisticated version of the Indian rope trick, this mobile personnel lift should soon make itself popular among building and maintenance men. The trailer, built on a strong, pneumatic-tired chassis, utilizes a heavy-duty hydraulic jack to elevate its 8' platform and 3 tons of building material and crew as high as 38'. It is equipped with dual controls—one set on the high-flying top and the other on the grounded carcass. The platform can be rotated in a complete circle—maneuverability needed for handling awkward trusses and pipes. A 7½ h.p. self-starting engine powers the versatile lift and its base is fitted with four stabilizing screw jacks on folding arms for use with heavy loads. Fully retracted with its guard rail collapsed, the machine needs only 13'-6" head room and so can shuttle around inside a plant or large construction job. Should the hydraulic line rupture completely, the lift will descend slowly; and in case of control failure, a by-pass valve in the base regulates the lowering. To keep tools and small items from falling off, the platform is provided with a 6" kickboard. Price, f.o.b. Pasadena, is \$4,750.

Manufacturer: Hamlin-Klock Corp., 28 N. Marengo Ave., Pasadena 1, Calif.



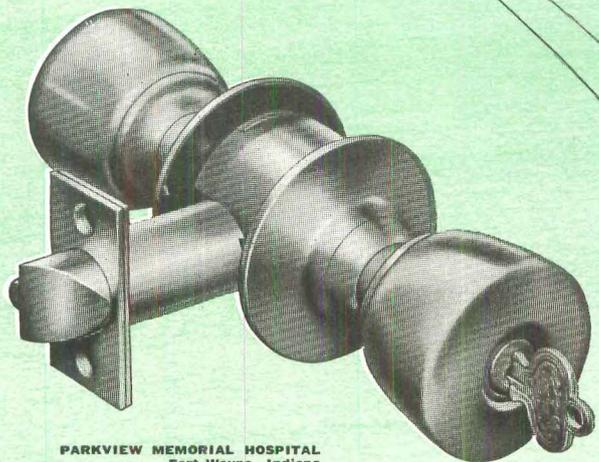
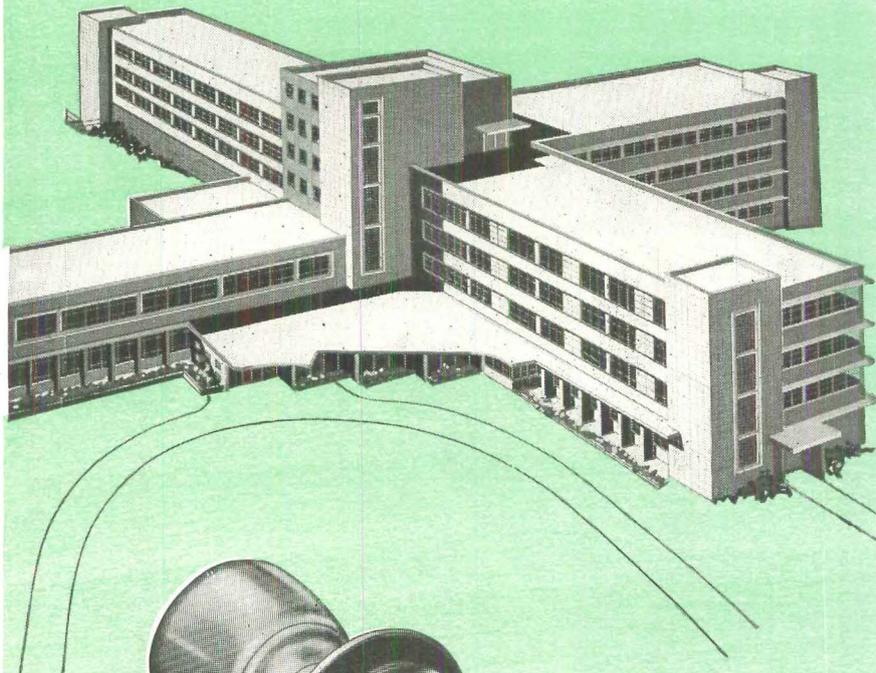
PACKAGED PORTABLE RAMP bridges factory dock and truck; cuts costly hand-to-hand loading

Enabling one man and a forklift truck to do the loading work of ten men and two trucks, the Illo ramp can add materially to the efficiency of a factory layout. The unit is shipped completely assembled and can be installed at any loading deck in about 5 min., and adjusted in seconds to meet any truck-

continued on p. 174



The New "Look" in Fort Wayne...



PARKVIEW MEMORIAL HOSPITAL
Fort Wayne, Indiana

ARCHITECT . . . A. M. Strauss, Inc.,
Fort Wayne, Indiana

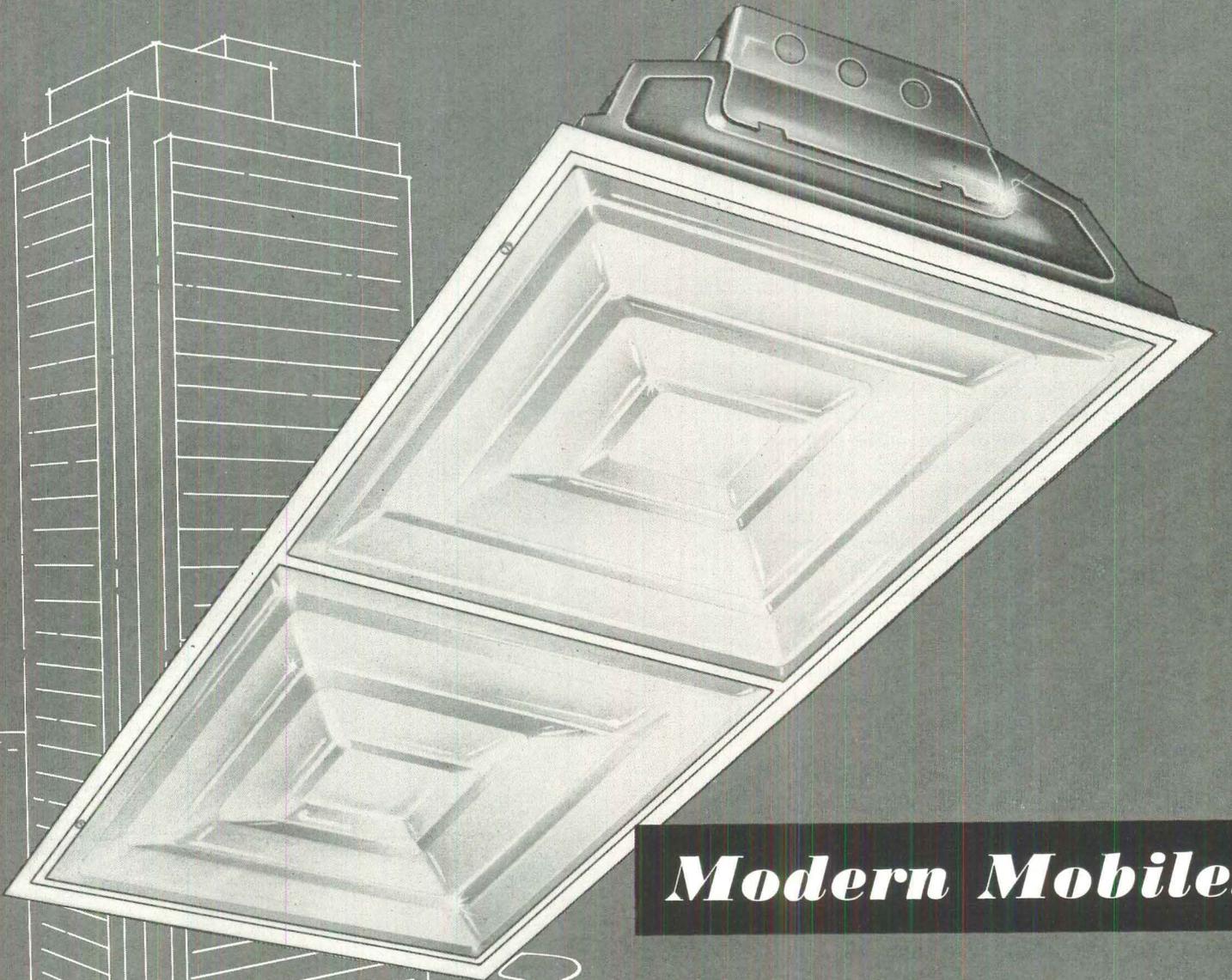
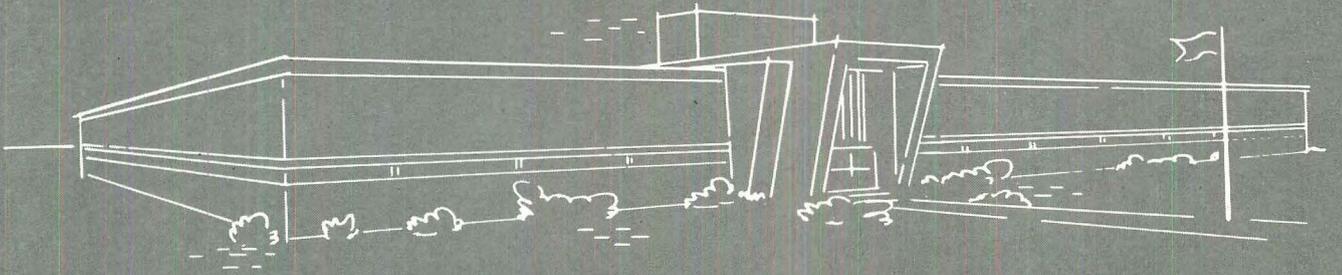
CONTRACTORS . . . Hagerman
Construction Corp.,
Fort Wayne, Indiana

gets the
new lock
in builders'
hardware

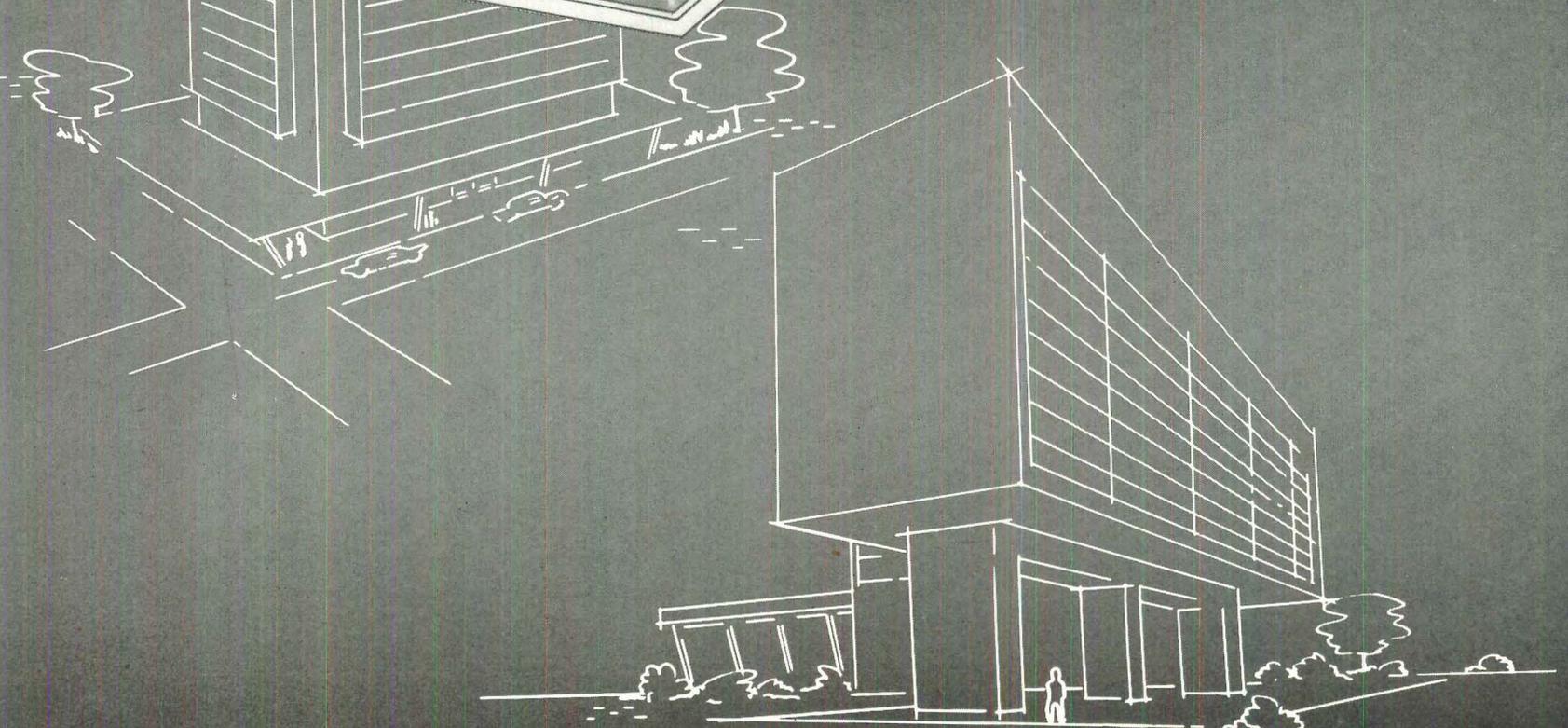
RUSSWIN[®]
"Stilemaker"

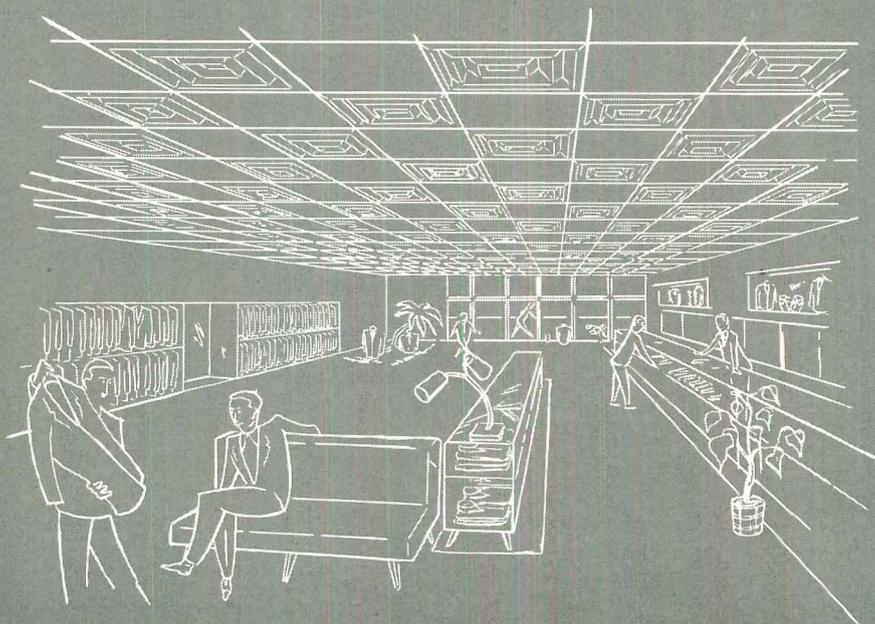
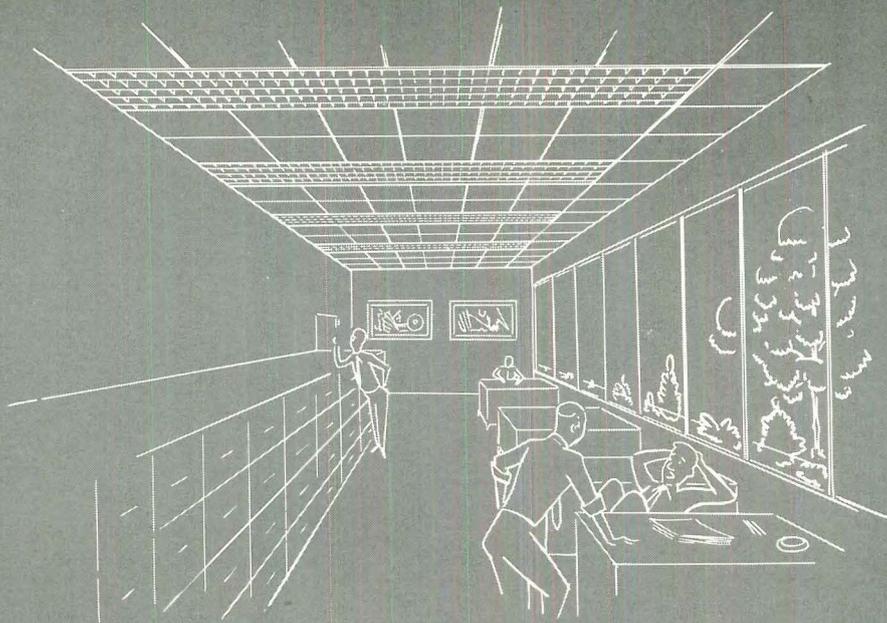
HEAVY-DUTY CYLINDRICAL LOCK

Russell & Erwin Division
The American Hardware Corporation
New Britain, Conn.

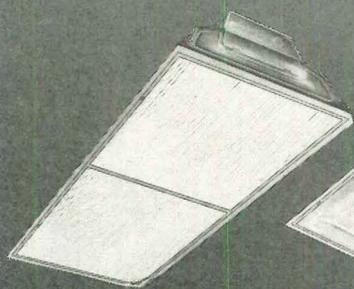


Modern Mobilex®

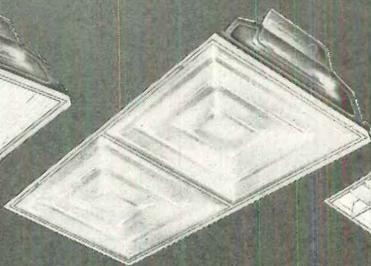




a new idea in lighting . . .



GLASS
PANELS



MOLDED PLASTIC
PANELS



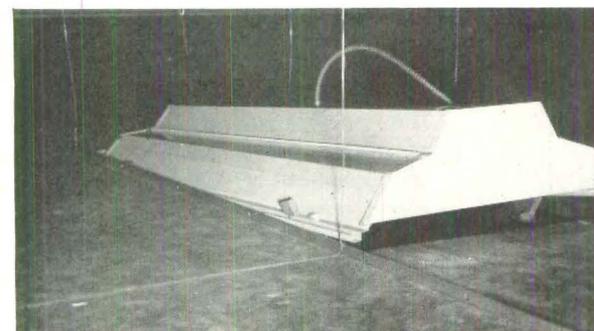
BOXCO®
LOUVERS

Mobilex places in the hands of the architect a new design element . . . a flexible new lighting tool that can help him conceive a thousand and one lighting ideas. You can use Mobilex as single units . . . build unlimited patterns of light . . . or create an entire luminous ceiling. And you can

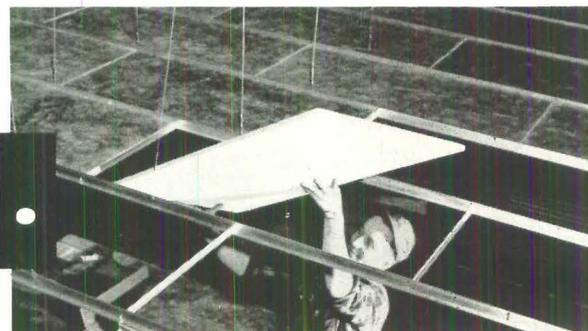
Mobilex is a recessed fluorescent lighting system. It is designed for use with grid-type suspended ceilings. Interlocking "tee" rails support Fiberglas* Ceiling Boards and Mobilex units. Mobilex is available in 2' x 2' or 2' x 4' units with a choice of molded plastic, glass or louvered shielding elements.



Mobilex is easy to install. Simply compress the sides of the fixture with "Mobilhooks" and insert it into the grid opening.



The fixture rests on the grid rails. End baffles lock the compression feature into place. No hangers or suspension straps.

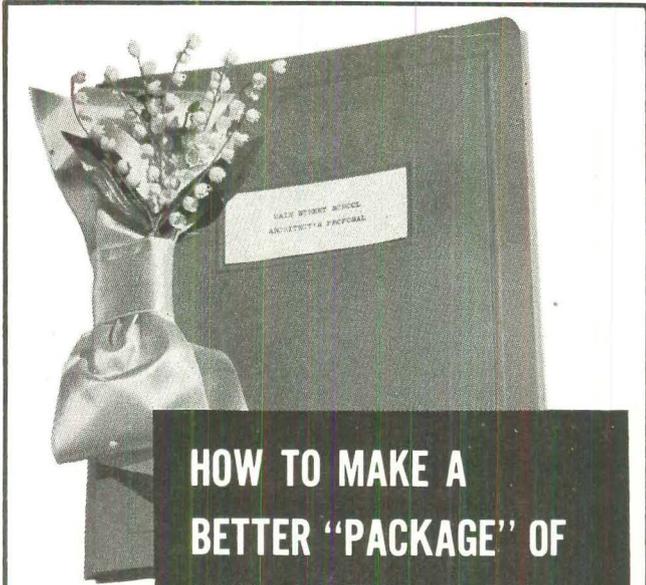


Mobilex units may be added or changed at any time. Just remove the ceiling panel and replace it with the Mobilex unit.

"DECIDEDLY BETTER"
DAY-BRITE®
Lighting Fixtures

Write today for the full Mobilex story. Ask for Bulletin OD-567. Day-Brite Lighting, Inc., 5471 Bulwer Avenue, St. Louis 7, Missouri. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

**ALSO AVAILABLE FOR USE
WITH OTHER TYPE CEILINGS**



HOW TO MAKE A BETTER "PACKAGE" OF YOUR SCHOOL PROPOSAL

The trend in school design is to multiple use of space. This provides a means of keeping within school building budgets in the face of rising prices and by reducing costs in one department permits incorporation elsewhere of wanted features. This equipment is now in use in hundreds of schools from coast to coast and is specified by more than 85% of leading school architects.

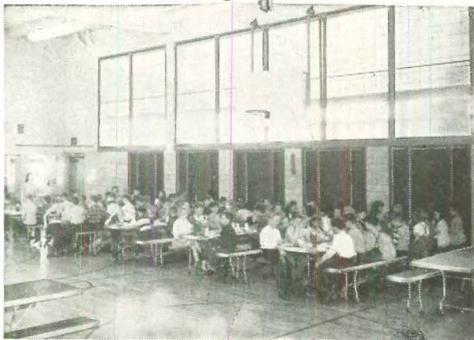
In-wall

FOLDING TABLES AND BENCHES

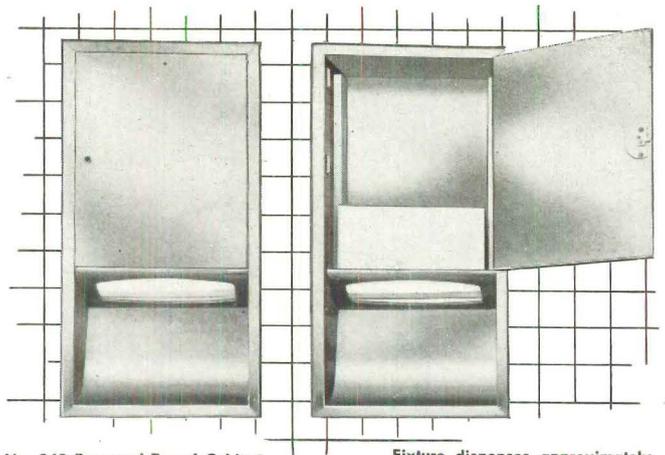


Write for catalog or consult SWEET'S

Conversion of activities room to lunchroom for 200 can be made in 8 minutes with no interruption of routine.



SCHIEBER SALES COMPANY
Detroit 23, Michigan



No. 943 Recessed Towel Cabinet is fabricated of stainless steel.

Fixture dispenses approximately 400 "C" type folded towels.

To make washrooms *really* modern

—specify the Scott No. 943 Recessed Towel Cabinet

Here's the fixture designed to keep step with today's growing trend to recess fixtures. It's one of the many Scott fixtures available to meet the most exacting demands for modern washrooms.

For a detailed dimension and installation drawing of the No. 943 fixture or for the help of a trained Scott consultant, write Washroom Advisory Service, Dept. MB-12, Scott Paper Company, Chester, Penna.

SCOTT

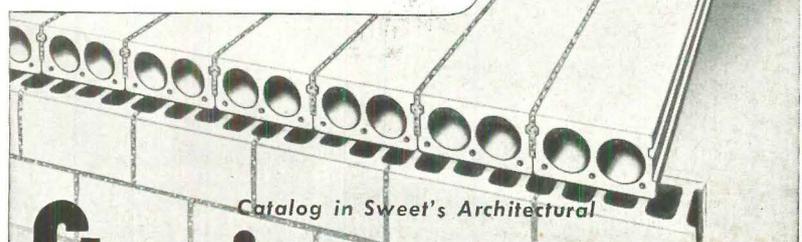
Symbol of Modern Washrooms

Trade Mark "Washroom Advisory Service" Reg. U.S. Pat. Off.



Long-Span Roof Slabs Provide 8' Cantilevers, Finished Ceiling

This \$175,000 Florida motel eliminated ceiling plaster, achieved 8' clear cantilevers easily and speeded construction by using Flexicore precast slabs in 16' to 22' 6" spans. Smooth underside of fire-resistant slabs formed attractive panelled ceilings. For catalog and nearest manufacturer, write The Flexicore Company, Inc., 1759 East Monument Avenue, Dayton 1, Ohio.



Catalog in Sweet's Architectural

flexicore® PRECAST CONCRETE FLOOR & ROOF SYSTEMS

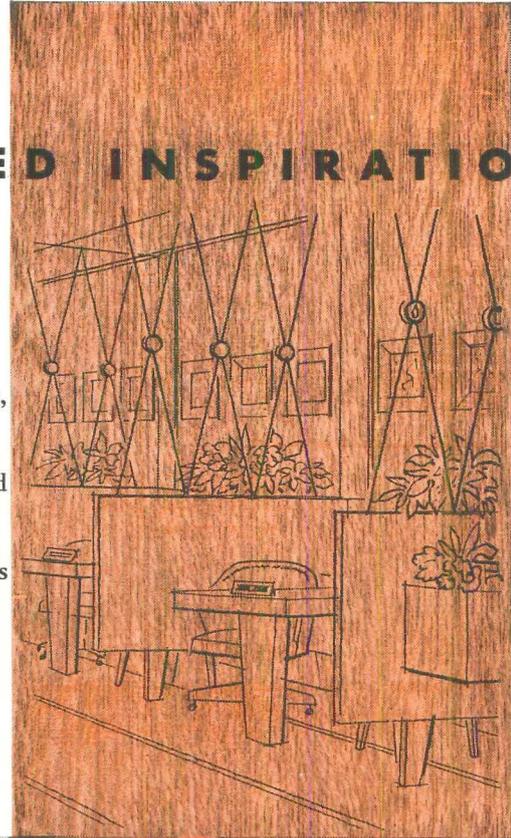
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PLASTIC SURFACE

Design ideas seem to spring naturally from the versatility of lovely, lasting MICARTA[®] plastic surfaces. The smart, efficient appearance of the United Fuel Gas Company installation, shown below, was made possible by MICARTA'S combination of long-lasting beauty and year-after-year utility... MICARTA'S ability to handle daily dealings with the public without showing the effects of wear and tear.

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UNITED STATES PLYWOOD CORPORATION
55 West 44th Street, New York 36, N. Y.

Please send MICARTA application booklet, Form No. 1118.

NAME _____

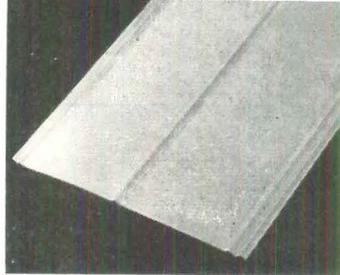
ADDRESS _____

CITY _____ ZONE _____ STATE _____

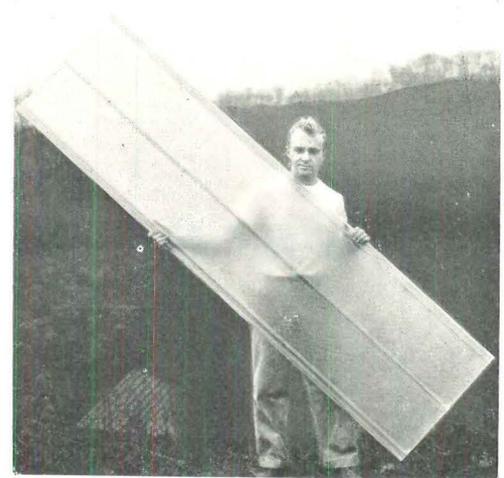
J-06493

MB 12-52

platform height. Both manually controlled and motor driven models are available at \$740 and \$840 f.o.b. Los Angeles. The electric ramp has a single-phase 1/2 h.p. motor connected to a 3/8", 350 lb. hydraulic pump and can be plugged into any 110 v. outlet. Heavy-duty tension-type coil springs counter-balance both types. Each measures 6' x 8', weighs 1,500 lbs. and has a 10-ton capacity.
 Manufacturer: John B. Illo Engineering Co., 2414 East 57th St., Los Angeles 58, Calif.



Translucent plastic takes on a new form in these building panels crimped to correspond to 5-V metal siding and roofing sheets.



PIGMENTED PLASTIC SHEETS made to match 5-V metal roofing and siding

Marking a subtle step forward in structural plastics, Resolite is adding 5-V crimped panels to its line of translucent polyester resin sheeting. Like the corrugated and flat panels, the new crimped units are reinforced with glass fiber and are about as strong as metal sheets of the same gauge and shape. They can be used alone as siding or roofing, or may be combined with standard metal 5-V units. Application presents no special problem since the plastic panels nest together and are fastened to the frame the same way as the metal—either by screws, nails or bolts. The sheeting sells for about \$1 to \$1.25 per sq. ft. and, requiring no caulking or flashing, makes inexpensive skylighting for industrial and farm buildings. It is said to be unaffected by weather extremes and most chemicals. Each panel is 26" wide and up to 12' long, and comes in eight pastel colors.

Manufacturer: Resolite corp., Zelenople, Pa.

PROJECTING NUMBER PLATES made of lustrous, colored plastic

These neat number plates are molded in several colors of a tough cellulose-acetate plastic. Highly resistant to corrosion and wear, they are suitable for indoor or outdoor use and make smart, inexpensive details for corridors of office buildings, schools, hospitals and apartments. Each tag measures 2" x 5" and projects lengthwise from its own permanently mounted plastic bracket.



The 1 1/2"-high numerals (or letters) are stamped in white against lustrous green, gold, red or black backgrounds, and are clearly visible at considerable distances. Lightweight, the plate can be cemented to metal or plaster wall surfaces; screws are used to fasten it to wood. The number plates can be ordered with one to four figures and cost 60¢ each in lots of 25 or more.

Manufacturer: Plastic Tag & Trade Check Co., Fourth & Saginaw St., Bay City, Mich.

continued on p. 178




FIREMEN EVERY 10 FEET

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 Insurance authorities know that automatic sprinklers *discover and stop FIRE*. Savings in annual premiums after you install automatic sprinklers, often pay for the system in 4 to 8 years. Install **GLOBE Automatic Sprinklers** now.

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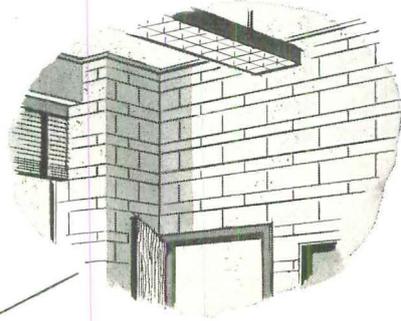
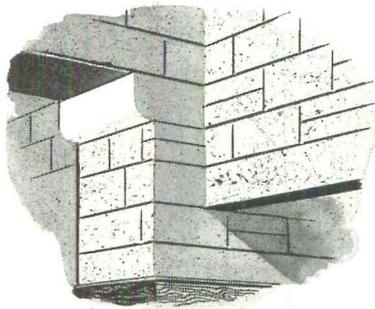
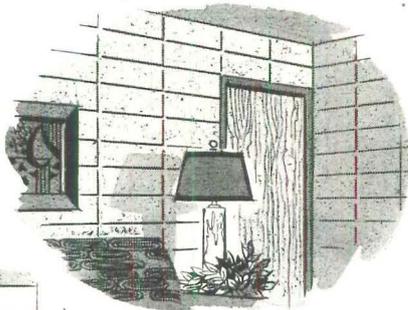
THEY PAY FOR THEMSELVES

Coursed Ashler variation with 4" & 8" units

Horizontally stacked 8" x 16" units

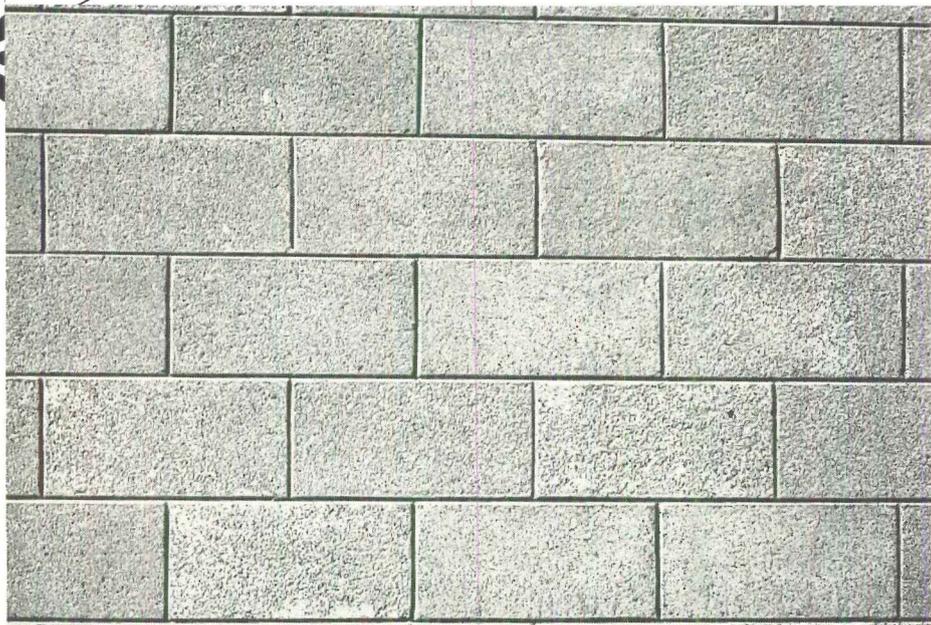
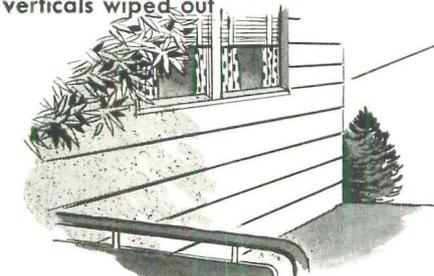
4" x 16" and 8" x 16" courses

Basket-weave using 8" x 16" units



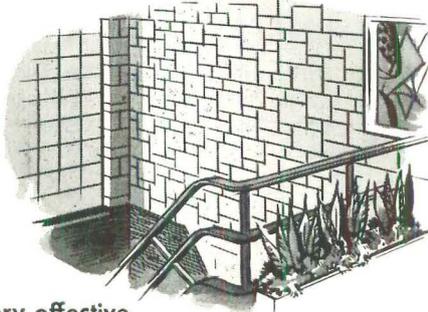
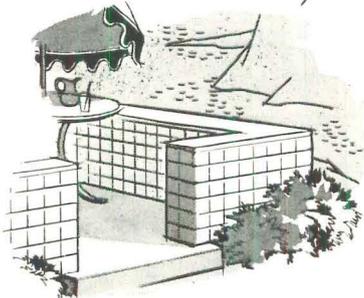
Theme and Variations

Tooled horizontal joints; verticals wiped out



THE FAMILIAR THEME—8" x 16" FACE UNITS IN RUNNING BOND

Here 8" x 8" units are stacked

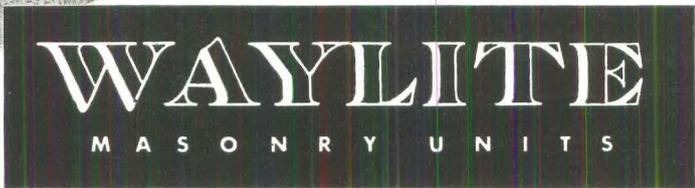
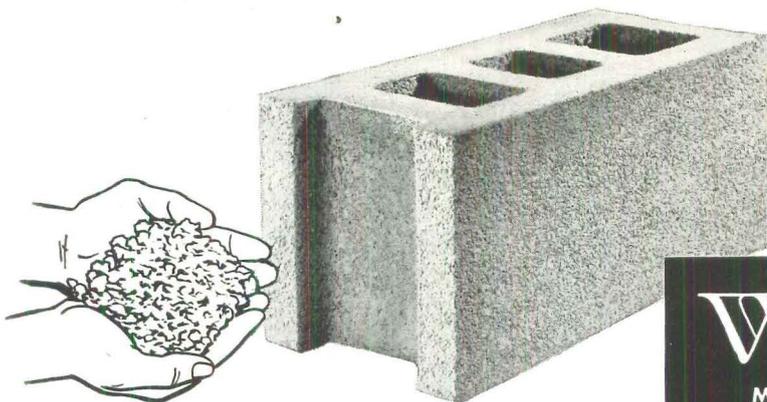


A very effective patterned Ashler

...with exposed **WAYLITE** Partitions and Bearing Walls

The vast musical literature of the world is limited to a maximum of 13 tones in any one octave . . . similarly there is a very wide range of harmonious effects to be obtained with Waylite masonry walls of any thickness . . . a few of the different handlings are shown here . . . they are achieved very simply. . . . Waylite masonry has adequate

structural strength—superior thermal insulative qualities—and exposed Waylite interior walls need no acoustical treatment. The Waylite Co., 105 W. Madison Street, Chicago, or Box 30, Bethlehem, Pa.

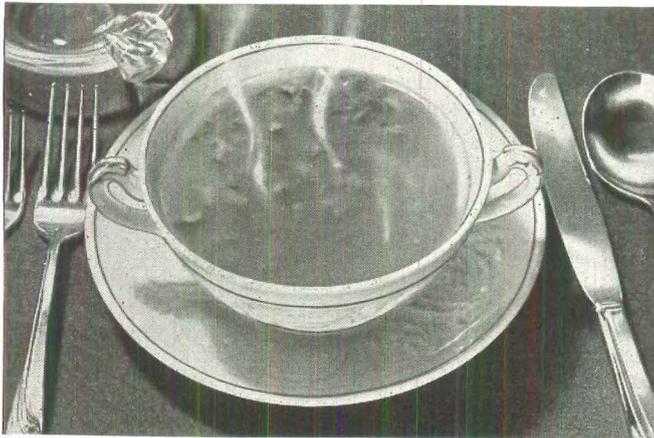


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Niagara,
but...**



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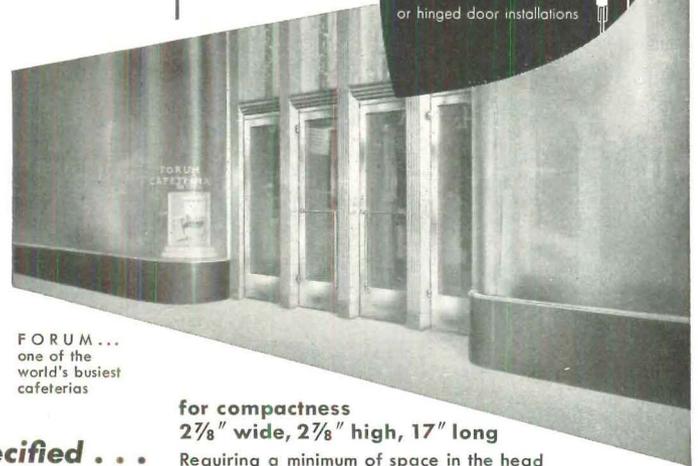
A wholly owned subsidiary of Homasote Company—manufacturers of the oldest and strongest insulating—building board, wood-textured and striated panels.



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available for center hung
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FORUM...
one of the
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Requiring a minimum of space in the head jamb or transom bar . . . this compact Rixson closer meets the specifications when modern architecture calls for narrow door trims or thin walls.

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The doors of this FORUM Cafeteria are opened nearly 18,000 times daily . . . 364 days a year. Since installation in 1939, Rixson Overhead Concealed Closers have brought these doors to a quiet close approximately 90 million times.

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MONUMENTAL
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are being specified by architects throughout the country for buildings where requirements call for the highest quality in aluminum awning windows. A recent outstanding example is the new plant, office and laboratory building of White Laboratories, Inc. at Kenilworth, New Jersey, incorporating the latest design features, including "Lemco" Series 62 Monumental Aluminum Windows. In planning any architectural project, look to "Lemco"—see our catalog in Sweet's Architectural File or write for descriptive literature.

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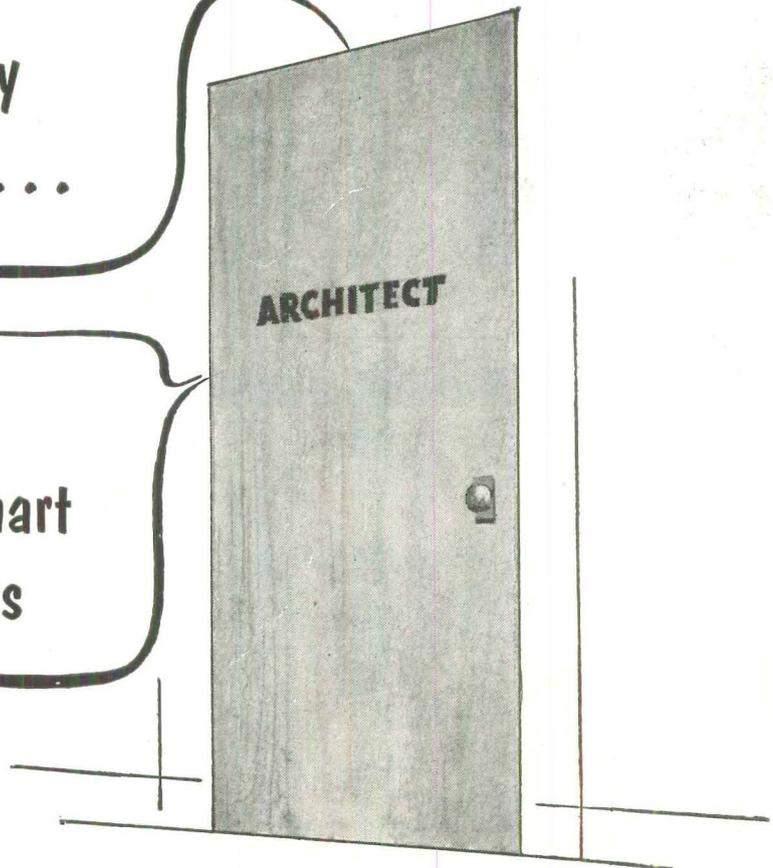
White Laboratories, Inc.
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Specify
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IN today's competitive hollow core door market, quality varies greatly. Make sure you get the best value when you specify.

You can always depend on Roddiscraft quality. Roddiscraft's reputation for quality built over a period of 60 years will never be sacrificed to expediency. We expect to be manufacturing and selling doors for another 60 years.

It will pay you to investigate the Roddiscraft Housemart Hollow Core Flush Door. Compare construction — compare appearance. Roddiscraft Housemart Doors are a finished product — no rough edges — smooth sanded faces — made to last.

You're safe when you specify Roddiscraft Housemart Doors. Like the famous Roddiscraft Solid Core Flush Door, they are backed by a two-year Guarantee Bond.

See Sweet's Architectural File for specifications and information on the complete line of Roddiscraft doors.

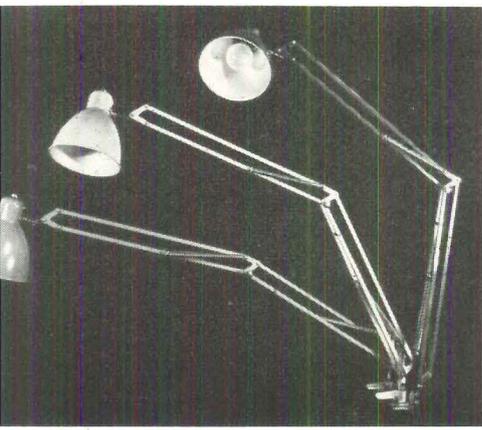
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Houston 10, Texas • Kansas City 3, Kan. • Los Angeles 58,
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55, N. Y. • Port Newark 5, N. J. • Philadelphia 34, Pa.
St. Louis 16, Mo. • San Antonio 6, Texas • San Francisco 24,
Calif. • San Leandro, Calif.

Roddiscraft

RODDIS PLYWOOD CORPORATION

Marshfield, Wisconsin



LIGHTING FIXTURE responds to finger touch

An ingenious take-off on human anatomy, the Norwegian *Luxo* lamp is as utilitarian as it is handsome. Its frank, aluminum shade is mounted on a highly maneuverable arm made up of square steel tubing and nickled springs. Vented to allow bulb heat to escape, the shade is designed for a 60 w. incandescent lamp. Painted white on the inside, it is an effective reflector,

diffusing glareless illumination. A finger touch to the shade or bracket moves the light to any position—and it stays wherever put. Several attachments are available for securing the *Luxo* to different surfaces: *bracket A* clamps to desk or table lip, *B* can be fastened to the wall by screws, and *C* secured to a workbench or any flat surface. Price for the lamp with any one of these three brackets is \$21.95. (Architects and designers receive a 25% discount.) *Bracket D*, a weighted felt-bottomed base for desk-top use, is also available at an additional \$4.25. Choice of finishes are: in glossy enamel—ivory, gray and light green; and in matte enamel—black. The *Luxo* carries Underwriters Laboratories' approval. Each unit is shipped assembled. *Manufacturer:* Form & Function, 212 Fifth Ave., New York 10, N.Y.

JUMBO SAFETY SWITCH made for industrial wiring systems

Rounding out its line of 30, 60 and 100 amp. safety switches, Trumbull is now manufacturing a 200 amp. 600 v. fusible and no-fuse model for heavy duty service. Tagged HCI (stands for high-capacity interrupter) the front-operated switches feature arc-quenching action much like that of circuit breakers. Visible contracts are projected and withdrawn with pistonlike

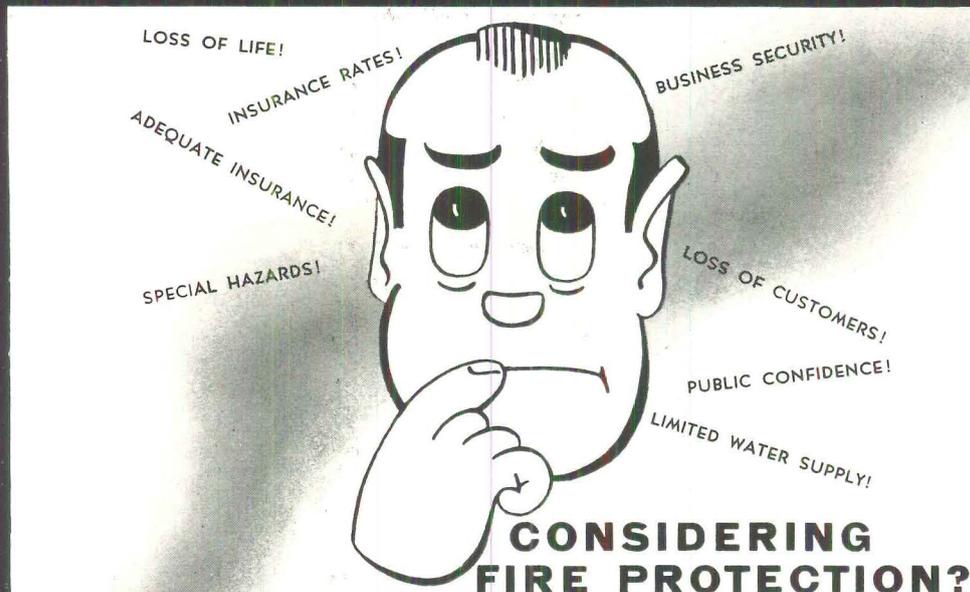


rapidity and force. Grid pins break up the arc, divide it into a series of smaller arcs, dissipating the heat. This type of design results in minimum wear and tear on the contacts. Standard equipment on all models is a felt gasket which keeps out dust and dirt. List prices for the switches range from \$79 for the 2-pole, 240 v. a.c. size to \$133 for the 4-wire, 600 v. a.c. unit. *Manufacturer:* Trumbull Electric, Department of General Electric, Plainville, Conn.

LIGHTWEIGHT BRICK TONGS have spring lock for easy handling

Toting up to eight bricks a load, the 21/4 lb. magnesium *Mag Liner* tongs are simple

continued on p.182

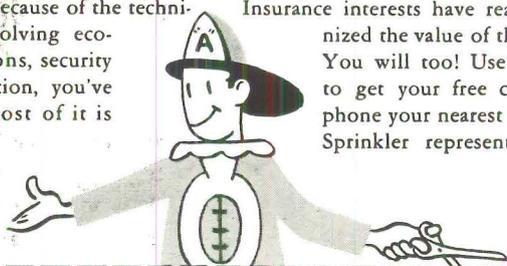


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THE COMPLETE STORY . . .
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"AUTOMATIC" SPRINKLER CORP. OF AMERICA *Please send us your Bulletin 66, "The ABC of Fire Protection"*

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P. O. BOX 360 COMPANY _____ TITLE _____

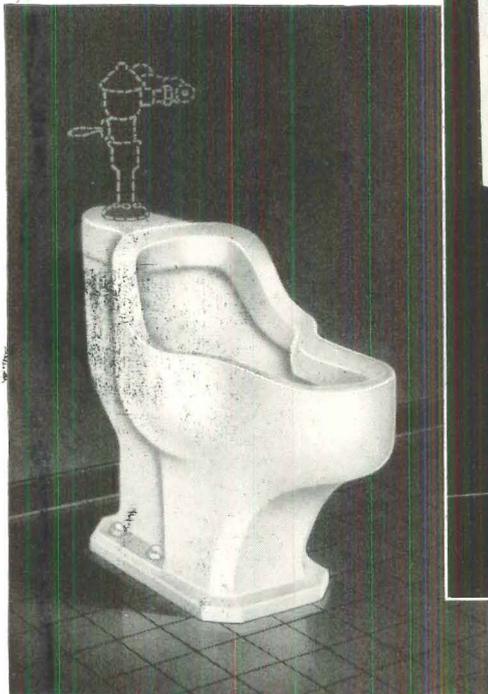
YOUNGSTOWN 6, OHIO CITY _____ ZONE _____ STATE _____

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN, OHIO

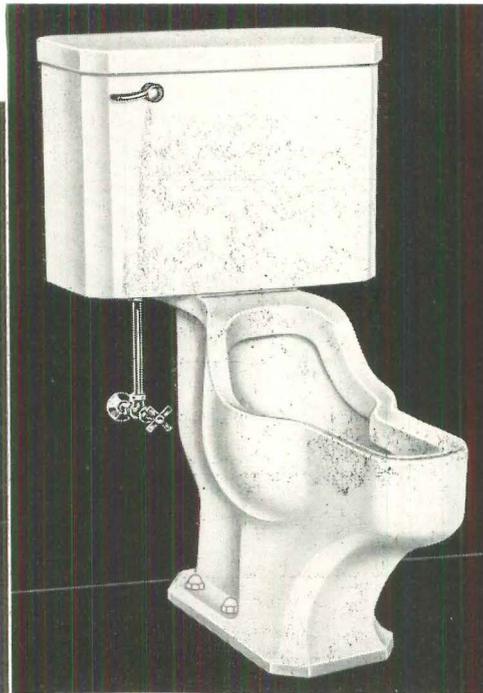
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

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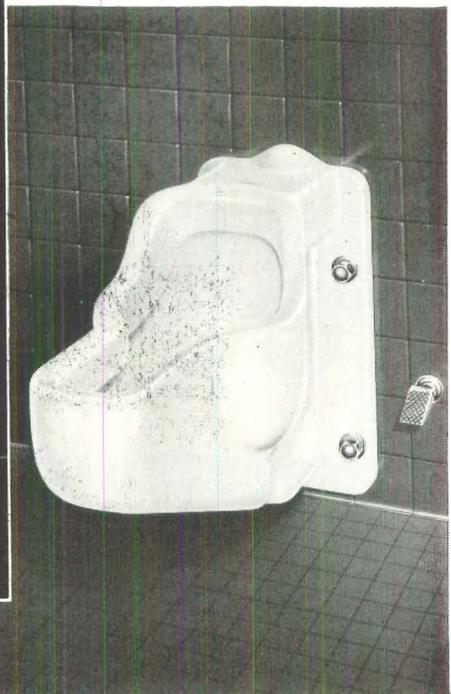
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WALL-HUNG

3 Different Models of the *Sanistand* Fixture Now Available with the addition of a tank model for normal water pressure installations

With the introduction of the new tank model of the Sanistand fixture, this women's urinal now meets installation requirements of any rest room. For the new tank model—which has all the same outstanding features that have made the pedestal and wall-hung models so popular—can be installed where direct pressure valves cannot be used. An eight gallon tank supplies sufficient water for flushing and refill. All three models of the Sanistand

fixture offer the same convenience and cleanliness for women that the standing urinal does for men, since users need not sit on or touch the fixture in any way. The slanted rim, extended lip and convenient 18-inch height of the fixtures discourage misuse and help keep rest rooms neater, more attractive. The genuine vitreous china fixtures—which are available in a variety of attractive colors—feature siphon vortex flushing action with jets

which empties bowl contents quickly. You will add to the popularity of the buildings you plan when you include these sanitary fixtures in rest room specifications. All three models of the Sanistand fixture are suitable for modernization work too . . . usually can replace existing water closets. For further information on rest room planning send for a copy of the Better Rest Room Guide.



AMERICAN RADIATOR & STANDARD SANITARY CORPORATION, Dept. AF-122, Pittsburgh 30, Pa.

AMERICAN-Standard
First in heating . . . first in plumbing

American-Standard
Dept. AF-122, Pittsburgh 30, Pa.
Please send me, without obligation, your new Better Rest Room Guide including complete information on the Sanistand fixture.

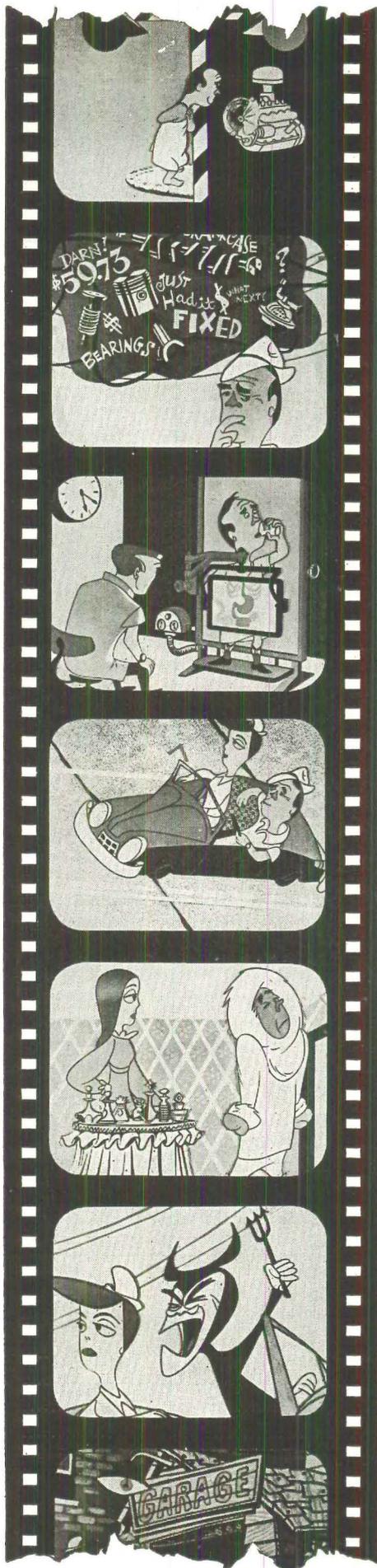
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Firm.....
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Look for this *Mark of Merit*

Serving home and industry

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At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee, and face the life-saving facts about cancer as presented in our new film "Man Alive!". You'll learn, too, that cancer is not unlike serious engine trouble—it usually gives you a warning:

(1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

While these may not *always* mean cancer, any one of them should mean a visit to your doctor.

Most cancers are curable but *only* if treated in time!

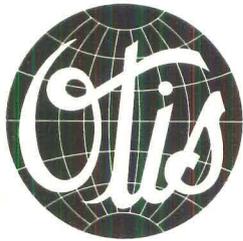
You and Ed will also learn that until science finds a cure for *all* cancers your best "insurance" is a thorough health examination every year, no matter how well you may feel—twice a year if you are a man over 45 or a woman over 35.

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society



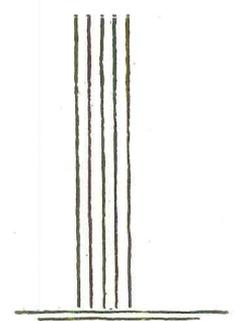
MAN ALIVE! is the story of Ed Parmalee, whose fear weakens his judgment. He uses denial, sarcasm and anger in a delightful fashion to avoid having his car properly serviced and to avoid going to a doctor to have a symptom checked that may mean cancer. He finally learns what a difference it makes (in his peace of mind and in his disposition) to know how he can best guard himself and his family against death from cancer.



AUTOTRONIC®

Without Attendant

ELEVATORING



SETS A LIVELIER PACE

MAKES TENANTS FRIENDLIER



Passengers simply press buttons for the floors they want

Autotronic—WITHOUT ATTENDANT—Elevating gives tenants a sprightly feeling of independence. All they have to do is step into the car and press buttons for the floors they want. Operation is like magic.

Tenants quickly accustom themselves to automatic dispatching and door closing. They step livelier. This speeds service. Tenants even push buttons for one another. They tell new riders what to do. Everybody's friendlier.

Tenants like to talk about this new advance in elevating. Word of their satisfaction spreads around town. It increases a building's prestige.

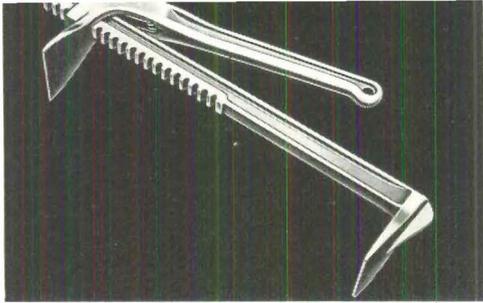
In no instance has a building switched back to attendants.

Autotronic—WITHOUT ATTENDANT—Elevating has been handling heavy traffic for more than two years. It offers an attractive saving in building operation.

It saves up to \$7,000 a car, each year. Why not visit a new or modernized installation? Ask any of our 266 offices for details.

Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.

BETTER ELEVATORING IS THE BUSINESS OF OTIS



PRODUCT NEWS *continued*

SLIDE RULE picks right wood beam for any light construction job

to use, easy to carry. Their span can be adjusted and locked in place in one operation by means of a tension spring and ratchet. The *Mag Liner* sells for \$10.95.

Manufacturer: Mag Line, Inc., Pinconning, Mich.

Designers who spend long hours over formulae figuring wood-beam dimensions will soon find warm spots in their breast pockets for Engineer Everett Rader's slide rule. The new device reduces the chore of selecting joists, rafters and girders to a few finger movements. If any four of the five factors—span, load, fiber stress, spacing and beam size—are

known, the fifth can be determined in seconds on the plastic rule. In a typical rafter-sizing problem, the user sets the load per sq. ft. indicated on *Scale B* opposite the desired span on *Scale A*. He then moves the arrow on *Scale C* beneath the fiber stress of the lumber species chosen and reads the rafter size required on *Scale D*. (A convenient table on the back of the rule lists basic fiber stresses under normal load conditions for common and select structural grades of fir, southern pine, hemlock, spruce and that anonymous timber, "general." Alternate *Scales B'* and *C'* printed on the reverse of *B* and *C* are used to design members which should not be allowed to deflect more than 1/360 of the span, such as

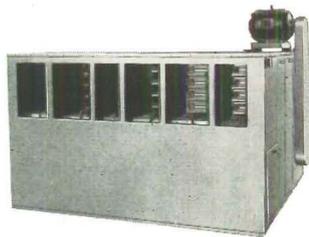
Marlo MULTI-ZONE UNITS in Michigan Bell's New Annex...For Comfort and Equipment Protection.



EIGHTEEN modern Marlo Multi-Zone Air Conditioning Units have been selected to perform a two-fold job in the beautiful new annex of the Michigan Bell Telephone Company in Detroit.

- Protect vital equipment . . . by maintaining perfect climate conditions all year — to, exacting requirements. Marlo units do this perfectly by control of heating, cooling, humidifying, dehumidifying and circulation of air.
- Employee comfort is assured for top year 'round working efficiency.

Architects and Engineers: Smith-Hinchman & Grylls, Inc.
General Contractor: Bryant & Detwiler Co.
Mechanical Contractor: Harrigan & Reid Co.



Marlo Multi-Zone Units solve varied air conditioning problems . . . offer the added advantages of separate zone functions. (One zone can cool while another heats—simultaneously!)

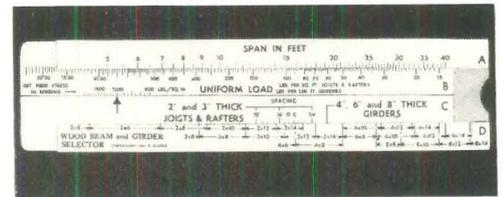
MARLO EQUIPMENT BELONGS IN YOUR BUILDINGS TOO! WRITE FOR INFORMATION.

Marlo

COIL COMPANY

Manufacturers of COOLING TOWERS • EVAPORATIVE CONDENSERS • INDUSTRIAL COOLERS • AIR CONDITIONING UNITS • MULTI-ZONE UNITS • BLAST HEATING & COOLING COILS

Saint Louis 10, Missouri

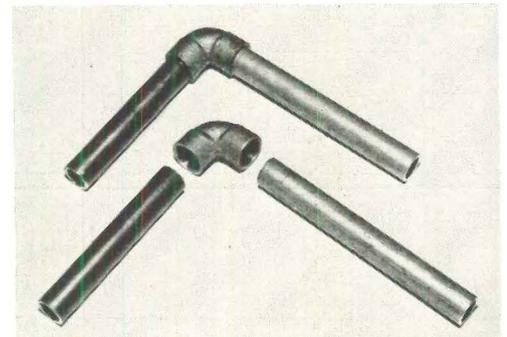


those above plaster ceilings. Price for the little daisy, including a simulated leather case and instruction manual, is \$2.50.

Manufacturer: Everett Rader Co., Dept. AF, Box 122, Bowling Green Station, New York 4, N. Y.

BONDING CHEMICAL joins dissimilar metals without danger of galvanic action

Chemotec is an unusual bonding agent that can be used to join metals to each other, one metal to another, or metal to ceramic, glass or wood. In a typical plumbing application, pipes or elbows can be shipped with the bonding agent already applied to the surfaces to be connected. The pipe fitter merely assembles the parts and grips the joint between the jaws of a portable resistance heater. The heat sets up a chemical reaction which changes the molecular structure and fuses *Chemotec*. In a few seconds a leakproof, corrosionproof bond is formed with a tensile strength of 5,000 psi—stronger than a soldered joint. The agent is



available in rod, powder, paste and liquid forms. *Chemotec* costs about \$2 per lb. in 100 lb. lots.

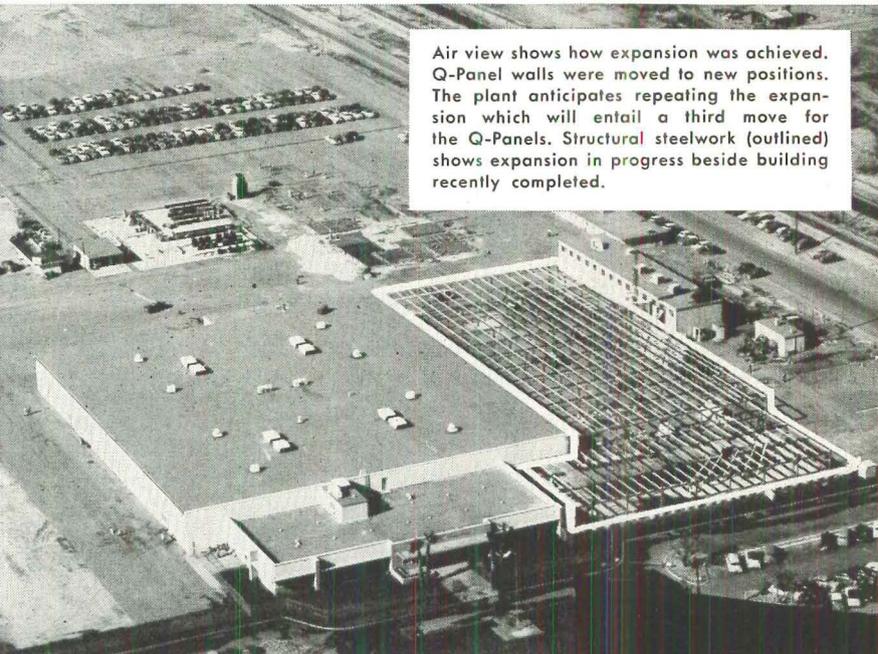
Manufacturer: Chemotec Div., 172nd St. & Northern Blvd., Flushing, N.Y.

Technical Publications p. 186

Featured as one of the ten outstanding buildings of the year, the AiResearch Manufacturing Company's building at Phoenix, was designed by Howard P. Hess. The entrance is faced with Arizona field stone. The remaining part of the façade, like the sides, is Robertson Q-Panel.



Uncertainty is now a part of Foresighted Design



Air view shows how expansion was achieved. Q-Panel walls were moved to new positions. The plant anticipates repeating the expansion which will entail a third move for the Q-Panels. Structural steelwork (outlined) shows expansion in progress beside building recently completed.

The AiResearch plant in Arizona is a perfect example of foresighted design at work. A few months after completion of the original unit of 100,000 sq. ft. area, an additional 54,000 sq. ft. was needed. Foresighted Architect Hess took this in stride . . . for it was necessary only to remove the Q-Panel walls, extend the steel frame, and put back the original walls with the necessary amount of new material to complete the job.

Q-Panel walls enable any owner and architect to build for the present with the future in mind. Although easily moved to new locations, Q-Panel walls are at the same time permanent construction, with insulation value, construction speed, and architectural appearance that recommend them for industrial, commercial, and institutional buildings of every description.

From coast to coast, Q-Panel buildings stand as monuments to foresighted architectural design and industrial management.

Q-PANEL Quick Facts



MATERIALS—Metallic-coated Steel, Galbestos, stainless steel, aluminum on one or both sides. Other materials on special order.

SIZE—2'-0" standard modular width. Lengths up to 25'-0", depending on material used.

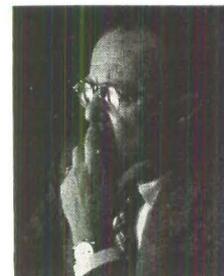
WEIGHT—Varies with metals selected but averages 4½ lbs. per square foot.

INSULATION VALUE—Superior to 12" of masonry with furred plaster. U-Factor—.14 B.T.U. in aluminum—.18 B.T.U. in steel.

STRENGTH—Great strength permits widest spacing of horizontal supports to meet the required wind load, thereby saving structural steel.

Architect—
Howard P. Hess, Los Angeles

Engineer—(right) ▶
Donald Douglass



H. H. ROBERTSON CO.

2403 Farmers Bank Building
Pittsburgh 22, Pennsylvania



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PANEL DISCUSSION

Plywood Forms Play Important Role in Parkmerced Project

Three prime factors—re-use, speed and appearance—dictated specification and use of plywood forms for both interior and exterior concrete surfaces on the new Parkmerced apartment project, San Francisco.

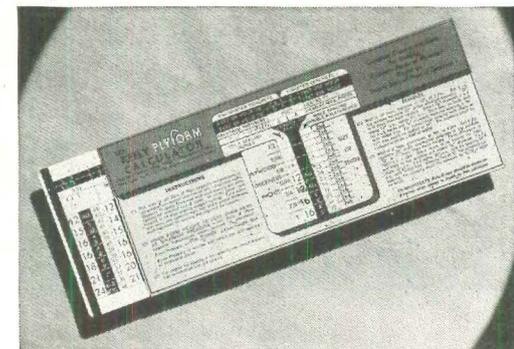


According to W. A. Bender, superintendent for Starrett Bros. & Eken, Inc., contractors on the job, plywood panels gave up to 15-18 re-uses, helped speed formwork application time and construction costs by about 20 percent and produced uniformly smooth, fin-free concrete surfaces. In fact, Bender reports, plywood-formed ceiling slabs were smooth enough to be painted after a minimum of grinding and application of spackling material—permitting a savings by eliminating expensive plastering.

Large built-up form sections 11 feet high and ranging from 20 to 48 feet long, were used on the walls. Forms were built of $\frac{3}{4}$ " exterior plywood, nailed to 2x4 studs, 12" o.c., backed by 2x4 and 3x4 walers. After each pour, sections were stripped and raised to the next story. Forms were used 13 times on the eleven 13-story tower buildings, then in some cases re-used further on the two-story Colonial type apartment buildings which dot the 200-acre tract.

Parkmerced was planned and built by Metropolitan Life Insurance Co. General Contractor: Starrett Bros. & Eken, Inc. Dinwiddie Construction Company was the subcontractor on concrete work. Leonard Shultze & Associates were the architects, with the firm of Thompson and Wilson serving as architectural consultants.

PlyForm Calculator Available



A handy slide rule calculator which gives plywood form construction data is available for \$1.00 from Douglas Fir Plywood Assn., Tacoma, Wash. Included with the PlyForm calculator is a leaflet of design assumptions.



When Re-Use Counts—Specify Plywood Forms

MEASURED in terms of cost per use, Douglas fir plywood ranks as one of the most economical of all form materials. On apartments, office or factory buildings, plywood form sections can be used to job completion—eliminating the expense of rebuilding forms once the job is under way. Plywood deserves ordinary care in handling, but it does *not* require extreme caution at every step and is far more rugged than other panel type materials. The exact number of re-uses obtained vary with grade and the care it receives on the job. Builders report up to 10 to 15 re-uses with *Interior-type PlyForm* . . . twice as many with *Exterior-type PlyForm* and new overlaid plywood panels. See grade data below.

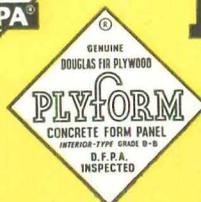
Only Plywood Offers All These Advantages

- Plywood forms create smooth, fin-free surfaces
- Economical! Plywood forms can be used over and over
- Plywood forms speed work—save time and labor
- Plywood is strong, rigid—yet light, easy to handle
- Plywood forms are puncture-proof, water and mortar tight
- Plywood has superior nail and tie holding properties
- Plywood is easy to work with hand or power tools
- Plywood provides sheathing and lining in one material

Douglas Fir Plywood

PLYFORM

These registered grade-trademarks positively identify special concrete form grades of Douglas fir plywood. *Interior PlyForm* (highly moisture-resistant glue) gives multiple re-use. For maximum re-use, specify *Exterior PlyForm* with 100% waterproof bond. Other panels also available to meet specific job requirements include plastic-surfaced and hardboard-faced Douglas fir plywood. Be sure of quality. Specify grademarked plywood every time!



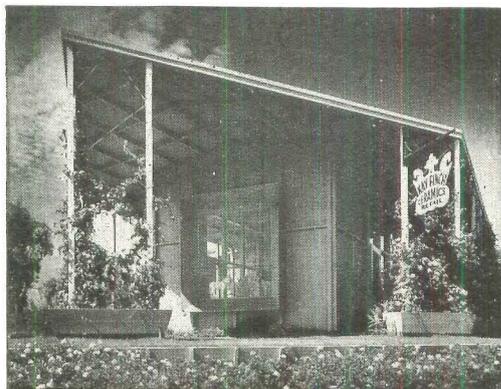
© Douglas Fir Plywood Assn. (DFPA)

Standard Tie-Hole Spacing Gives Extra Re-Uses

Careful planning of tie-hole spacing and use of varying-size plywood form sections is paying off in extra re-uses on the Clover Park School job in Tacoma, Wash. On the job, 8'-long Exterior plywood form sections were pre-built in 3', 4' and 5'-heights to form concrete walls of the school which range in height from 2' to over 16'. Necessity of drilling new tie-holes for each pour was eliminated by pre-drilling holes so that placement of tie-rods is standardized. Holes were made by stacking plywood and drilling with a template positioning guide.

The idea was developed by Roy Hartman, partner, Standard Construction Company, Tacoma. He reports that by eliminating drilling and form re-construction as the job progressed they were able to get better than 25 re-uses—and the plywood will give additional uses on subsequent jobs.

Single Wall Construction Used For California Studio



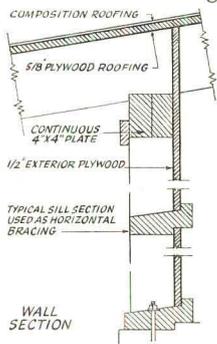
A single thickness of Exterior-type Douglas fir plywood attached to the inside of 4x4 posts serves as the exterior walls of this striking Corona del Mar, California, ceramics studio and shop. Designed by California Architect Frank Gruys, the structure also uses Douglas fir plywood roof sheathing.

Exterior-type fir plywood was specified for single thickness walls because of the unique combination of properties which permits the panels to act simultaneously as both a structural and finish material.

Because good lighting is needed for work done in the studio, the building features large glazed areas. With so many windows, the insulating quality of double walls is not important. In addition, the mild climate provides good conditions for the use of plywood single wall construction.

Exterior walls of the Kay Finch studio are A-A grade Exterior plywood placed on the inside of 4x4 posts on four foot centers so that the plywood presents a smooth wall on the inside. Windows are top hung or are in fixed sash between posts.

The overhanging roof which reduces sun glare forms a definite architectural feature. Exterior plywood 5/8"-thick is used for decking beneath built-up roofing.



When Appearance Counts—Specify Plywood Forms

How **SMOOTH** can concrete be? As smooth as the material against which it's cast. That's why plywood-formed concrete surfaces are smooth, dense, uniformly attractive. Large panel size automatically reduces fins and joints to an absolute minimum. Exact-size Douglas fir plywood concrete form panels are tough, rigid, dimensionally stable. Stark monolithic surfaces, curved surfaces, rustication lines, fluting and other special architectural design effects are also easily achieved with plywood forms. For free catalog, write Douglas Fir Plywood Association, Tacoma 2, Washington.

Only Plywood Offers All These Advantages

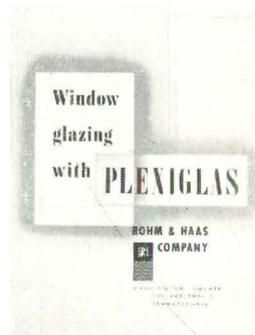
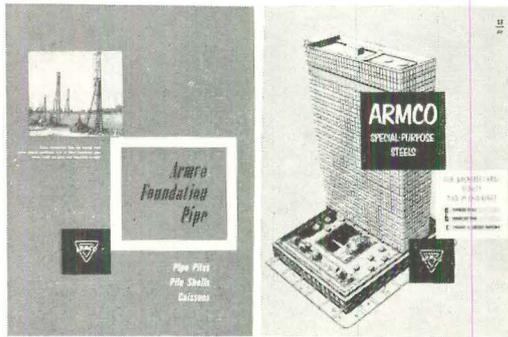
- Plywood forms create smooth, fin-free surfaces
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- Plywood provides sheathing and lining in one material

Douglas Fir Plywood

PLYFORM

These registered grade-trademarks positively identify special concrete form grades of Douglas fir plywood. Interior PlyForm (highly moisture-resistant glue) gives multiple re-use. For maximum re-use, specify Exterior PlyForm with 100% waterproof bond. Other panels also available to meet specific job requirements include plastic-surfaced and hardboard-faced Douglas fir plywood. Be sure of quality. Specify grademarked plywood every time!





PIPING. Armco Foundation Pipe. Armco Drainage & Metal Products, Inc., Middletown, Ohio. 8 pp. 8½" x 11"

Deals with sizes, mill service and field advantages of Armco's pipe shells, pile shells, and caissons.

STEEL. Special Purpose Steels for Architectural Beauty and Permanence. Armco Steel Corp., Middletown, Ohio. 8 pp. 8½" x 11"

Covers properties and finishes of stainless steel, porcelain enameling iron, and zinc-treated sheet metal.

STORE FIXTURES. RHC Display Equipment, Catalogue No. 52-G. Reflector Hardware Corp., Western Ave. & 22nd Place, Chicago 8, Ill. 72 pp. 8½" x 11"

Cataloguing a comprehensive line of metal merchandising equipment—including binning hardware, window and counter stands, and floor racks—the publication introduces Reflector's *Spaceboard* and *Space Klip* fittings for perforated panel displays.

PLASTICS. Window Glazing with Plexiglas. Booklet No. PL-23. Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa. 16 pp. 8½" x 11"

Twelve detail drawings and text explain how to glaze industrial buildings with flat panels of *Plexiglas*. Includes tabular data on solar heat and light transmission, as well as recommended thicknesses for openings of various sizes.

STEEL. Guide to Steel Selection. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. 4 pp. 8½" x 11"

Characteristics, mechanical properties, and uses of hot-rolled and cold-finished carbon and alloy steels.

STAINLESS STEEL. Just Quality Stainless Steel Products. Just Mfg. Co., 9233 King Ave., Franklin Park, Ill. 14 pp. 8½" x 11"

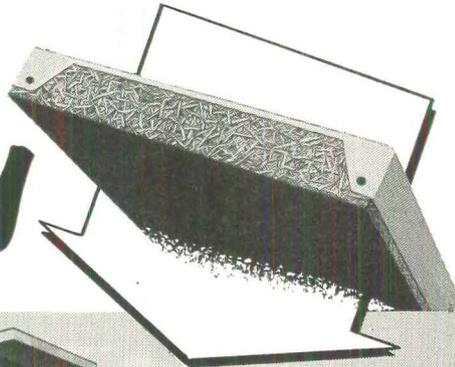
Describes and pictures various operations in the manufacture of stainless-steel equipment for laboratories, hospitals, schools and industrial plants.

LIGHTING. How to Get Nature Quality Light for School Children. Libbey Owens Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio. 8 pp. 8½" x 11"

Readable text and good illustrations in this booklet explain the *American Standard Practice for School Lighting* recommendations to school officials and designers. Case histories and photos of "daylight walls" are included as well as typical cost figures. Some of the pictures show windows of contemporary schools glazed with *Thermopane* insulating glass.

continued on p. 190

Quality + Economy



COMPOSITE POREX

Insulating & Acoustical PRECAST ROOF DECKS

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weighs only 14 lbs. per sq. ft.

Provides

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Are YOU risking fires like these?



WHEN DISCOVERED BY OUTSIDERS, fire in this 6-story brick, wood-joisted warehouse had progressed too far to save the building. Such losses can be prevented with Fenwal DETECT-A-FIRE® thermostats on the job. Incorporated in a properly engineered alarm or release system they react instantly when temperature of the surrounding air reaches the danger point.



MOST TERRIFYING OF ALL are hospital fires, when removal of helpless patients is an extra hazard. Loss of lives and property in institutional fires are preventable with efficient, automatic fire detection systems — alarm or release type — actuated by Fenwal DETECT-A-FIRE thermostats. No risky delays! No false alarms! No other fire detection units are so positive.



YOU REDUCE EXPENSES as well as risks, when you specify DETECT-A-FIRE thermostats in your fire detection equipment. Their long service life, corrosion resistance and repeatability provide built-in extra value that assures long-term economy. Fenwal DETECT-A-FIRE thermostats are listed by  . . . approved by .

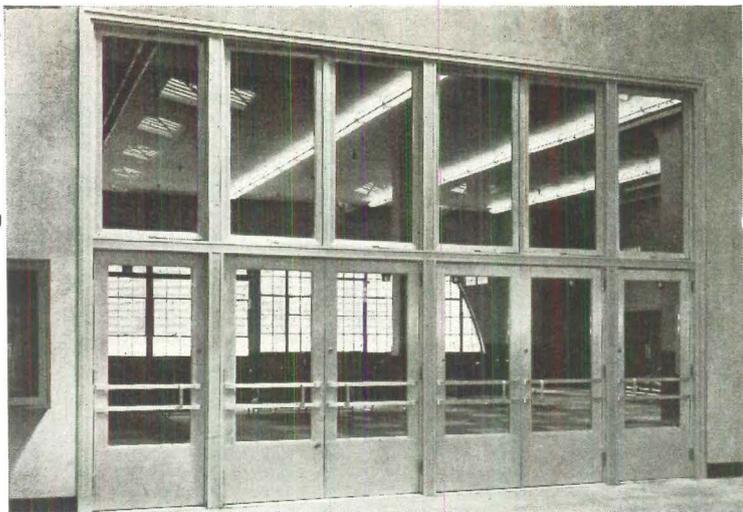


THESE FREE BULLETINS contain complete details on Fenwal DETECT-A-FIRE thermostats — the only units bringing you the benefits of Rate-Compensation Actuation, a new principle of fire detection. Fenwal engineers will gladly work with your system installer so that you may enjoy the benefits of *full* fire protection and *long-term* economy. Write Fenwal, Incorporated, 2512 Pleasant St., Ashland, Mass.



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DYNAMIC, RATE-COMPENSATION ACTUATED FIRE DETECTORS



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- . . . houses of every description to give you a 360-degree outlook on today's domestic architecture

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Work of the world's most widely discussed architect will appear in *House & Home* regularly this coming year. You'll see what's new about his latest houses, and what is evolving from his early style—how Wright "extends" space in his houses and yet maintains a sense of shelter—how he integrates the house with its site and with the people in it.

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house + home 540 N. Michigan Avenue, Chicago 11, Ill.



Neff & Fry Silos for coal and ashes

These two 18' x 60' coal silos and the 12' x 20' ash silo were erected in 1946 at the Larkin Terminal Warehouse, Buffalo, N. Y. Coal is moved by reciprocating plate feeder to a roll crusher, thence by a bucket elevator to the big silos. Withdrawal is with a screw conveyor. Ashes are hoisted by a bucket elevator and fed into the small silo by a drag chain conveyor. A gate drops loads of ashes into trucks.

We collaborated with the machinery makers in designing the system, as we do in most jobs for handling nearly a hundred kinds of flowable bulk materials.

A large part of our work is additional construction for customers. This is prima-facie evidence of user satisfaction.

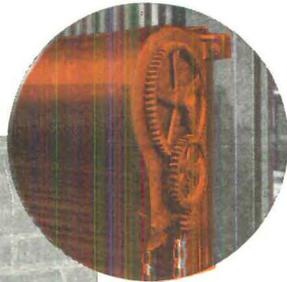
Be sure to read our folder, "Bins With the Strength of Pillars," ask for a copy.

THE NEFF & FRY CO. • 148 Elm St. • Camden, Ohio

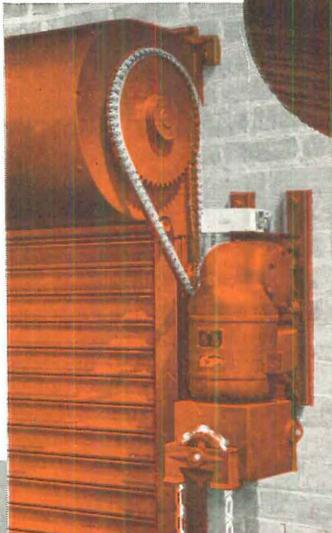
NEFF & FRY SUPER-CONCRETE STAVE STORAGE BINS

Rolling Steel

DOORS



MAHON
CHAIN-GEAR
OPERATOR



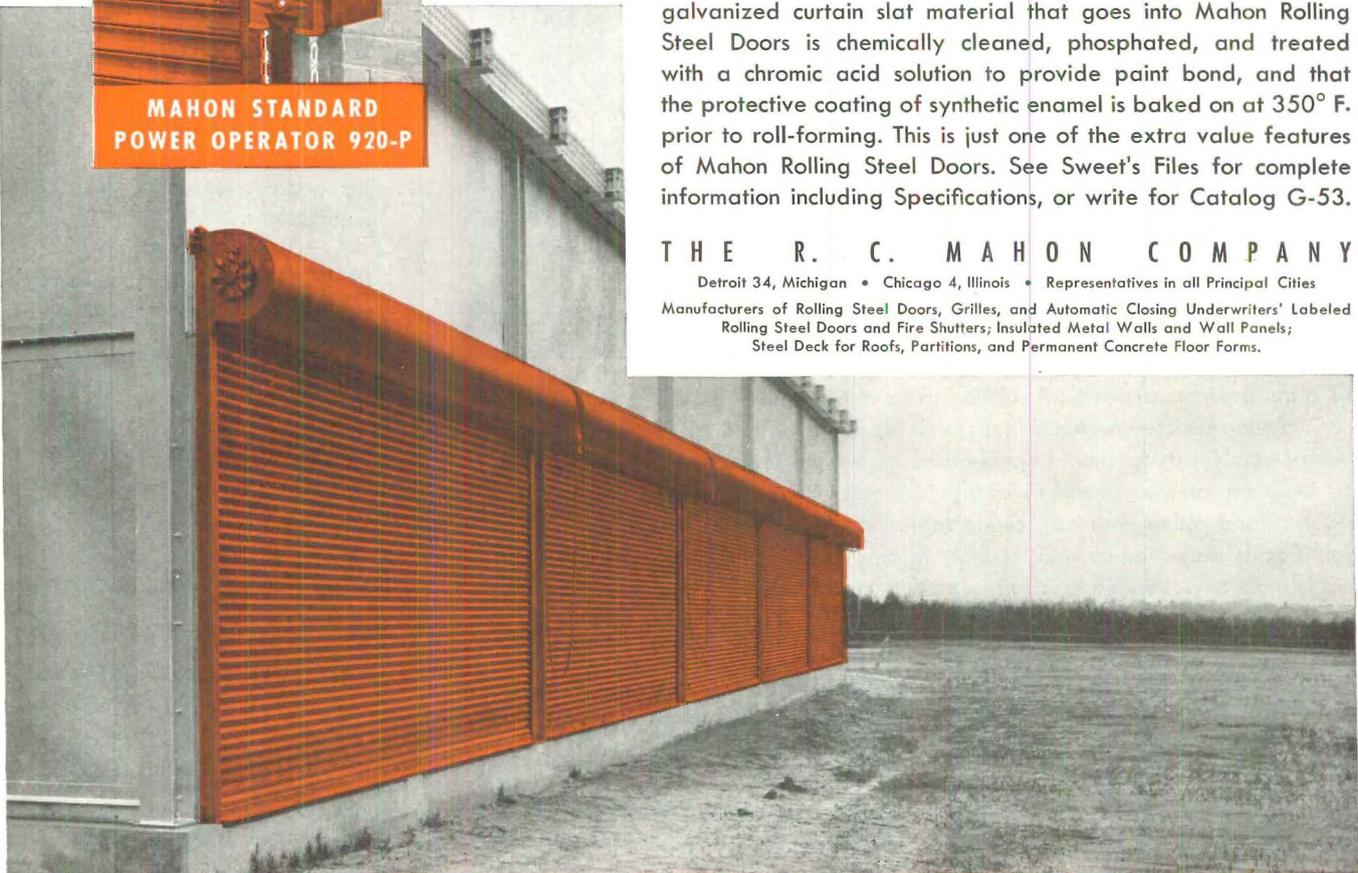
MAHON STANDARD
POWER OPERATOR 920-P

Manually, Mechanically, or Power Operated

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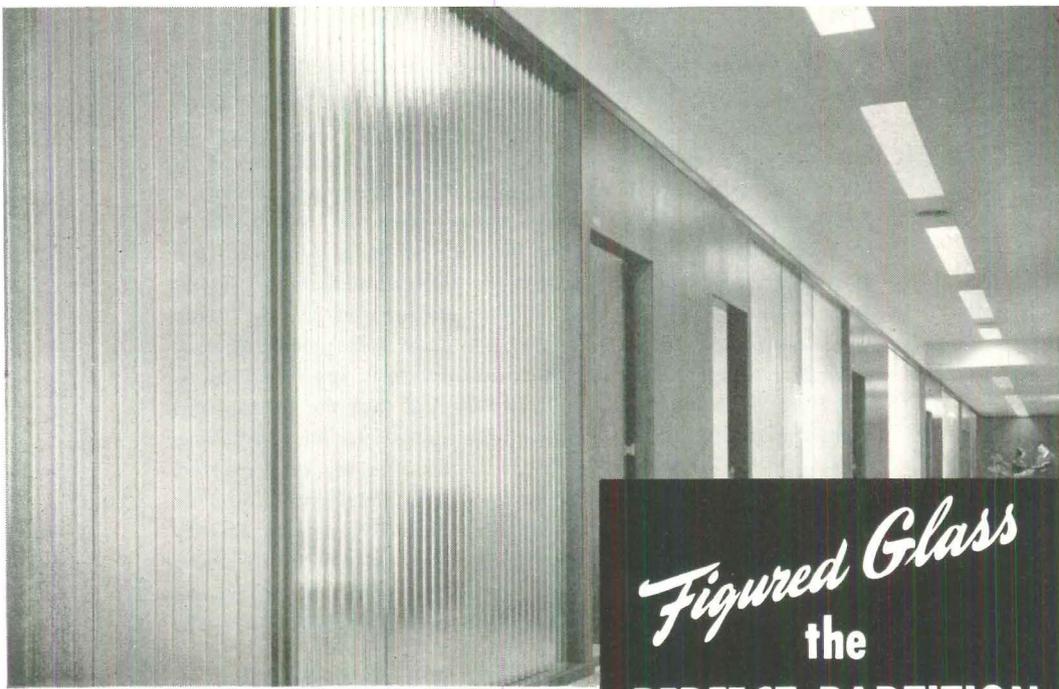
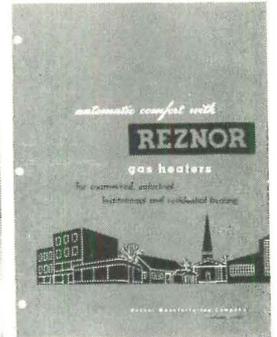
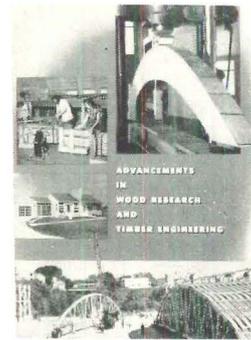
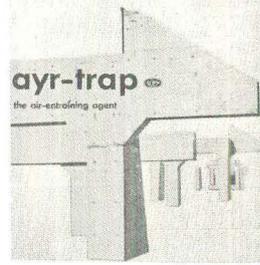
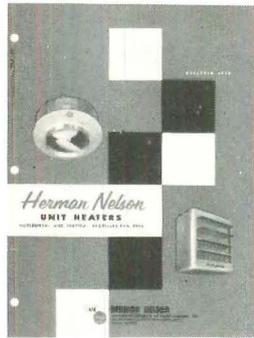


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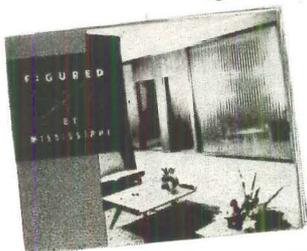
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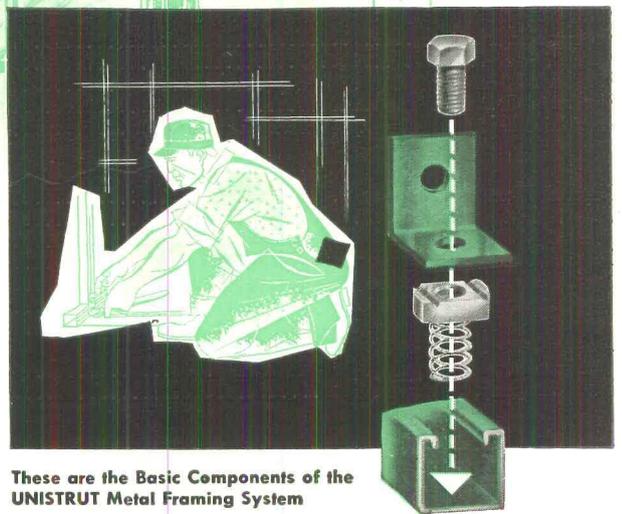
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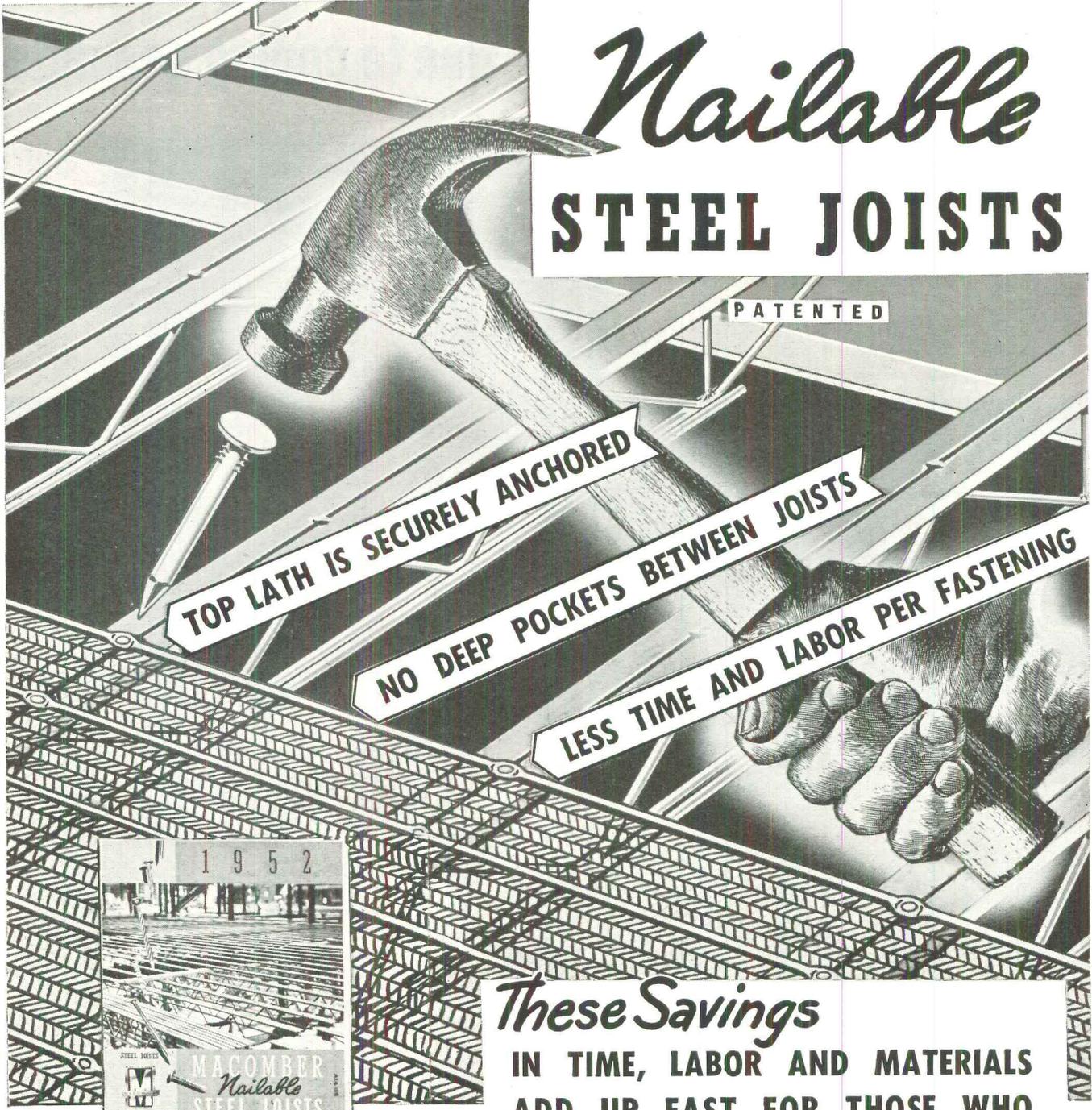
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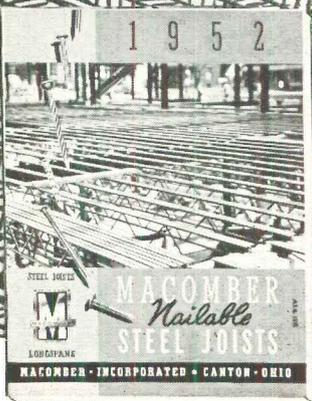


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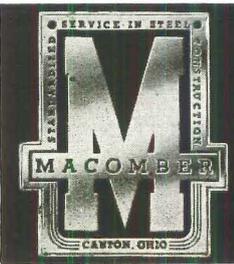


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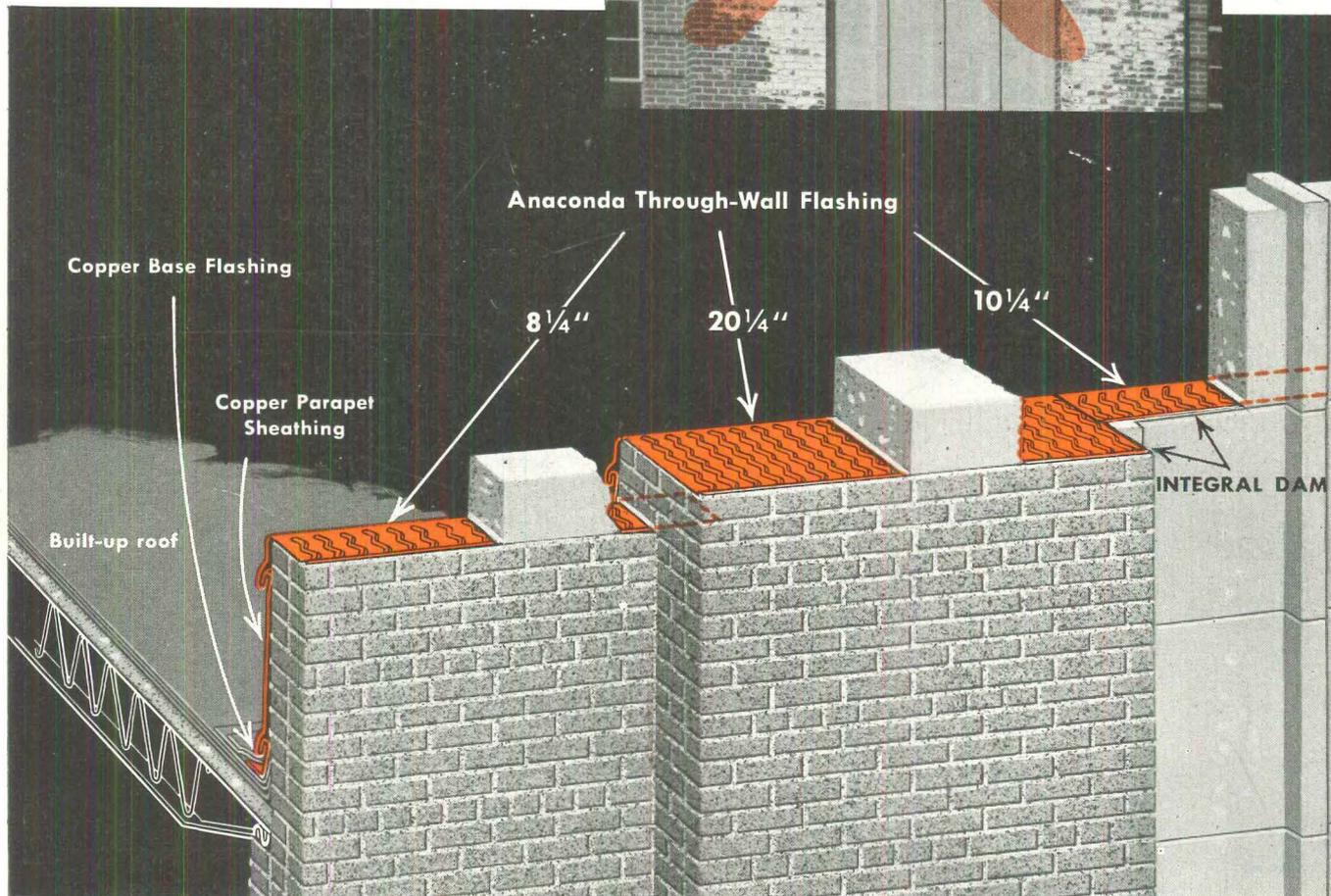
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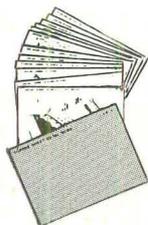
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