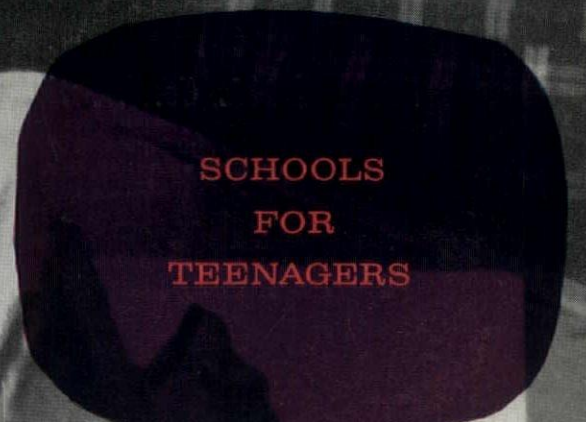
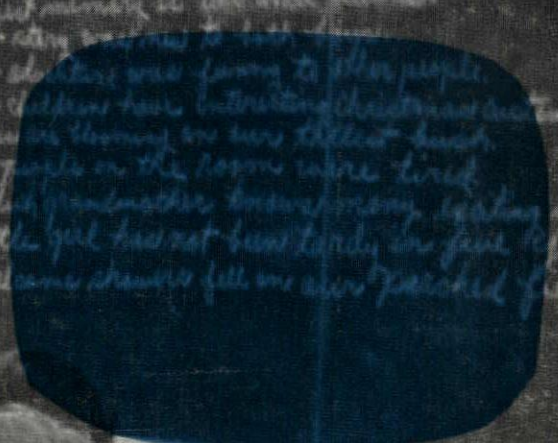
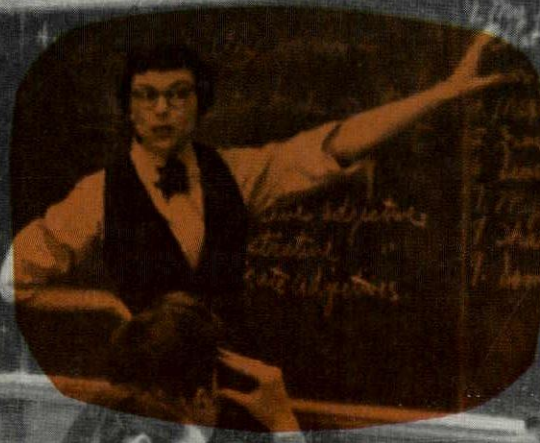
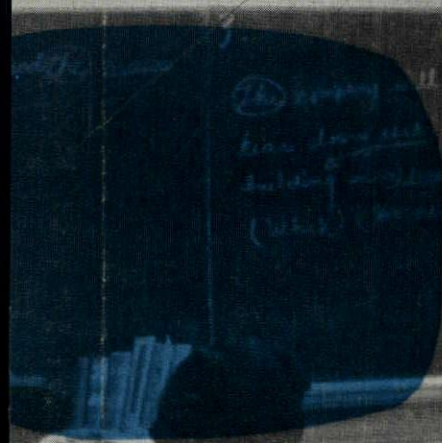
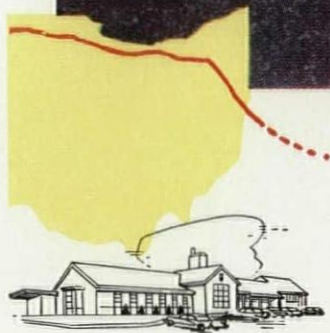


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SCHOOLS FOR TEEN-AGERS

114 Obligations for 1958

A statement of the problem presented by the mounting curve of school enrollment which has now reached the junior and senior high level.

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It implied that schools are too palatial. Here is a critique of the article and a fuller account of the 16 buildings the *Digest* praised and panned.

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The Benedictine priory and school in St. Louis promises to be one of the greatest achievements in US educational and religious design. Architects: Hellmuth, Obata & Kassabaum. Consulting engineer: Pier Luigi Nervi.

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Happily for education and architecture, the emphasis is now shifting from the package school to package parts.

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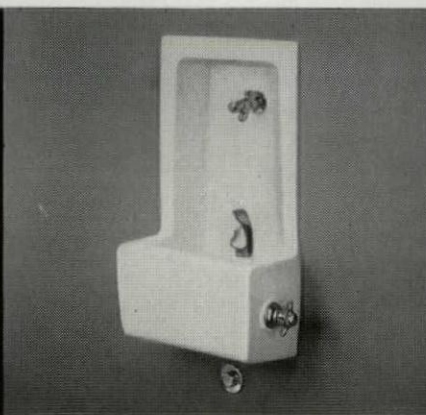
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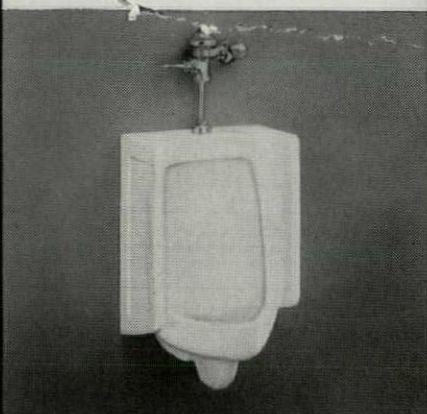
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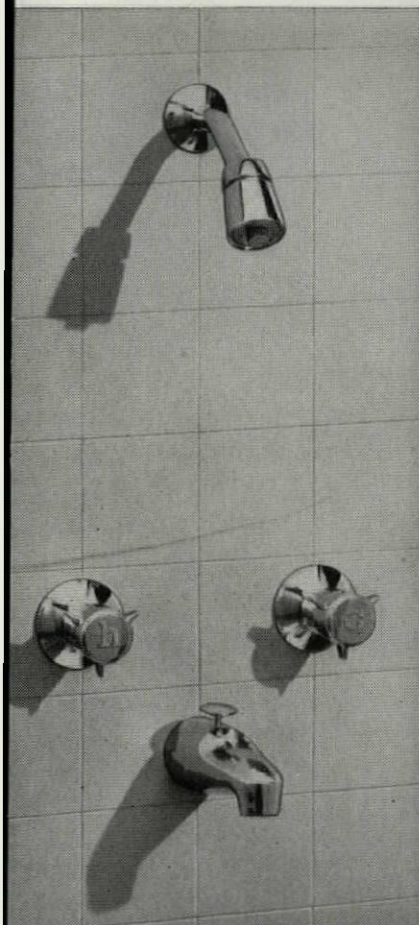
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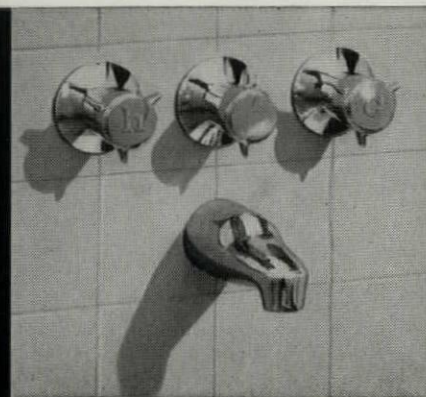
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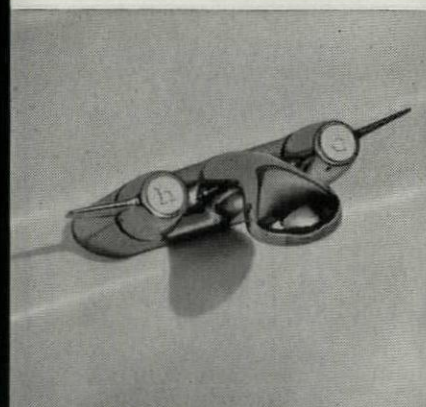
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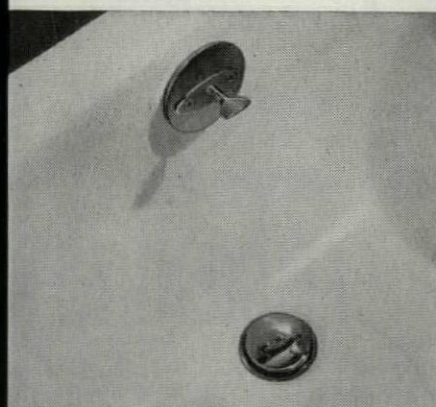
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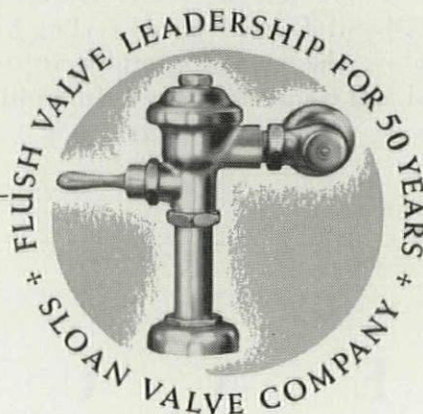
• The new \$15-million CHICAGO SUN-TIMES building stands on a scenic riverside site in the heart of the city and combines the latest in design and excellent efficiency. The two lower floors are encased in polished granite, and above are vertical aluminum piers which extend to the terraced roof where the heating unit is housed in a penthouse. Also on the roof is a heliport for both passenger service and speedy newspaper transport. A corridor through the building connects with a tree-studded plaza leading to famed Michigan Avenue. The decision to provide the finest possible equipment resulted

in 30 specially devised giant printing presses, each resting on its own caissons and all totally independent of those on which the building rests. To assure the highest degree of color printing accuracy, each press unit is equipped with precision jacks capable of minute adjustments for leveling. The newsprint is delivered from a riverside dock and from rail tracks into the plant. Newspaper delivery trucks are loaded and dispatched from an enclosed concourse. In this building, where only the best would suffice, plumbing plans specified the installation of SLOAN Flush VALVES.

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Public housing may get no new authorizations in 1958; middle-income housing favored

There probably will be no additional public housing requested by the Administration in next year's housing bill. That is the opinion of well-informed Washington observers who have been taking a look at some impressive figures—the size of the current public housing backlog. This now totals a whopping 90,016 units, and it is unlikely that PHA Commissioner Charles Slusser will recommend more food for the program which still has not digested its last meal.

Actually, by the time the Housing Bill of 1958 reaches its formative stages next summer, the indigestion will probably amount to 125,000 units or more. This is based on the fact that, in addition to the existing backlog, only 17,280 units have been built in the past two fiscal years out of an authorized 35,000 units per year. However, these can be committed through June 30, 1959. If no new units were built between now and June, 1959, the backlog would climb to 142,736. But allowing for the rate of construction during the two years that ended last June 30, it will more probably be around 125,000.

PHA is already rumored to be ready to cancel some building commitments that have been outstanding for particularly long periods—some have been on the books five years and more. In many cases, local authorities, faced with a variety of problems, have deliberately stalled building new units. One of the biggest problems has been the soaring costs of sites. And the problem of putting desegregated public housing into predominantly white neighborhoods in northern cities has stirred up more political opposition than housing authorities like to cope with. To intensify the problem, relocation housing is not doing the job it was supposed to do (p. 113).

In New York City, the housing authority reports it has not only a backlog of some 85 projects for a total of 94,000 families still to be built, but a backlog of 100,000 family applications for accommodations. This authority, already landlord for another 94,000 families in properties valued at almost \$2 billion, is currently under fire from

both local and congressional investigators on complaints of "grave management defects."

Middle-income housing drive

While public housing's problems mount, there are indications that some congressmen may turn their attention away from that touchy area to one that is relatively untouched—middle-income housing. Again, relocation is bringing the problem of middle-income families to the attention of politicians, particularly, say Capitol Hill observers, to the attention of Democratic congressmen who feel that they need some liberal legislation to take the heat of Little Rock off their bid for the growing northern Negro vote.

It is unlikely that Congress will adopt a full-blown bill for middle-income housing next year, but will probably jigger and oil existing mechanisms such as FHA insurance programs, which could be made more useful for middle-income urban families and for rental housing builders.

HOSPITAL BUILDING

Hospitals join colleges in tapping federal funds

A combination of record enrollments and high interest rates has caused the nation's colleges to turn increasingly to the federal government for badly needed construction funds. And now, hospitals with training facilities for nurses and interns are seeking federal student shelter loans.

The college loan program, administered by HHFA's Community Facilities Administration, has pumped \$504 million into colleges since its inception in 1950. It allows colleges to borrow funds to build dormitories and related living facilities (cafeterias, student unions, etc.), at a 3% interest rate, well below the 4½% or more they would have to pay to float bonds in the public market.

The latest expansion of the college

housing loan program for hospitals providing housing for student nurses and interns has been getting a fast workout in its first three months' existence. In September, for instance, 25 of 36 loan applications to CFA were for new hospital housing facilities. This represented \$19.6 million set aside, although not actually lent yet, for new hospital dormitories.

The pace of the hospital housing program poses a dilemma for CFA and for the Administration. Only \$25 million was authorized for such loans for the whole fiscal year of 1958. In view of the \$19.6 million requested so rapidly, it is obvious that many hospitals will be disappointed. If the volume of applications continues heavy, there may be some demand for a stepped up program for hospital facilities, although it is unlikely to move very far in the face of the Administration's present efforts to curb spending.

Administration budget hawks, in fact, are planning to take another pass at getting higher interest rates on all CFA loans. Last summer, their efforts in this direction were thwarted when Congress killed proposals for higher rates. Now it is believed that there will be an attempt to push through a bill at the next session of Congress to put all federal loan programs on a non-subsidy basis. The chances are that Congress will fend off this move, too.

URBAN RENEWAL

High New Haven land bid OK'd for FHA loan

Redevelopers and local redevelopment officials everywhere were greatly encouraged last month by a realistic decision by FHA on the land values it will recognize in urban redevelopment projects.

After considerable study and soul-searching, FHA policy makers decided to allow a valuation for a Sec. 220 mortgage on the Oak St. redevelopment project in New Haven, Conn., equal to the \$1,150,000-valuation leasehold bid for it made last May by New York Builder Seon Pierre Bonan.

What gave FHA, URA and HHFA officials pause was the fact that FHA originally had put a tentative valuation of only \$700,000 on the ten-acre property. FHA had apparently misjudged the market or had not anticipated the vigorous auction competition for the property that brought a final valuation

PUBLIC BUILDING

Capitol East Front advisory architects sought plans that would be "least detrimental"

Belated publication of their official report a month ago verified the extraordinary fact that not one of the distinguished Advisory Architects for proposed changes to the national Capitol in Washington freely or truly favored the ancient, once-before discarded plan for changing the position of its historic Central East Front.

In stark, revealing contrast to the report of Architect of the Capitol J. George Stewart representing that these architectural consultants had genuinely "recommended" the controversial 32'-6" East Front extension, and in addition had done so with "no restrictions imposed on them," the carefully qualified actual report of the consultants declared:

"It was agreed that . . . whether or not to move out the East Front would not be a matter for discussion as this had been decided already by an Act of Congress. Your consultants are therefore concentrating on the problem of how best to accomplish the will of the Congress within the limitations imposed by the Act in ways that will be

least detrimental to the beauty and majesty of the East Front. . . .

"In his 1903 report . . . Thomas Hastings stated that if the original central part of the East Front were to be brought forward as much as 36', it would be so nearly in line with the wings that it would be effectively dwarfed by them. . . . Hastings apparently did not realize that there is a way of retaining the magnificence of the central element of the East Front and keeping it from being dwarfed by the wings . . . move out the wings an equal distance with the central element.

"We do not want to leave the [congressional] commission in ignorance of our considered belief that the present beauty of the Capitol can be kept [if the East Front must be extended] *only* by moving out the whole East Front, wings and all, and not the central part alone."

It was not until Sept. 30 that Stewart released the Aug. 19 report of the Advisory Architects—John F. Harbeson of Philadelphia, Henry R. Shepley of Boston, and Gilmore D. Clarke of New York. He did so reluctantly, and only after learning of the report in the October FORUM that revealed that none of the consultants really liked the basic idea of altering the East Front, and that his office previously had refused to release the advisors' actual report.

Succinctly reviewing the considerably different situation in the light of the now-disclosed true opinions of the consulting architects, Washington's *Post & Times Herald* declared:

"Now that Stewart has belatedly made public the report of his advisors . . . it seems evident that the proposed change should not be made before further expert advice is obtained. This time the consulting architects ought to be completely free to express their best views on how the added space which Congress wants—and no doubt needs—can be provided. Such a procedure was proposed in bills introduced late in the congressional session by Rep. Henry S. Reuss and others.

"ARCHITECTURAL FORUM has performed a valuable service in publishing a hitherto off-the-record interview with one of Stewart's architect advisers, Arthur Brown Jr., who died July 7 be-

LAW

Wisconsin governor signs spite bill that kills Frank Lloyd Wright's Madison civic center

fore the report was signed. Brown made plain that he did not personally think the East Front should be extended at all, lest the unique relationship of the dome to the east façade be destroyed. . . .

"When Congress voted to extend the East Front in 1955, it did so without hearings and it specified, oddly, that the extension be 'in substantial accordance' with a scheme worked out—but not recommended—in 1904 by two architects who seemingly were trying to show how the extension *ought not* to be handled. . . .

"It would seem ridiculous, in the face of consistent and overwhelming opposition from professional architectural groups to any extension, to proceed with a plan which was discarded by its initiators, in 1904, and, apparently, is opposed by those . . . forced to work within its limitations today."

With the report of the advisory architects, Stewart also released three recent letters from each of them that broadly complimented him on the effectiveness of his over-all report to the congressional commission in charge of the Capitol improvement program.

Stewart's letter from Harbeson, however, pointedly reiterated one of the consultant's major qualifications: "Believing, as I do so strongly, that criticism of the change in the East Front will be stilled if the enframing relation of the wings to the central portion is maintained, I hope you will have the opportunity to discuss this with the others of your commission so that they may consider it a logical next step."

This ironically served to highlight another unusual shortcoming in Stewart's own Aug. 30 report to the commission. In spite of the consultants' specific advice that the Senate and House wings would also need to be extended to achieve the "least detrimental" effects in preserving the Capitol's beauty, the five-year program and \$110 million appropriations being pushed by Stewart completely ignored the consultants' recommendation on this score. It made no provision whatsoever for any such extensions to the wings, except to endorse this concomitant change at some remote, unspecified period when the Capitol would again have to be enlarged to provide more space for congressional activities. Without any plans (or appropriations!) to extend the wings, Stewart's proposal to move only the central section would not even be in conformity with the qualified recommendations of the consultants.

Under a law signed late in September by Gov. Vernon W. Thomson, the Lake Monona waterfront civic center for Madison, Wis., designed by Frank Lloyd Wright (FORUM, April '55) has been killed for at least several years, if not permanently.

The new law—a single paragraph—simply amends with a 20' building height limitation the 1931 legislation that allows Madison to use the reclaimed, state-owned waterfront property on which the civic center would stand. Two efforts to repeal or upset the new law were made at a one-week recessed session of the legislature before it adjourned until 1959, but both were unsuccessful.

Considerable partisanship marked enactment of the crippling measure. It was authored and steered through both Republican-dominated chambers of the legislature last summer (FORUM, Aug. News) by Assemblyman Carroll E. Metzner, Democratic Madison's sole GOP member of the legislature and an opponent of the project when he was a Madison city councilman. Many Republican legislators admit privately that the bill became a "party issue" and spite measure, deliberately intended as a slap in the face for William T. Evjue, Republican-baiting liberal editor of Madison's *Capital Times*, an ardent project sponsor and friend of Wright.

Only five months ago, on June 4, the Wisconsin Supreme Court affirmed a Circuit Court decision that Madison might (then) legally build the 60' high Wright project (see cut) under original legislation giving the city the right to improve this state-owned riparian property. The court noted, however,

that under the law the city's interest in this property was a "revocable right"—rather than an ownership grant.

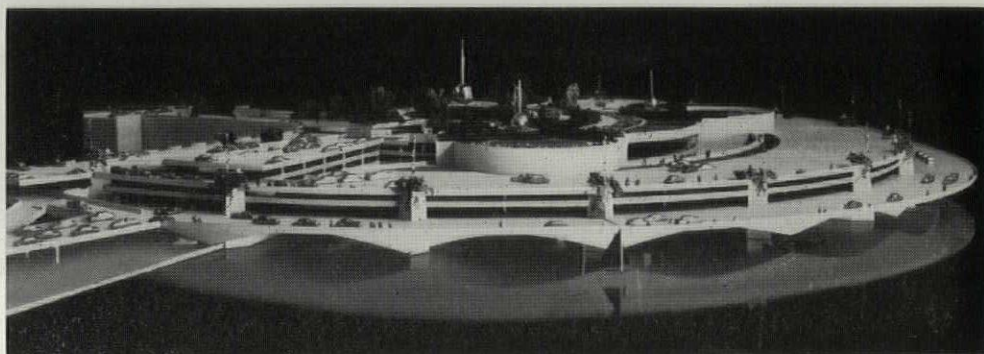
Gov. Thomson, Republican, delayed his decision on signing the fateful "party measure" Metzner bill until he had acted on all other measures passed by the legislature this year. He talked to scores of opponents and proponents. Former Republican Gov. Oscar Rennebohm urged Thomson to sign it. Former Republican Gov. Walter J. Kohler, a personal friend of Wright, tried to arrange a meeting between Wright and Gov. Thomson. That fell through when Wright issued a statement that the governor would have to ask him (Wright) for the meeting.

In signing the bill, however, Gov. Thomson, long known as a champion of municipal home rule, cited the "revocable permit" nature of the city's interest in the site, and said: "No informed person can rightly or honestly claim that the right of people of cities to settle their own affairs extends to property they do not own. . . . To permit this unauthorized use of the state's property would create precedents for frightening possibilities . . . [at some future date projects] no more improbable than was the present project in 1931. . . . [This bill] makes explicit what was implicit in the legislative action of 1931."

Gov. Thomson also declared that he had deliberately avoided any "consideration of personalities, partisan sympathies, style of architecture, or costs of construction. These are not the issues involved."

Nevertheless, the governor's refusal

continued on p. 9



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to consider architecture, or to assume his responsibility for leadership in the public interest, in this case would have the rueful, tragic effect of depriving the citizens of his own state of a masterpiece of public architecture that would have further enhanced the beauty of the state's capital city. His action also completely disregarded the circumstance that a majority of Madison voters had specifically expressed their desire to have Wright design this project in a public referendum in 1954.

Notwithstanding the ordinary reasons Gov. Thomson gave to justify his approval of the Metzner bill, discerning observers were unwilling to hold him blameless for killing this architectural masterpiece in its embryo. In their view he could have vetoed the bill and thus allowed the project to proceed, and such action would in no way have prejudiced the right of the state in the future to properly exercise its prerogative to bar any detrimental or unwholesome development. In this respect, the governor could have escaped personal responsibility for killing the project only if he had vetoed the measure and it was subsequently repassed over his objection (and the bill lacked sufficient support for such repassage).

In their 1954 referendum, Madison voters also approved a \$4 million bond issue for the central auditorium core of the project. Later the city added another \$1.5 million of parking revenue funds for parking facilities for it, and approved a \$380,000 contract with Wright.

FINANCE

Interest curb lifted on lease-purchase projects

In a significant change of direction GSAdministrator Franklin G. Floete last month announced plans to resume the federal lease-purchase construction program that was "temporarily deferred" last February for "aggravating inflationary pressures" (FORUM, March '57). Actually the program had already ground to a halt because of lack of bidders at the maximum 4% interest equivalent then set by the Budget Bureau.

Last month the interest ceiling was removed. Floete said the Budget Bureau has now approved financing projects at "the lowest interest rates obtainable and judged reasonable."

METROPOLITAN PROBLEMS

Philadelphia, Washington area studies are set

The Ford Foundation last month announced a \$900,000 grant for an ambitious seven-year study of the various urban-metropolitan problems besetting the tristate, four-city area embracing Philadelphia, Pa., Camden and Trenton, N.J., and Wilmington, Del. In the final four years of this Delaware Valley program, local interests will contribute another \$900,000 to match the Ford grant, the largest it has made to date for urban affairs research. The study will be directed by Community Studies, Inc., headed by William H. Willcox, executive director of the Greater Philadelphia Movement.

(Ford Foundation grants in this planning and government field in the US during the past two years have totaled more than \$4 million. Last month its overseas department also made a \$1.1 million grant to the Pakistan Planning Board.)

As it adjourned, Congress gave significant recognition to the need for area-wide studies to help find common solutions to metropolitan-wide problems.

Although confined to their own backyard, rather than on a national basis, the House and Senate voted \$50,000 for a study of the major growth and development problems vexing the Washington, D.C. metropolitan area, which now spreads well into Maryland and Virginia. This study will explore such problems as realty taxes, schools, traffic, water supply and sanitation. It will be directed by Representative DeWitt S. Hyde (R, Md.), author of the legislation, as head of a joint committee composed of three members each from the District committees of the Senate and House.

St. Louis report stirs action

In August citizens and officials of St. Louis and adjacent St. Louis County received a comprehensive study urging sweeping coordinated governmental reforms covering both jurisdictions. Within a week officials and civic leaders filed formal petitions for the creation of a special joint board of freeholders to draft the necessary laws for such reforms, and for special elections about fifteen months from now to adopt or reject the measures they propose.

The St. Louis study, one of the broadest of its kind ever undertaken

anywhere, was financed with \$300,000 provided by the Ford Foundation and a McDonnell Aircraft Corp. charitable trust. It was directed by John C. Bollens, UCLA associate professor of political science.

The idea of an outright merger between St. Louis and St. Louis County was rejected by this study. Instead it recommended the formation of a multi-purpose metropolitan district with area-wide broad powers in the fields of traffic, transit, planning, economic development, sewers, assessments and civil defense. The study also recommended some drastic reforms in the city and county governments that would still continue to function.

One proposal called for a uniform county-wide school tax to be returned to the various school districts on a per pupil basis, so all districts would share equally in the increased ratables if proper planning concentrated future industrial and commercial growth in only a limited number of areas in different parts of the county.

Masstransit winning more support from officials

Rapid transit as a vital necessity for the economic health of large cities was finding a host of new friends with a lot of kind words for it. In several cases influential groups who may have had the old rural adage in mind (you never miss the water 'till the well runs dry) were recommending public subsidies if necessary to keep urban mass transportation primed and running.

Perhaps the strongest semi-official boost came in the formal summary of the consensus of federal, state and local officials who attended a three-day Conference on Metropolitan Area Problems held at Arden House, Harriman, N.Y., sponsored by the governors of Massachusetts, Connecticut, New York, New Jersey and Pennsylvania, and the mayor of New York. Said the report summarizing their deliberations:

"At the heart of the problems of most metropolitan areas is the problem of mass transit. Because of the increasing use of private autos, the mass transit system is in serious difficulty, yet it is essential that it be preserved. The problem in each case is a regional one, but there can be no mas-

continued on p. 12

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What is there about Dorlux that it has so quickly supplanted other panel materials in the estimation of so many manufacturers? How can this paneling carry such a strong guarantee?

SPECIALLY DEVELOPED FOR GARAGE DOORS!

Masonite Exterior Grade Dorlux is an extra tough, specially manufactured hardboard $\frac{1}{4}$ " thick. It was developed after extensive research and consultation with door manufacturers, to meet their specific requirements.

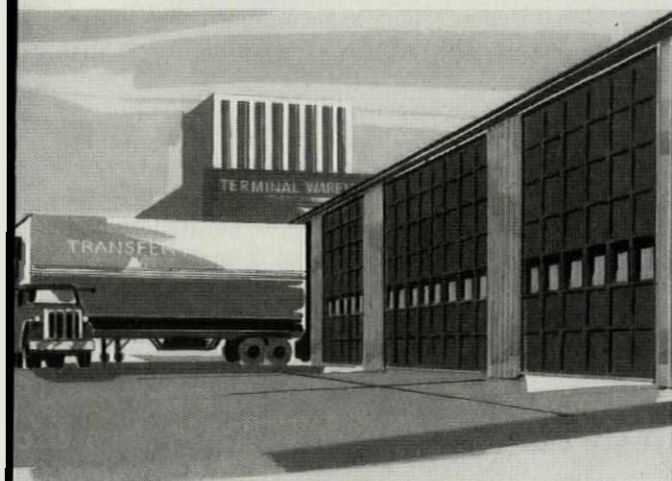
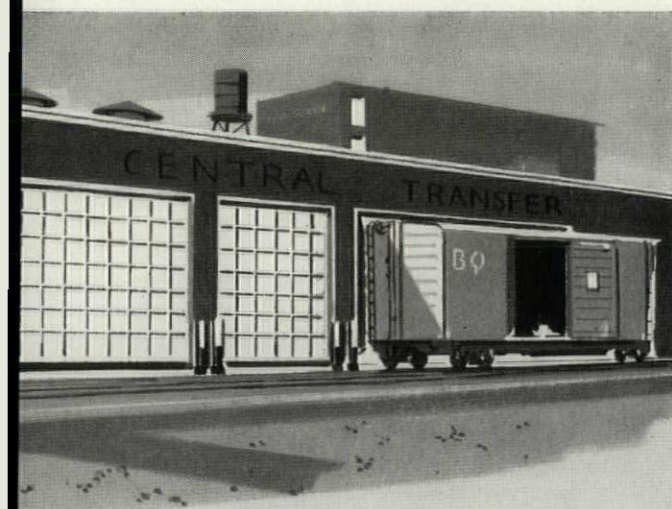
Dorlux exhibits a high degree of dimensional stability, an important characteristic, for you often find one side of garage doors subjected to severe cold and high humidity, with the other side reflecting the relatively dry and warm conditions of a heated interior.

SUPER-STRONG, ABSORBS SHOCK

Dorlux is grainless. It has no knots, no drips, no splits, no patches or other imperfections...even, a consistent structure at all points. Its surface is exceptionally smooth and firm, and serves as a superior base for finishes. With no grain to "work" under the finish, there is no concern over checking and crazing of the finished surface. Paint stays new-looking longer. Repainting is years away; maintenance costs are trimmed.

Dorlux is super-strong. It absorbs the shock of frequent opening and closing of the door. Its resistance to dents, bumps and scrapes is especially welcome in heavy-duty commercial and industrial applications.

Adding all these factors together, you can readily see why so many garage door manufacturers are turning to Masonite® Exterior Grade Dorlux®, the panel with a Lifetime Guarantee.



In warehouses, terminals, factories, public buildings—
wherever upward-acting doors get heavy service—

the trend is to **MASONITE**
Exterior Grade **DORLUX**

—the Top-Quality Door Panel That's
GUARANTEED FOR A LIFETIME!



High impact strength

Exterior Grade Dorlux is engineered and manufactured to pass the 4.5 ft. lb. impact (steel ball) test in a panel size of 12" x 18".



Minimum caliper variation

Variations in the thickness of Exterior Grade Dorlux is held to the narrow range demanded by the garage door manufacturers who assisted Masonite in the product's development.



Both sides smooth and blemish-free

No face sanding mars the surface. No sanding is necessary to minimize caliper variation.



Balanced panels

Since two sides of Exterior Grade Dorlux are equal in density and surface smoothness, moisture absorption on both sides of the door is equalized.



Excellent paint retention

Equal smoothness on both sides insures equal paint seal on both sides...lessens possibility of paint chipping, crazing, blistering or peeling. Paint jobs stay new-looking longer.

©Masonite Corporation
manufacturer
of quality panel
products.



FREE DATA!

Masonite Corporation, Dept. AF-11
Box 777, Chicago 90, Ill.

Please send me suggested architectural specifications for garage doors made with Masonite Exterior Grade Dorlux panels... also names of door manufacturers using Exterior Grade Dorlux.

Name.....

Firm.....

Address.....

City.....State.....

Zone.....County.....

ter plan which can apply in each case. Government should be prepared to meet the need for mass-transit services, where private enterprise is unable to do so."

(This conference found traffic congestion and parking problems becoming so acute in central cities that it also urged the auto industry to "give consideration to the needs of our metropolitan areas in styling and designing of their models." Longer and wider

cars have already caused substantial loss of parking and garage space, their report observed. "A reduction of just one foot on 10,000 cars represents two miles of bumper-to-bumper traffic.")

Another report last month by the New England Governors Committee on Transportation recommended that railroads, and bus lines if necessary, be given some form of subsidy to offset passenger service losses.

This transportation investigation

group was appointed by the six New England governors in 1955 and is composed of representatives of business, labor and the public. Emphasizing the threat posed by sharp declines in railroad commuter traffic, this committee's report pointed out that both passenger autos and trucks are subsidized, at least in part, by the construction of more and more improved highways, their maintenance and traffic control.

Across the continent, the San Francisco convention of the League of California Cities heard John S. Burd Jr., member of the Berkeley City Planning Commission, urge a temporary halt to all new freeway construction in metropolitan areas, because of the many complications it causes. Former State Senator Gerald J. O'Gara added an appeal that gasoline tax funds—now usable only for highway construction—should be released for construction of rapid transit and other means to solve the transportation problem, instead of more freeways. Backing area-wide planning and action, San Francisco Planning Director Paul Oppermann said transportation problem solutions must come through study of the whole metropolitan region and a comprehensive plan covering freeways, transit and all other forms of transportation.

In Springfield, Ill., a state Metropolitan Mass Transportation Commission created by the legislature held its first meeting and elected Rep. Elroy C. Sandquist of Chicago as chairman, and Sen. Merritt J. Little of Aurora as vice chairman. Governor William G. Stratton told the group that moving people "probably is the thorniest problem we have because it affects the public health and comfort of a big segment of the population, particularly in the cities." The commission has an initial appropriation of \$75,000 for its work.

Last month's FORTUNE, sister magazine of FORUM, published results of a survey it conducted that showed that many Washington, Los Angeles and San Francisco motorists would gladly switch from their automobiles to public transportation, provided the service could compete in time, cost and service. This survey for the magazine's comprehensive study, *The City and the Car*, found "a surprising number fed up with driving." Alternatively, however, it found that most people also spurn public transit now available because it is "too slow," "too crowded," "too expensive," "involves transferring," and service is "too poor."



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Cincinnati

Architect
Edward J. Schulte



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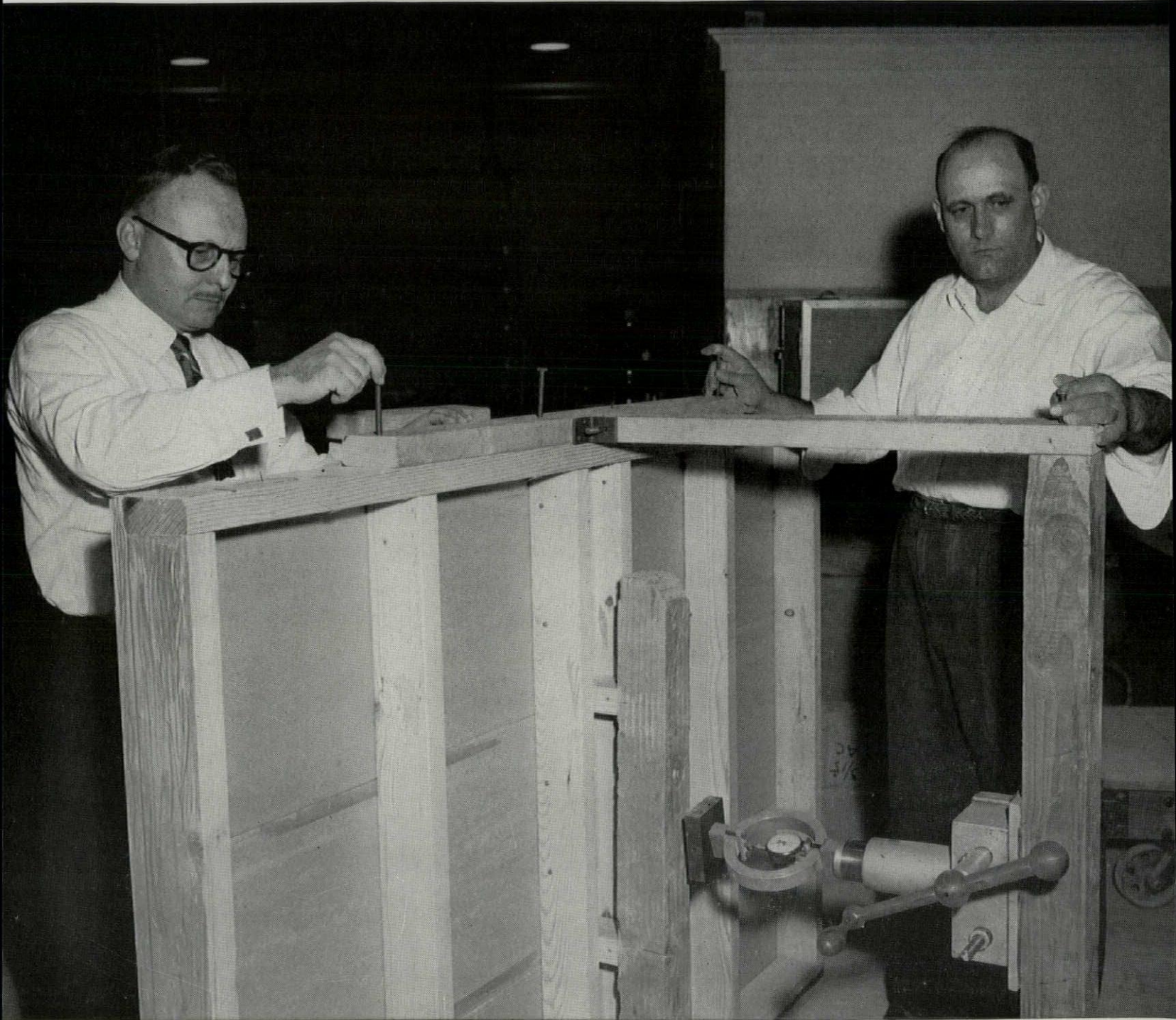
CINCINNATI 2, OHIO

Comparison test of crack
resistance of four most
common types of reinforced
plaster corners

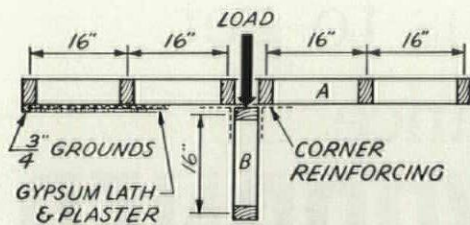
*with New KEYCORNER,
you can almost double
crack resistance,
tests reveal*

[See next page for digest of test report by
Research Foundation, University of Toledo.]

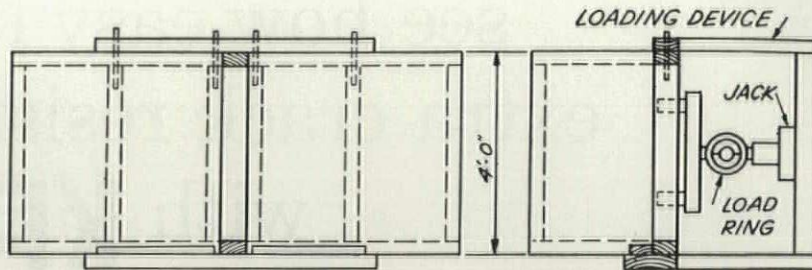
how crack resistance of plaster corners was tested



A series of tests on crack resistance of plaster corners was recently completed by Edwin L. Saxer, Professor and Chairman, Civil Engineering Department, Research Foundation, University of Toledo. Here you see the design of the test specimens, and the assembly of the testing equipment.



TOP VIEW



FRONT VIEW

SIDE VIEW

Wall section A and wall section B held together only by plaster and the embedded reinforcing fastened to the gypsum lath by a few light staples.

Test panels were built so that a measurable force could be applied to the test panel so as to produce direct stresses on the reinforced corners of the specimens.

These specimens consisted of two parts: one, a section of wall 48 inches high and approximately 70 inches long; the other, a similar section, but only 16 inches long.

The construction of the frames and studding, as well as application of gypsum lath, complied with F.H.A. recommended practices.

These two sections were aligned in the shape of a "T" and were

held together only by the plaster and the embedded corner reinforcing. The corner reinforcement was fastened to the lath by a few light staples before application of the brown coat.

At the juncture of the two sections, openings were provided so as to permit the application of loads which forced one section away from the other, thus bringing about a severe cracking tendency at the two interior corners.

Load was applied through a precision screw jack having a capacity of 10,000 pounds, and was

measured by a 6,000 pound capacity proving ring having a sensitivity of 5 pounds.

The magnitude of the load required to produce the first crack was the criterion for evaluating reinforcing. However, all tests were carried beyond this point in an effort to gain some measure of the ultimate capacity of each material. As it turned out, it was not possible to ascertain maximum strength because the specimens failed in some way first, namely pulling the gypsum lath loose from the studding.

here's what tests reveal

Based upon these tests it is concluded that KEYCORNER lath when embedded in gypsum lath and plaster angles provides better than $1\frac{2}{3}$ to almost two times as much resistance to cracking than any of the other materials tested:

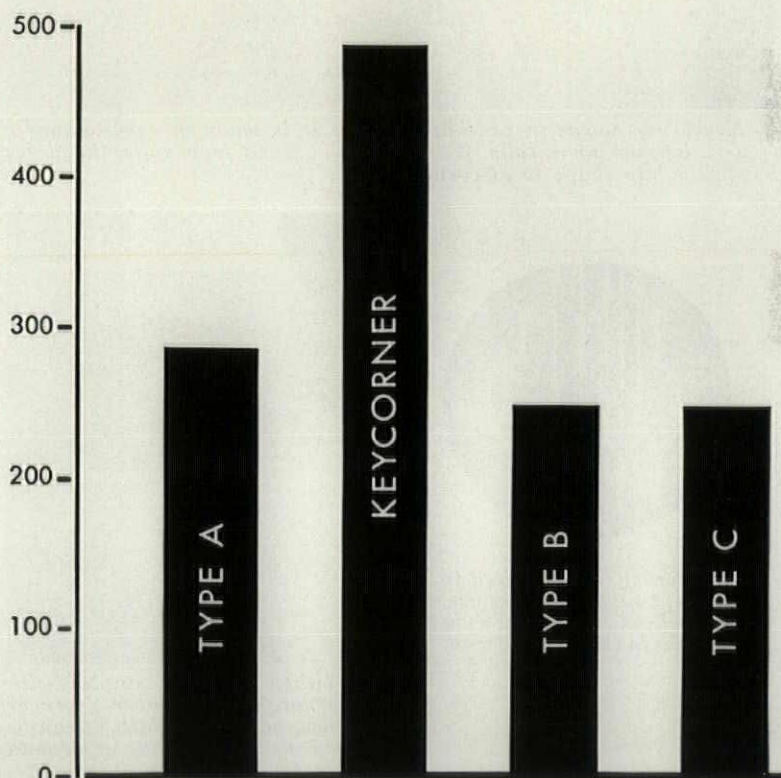
1 The results make it obvious that Keycorner imparts a strength when embedded not present in any of the other products tested.

2 The open mesh design of Keycorner does not impair the bond of the plaster to the lath.

3 The design of the welded wire product imparts only enough strength when embedded to resist cracking up to about one half the loads of the Keycorner design.

4 Reinforcing angles made from 21 ga. wire lath greatly reduce the bond strength between the plaster and the lath under the reinforcing and when embedded resist cracking up to about one half as much load as Keycorner.

5 Even though heavier and with wider flanges, the design of the 3" x 3"—2.5 pounds expanded metal lath cornerite does not impart enough strength to a gypsum lath and plaster angle to carry more than 59% as great loads without cracking as Keycorner lath.

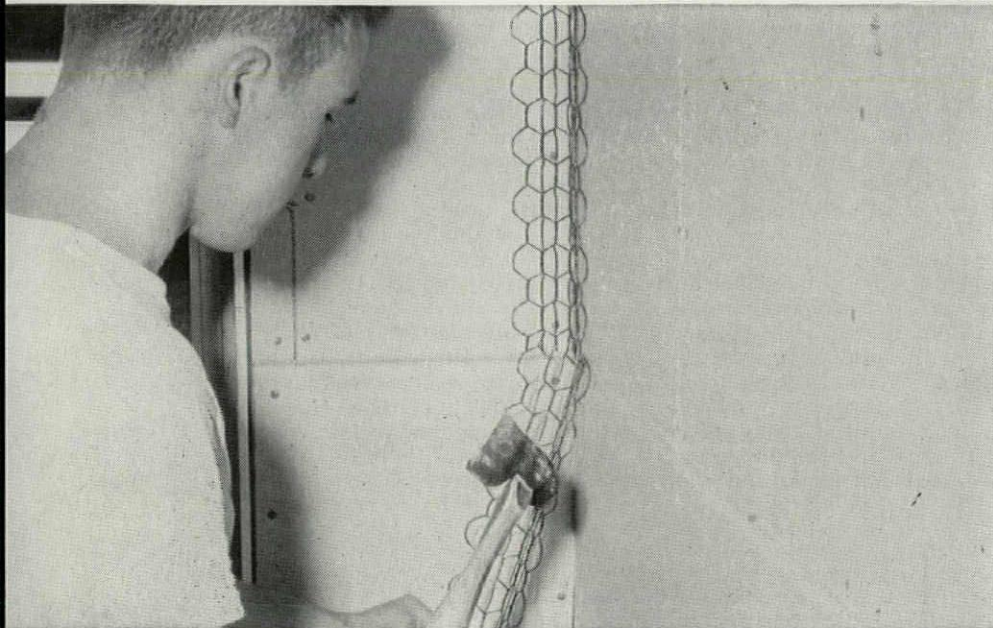


This chart records the results of KEYCORNER, plus those of the other commonly used types of reinforcement tested by Saxer. They included 3" x 3"—2.5 lb. metal lath cornerite; 2" x 2"—18 ga. welded wire cornerite; 2½ x 2½ meshes—21 ga. galvanized wire.

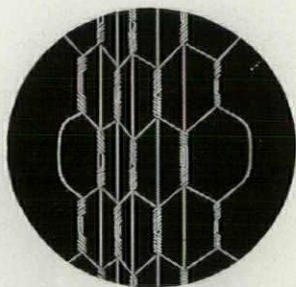
Load Test Data

		(Load Lb.) First Crack			(Load Lb.) First Crack
Type A	1st	300	Type B	1st	250
	2nd	275		2nd	250
	Average	288		Average	250
2"x2"—19 ga. Keycorner	1st	475	Type C	1st	250
	2nd	500		2nd	250
	Average	488		Average	250

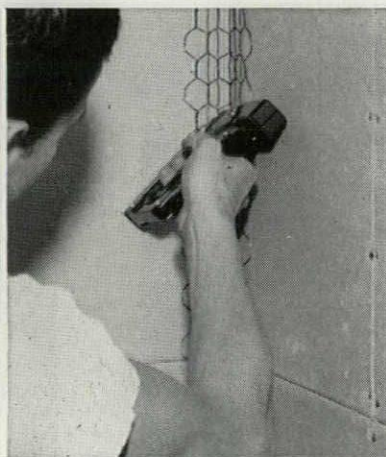
see how easy it is to get
extra crack resistance
with **KEYCORNER**



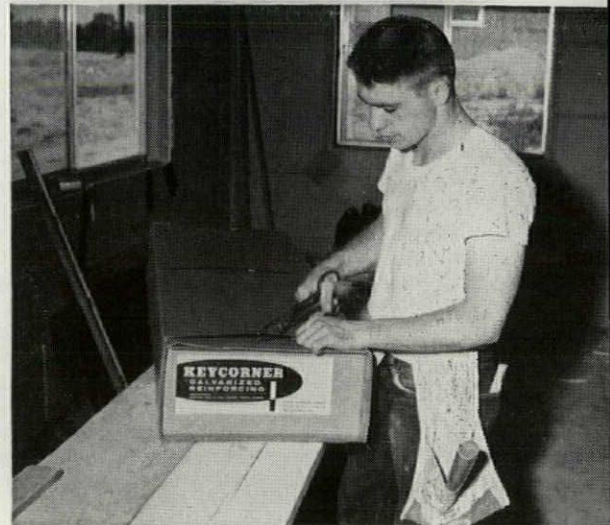
Keycorner comes in preshaped form. It is made in easy-to-handle 4-ft. lengths, or in rolls. When lengths are cut from rolls, the pieces spring into shape to fit corners.



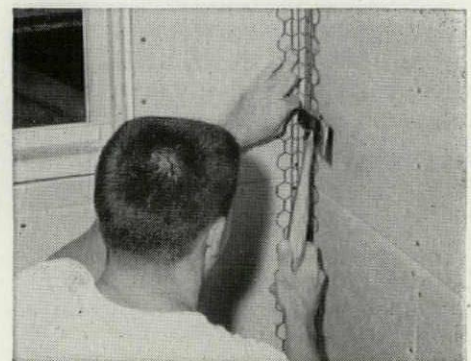
Keycorner is galvanized to prevent rusting before use, as well as to prevent rust streaks in the finished wall.



Use either nails or staples with Keycorner. For use over doors or windows, or as strip lath, it can be pressed flat to provide a smooth surface for plastering.



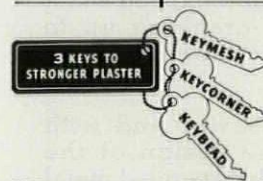
Four-foot lengths are packed in strong cartons, 1000 per carton. This assures delivery to the job in good condition. Rolls are tight and compact to stand up under normal job abuse.



Keycorner is precision shaped to assure proper embedment in the plaster for maximum reinforcing value. It is easy to lap without interfering with plastering.

SPECIFICATIONS

Wire gauge	2'x2'-4' lengths	Shipping wt. per package
	Lineal feet per package	
19	1000	65.5 lbs.
4' wide x 500' rolls		
19	1000	65 lbs.



Keystone Steel & Wire Company
Department AF-117
Peoria 7, Illinois

Please send me test report on Keycorner.

Name _____

Firm _____

Business _____

Street _____

City _____ State _____

Keystone Steel & Wire Company

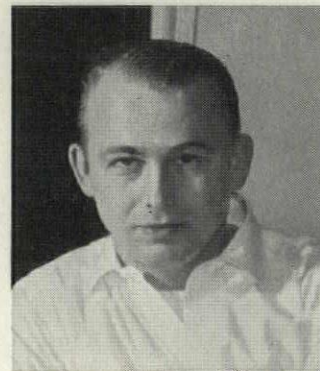
Peoria 7, Illinois

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The gay playroom atmosphere makes children's visits to this hospital almost fun. Colorful Koroseal Rope Square covers giant hassocks.

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KOROSEAL vinyl fabric shows its remarkable versatility by helping transform 108-year-old St. Joseph's Hospital in Philadelphia into a tastefully modern haven of cheer. Durable Koroseal keeps its original beauty for years, cleans readily with soap and water. To give fresh charm to walls and furniture, follow the lead of America's foremost designers. Specify Koroseal.

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Report to architects:

Indoor-Outdoor Living for Business!

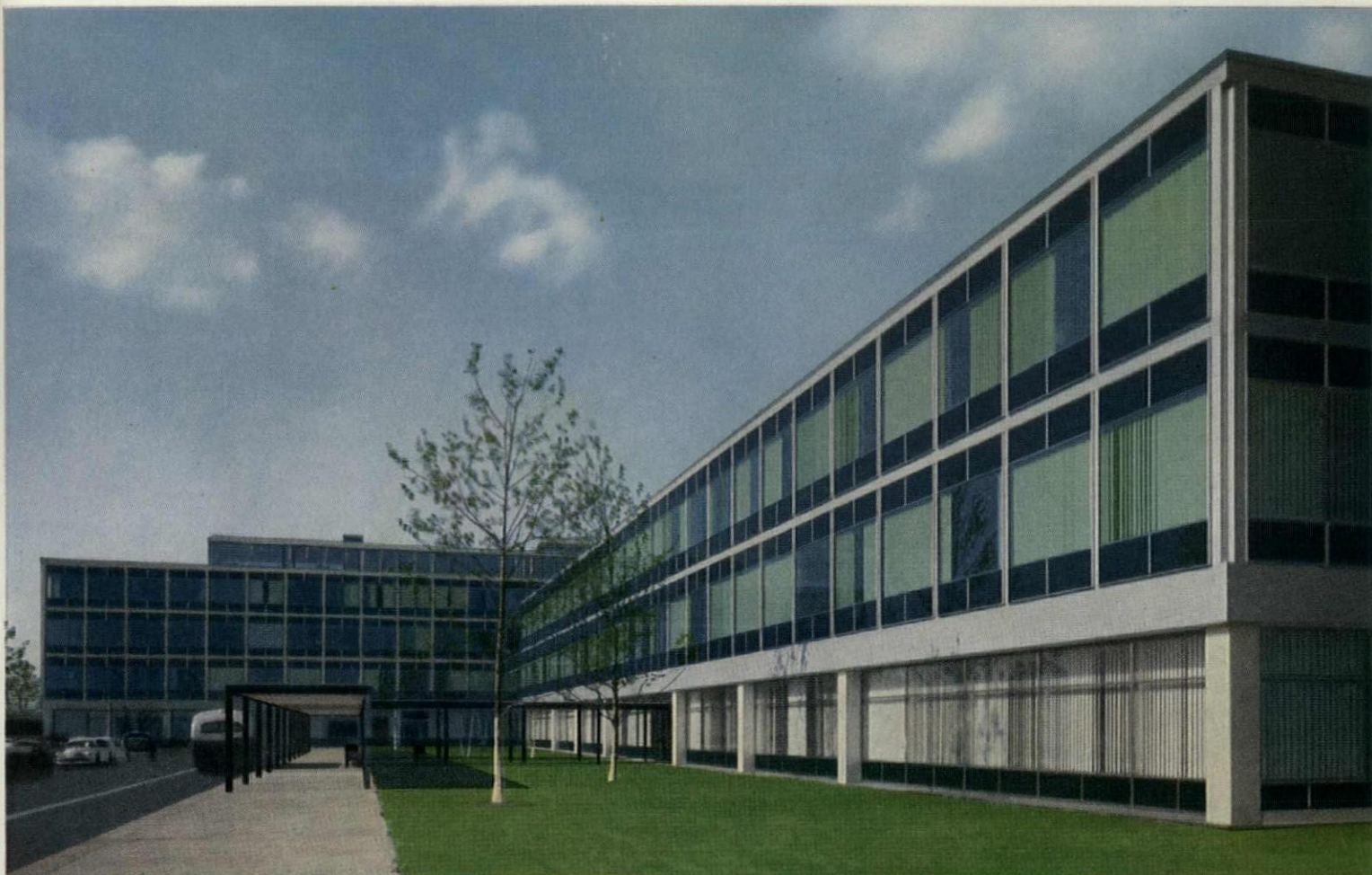
This message about the beautiful Connecticut General Life Insurance Company office appears in the November issue of *Fortune*. It tells the story of how beauty and function, in a country setting, bring indoor-outdoor living to business . . . and of the important role played in that concept by Alcoa® Aluminum, the versatile metal. We've exposed it to the business management audience . . . with the view that you may be faced with a similar design problem . . . and know that your client has been preconditioned to the architectural beauty and practicality of aluminum and its many uses for buildings.

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Functional beauty makes this a home office masterpiece

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Since function and beauty played such an



Building: Headquarters Office, Connecticut General Life Insurance Company, Hartford 15, Connecticut • Architect: Skidmore, Owings & Merrill, New York, N. Y.
General Contractor: Turner Construction Company, New York, N. Y. • Aluminum Subcontractor: General Bronze Corporation, New York, N. Y.

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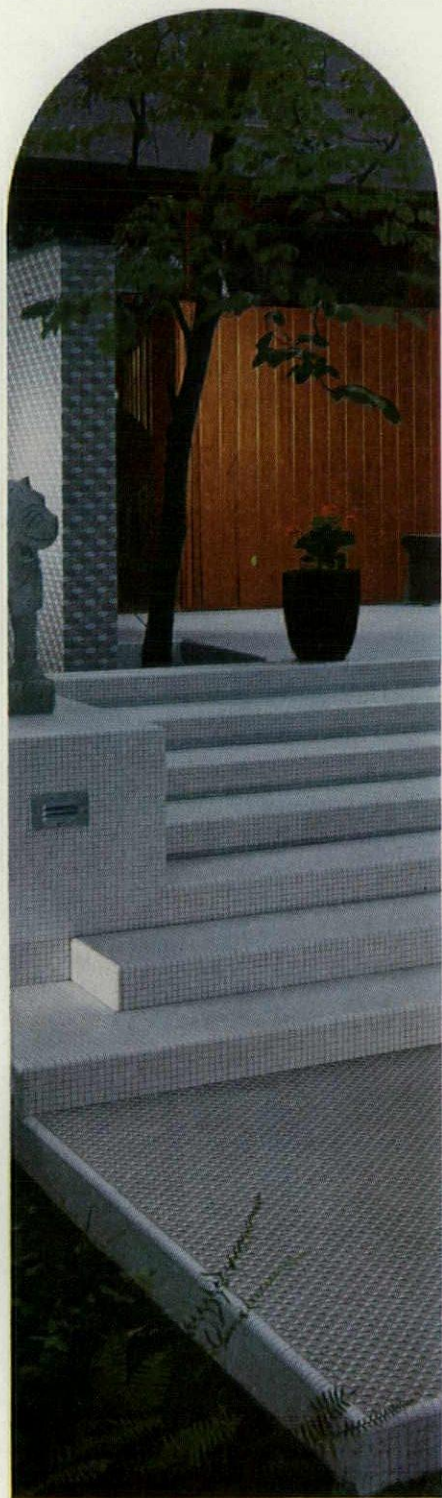


Plate No. 575

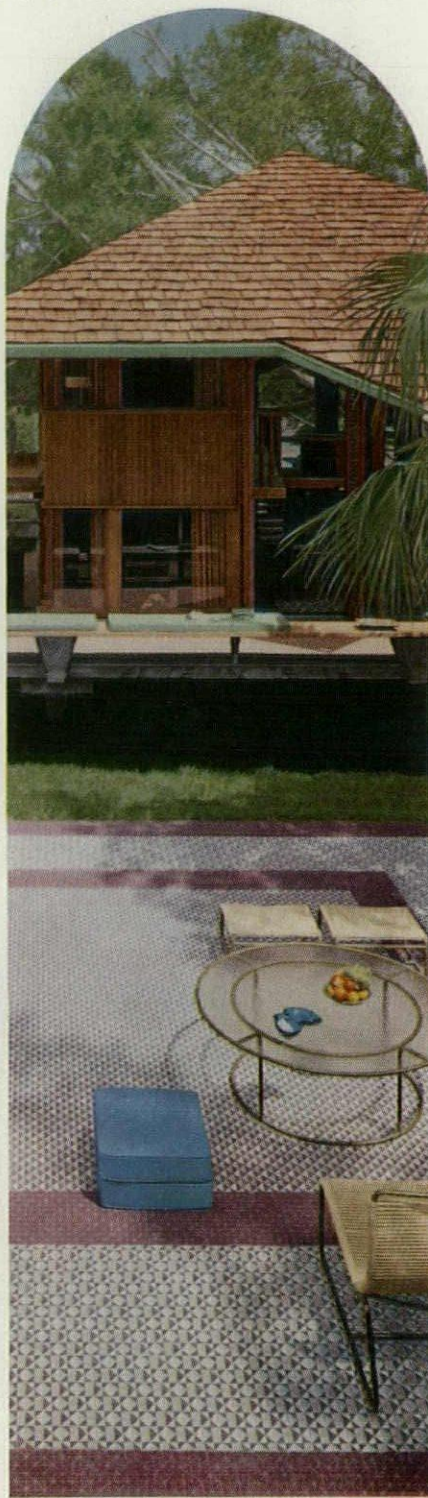


Plate No. 621

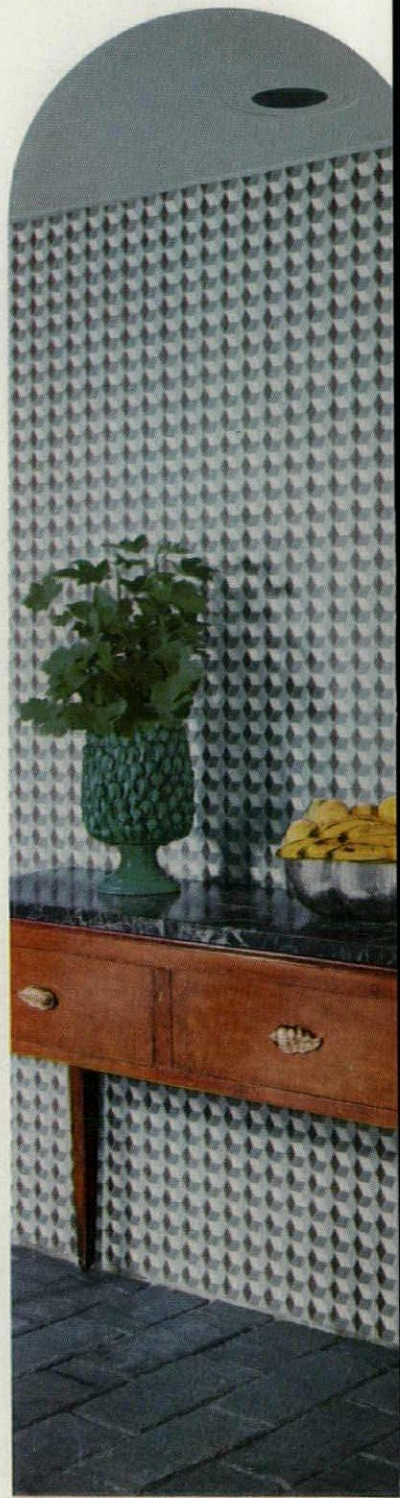


Plate No.

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Plate No. 620



Plate No. 584



Plate No. 579

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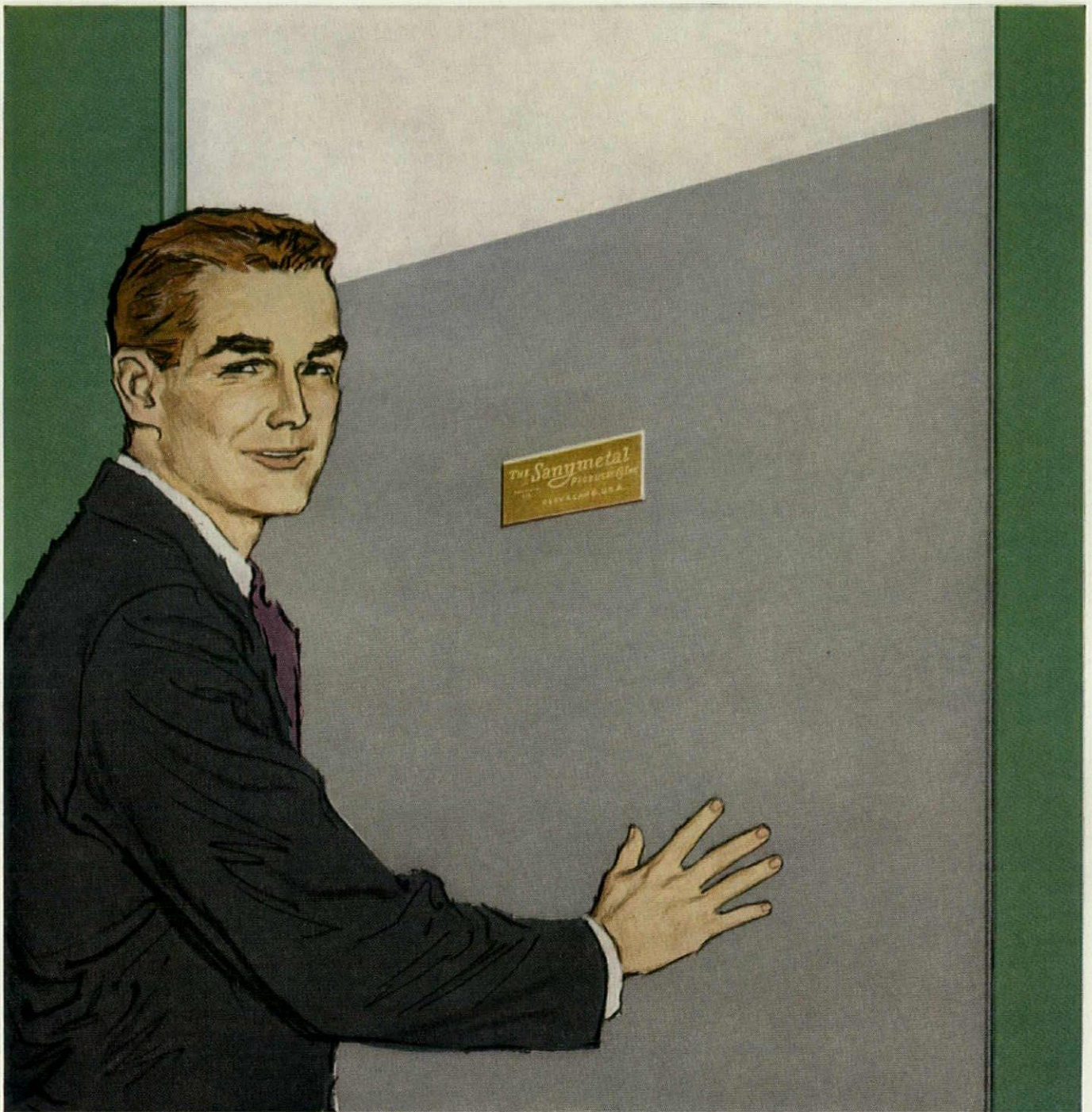


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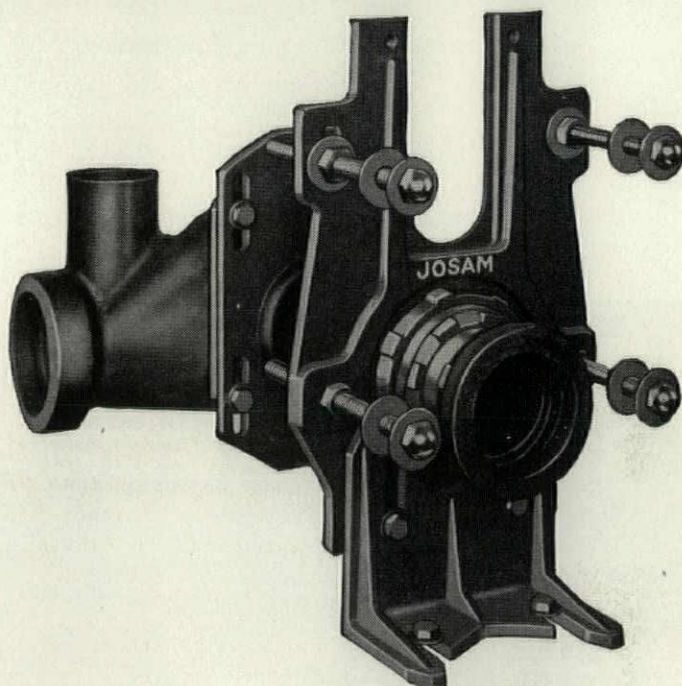
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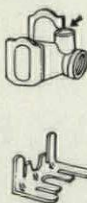
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REVERSIBLE CARRIER BODY — Reversing carrier body from top to bottom position permits connection for blow-out or syphon jet bowls of any manufacturer.

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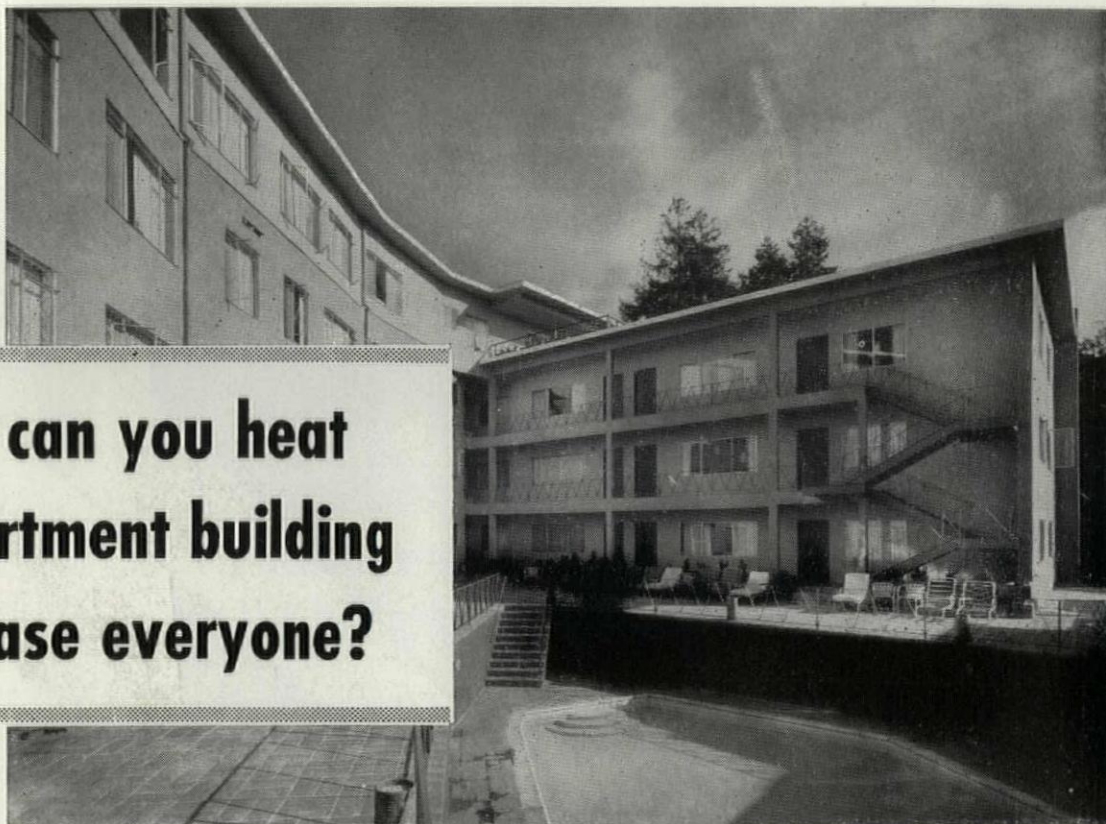
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Fitchburg:
Service Elec. Sup. Co.
Pittsfield: Carr Supply
Springfield:
Eastern Elec. Sup.
Worcester:
Atlantic Elec. Sup.
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Michigan Chandelier Co.
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Charles A. Anderson & Co.
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St. Paul: Lax Elec. Co.

MISSOURI
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Portsmouth:
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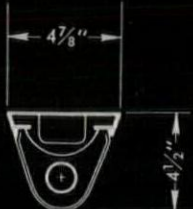
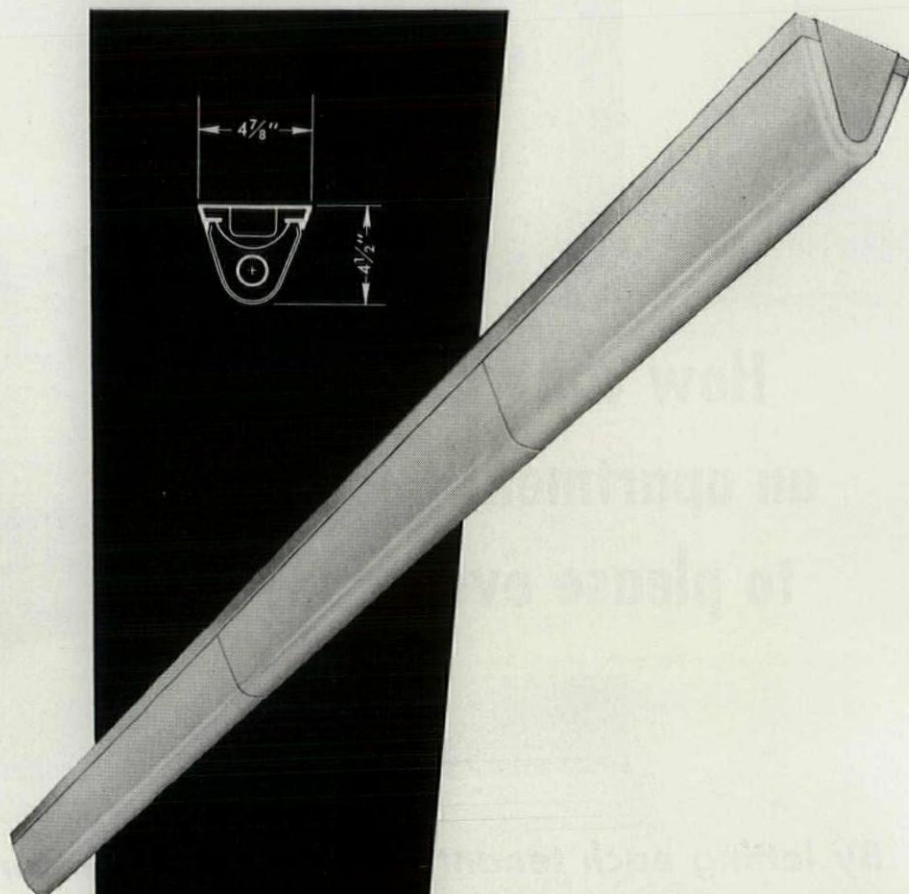
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ALUMILINE ANNOUNCES

New Color Finish on Architectural Aluminum

A new, beautiful and long-lasting green finish on aluminum is now available to the architectural field. This new finish, a chemically formed coating integral with the metal, is produced by The Alumiline Corporation in accordance with the American Chemical Paint Company's Architectural Alodine* Process.

The color is sunfast and long-lasting. The finish is corrosion resistant. It requires little maintenance. In addition to normal roofing, siding and curtain wall application, aluminum treated with the Architectural Alodine Process is widely used on airport hangars to reduce glare and on church roofs to simulate the patina of aged copper.

The Finishing Division of The Alumiline Corporation is an ACP-Alcoa†-approved processor. All Alumiline curtain wall, fascia and spandrel materials, as well as Alcoa Industrial Building Products, are available with this new color finish. Write today for detailed information and samples.



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Division of ENGINEERING PRODUCTS & SPECIALTIES, INC.

Dunnell Lane, Pawtucket, R.I.

*Reg. T.M. of American Chemical Paint Company

†Reg. T.M. of Aluminum Company of America

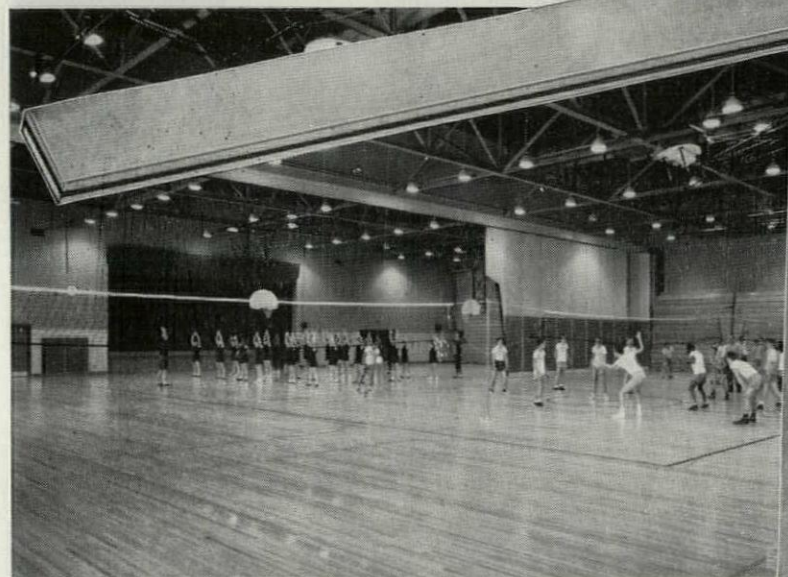


Above:

Hyde Park School, Waukegan, Illinois.
Architects, Ganster & Hennighausen,
Waukegan. Photo by Bill Hedrich,
Hedrich-Blessing, Chicago.

Below:

Commercial High School,
North Chicago, Ill.
Architect, Warren S. Holmes Co.,
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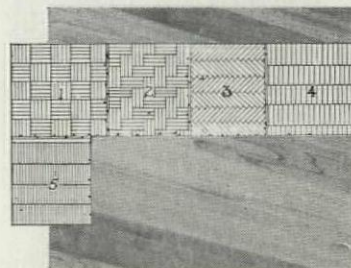
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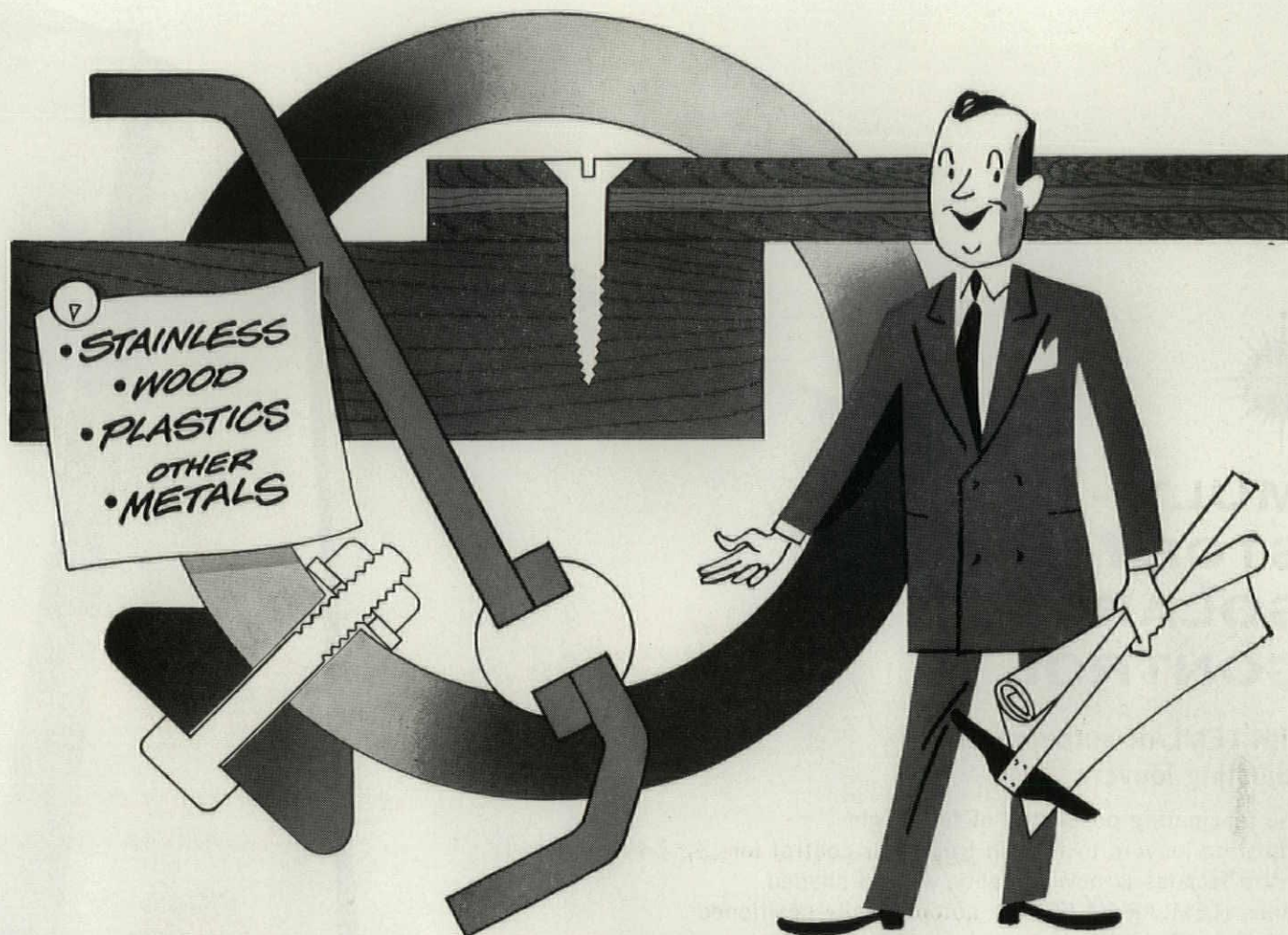
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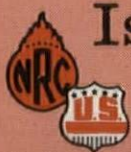
Architect: John C. Lindsay, AIA
Builder: Buckeye Construction Co.



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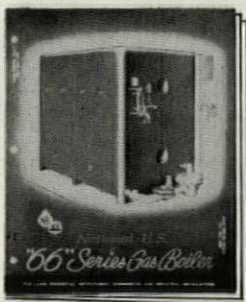


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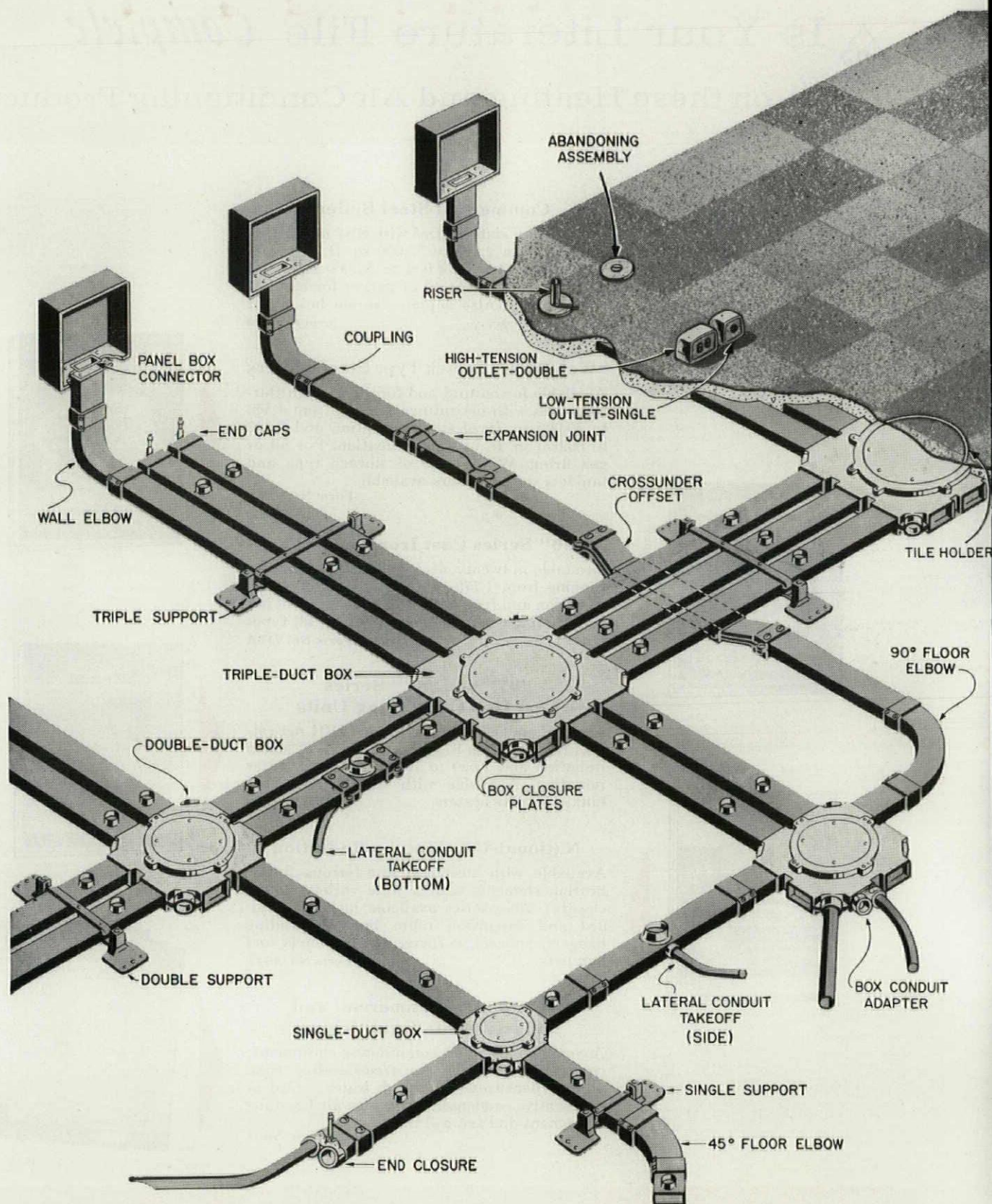
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Johnstown, Pennsylvania



General Electric's new single-level steel under-floor wiring system provides a low-cost but efficient means of handling both feeder and

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These new, attractive surface fittings are available for both the new G-E single-level and the G-E two-level steel underfloor duct systems. The modern styling with low silhouette was designed especially to blend with the modern interiors of today's buildings.

General Electric offers you a . . .

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For all types of floor constructions . . . can be used in fills as shallow as 2½ inches

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This addition to the G-E line of steel underfloor systems is designed for standard floor layouts where the greater flexibility of the two-level system is not required, or where fills are too shallow to accommodate other systems.

General Electric engineers have designed this system for easy installation—box and duct leveling is done quickly with a screw driver . . . slip couplings simplify duct connections . . . and wire pulling is a fast job because the galvanized ducts have smooth, organic-coated interior surfaces.

The standard-size steel ducts (3.357 sq inches) provide adequate feeding and distribution capacity. Single, double, or triple runs of duct can be used

according to the number of services needed.

All three General Electric steel underfloor wiring systems are listed by Underwriters' Laboratories, Inc.

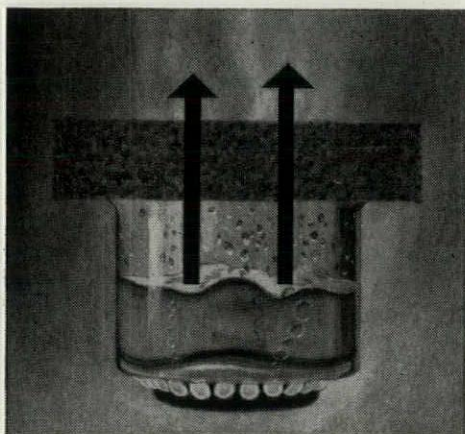
When to Use the G-E Single-level System

Consider these factors before choosing an underfloor wiring system for your next project: a. Can a standard floor layout handle feeding and distribution? b. Is the floor fill less than 3½ inches? c. Can a single-level system fulfill future wiring requirements?

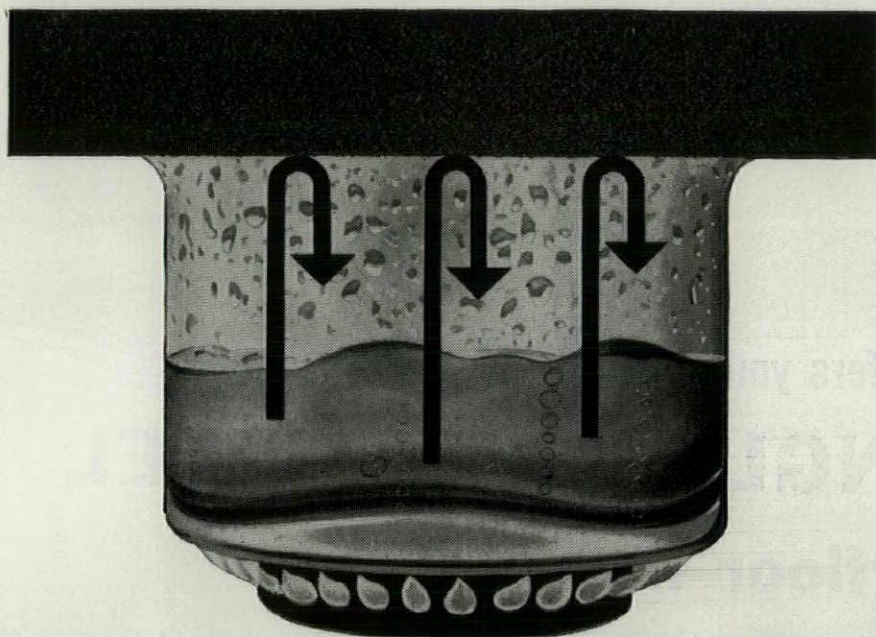
If so, you should consider this new General Electric single-level steel system. However, for other applications investigate G-E cellular-steel floor and two-level systems. Whatever your needs, General Electric's experience and complete product line can provide your best answer. Call your nearest General Electric Construction Materials district office or write Section C77-1171, Construction Materials Division, General Electric Co., Bridgeport 2, Conn.

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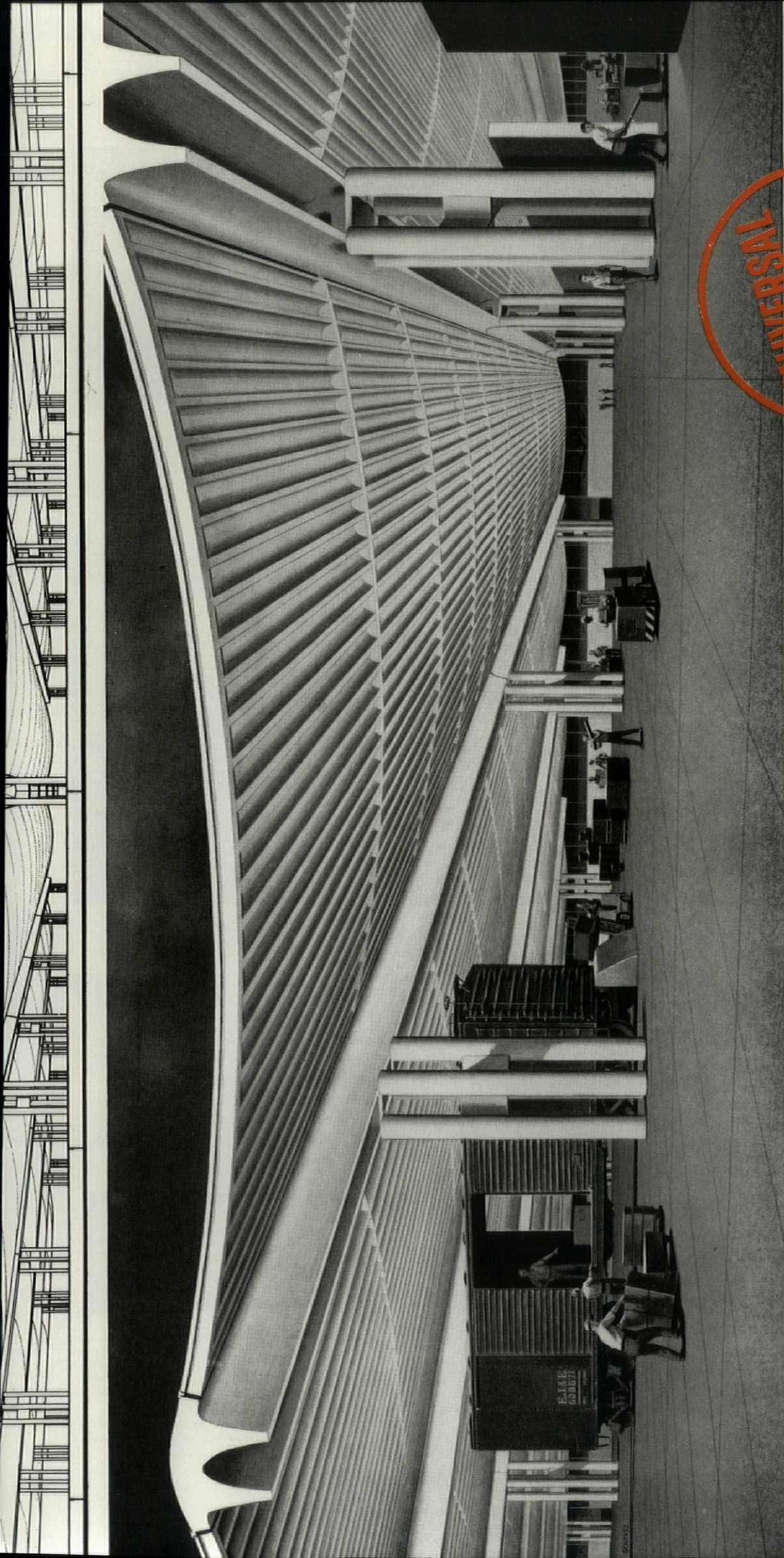
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ULRICH FRANZEN, *Architect*

■ One of a series of advertisements being presented in national magazines by Universal Atlas — to promote interest in architectural contributions for a greater America through the medium of concrete. For more about this construction system, write to Universal Atlas, 100 Park Avenue, New York 17, N. Y.



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THIS UNIQUE vinyl tile pattern is a Gold Seal® exclusive. We adapted it from a magnificent old Italian marble design to our full-thick vinyl Nairon® Custom tile. And ten feet away, you'd never know the difference. The overall design—we call it Venetian*—creates a virtually seamless effect. What's more, this modern classic design shares the incredible ruggedness of the best in vinyl tile—Gold Seal Nairon Custom. It's virtually immune to acids, alkalies, grease and grime. Neither wear nor age nor pounding traffic will dull its colors, blur its design. Unlike its marble ancestor, "Venetian" is unusually quiet and comfortable underfoot. An occasional damp mopping keeps it gleaming.

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SPECIFICATIONS: Gold Seal Nairon Custom tile: 9" x 9", 12" x 12", 18" x 18" tiles in 1/8" gauge, 9" x 9" tile in .080" gauge. Install over suspended wood, suspended below-grade or on-grade concrete, even over radiant heat. Pattern selections include "Venetian" (5 colors), Sequin® (19 colors, including Black and White) and "Marble" (7 colors).



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Pinehurst tees off on fuel costs

Golfing resort cuts costs 33% with modern burning of coal

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Facts you should know about coal

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Not only students but others benefit by the quality of the lighting in this library which is attached to a school in Cambridge, Mass. Both the stacks and the reading tables are softly, glarelessly illuminated with Litecontrol No. 5100 series recessed Holophane lens fixtures.

Some of these standard, cost-saving fixtures are arranged to fit in the corners of the rectangles. In addition, there are two rows of single lamp fixtures in the soffit over the bookshelves. There are also a few special two-foot square fixtures which appear across the center of the room and tie in attractively

with the shape of the air diffusers.

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ENGINEER:
J. M. McCusker Associates, Boston, Mass.

LIGHTING SPECIALIST:
R. J. Kearns, J. M. McCusker Associates

ELECTRICAL CONTRACTOR:
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CEILING HEIGHT: 10'-0"

FIXTURES:
Litecontrol No. 5124, 5128 2 lamp recessed slimline fixtures in rectangle, using Holophane #9016 low brightness lenses; No. 5114, 5118 1 lamp recessed slimline fixtures, using #9016 lenses; and special No. 5142 4 lamp 2' x 2' recessed fixtures using #9016 lenses.

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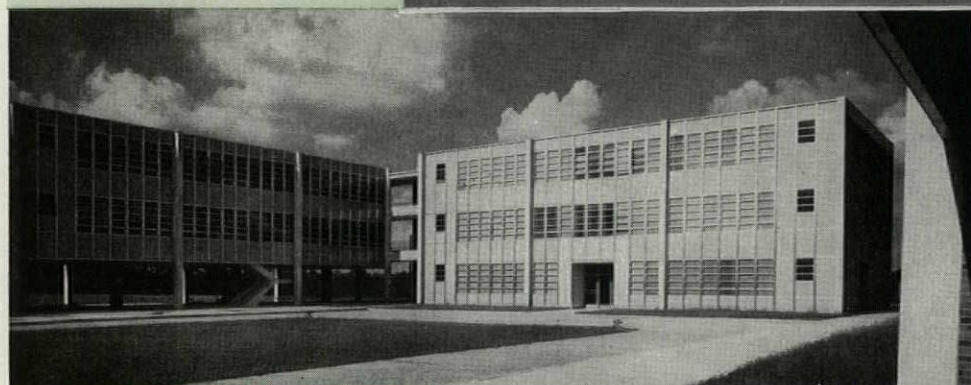


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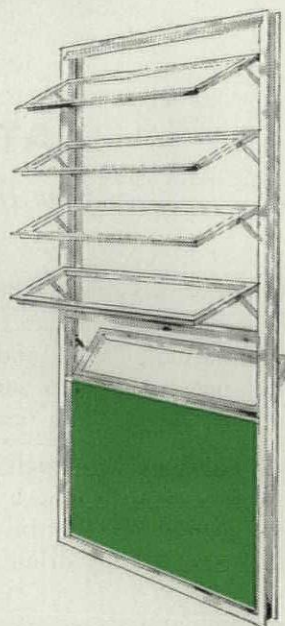
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LATEX PAINT FACTS FOR ARCHITECTS

New 16-page booklet tells why and where to specify latex paints

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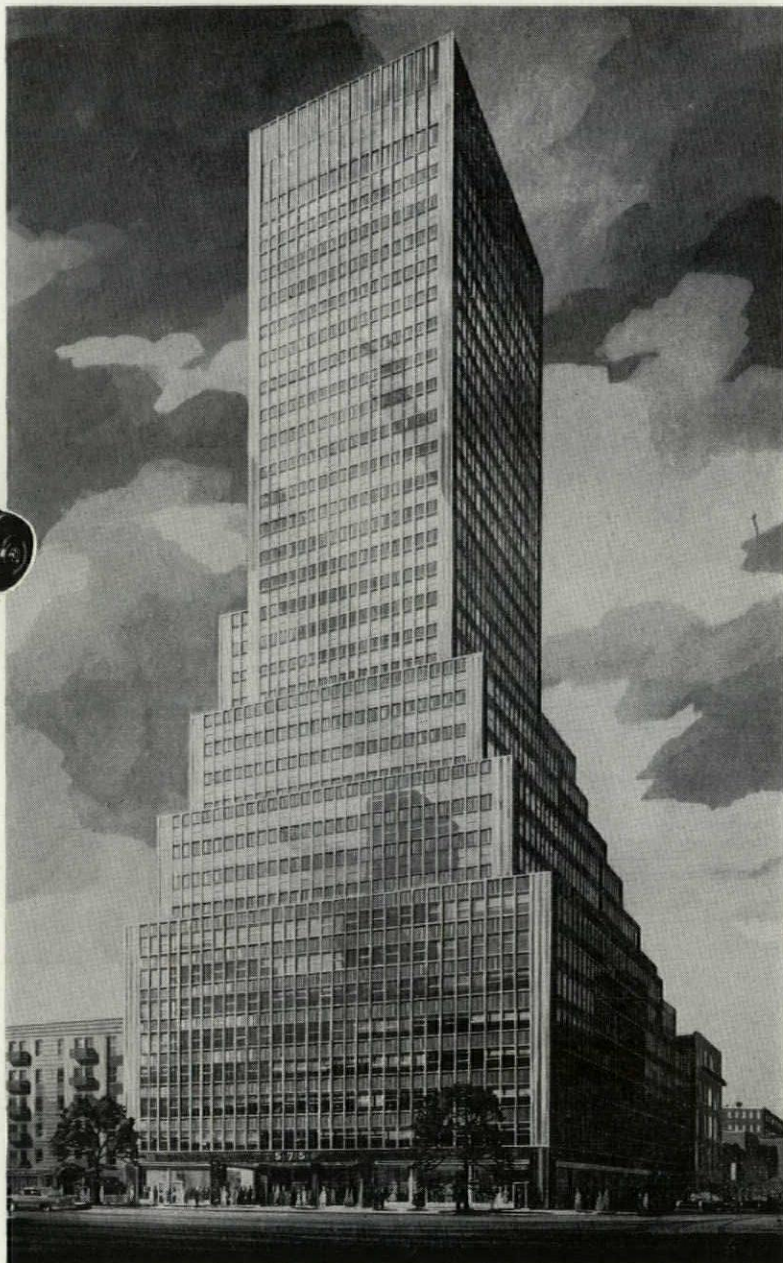
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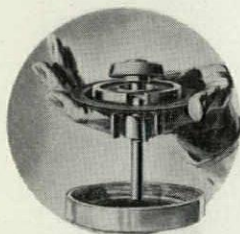
A gleaming gold-anodized aluminum sheathing marks this new 34 story showplace as an architectural milestone. Other pace-setting features of this building-of-tomorrow include automatic high speed elevators and air conditioning throughout.



DELANY diaphragm type FLUSH VALVES were specified to provide the rugged performance and graceful appearance to meet tomorrow's tailored building designs. These

DELANY FLUSH VALVES will be performing perfectly... will look as new as today... when this years-ahead building becomes contemporary in the future.

DELANY VALVES will enhance this future with a record of faultless service.



One of the major reasons behind the longer-lasting performance of DELANY diaphragm type FLUSH VALVES is the simplicity of design of the interior working assembly. Only six working parts, including a highly durable chromed leather diaphragm, provides positive performance and ease of maintenance found in no other valve today.

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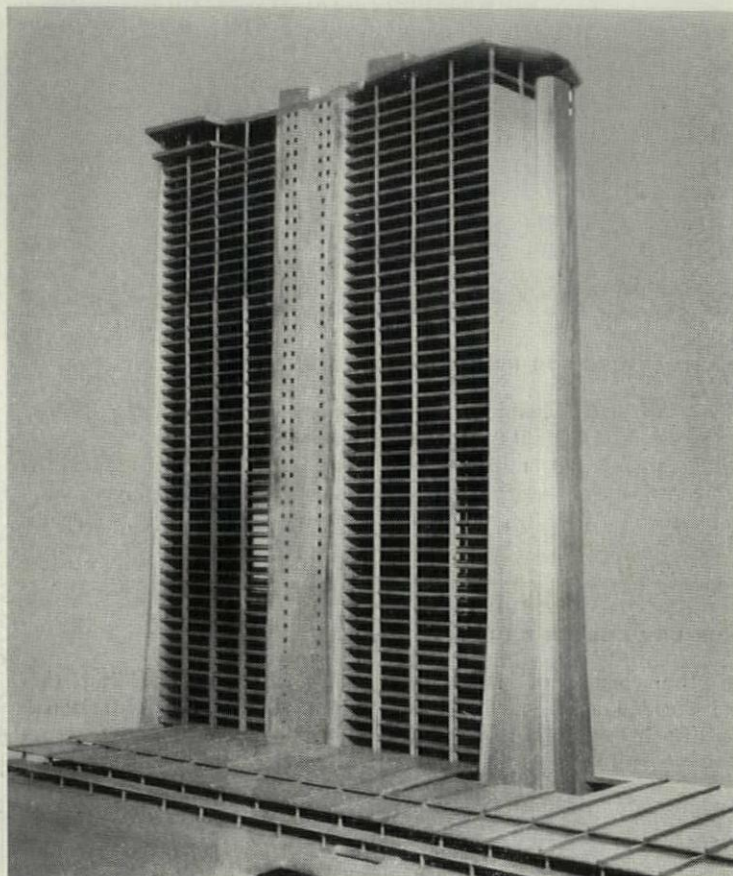
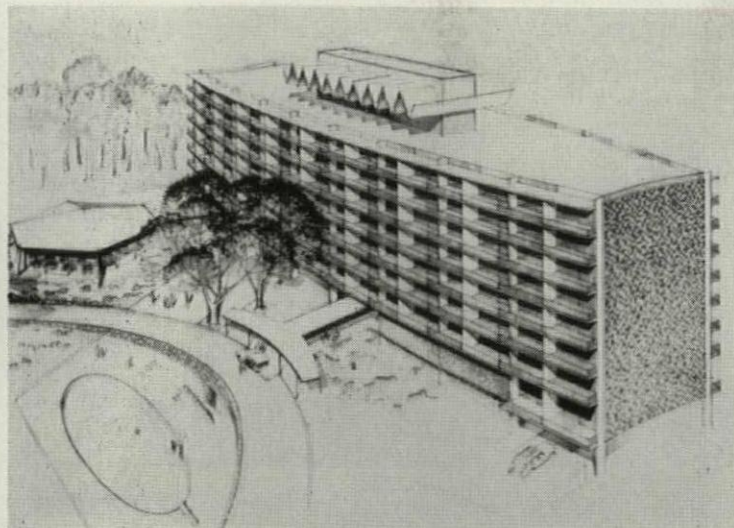
DELANY
Flush
VALVES

Since
1879

A roundup of recent and significant proposals

HIGH ROADSIDE HOTEL

With the help of eye-catching color, a swimming pool, and a roof terrace, planners of the eight-story Arlington Motor Hotel, near Washington, hope to lure motorists from Route 1. Designed by Albert G. Mumma Jr. of John Jamieson White & Associates, it will accommodate 274 guests.



HAMILTON WRIGHT

WORLD'S TALLEST PRESTRESSED-CONCRETE BUILDING

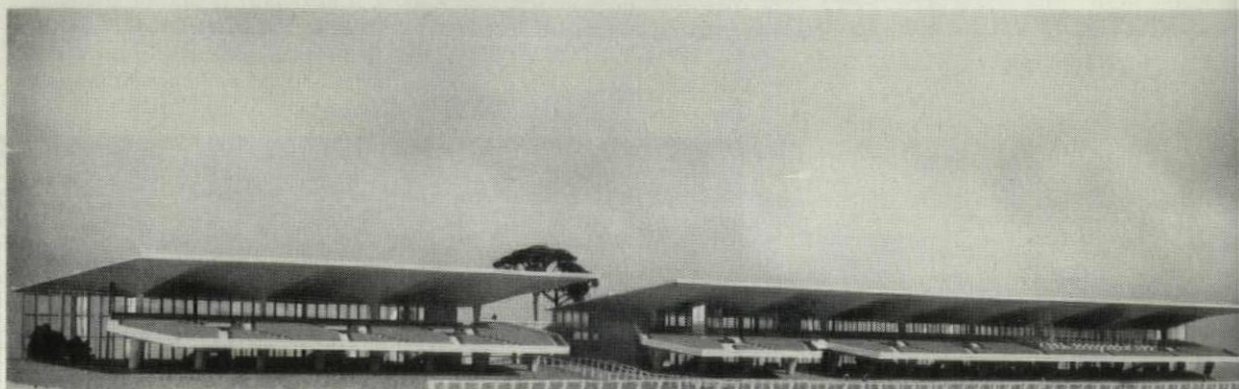
This 58-story office and apartment just outside Caracas, Venezuela, due for completion in July, 1959, will have a four-

story, 3,200-car garage, shops and small hotel at its base. Architect: Carlos Raul Villanueva.

MODERN TROTTING TRACK IN ITALY

A new trotting track near Rome, designed by Architect Aicardo Birago, will have two stands for 2,000 and 4,000

spectators (below), an air-conditioned restaurant, parking for 4,000 cars, and four small apartment buildings.





HEADQUARTERS FOR NATION'S CHEMISTS

The American Chemical Society is tapping its 80,000 members for \$3 million to build this eight-story headquarters in Washington. De-

signed by Architects Faulkner, Kingsbury & Stenhouse, the new building will house the Society's 204 employees and provide 80,000 sq. ft. of space.

BACK BAY BOSTON BUILDING FOR I.B.M.

On the corner of Boylston and Clarendon Streets in Boston's Back Bay, IBM has started this six-story aluminum-

and-glass office building (below). Designed by Harrison & Abramovitz, the new structure is to be completed in 1958.



DRUCKER-HILBERT CO., INC.

NEW CENTRAL LIBRARY FOR SEATTLE

Architects Bindon & Wright borrowed from department-store planning to make Seattle's new public library easy to use and its wares readily

accessible. The sloping site makes possible two main public floors, connected by escalators. Decker, Christenson & Kitchin, associated architects.



OFFICE TOWER WILL SET A BRITISH RECORD

The London County Council has approved plans for the 30-story office building below—the tallest in Britain—on a 3½-acre site near the Tate Gallery. Principal tenant of

the 350' tower will be the Vickers Group of Companies. Lower buildings are apartments; open areas are gardens and car parks. Architects: Messrs. Ronald Ward & Partners.

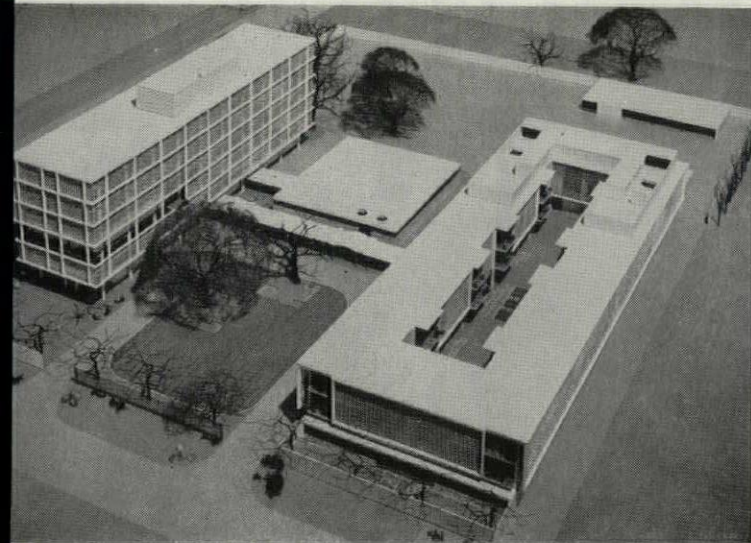


EXPANSION AT LANKENAU

Lankenau Hospital, Philadelphia, has started a \$3.7 million addition, exclusively for ambulatory patients, beside its main

building (right background). Eventual medical center expansion, by Architect Vincent Kling, will cost \$40 million.





FRANK LOTZ MILLER

THREE-UNIT US EMBASSY COMPLEX IN SAIGON

By carefully avoiding anything resembling French Colonial architecture, Architects Curtis & Davis proved to be diplomats, too, in their design for

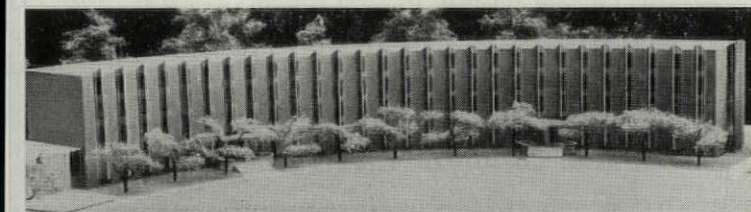
the US Embassy, Saigon. The seven-story office building (l) and staff housing (r) will have cellular concrete sun screens. At the center are USIA offices.



TWO-IN-ONE SCHOOL FOR NEW YORK CITY

New York City officials are faced with a perennial problem: finding sites for new schools, particularly in residential areas. One solution (above), worked out by Archi-

tecs Kahn & Jacobs and William Lescaze, combines a high school and an elementary school in a single 62,500 sq. ft. site. Six-story high school will accommodate 2,000 students.



CONCAVE VASSAR DORMITORY BY SAARINEN

Next year Vassar College girls, 156 of them, can move into Emma Hartman Hoyes House (above), designed by

Eero Saarinen. The new dormitory, on the curve of the circle, will cost about \$1.4 million.



RAOUL A. IBARCUEN

HIGH RISE REDEVELOPMENT HOUSING FOR PHILADELPHIA

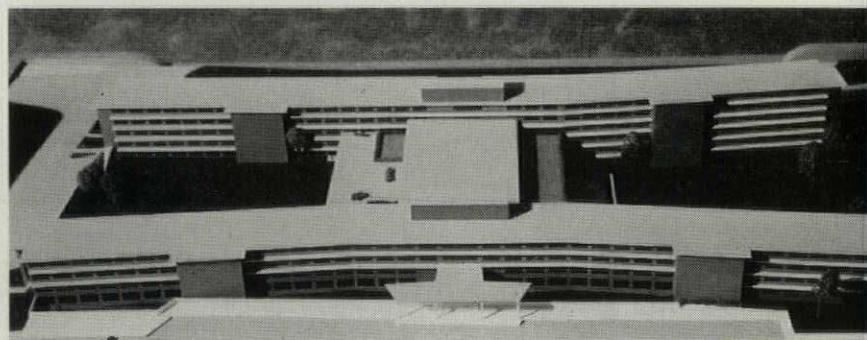
On a site acquired from the Philadelphia Redevelopment Authority, the Parkway Triangle Corp. will erect four 18-story apartment buildings (above) at a cost of \$17.5

million. Architects for Park Towne Place, one of the largest urban renewal housing projects in the country, are John Hans Graham & Associates and Milton Schwartz.

HUGE DORMITORY FOR MICHIGAN CO-EDS

A loan of \$3.5 million from the Community Facilities Administration of HHFA will help to finance the University of Michigan's largest dormi-

tory for women. Designed for 1,190 students, Mary Markley Hall will cost \$6 million. Architects: Harley, Ellington & Day, Detroit.

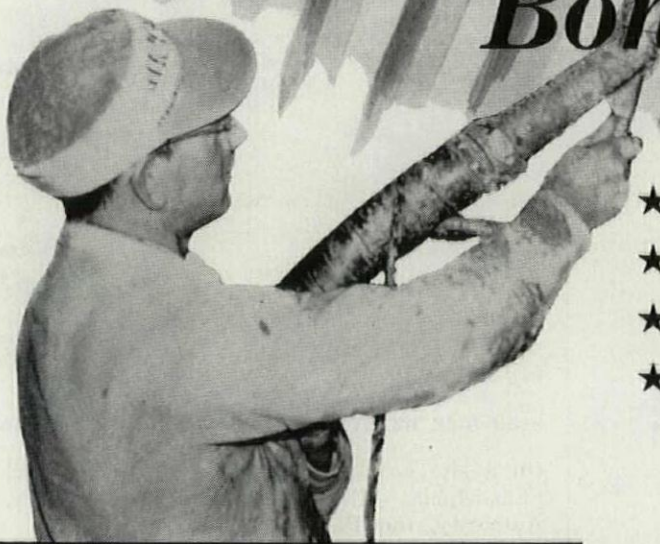


GIANT CLUB SANDWICH

Two sandwiches, each formed by a floor of living rooms between two floors of bedrooms, will be stacked to form Harvard's Eighth House. This plan by Shepley, Bulfinch, Richardson & Abbott eliminates corridors on two out of three floors.



Now ZONOLITE® Perfect LOWEST COST



Bonds Directly to

- ★ Provides 3- and 4-hour Fire Ratings
- ★ Saves Days on Construction Schedules
- ★ Eliminates 7 inches of Height per Story
- ★ Gives Built-in Acoustical Benefits

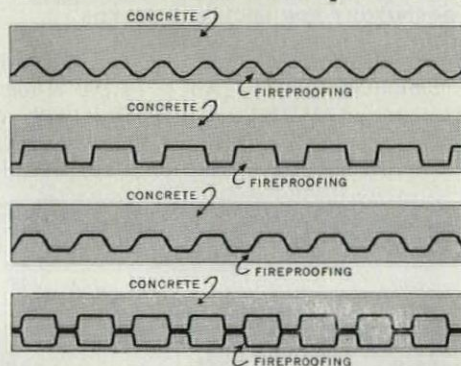
Now, with Zonolite direct-to-steel fireproofing, can cut over-all costs of materials and construction. On one building, for example, a saving of \$30,175 was effected simply by using this new technique in lieu of another fireproofing method. Zonolite direct-to-steel fireproofing "has everything"—it speeds work progress, provides three and four-hour fire ratings—provides additional bonuses other fireproofings do not offer.

Zonolite direct-to-steel fireproofing amazingly sticks to the underside of steel floors, applies quickly by hand or machine—reducing former construction schedules by days. It provides its own attractive finish.

Sound-Conditions As You Fireproof!

This new direct-to-steel technique does more than fireproof—it *sound conditions!* Zonolite fireproofing

Typical Steel Floor Systems Using ZONOLITE® Direct-to-Steel Fireproofing



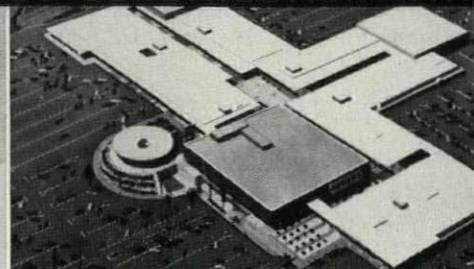
OTHER WAYS TO ACHIEVE FASTER, LOWER-COST CONSTRUCTION WITH



In Bedford, N. H., School, insurance savings quickly pay for the Zonolite Plaster Fireproofing and Zonolite Acoustical Plastic. Arch.: A. J. Majeski. Plast. Contr.: J. F. McGranahan.



3325 Wilshire Blvd., office building, Los Angeles, Calif., uses Zonolite Plaster Fireproofing and Zonolite Spandrel Back-up System throughout. Arch.: Victor Gruen. Plast. Contr.: Martin Bros.



Gulfgate Shopping City, Houston, Texas, has Zonolite Plaster Fireproofing throughout. Arch.: John Graham & Co. Plast. Contr.: Tobin & Rooney.

New Advanced Technique for **FIREPROOFING**

Underside of Steel Floors!

composed of vermiculite and suitable binders with exceptional noise-reducing characteristics. The architect can often design so that further sound-conditioning is unnecessary.

Reduces Other Material Costs

With Zonolite direct-to-steel fireproofing you cut 7 inches from the height of each floor—a gain of one story in every 14 in multi-story construction, a saving in other construction materials.

Tenant Changes, Mechanical Alterations Easily Accomplished

Because the fireproofing is applied direct-to-steel—up high, out of the way—there is free access to the mechanical installations. Tenant changes are accomplished without cutting through the fireproofing in new or old buildings.

PREPARED to make the most of Zonolite direct-to-steel fireproofing. **BE INFORMED** on quick, sure, low cost fireproofing in all types of construction. Tear out the coupon now for **FREE** reference booklet giving ratings, application data, all details.

Typical ZONOLITE DIRECT-to-STEEL Fireproofing Installations

AAA Office, Kalamazoo, Mich. Fireproofed throughout with Zonolite applied directly to steel. Arch.: Louis Kingscott & Associates. Plast. Contr.: Ben Schuemann.



Zonolite Fireproofing was applied to underside of steel by machine in new-type steel roof at Phoenix, Ariz., Coliseum. Plast. Contr.: Gray Plastering Co.



Fireproofing direct to underside of steel floors in Bell Telephone Building, Pittsburgh. Arch.: Press & William C. Dowler and Associates. Plast. Contr.: Easley and Rivers.



ZONOLITE PLASTER FIREPROOFING AND ZONOLITE ACOUSTICAL PLASTIC



New York International Airport, Idlewild, N. Y., world's largest, is made firesafe with Zonolite Plaster Fireproofing throughout. Arch.: Skidmore, Owings & Merrill. Plast. Contr.: Mario & DiBono.

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135 S. LaSalle St., Chicago 3, Illinois

Send me booklet PA-41 "Plaster and Acoustical Systems", and Data Sheet, PA-35 on "Direct-to-Steel Fireproofing".

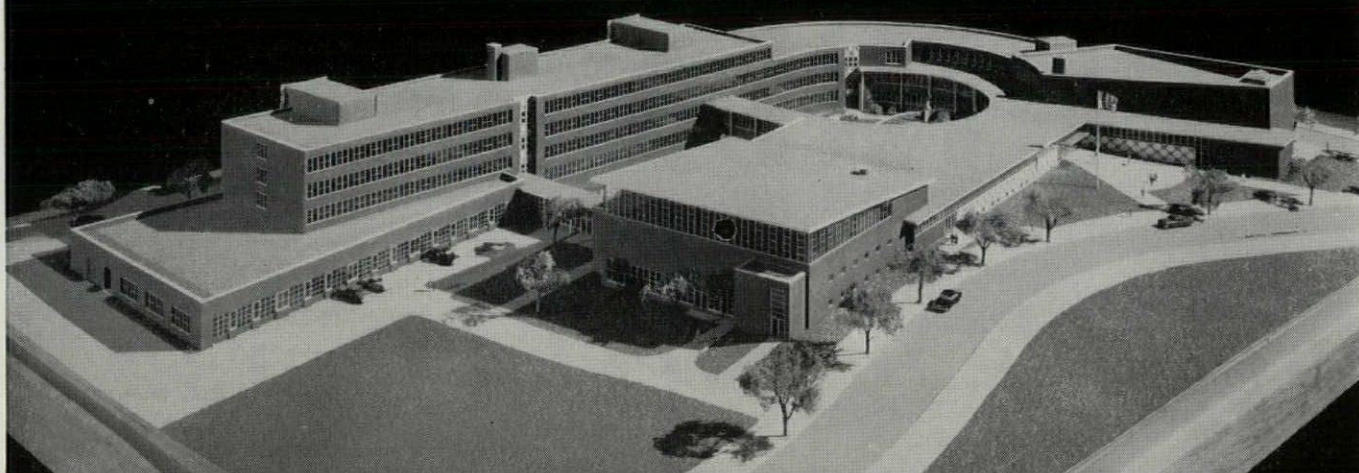
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City Zone State

THOMAS A. EDISON VOCATIONAL HIGH SCHOOL



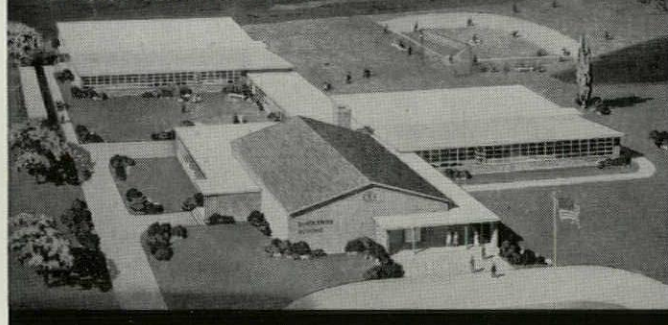
PUBLIC SCHOOL 11



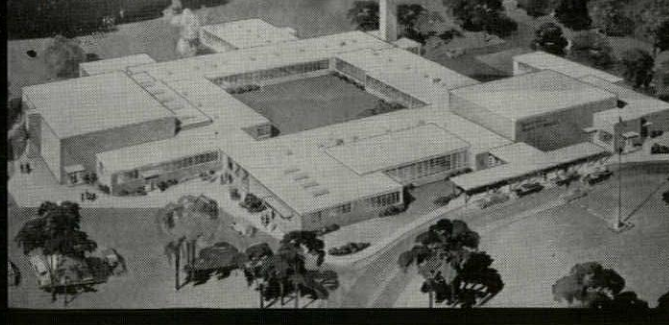
PUBLIC SCHOOL 105



ROCKAWAY TOWNSHIP SCHOOL



MADISON HIGH SCHOOL



These excellent examples of modern
school architecture will incorporate
POMEROY Custom-Built Windows!



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HUNG
WINDOWS

360°
REVERSIBLE
WINDOWS

FIXED
and HINGED
WINDOWS

CUSTOM-
BUILT
ENCLOSURES

CURTAIN
WALLS

ACOUSTICAL
CEILING
SUSPENSION
SYSTEMS

FABRICATION IN ALUMINUM — STAINLESS STEEL and COATED STEEL

THOMAS A. EDISON VOCATIONAL HIGH SCHOOL, Jamaica, N. Y.
Architect: Fellheimer & Wagner Assoc., New York City
Contractor: Caristo Construction Corp., Brooklyn, New York

PUBLIC SCHOOL 11—Brooklyn, N. Y.
Architect: John A. Thompson, New York, N. Y.
Contractor: Colmar Construction Corp., Brooklyn, New York

PUBLIC SCHOOL 105—Queens, N. Y.
Architect: H. I. Feldman, New York, N. Y.
Contractor: Planet Construction Corp., New York, New York

ROCKAWAY TOWNSHIP SCHOOL—Rockaway, N. J.
Architect: Alfonso Alvarez, Upper Montclair, N. J.
Contractor: Wortmann Construction Co., Elizabeth, N. J.

MADISON HIGH SCHOOL—Madison, N. J.
Architect: Lawrence C. Licht, Englewood, N. J.
Contractor: Thomas Construction Co., Paterson, N. J.

S. H. POMEROY COMPANY, 25 BRUCKNER BOULEVARD, NEW YORK 54, N. Y.

September building sets another all-time record; Canada has commercial boom, but 19% drop in total awards

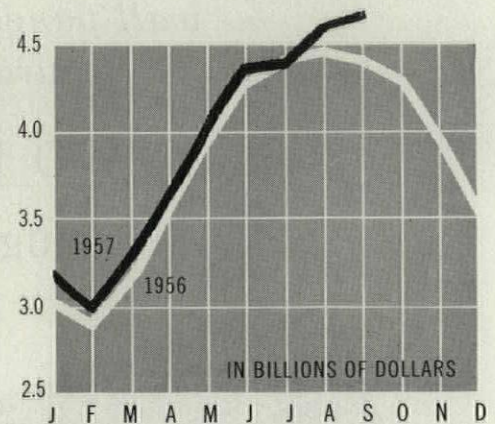
Instead of starting their usual seasonal decline, outlays for new construction set a new all-time monthly record of \$4,618 million in September, a 1% advance over the record of \$4,595 million in August and 4% over the Sept. '56 level.

Total private construction, which has lagged this year mainly because of the decline in homebuilding, registered a year-to-year gain of 1% in September, largely as a result of an \$80 million (17%) gain in public utility construction and a \$24 million (12%) gain in nonbusiness nonresidential work.

Some revived strength in homebuilding also was noticeable in the September data of the Commerce and Labor Depts. Although outlays of \$1,140 million for new dwelling units were only \$5 million higher than in August, the year's decline in homebuilding from 1956 has now been narrowed to 8%, compared with a 14% deficit during the first four months of the year.

For the first three quarters of 1957, total spending for all types of construction has exceeded comparable 1956 spending by 2%. Total public spending for this period was \$10.5 billion, a 10% increase over 1956, while total private spending was \$24.5 billion, a 0.3% dip from 1956.

For new educational buildings, public outlays in the first nine months of



TOTAL EXPENDITURES for new construction in September were \$4.6 billion, a new all-time record, 1% over the previous high set in August, and 4% over Sept., '56.

this year were \$2.1 billion, an 11% gain over comparable 1956 spending; private outlays totaled \$382 million, a 3% decrease.

In Canada, total construction awards for the first three quarters of 1957 were \$2.1 billion, a 19% decline from 1956. Private commercial showed a booming 100% increase to \$600 million, and private industrial construction gained 3% to reach a nine months' total of \$350 million. But residential awards were down more than 33%.

SPENDING BY BUILDING TYPES

(in millions of dollars)

PRIVATE BUILDING

	Sept. '57	1957	1956	±%
Residential (nonfarm)	1,573	12,286	13,169	-7
Nonresidential	802	6,762	6,444	+5
Industrial	260	2,407	2,256	+7
Commercial	322	2,597	2,677	-3
Offices; lofts;				
warehouses	168	1,332	1,202	+11
Stores; restaur-				
rants; garages ..	154	1,265	1,475	-14
Religious	81	636	548	+16
Educational	47	382	394	-3
Hospital; institutions	48	360	233	+55
Public utilities	558	4,184	3,741	+12

*PRIVATE TOTAL... 3,110 24,577 24,663 —**

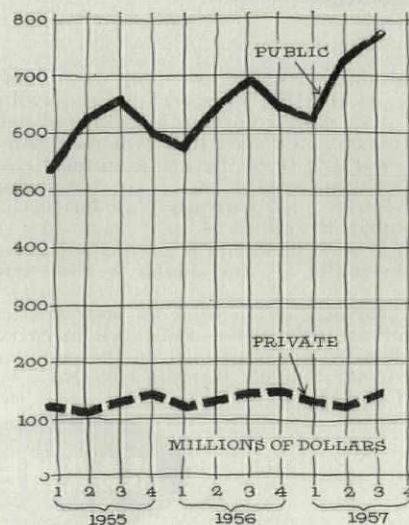
PUBLIC BUILDING

Residential	51	339	201	+69
Nonresidential	415	3,377	3,033	+11
Industrial	37	365	321	+14
Educational	261	2,115	1,912	+11
Hospital; institutions	29	258	219	+18
Military	140	956	1,039	-8
Highways	615	3,730	3,393	+10
Sewer; water	128	1,025	945	+8
*PUBLIC TOTAL ...	1,508	10,514	9,587	+10

*GRAND TOTAL ... 4,618 35,091 34,250 +2

* Minor components not shown, so total exceeds sum of parts.

** Less than one per cent.



EDUCATIONAL BUILDING expenditures in the first nine months of 1957 were up 11% over 1956 for public structures, but down 3% for buildings for private institutions.

Office population growth will spur construction

Even with more electronic machines and automation, the total office forces and office space needs of American business and industry will continue to increase—and require additional construction.

Last month *Dun's Review and Modern Industry* published results of a survey of future office requirements of 376 representative corporations (48% now having fewer than 500 employees each, 41% having 500 to 5,000 employees, and 11% with over 5,000 employees). Although about 60% of the surveyed companies expect to have larger

continued on p. 49

MARMET

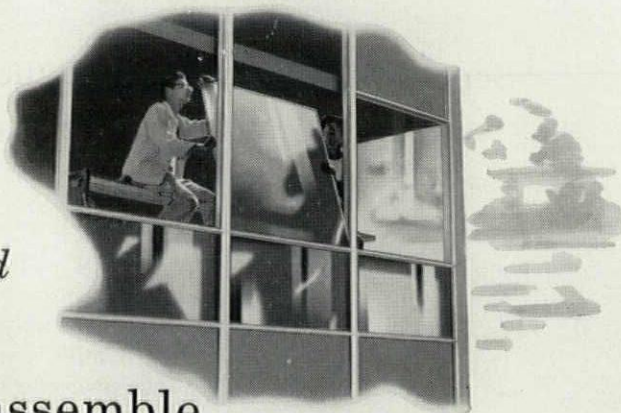
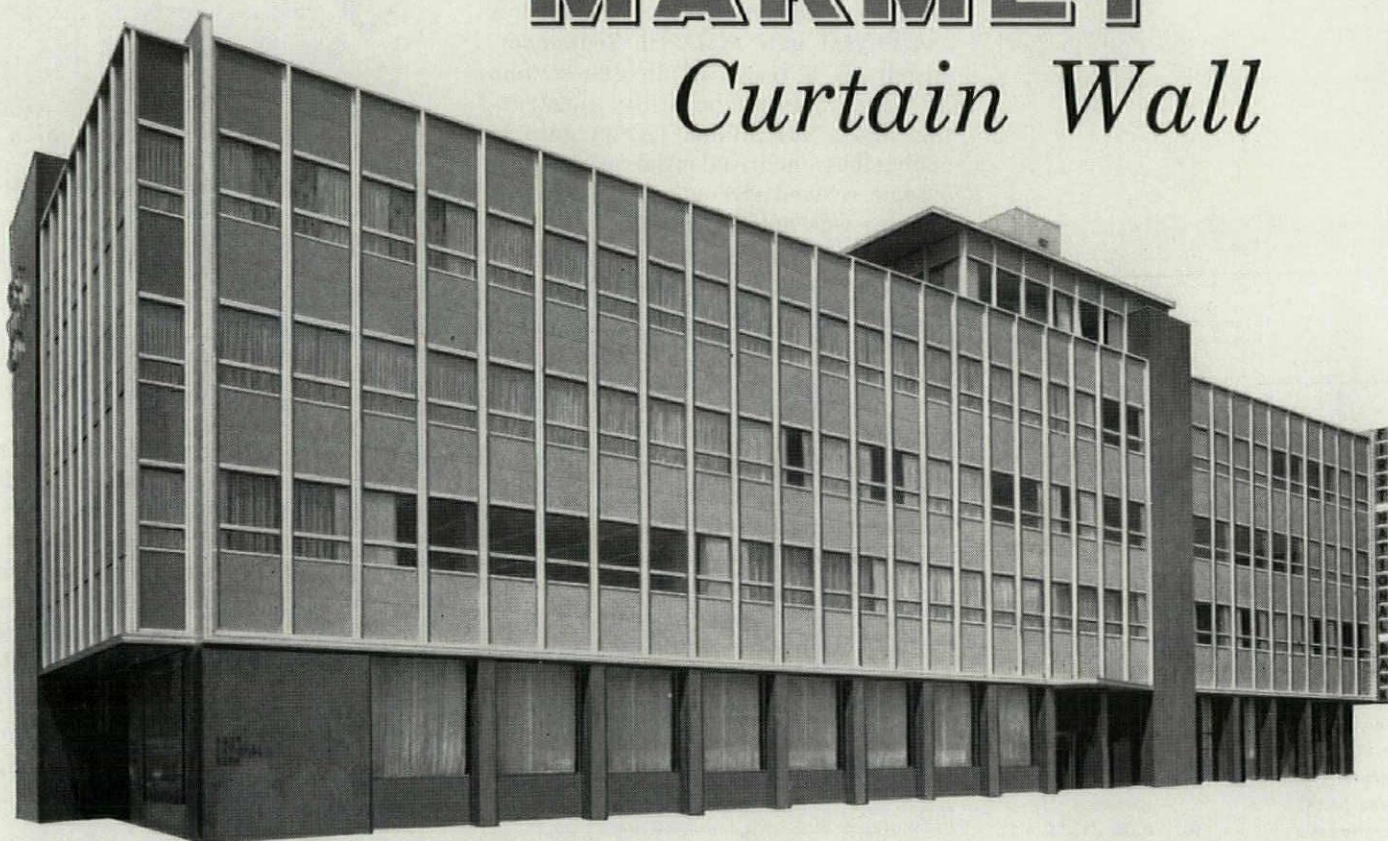
*lite sections and
wall panels are assembled
separately...*

...just TWO MEN could assemble

a huge

MARMET

Curtain Wall



• Once the large, vertical aluminum mulls are hung or supported at each story of the building . . . MARMET's lite sections and wall panels can be stacked one atop the other with a horizontal locking system that fits any condition. Units are small enough that two men can easily handle and install them . . . working from the inside in most cases . . . saving the time and cost of erecting scaffolding. This cost saving, mechanical stacking system of Series 1400 Curtain Wall has become attractive to an increasing number of architects.

Expansion or contraction of sash members is engineered to coincide with vertical movement in the mulls . . . and double weather-stripping seals out water.

Put the MARMET engineering staff to work on your next curtain wall design . . . you will get comprehensive assistance in carrying it forward to execution. For detailed specifications on the complete line of MARMET products — consult Sweet's Catalog File No 3a . . . or write to MARMET for Catalog 58c. Mar

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*First National Bank Bldg.
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*Associate architects:
Edwin A. Francis
Carlisle B. Guy*

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Corporation

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office forces three years from now (in 1960), only about 40% expect to have larger offices. Out of the 376 companies, 58 plan to rent more space, while 121 (or 32%) plan to construct new facilities that will include more office area.

For every one of the surveyed firms that expects to get along with a smaller office force in 1960 than today, six others anticipate they will have larger clerical forces. Over the last 15 years, the survey report notes, the ratio of nonproduction workers to production workers in the US has risen from 16-to-100 to 28-to-100. Modern office machines have enabled some companies to handle the same volume of paperwork with fewer employees than several years ago, but as their total amount of paperwork increases the number of employees also starts increasing again.

Almost 22% of the surveyed concerns, mainly the largest, reported that they already have at least one general-purpose electronic computer in use. Another 28%, mainly the medium-sized firms, reported plans for installing one within three years.

BUILDING MONEY

Mortgage squeeze halts Astor job temporarily

Loan and bond rates of all types held steady last month, and in some instances even declined slightly.

It was too soon to judge whether the worst squeeze of the current tight money market was past and further easing could be anticipated. Meanwhile, however, several reports illuminated the effects tight money has had on the financing for various types of nonresidential construction:

► In New York, mortgage conditions were causing Vincent Astor to look for supplementary equity capital to build the 1.2 million sq. ft., 46-story Astor Plaza tower on Park Ave., now estimated to cost above \$75 million, according to the *Times*. Excavation was halted temporarily when no lenders appeared to be ready right now to make a commitment for a permanent loan as large as desired, despite Astor's reported willingness to pay 5½% interest. There was no doubt Astor could obtain financing, and by delaying he might even obtain easier terms than now available. Among those who may

invest in the structure besides Astor and CBS Executives William S. Paley and Frank Stanton, his initial associates (if greater equity funds are finally needed in excess of whatever loan is ultimately obtained): Owner-Builder William Kaufman, whose post-war New York office structures include the 19-story 711 Third Ave. building (FORUM, Oct. '56).

► At ceremonies of the Mutual Benefit Life Insurance Co. dedicating its 20-story home office in Newark, N. J. (FORUM, Sept. '57), company officials disclosed that they had trimmed Mutual Benefit's investment in an adjacent \$3 million, six-story office building it has erected by selling the equity position in it to the realtors, architects and builders of the structure. In addition

to investing their fees on the structure, the new owners also contributed cash to the venture above the insurance company's mortgage. Mutual Benefit also announced acquisition of two more sites nearby for ultimate enlargement of its present \$20 million Washington Park redevelopment (three office buildings and a huge parking garage) with two more 12- and 15-story structures.

► At a New York American Legion realty post meeting, Investor-Builder Erwin S. Wolfson, head of Diesel Construction Co., said recent material and labor cost increases have upped rents in new office buildings 5¢ to 10¢ per sq. ft. But a 1% higher interest rate on mortgages, he added, has boosted rental terms 25¢ per ft. (based on loans averaging \$25 per sq. ft., rental area).

BUILDING MATERIALS

Steel situation getting easier: several price cuts announced; shipments up; orders down

There was a mixture of good news and bad news in structural steel last month.

On the encouraging side for builders, it was becoming increasingly easy to obtain heavy structurals, and two producers announced reductions in their premium prices for some plates and shapes. But on the discouraging side for everyone, new orders for fabricated structurals fell to their lowest volume in almost four years in August, and for the first eight months of the year trail the record orders of 1956 by 23%.

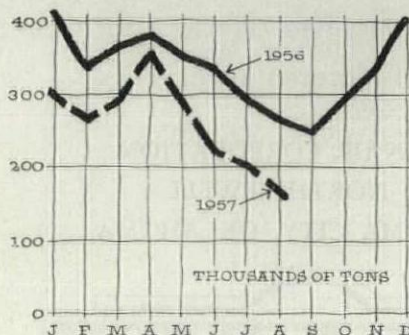
As the availability of structurals steadily eased, Lukens cut its carbon plate prices by \$8 a ton, down to the \$102 industry standard, and Barium Steel reduced its standard structural

shapes \$3.50 a ton, down to the eastern standard of \$106.50. Barium and several other producers still retained \$2 to \$14 premiums on carbon plates in the Philadelphia district, however, and, in Chicago, Inland Steel still kept its \$4 premium on wide flange beams over the \$106.50 rate of other big producers.

Lukens depends largely on scrap supplies for raw material, and Barium entirely on scrap. Their price reductions largely reflected the recent sag in scrap prices—now about 50% below scrap prices a year ago.

A major factor helping to break the scarcity of fabricated structurals has been the steady increase in production and shipments (up 17% for the first eight months of this year) combined with the considerable drop in new orders. Through August, according to the American Institute of Steel Construction, shipments totaled 2.4 million tons, or 360,000 tons in excess of new orders in the same period. In the comparable months of 1956 shipments totaled 2.1 million tons, but were 630,000 tons short of equaling new orders.

Commented Realtor James E. Hanson of Newark at a seminar of the Society of Industrial Realtors in New York: "Don't be too concerned any longer about obtaining steel—sellers are now beginning to get just a little hungry." Observed an official of Allied



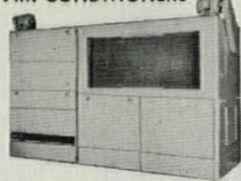
FABRICATED STRUCTURAL STEEL orders during the first eight months of 1957 have trailed 1956 orders by 23%, according to American Institute of Steel Construction data.

WHY SUFFER FROM
"STANDARD CATALOG UNIT"
 HEADACHES?

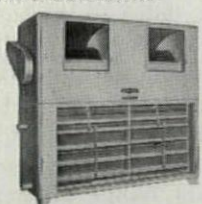
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 AIR CONDITIONING UNITS
 BY **GOVERNNAIR**
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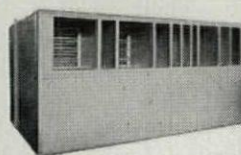
SELF CONTAINED
 AIR CONDITIONERS



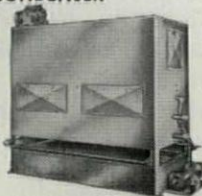
FAN & COIL UNITS



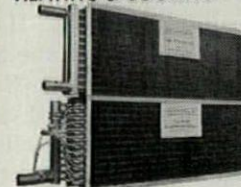
MULTI-ZONE
 FAN & COIL UNITS



EVAPORATIVE
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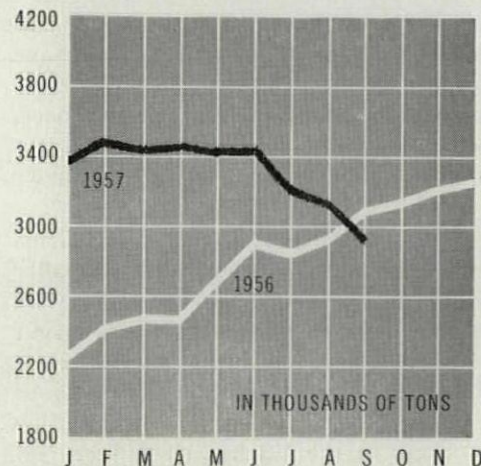
When ordering packaged air conditioners, why should you inherit the headaches of fitting other manufacturers' unalterable "standard catalog" units to your needs?

Not when it's so easy to order "Satisfabricated" Governair units . . . completely self contained . . . completely flexible in design, to suit any particular load conditions or unusual space requirements. Governair "Satisfabricated" units operate with simple water, electrical and duct connections. Important, too, is the fact that Governair units are **engineered** better . . . and **built** better to **operate** better, at minimum maintenance cost.

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BACKLOG of unfilled orders for fabricated structural steel on Sept. 1 fell below 3 million tons for the first time in a year, and at 2.9 tons was 4% under the backlog in Sept., '56.

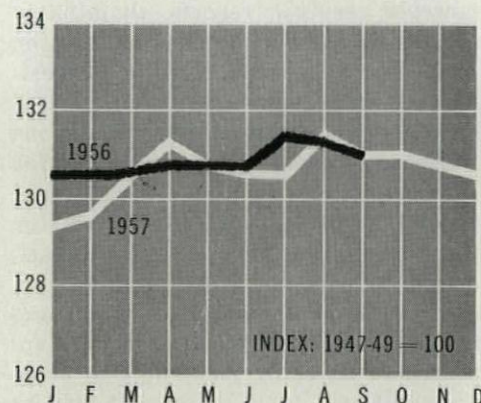
Structural Steel Co., of Chicago, in the *Wall Street Journal*: "Competition among fabricators is getting keener. Profit margins are a lot closer now than at this time last year."

Lumber uncertainty continues

The gradual drop in lumber prices over the last 18 months halted at least temporarily early last month, and in the Northwest a few selected items registered small price increases.

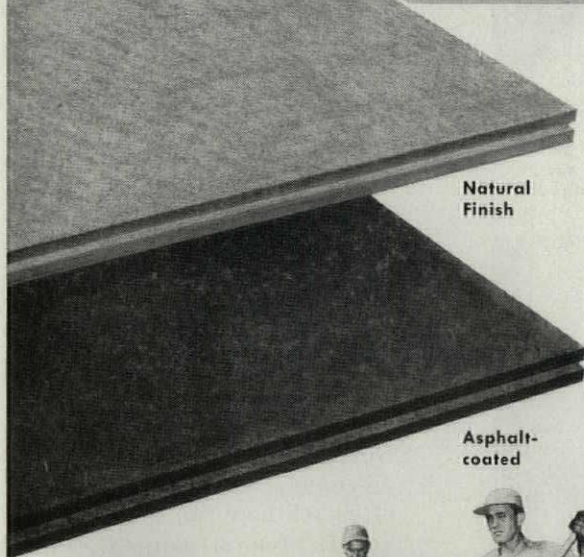
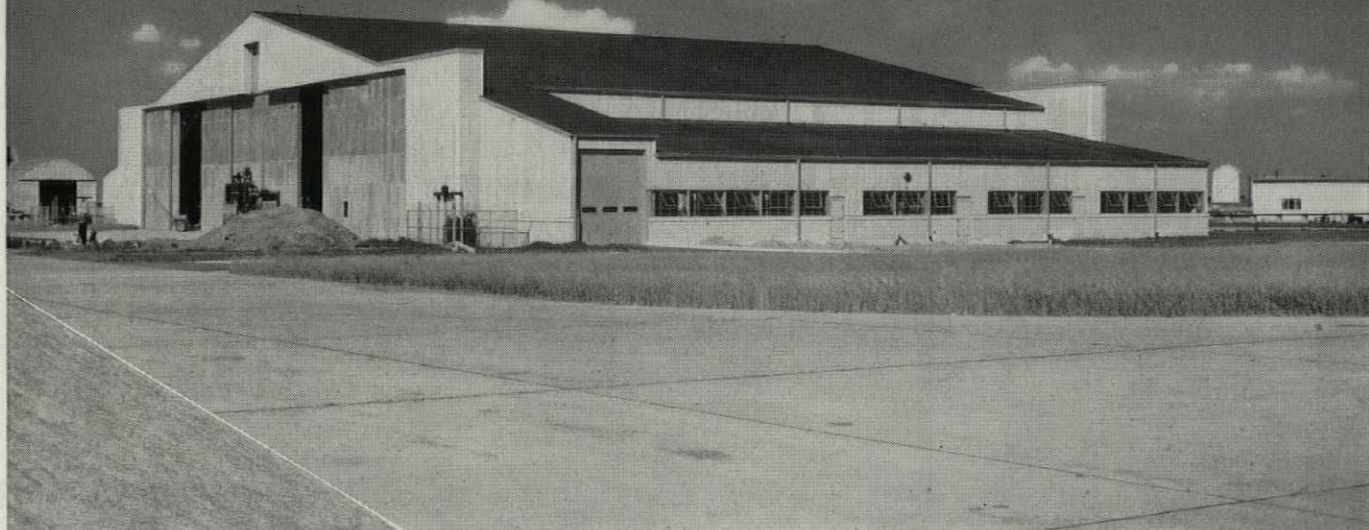
But observers were quick to note that the change had not resulted from any major pickup in demand. Instead the main causes were a series of factors that produced a cutback in output—and the prospect of further reduced production throughout the winter. In the Northwest, logging was slowed by a late summer dry spell that caused fire hazards in the woods and was followed by heavy fall rains that mired

continued on p. 52



BUILDING MATERIALS PRICES declined a trifle in September for the second month in a row on the BLS index of average wholesale prices. At 130.9, the September index was 0.2% below August's 131.2, and less than 0.1% under the 131.0 index for Sept., '56.

MINOT AIR FORCE BASE GETS ROOF INSULATION VALUE THAT LASTS!



INSULATION ROOF BOARD

NATIONAL GYPSUM COMPANY

Gold Bond Insulation Roof Board was used at the new Minot Air Force Base, Minot, N. D. for pitched roofs on hangers and for flat administration and service building roofs. Here's why:

1. Roof insulation value gets maximum protection because Gold Bond's unique "Fiberlok" fabricating process makes the roof board highly resistant to compression from workmen's feet and wheelbarrows during construction. *And* it cuts to a minimum any "soak-in" of hot pitch or asphalt.

2. Roofs cost less to build because Gold Bond Roof Board is rigid, easy to handle; its smooth surface speeds mopping; its low absorption of pitch or asphalt holds down cost of these materials.

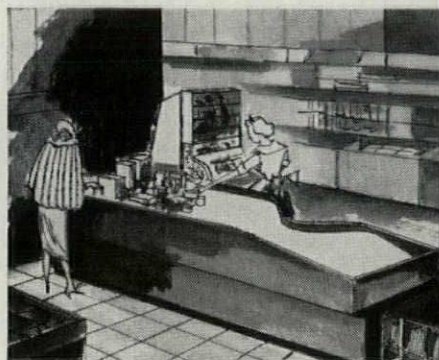
3. Gold Bond Insulation Roof Board is moisture-resistant because the fibers are treated with water-resistant rosin or asphalt. Available with treatment to protect from termites and dry rot; and with full asphalt coating for still more moisture-protection if needed. You can specify square, shiplap or offset edges... thicknesses to meet any specified "C" value.

For further information, call your Gold Bond® representative or write National Gypsum Company, Dept. AF-117, Buffalo 2, New York.

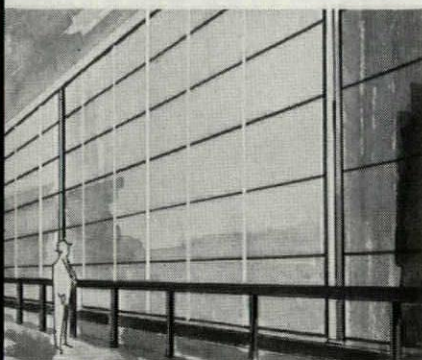
Gold Bond
BUILDING PRODUCTS

When wear creates problems...

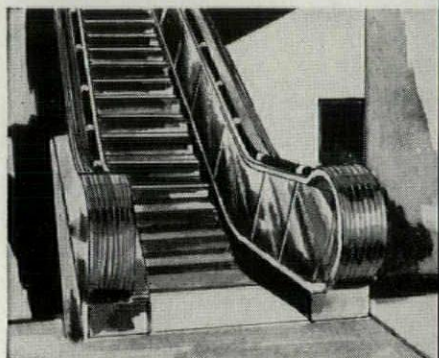
MET-L-WOOD® puts beauty to stay!



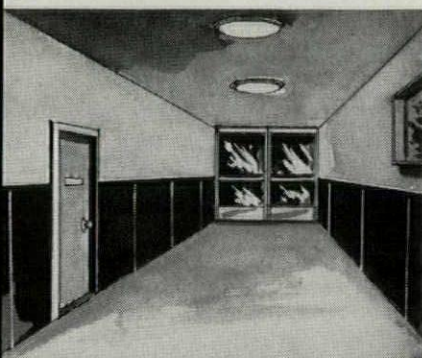
COUNTERS of Met-L-Wood can be designed to fit any decorating scheme, yet stand hardest service.



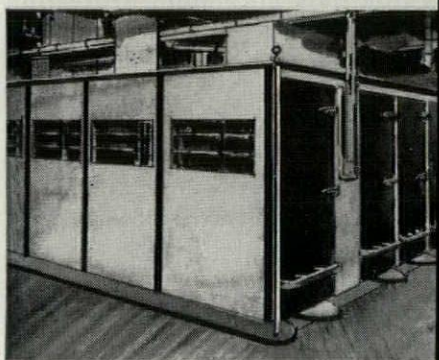
CURTAIN WALLS made of Met-L-Wood panels permit fast construction; lend beauty and life to buildings.



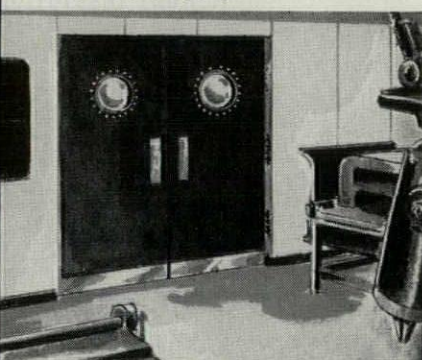
MOTOR STAIRWAY and WALKWAY PANELS of Met-L-Wood stand up under constant use... help damp vibration, resist denting.



WAINSCOTING in traffic areas gets rough treatment; is a natural for decorative Met-L-Wood use: sustained beauty without upkeep.



CABINETS and enclosures of all kinds gain strength, beauty, life from Met-L-Wood.



X-RAY & RADIATION ROOMS can be attractive as well as safe with lead-cored Met-L-Wood panels, doors.

Detailed data on how Met-L-Wood can serve you, in one or more of its many forms, is yours for the asking. Write for new Bulletin 522. Met-L-Wood Corporation, 6755 West 65th Street, Chicago 38, Illinois.

STRONG
DURABLE
LIGHTWEIGHT

MET-L-WOOD

Metal bonded
to plywood

logging roads—plus the start of the hunting season, when many sawmills customarily shut down because so many of their Nimrods take off.

Unless exceptionally unfavorable winter weather curtails construction (and the use of lumber) in other areas, lumber prices are likely to show some slight increases in the months ahead because of the decline in output this fall. Otherwise, producers do not look for any major improvement in sales much before May, when they hope a marked revival in demand for home-building will strengthen the market again.

According to a report last month by the Commerce Dept. lumber survey committee, the national consumption of lumber (including exports and imports) totaled 18 billion bd. ft. in the first half of 1957, or a 12% decrease from 1956. Hardwood flooring production was down 19% for the first half of the year, and shipments off 5%.

COSTS

New plant costs detailed; resales bring profits

If its suitability for the first occupant ends, a well-constructed modern industrial building three to five years old usually can be resold for a profit these days, according to participants in an industrial construction seminar at the eastern regional fall conference of the Society of Industrial Realtors.

Frank B. Morrell, of the Charles F. Noyes Co., New York City chapter SIR president, reported that such buildings often sell now for about \$10 to \$12 per sq. ft. for structures ranging from 250,000 down to 50,000 sq. ft. Joseph J. Garibaldi Jr. noted that profits often include substantial increments in land values that resulted from the development of new industrial tracts. Sale-leasebacks of relatively new structures can often be made today by many corporations for annual net payments of 9 to 10% of capital values for initial 15-year lease terms, he added, and ten-year-old buildings of equal area sell for about \$8 to \$9 per usable sq. ft.

Main feature of this seminar was the presentation and discussion of various cost items for construction of a typical (but specific) general-purpose plant completed recently in northern New

continued on p. 54

In current commercial and industrial construction . . .

1 ROOF DECK IN EVERY 4 IS POURED GYPSUM

Here's Why!

FAST APPLICATION—One crew can pour up to 20,000 sq. ft. of FIRE-FIGHTER deck in a day, flowing the gypsum smoothly around roof openings and irregularities to form a reinforced monolithic slab. Built-up roofing can be started within a day.

VERSATILE DESIGN—With Gold Bond FIREFIGHTER Roof Deck, you can plan with lighter structural steel framing—for use with or without sub-purlins. Formboards can rest directly on bar joists, allowing for a low-cost deck with suspended ceiling construction. Gold Bond's complete line of

formboards gives you flexibility to meet conditions of insulation, acoustics, exterior exposure to weather, interior exposure to heat, high humidity and various acid fumes.

INCOMBUSTIBLE—Only an incombustible gypsum slab can offer your structures the exclusive FIREFIGHTING feature of emitting steam when subjected to intense heat. See this demonstrated in our new 12-minute color movie, "The Story of Poured Gypsum Roof Decks." Ask your Gold Bond® representative to show it at your convenience—or just clip this coupon to your letterhead and send to National Gypsum Company, Buffalo 2, New York.



FIREFIGHTER GYPSUM DECKS can be poured in the coldest weather during which mechanics normally work. This job: 15° above zero.



Gold Bond
BUILDING PRODUCTS

"FIREFIGHTER" GYPSUM ROOF DECK

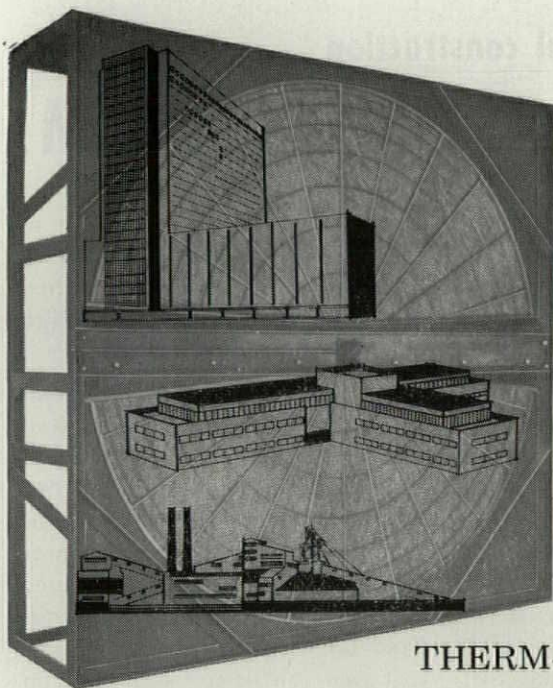
NATIONAL GYPSUM COMPANY

NATIONAL GYPSUM COMPANY, Dept. AF-117
Buffalo 2, New York

I would like to see the new film, "The Story of Poured Gypsum Roof Decks." Please have a Gold Bond representative schedule this with me.

Name _____ Address _____

City _____ County _____ Zone _____ State _____



Ideal for
SCHOOLS...
HOSPITALS...
and
every type
of
INDUSTRIAL
and
COMMERCIAL
BUILDING.

THERM-O-WHEEL

recovers

Btu's

SUMMER and WINTER

The THERM-O-WHEEL is a device for transferring heat between two separated gas streams which differ in temperature.

To affect savings in fuel, power, equipment — dollars. To achieve better ventilation, cleaner dust free air, greater comfort, more healthful conditions.

When your exhaust system is throwing away costly heated (or cooled) air which has been contaminated by the industrial process in use, or made uncomfortable because of odors, smoke, etc.

Practically speaking, when the THERM-O-WHEEL is used for preheating a fresh air supply, heat is transferred from the exhaust air stream to the fresh incoming air stream. Similarly, when used for precooling fresh air, the THERM-O-WHEEL transfers heat from the fresh air to the cooler exhaust air stream.

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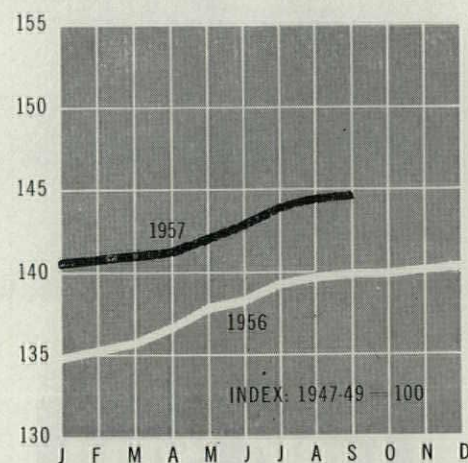


Jersey in the New York metropolitan area. This presentation (table below) was made by James E. Hanson, SIR New Jersey regional vice president, and A. Fletcher Collins, vice president of Joseph L. Muscarelle, Inc., industrial builders, of Maywood, N. J. Their data are applicable to a rectangular (277' x 202') one-story structure of 55,000 sq. ft. net usable area (55,900 sq. ft. gross) on a three-acre site purchased for \$10,000 an acre. All items are quoted as the cost per square foot of usable building area (including a building contractor's profit of 10%).

Land	\$0.532
Foundations	0.815
Structural steel	1.280
Fireproofing columns	0.076
Roof deck	0.885
Exterior walls	1.037
Concrete floor: 5"	0.550
Heating	0.732
Plumbing	0.336
Sprinklers (FIA)	0.348
Electric system	0.642
Site improvements	0.262
Office section finish	0.478
Office air conditioning	0.127

Total land and building	8.10
Architect-engineer: 5%	0.405
Construction money, financing and legal fees	0.319
	8.824
Realtor's commission	0.426
Grand total	\$9.25

Collins said the cost would have increased 15¢ per sq. ft. if a recessed truck dock had been provided inside the main structure. This would also have reduced the building's net usable area.



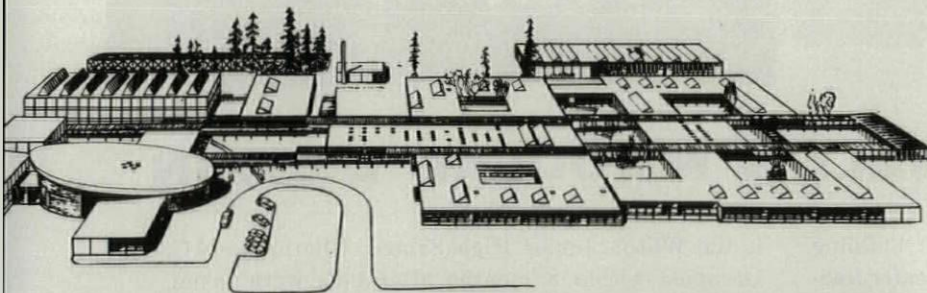
CONSTRUCTION COSTS for nonresidential buildings rose only imperceptibly in September on the index of E. H. Boeckh & Assoc. At 144.35 the index compared with 144.25 in August, an advance of 0.1%.



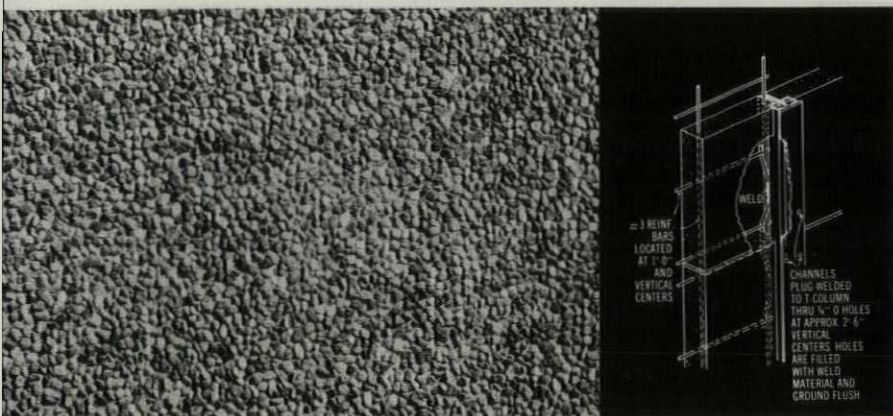
Edmonds Senior High School Edmonds, Washington
Architects: Waldron and Dietz

Curtain-wall Construction for **SCHOOLS** with

Mo-Sai



Rendering above shows extent of the 156,000 sq. ft. Edmonds Senior High School.



Detail shows 1" x 2" channels cast in Mo-Sai panel edges, which were plug-welded to T-columns, making an especially clean interior surface. Photo left shows Mo-Sai texture.

Mo-Sai curtain-wall panels, 4" thick, and made with an insulating expanded shale concrete core, are used for 40,000 square feet of walls in the new Edmonds Senior High School in Edmonds, Washington. Beautifully textured on the outside, the inside surface of the Mo-Sai panels is sand-finished, ready for painting. Some 2"-thick Mo-Sai precast facing was also used on the job.

- ✓ **LOW MAINTENANCE**—a major consideration in selecting Mo-Sai for Edmonds School.
- ✓ **DESIGN VERSATILITY** — with wide choice of textures and colors, sizes and shapes to suit your design.
- ✓ **MORE FLOOR AREA**—with relatively thin Mo-Sai walls.
- ✓ **FAST ERECTION**—for earlier classroom occupancy.

For handbook, "Mo-Sai Design Details," and samples of this modern material, call or write any of the following:

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THE DEXTONE CO., New Haven 3, Conn.
THE MABIE - BELL CO., Greensboro, N. C.
TORONTO CAST STONE CO., LTD., Toronto 13, Canada
WAILES PRECAST CONCRETE CORP., Los Angeles, Calif.



BADGER CONCRETE CO., Oshkosh, Wis.
CAMBRIDGE CEMENT STONE CO., Allston 34, Mass.
ECONOMY CAST STONE CO., Richmond 7, Va.
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GOODSTONE MFG. CO. INC., Rochester 21, N. Y.
HARTER MARBLECRETE STONE CO., Oklahoma City, Okla.
OLYMPIAN STONE CO., INC., Seattle 7, Wash.



Modular Architecture with a personality all its own is reflected by the Wilson Junior High School, Charlotte, N.C. Architects: A. G. Odell, Jr., & Associates.

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The concept of Modular Planning calls for building components that give the architect even greater freedom, rather than limit him. Such is Ceco Curtainwall, which permits freedom of originality . . . flexibility . . . versatility . . . utility. Ceco provides either aluminum or steel sections that allow a variety of architectural treatments, yet live in a complete harmony with panels of stone, marble, glass or coated metals. Furthermore, you gain these added advantages when you specify Ceco Curtainwall: speedy erection—light construction—economy of materials—4 to 6% more floor space.

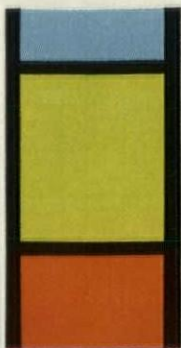
Model of Modular Design employing Ceco Products

is the Wilson Junior High School, Charlotte, N.C. Occupied within 8 months after bids were taken, this 3-wing structure tastefully blends Ceco Aluminum Projected Windows with porcelain enameled panels. Most unusual effects have been attained by adapting panels of various color arrangements . . . and colored glass is used to complement the panels. For greatest freedom in design—for the world's widest line of quality Aluminum and Steel Curtainwalls—see Ceco Steel Products Corporation—general offices, 5601 West 26th Street, Chicago 50, Illinois—offices, warehouses and fabricating plants in principal cities.

**CECO
STEEL**

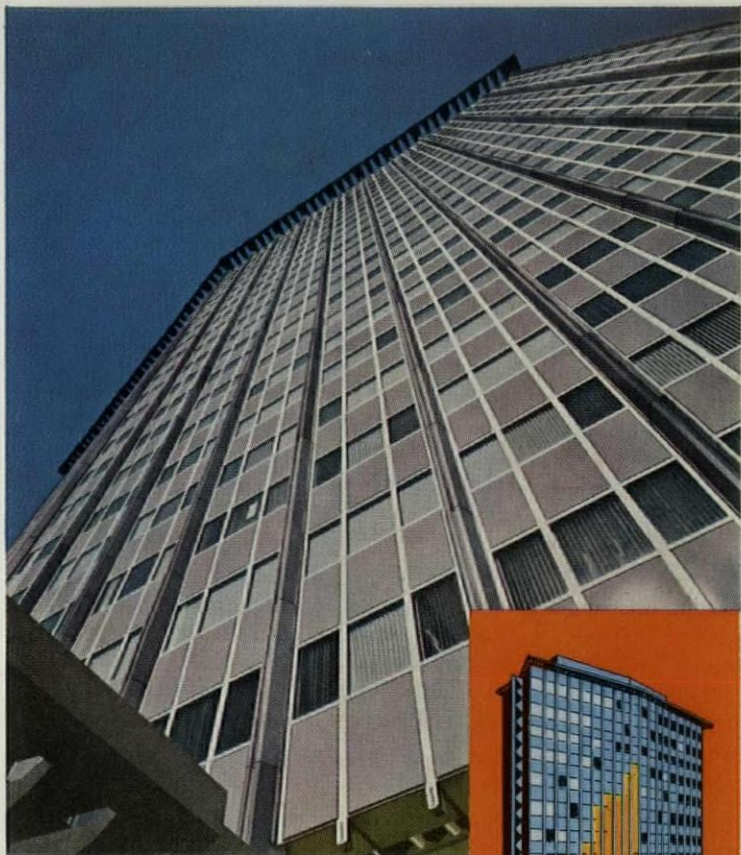
IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Windows, Screens / Hollow-Metal Doors / Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck / Metal Lath

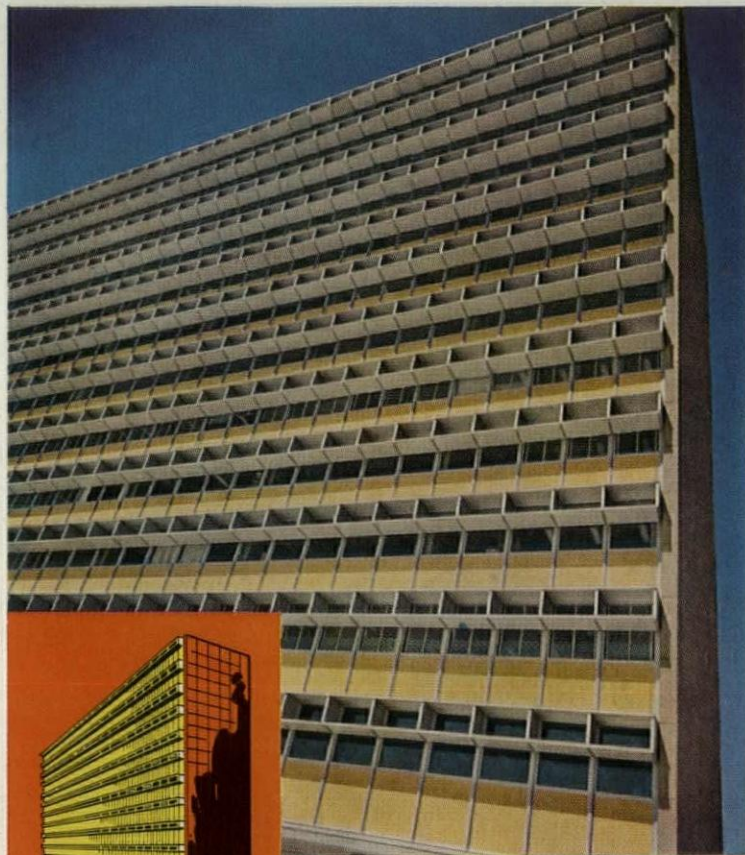
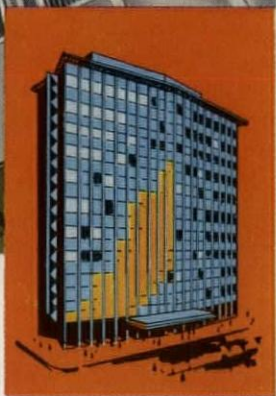


Designed in Porcelain Enamel for durable beauty, low maintenance

Distinctive architecture demonstrates how porcelain enamel on Armco Enameling Iron helps achieve color, durability and economy in curtain wall design.



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Vancouver, British Columbia
Architects: **THOMPSON, BERWICK & PRATT**
Porcelain Enamel Panels:
GRAHAM BELL LIMITED, ASSOCIATED
WITH **THE BETTINGER CORPORATION**



EXCHANGE BANK BUILDING
Exchange Park, Dallas, Texas
Architects: **LANE, GAMBLE AND ASSOCIATES**
Porcelain Enamel Panels:
THE BETTINGER CORPORATION



These outstanding new buildings dramatically illustrate the multiple advantages of porcelain enamel in curtain wall construction.

The warm yellow and rich blue-gray porcelain enamel panels make color a basic element of the designs. The durable, weather-resisting surface of porcelain enamel preserves the buildings' original beauty, assures low maintenance costs. And the thin, lightweight panels make possible full utilization of the economies and space-savings of curtain wall construction.

Adaptable to your designs

For the curtain wall buildings you design, porcelain enamel on Armco Enameling Iron offers all these advantages . . . plus freedom of architectural expression. Limitless hues in any shade or tone provide the permanent beauty of lifetime color. Standard panels are available in the size, thickness and insulation you need. Custom-designed ribbed or textured panels create the opportunity to make form an outstanding feature.

Give your curtain wall buildings permanent beauty and insure utmost economy for your clients by specifying porcelain enamel on Armco Enameling Iron. Because of its purity and uniformity, enamellers use more of this special metal than any other base for architectural porcelain enamel.

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Here's the new look in labs that's just as practical as it is attractive. It's Johns-Manville's chemical-resistant work-surface material—Colorlith—and it's ready to help you bring new color and design into the school and industrial laboratory.

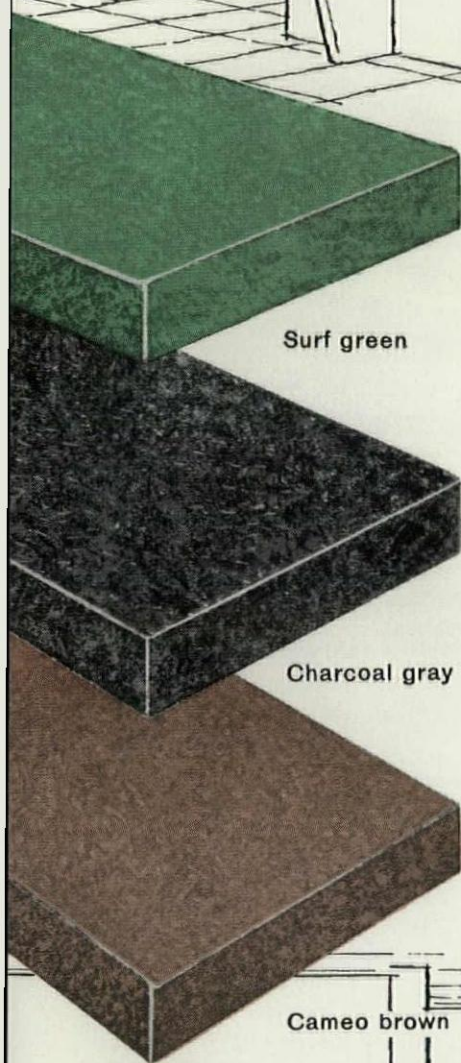
Made of asbestos and cement—Colorlith offers all these important advantages: **COLOR**—makes any lab a showplace. **WORKABILITY**—offers new design freedom. (Large 4' x 8' sheets can be cut in any shape with standard tools.) **HIGH UNIFORM**

STRENGTH—resists years of strenuous service—can be used in thicknesses as low as 1/4" for resurfacing and fume hoods. And Colorlith offers unusually good chemical resistance, *plus* a smooth-writing surface that lab workers consider so important.

For free Colorlith specification sheet plus a coast-to-coast list of J-M Colorlith laboratory furniture manufacturers, see your local J-M representative. Or write Johns-Manville, Box 14, New York 16, N.Y. In Canada: Port Credit, Ontario.



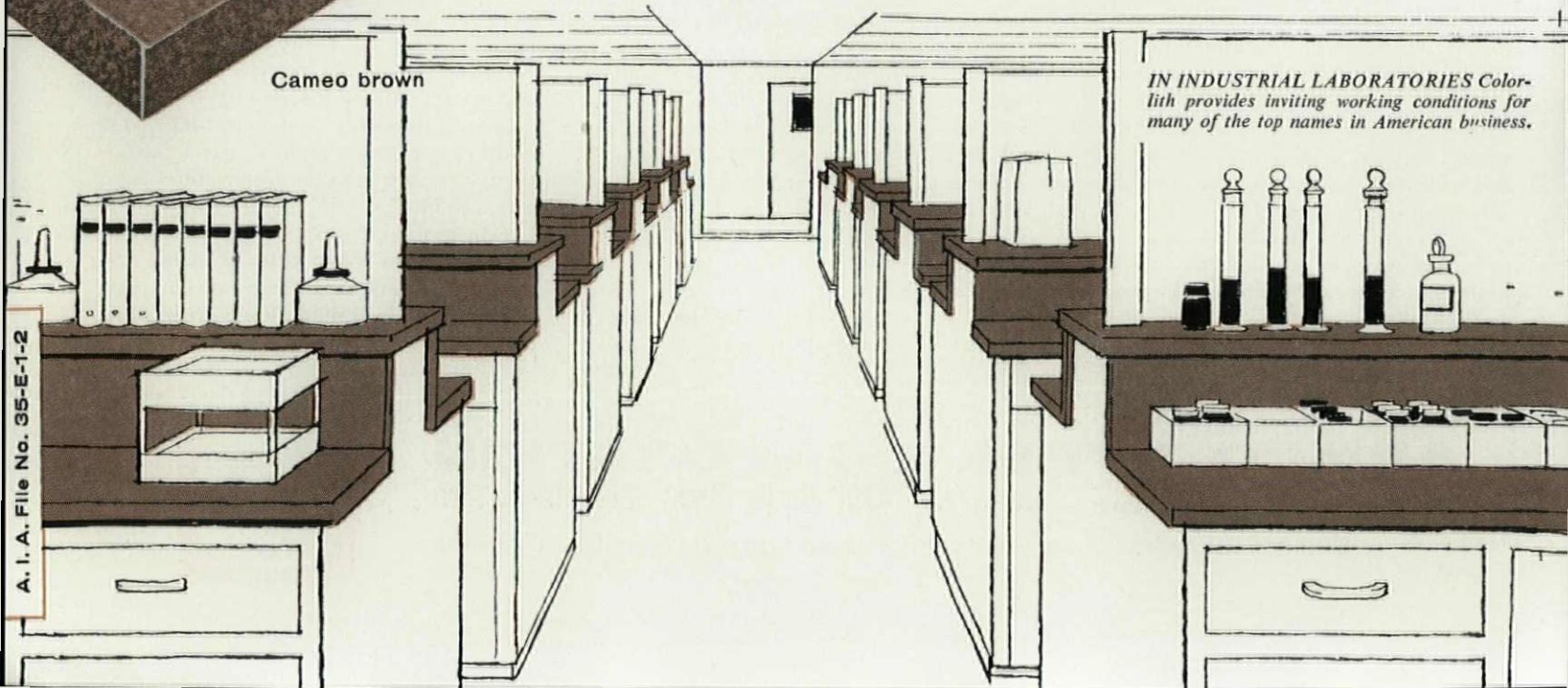
JOHNS-MANVILLE



Surf green

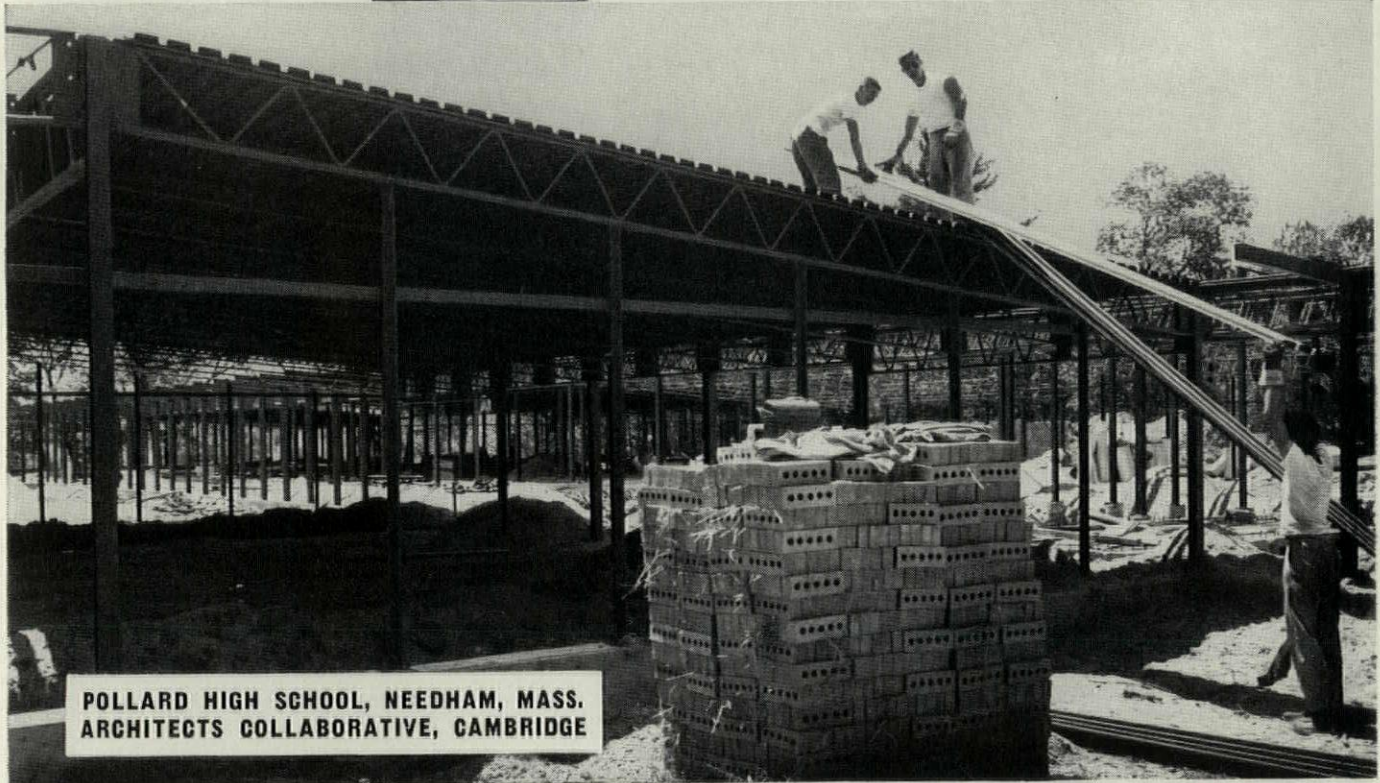
Charcoal gray

Cameo brown



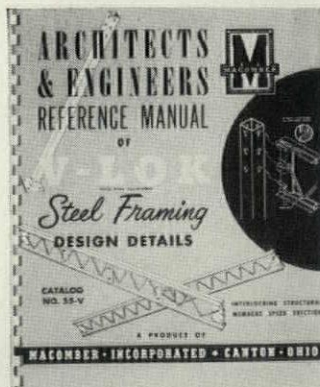
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V-LOK reverses the old procedure of waiting months to lay up masonry walls and partitions so that a school can be roofed in and interior work started.

V-LOK with curtain walls designs into every need of the modern school and the Architect's structural requirements at a cost per square foot that warrants first consideration in every school district.

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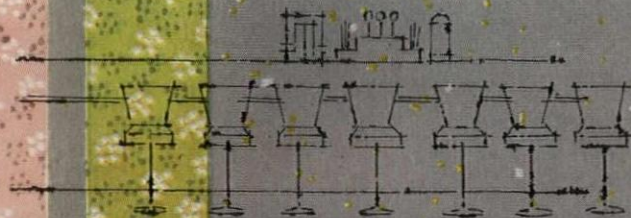
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GALAXY

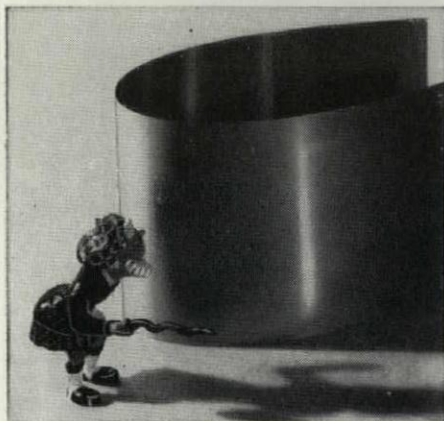


Illustrated here are 3 new patterns developed exclusively for Panelyte...pre-tested *Princess*, true metallic-lustre *Coppertone*, gold and silver-sprinkled *Galaxy*.

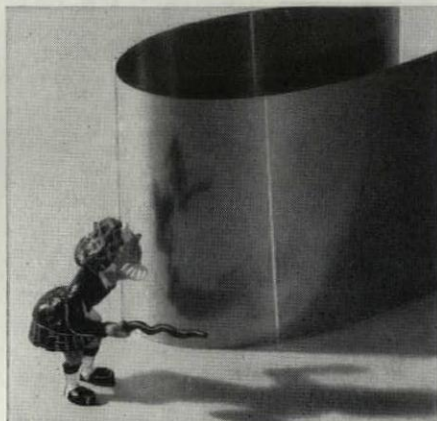


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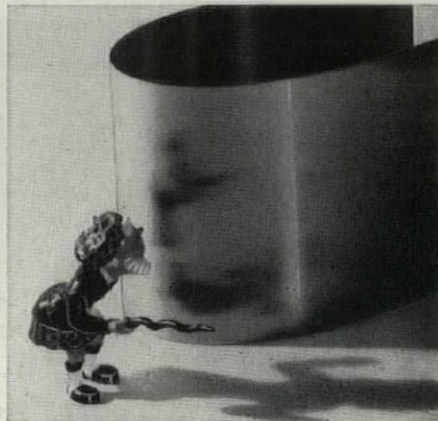
MicroRold® QUALITY STAINLESS STEEL



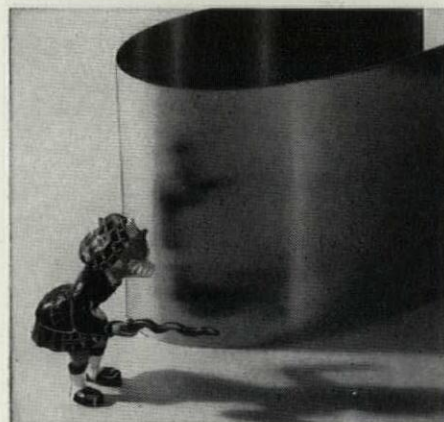
2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.



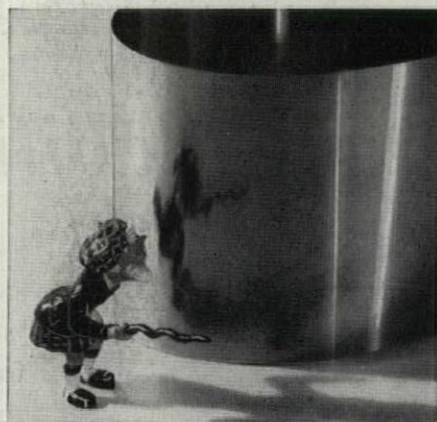
2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.



No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.



No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.



No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.



BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept. 11-K.



Washington Steel Corporation

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Underwriters' Rated FIRE WALLS



...for Interior or Exterior Use!

Mahon Underwriters' Rated Metalclad Fire Walls are now available for use as interior dividing fire walls or as exterior curtain-type fire walls. They can be installed in old or new buildings, of either steel or reinforced concrete construction, where a fire hazard may exist, or where the requirements of Fire Insurance Underwriters or Building Codes must be met. The Mahon Metalclad Fire Wall is field constructed. It has been tested by the Underwriters' Laboratories, Inc., and has been given a Two-Hour Rating for use as either an interior or exterior fire wall. When employed as an exterior wall, Fiberglass insulation can be inserted between the interlocking ribs of the inner wall plates, thus providing insulating properties superior to that of a conventional masonry wall with furred lath and plaster. Exterior Wall Plates may be Aluminum, Stainless Steel or Enamel Coated Cold Rolled Steel. The important feature of the Mahon Fire Wall is the Impaling Clip with its Stainless Steel Spike (Patents Pending) which permits construction of the wall with only .0048 sq. in. of through-metal per sq. ft. of wall area. Mahon engineers will cooperate fully in supplying information and assistance in adapting this product to your particular requirement.

THE R. C. MAHON COMPANY • Detroit 34, Michigan
Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities
Manufacturers of Underwriters' Rated Metalclad Fire Walls; Insulated Metal Curtain Walls; Steel
Roof Deck and Long Span M-Decks; Acoustical and Troffer Forms; Electrified M-Floors; Rolling
Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Fire Doors and Fire Shutters.

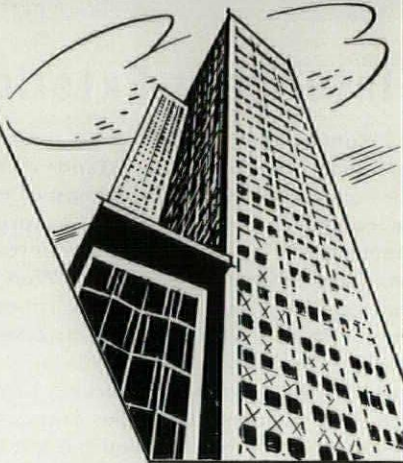
Section of Mahon Metalclad Fire Wall showing Construction Features. Four layers of 1/2" Plaster Board are sandwiched between Roll-Formed Steel Wall Plates. All Joints in both Wall Plates and Plaster Board are Offset.

MAHON

THERE IS NO OTHER

**Heating System offering
all these advantages!**

**The
BURGESS-MANNING
Radiant Acoustical
Ceiling**



Remember —

**Your Building Is Better
Your Building Costs No Higher**

**The Only Completely Integrated
Radiant Heating, Cooling and
Acoustical Ceiling**

The Burgess-Manning Radiant Acoustical Ceiling has been thoroly proved in many schools, hospitals and other institutional and commercial buildings all over the country. No other heating system offers so many advantages, not only in body comfort, but in efficiency and economy!

Because this ceiling heats by radiant energy exclusively, and does not depend on air currents, room temperatures are more uniform with no drafts. Response to temperature controls is instantaneous with practically no lag or over-run. Floor temperatures are always higher than room temperature.

The Burgess-Manning Radiant Acoustical Ceiling utilizes less valuable building space than conventional heating systems — with no radiators to occupy usable floor space. It offers maximum freedom of architectural design. Add to this, the highest noise absorbing capacity available today for complete acoustical control!

With direct metal-to-metal contact between coils and radiant panels, heating and cooling are accomplished with a minimum input of energy or fuel consumption. With fewer mechanical parts, maintenance, too, is cut down.

No other heating system offers so many advantages—in comfort, in efficiency, in economy.

**Write for Descriptive Burgess-Manning
Catalog No. 138-2F**



BURGESS-MANNING COMPANY

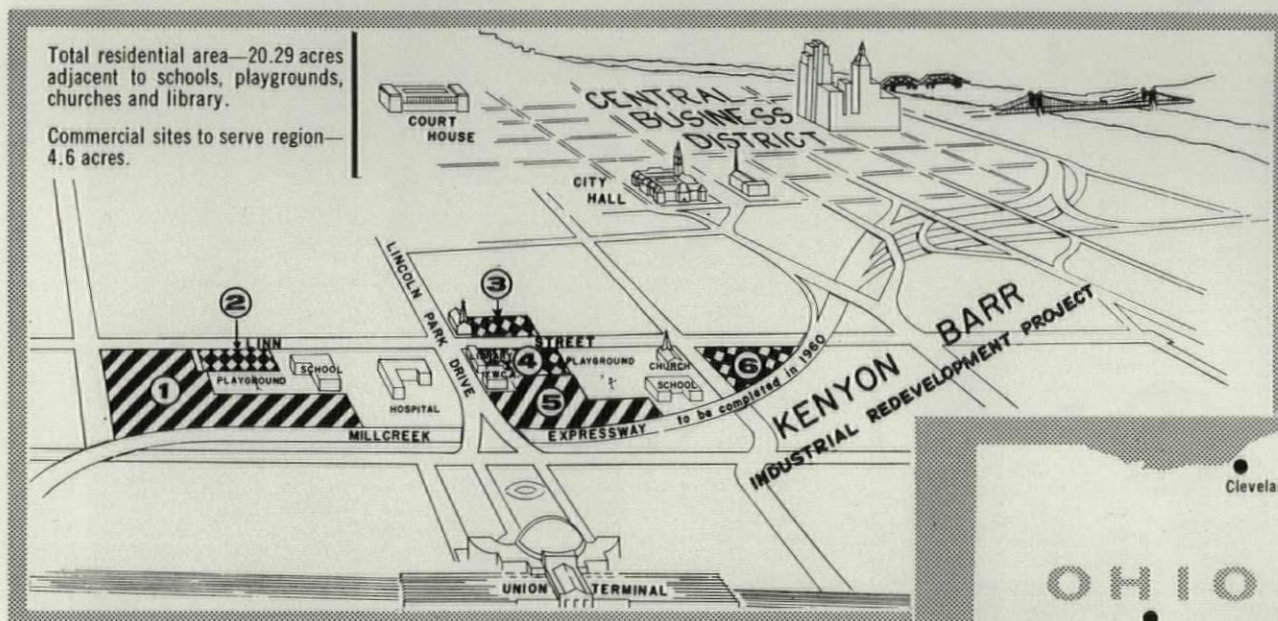
Architectural Products Division

5970 Northwest Highway, Chicago 31, Ill.

FOR SALE!

CINCINNATI'S CLEARED LAUREL-RICHMOND PROJECT

Residential and commercial tracts in the Cincinnati Metropolitan Area—25 acres—one mile from heart of city. Offered by City of Cincinnati as part of its Urban Renewal Program.



This area is planned as part of a greater development, under the authority of the Urban Renewal Department of Cincinnati, and is situated for future appreciation and growth, as part of Cincinnati's Master Plan.

① 542,000 sq. ft. of residential land bounded on three sides by modern highway. Served by school, playground and hospital. Excellent retail site.

② 74,818 sq. ft. of commercial land facing main thoroughfare, serving entire north section of project and opposite 1,823 existing modern residential units.

③ 14,760 sq. ft.; this commercial site faces Linn Street across from 1,823 modern residential units.

④ 62,736 sq. ft. commercial property, providing liberal parking space, serves large residential section bordered by new library and Y. W. C. A.

⑤ 341,895 sq. ft. of residential sites fronting on the parkway leading to railroad terminal, located near playground, school, church and commercial center.

⑥ 50,620 sq. ft. of centrally-located commercial land. This corner location bordered by two busy streets and will serve large future residential development.

Purchaser must agree to construct buildings and facilities in conformance with the approved Redevelopment Plan.

• Industry, Commerce, and
• Culture make Cincinnati the
• Nation's 15th Market Place.

• For further information
• and copy of the
• redevelopment plan write to:

• URBAN RENEWAL DEPT.

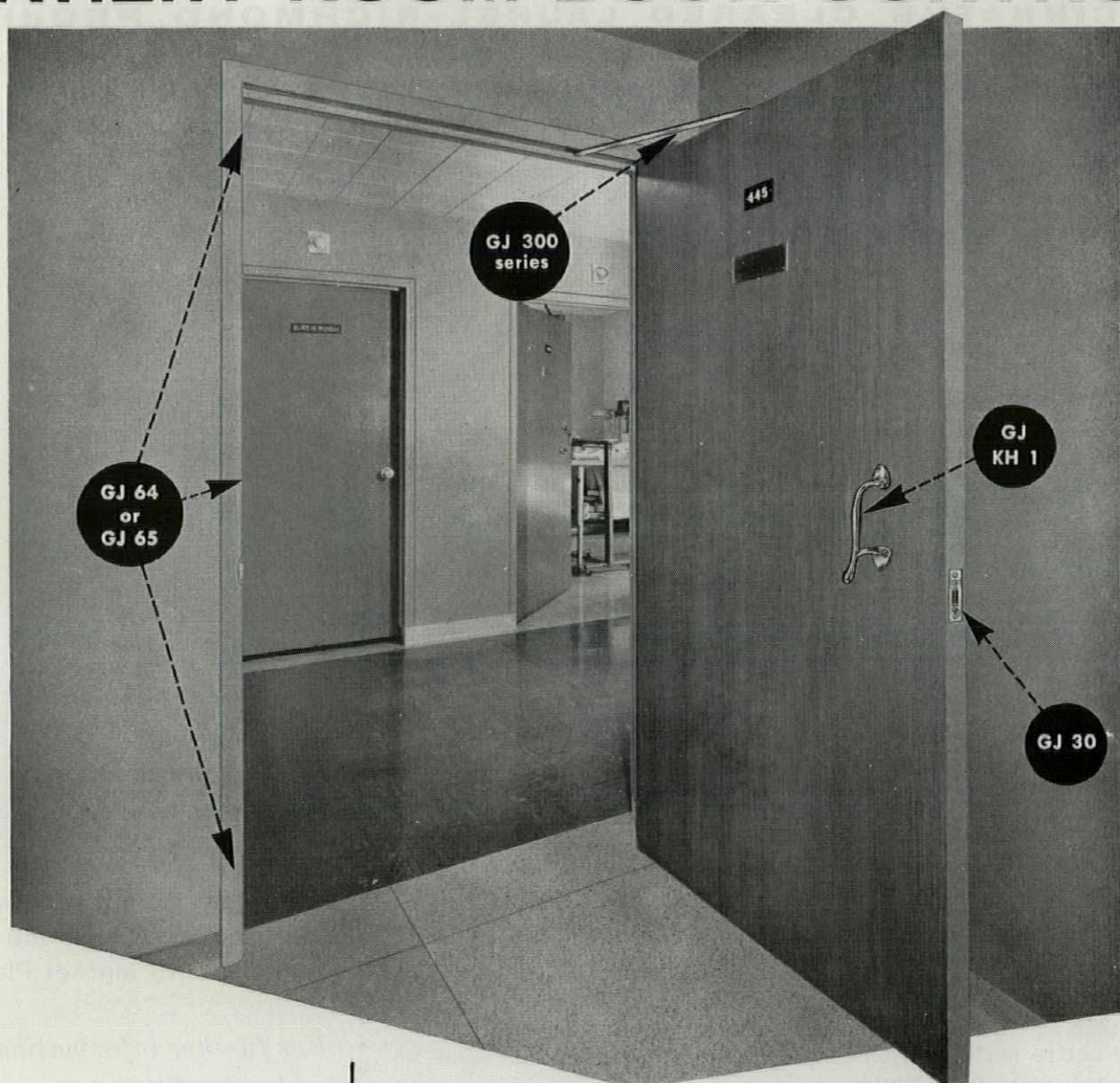
• City Hall Room 340
• Cincinnati (2) Ohio
• Phone: GARfield 1-5700

• Charles P. Taft, Mayor
• C. A. Harrell, City Manager
• Charles H. Stamm, Urban Renewal Director

(Certified by F. H. A. as eligible for Sec. 220 Mortgage Loan Insurance)

CINCINNATI...the city closest to the heart of America

an ideal specification for silent, efficient **PATIENT ROOM DOOR CONTROL**



This ideal specification for patient room doors is used in such outstanding hospitals as:

Kaiser Foundation Hospital, Los Angeles, Calif.
Wolff & Phillips, Portland, Oregon — architects

Oak Park Hospital, Oak Park, Illinois
Shaw, Metz and Dolio, Chicago — architects

Providence Hospital, Washington, D.C.
Faulkner, Kingsbury & Stenhouse, Washington, D.C. — architects

Rhode Island Hospital, Providence, R. I.
Shepley Bulfinch Richardson & Abbott, Boston, Mass. — architects

All above hardware can be quickly installed on existing patient room doors.

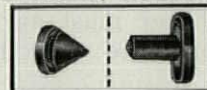
"shall have GLYNN-JOHNSON . . .

GJ 300 series CONCEALED (or surface mounted) OVERHEAD FRICTION TYPE DOOR HOLDER." (Nurse may set door at any desired degree of opening for ventilation or privacy. Door cannot slam open or shut.)

"GJ KH 1 COMBINATION HAND AND ARM PULLS to be mounted back to back as a pair." (Convenient for opening door from either side with sterile hands or when carrying loaded trays.)

"GJ 30 ROLLER LATCH." (Eliminates disturbing latch "clicking" sound. Replaceable rubber roller *silently* engages dirt-free strike. Latching pressure adjustable.)

"THREE GJ 64 for metal frame (or GJ 65 for wood frame) RUBBER SILENCERS." (Form pneumatic air pockets to absorb shock or noise of closing and create constant latch tension . . . no door rattling.)



write for HOSPITAL DOOR CONTROL brochure E-4

GLYNN-JOHNSON CORPORATION

4422 n. ravenwood ave.

chicago 40, illinois

The Interior is what you make it in an Armco Steel Building

You Gain the Economy and Convenience of a Factory-Made Structure Yet Retain Important Freedom of Treatment.

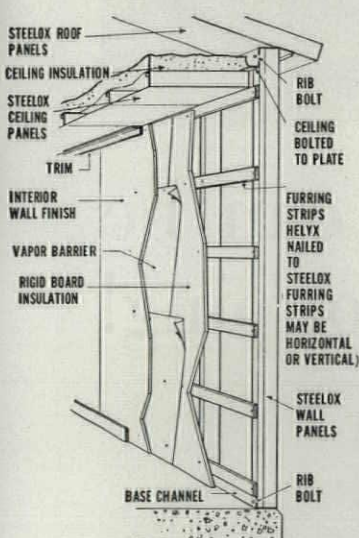


VAULTED CEILING finished with acoustical tile, and plaster walls contribute to the spacious good looks of the main lounge of the Wildwood Golf Club, Middletown, Ohio. The basic structure is a rigid frame Armco Steel Building.



WOOD PANELING and other drywall materials find broad acceptance as interior finish in many types of building construction. In an Armco Building they give you a plus benefit in savings. The **STEELOX®** Panels that make up the walls form a regular framework (16-inch module) that makes the basis for the interior treatment. The ceiling in this office is also STEELOX panel construction.

Drawing shows typical method of finishing the interior of an Armco Steel Building.



For more information or prices, Call Western Union and ask for Operator 25

Get the Armco Building story and see how these basic structures can help you save preliminary design time, speed your work and save money for your client. Tell us your functional requirements. Armco Drainage & Metal Products, Inc., 3367 Curtis Street, Middletown, Ohio • Subsidiary of Armco Steel Corporation • In Canada: Write: Guelph, Ontario. Export: The Armco International Corporation.



a new face for **MICHAELS**

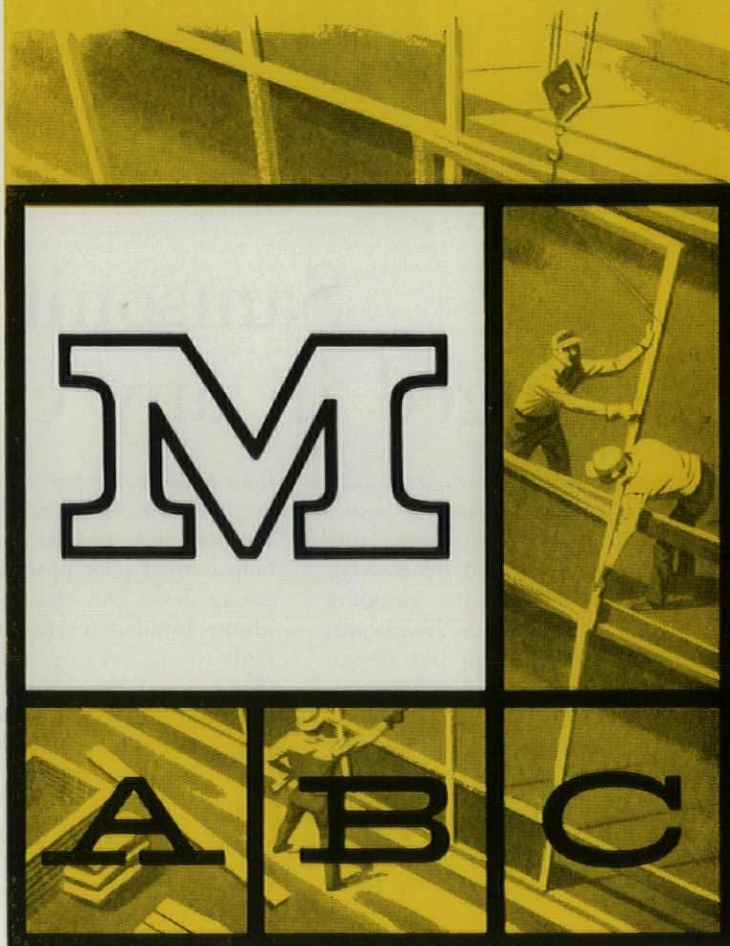
It's a symbol of the curtain wall era—this new emblem now being emblazoned on all Michaels Art Bronze Co. products.

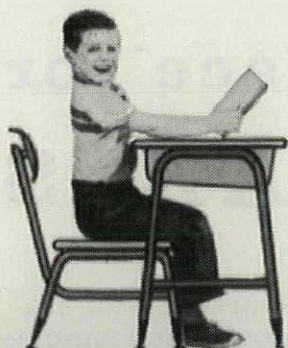
We've taken our cue from the drawing room, off the architects' grid, as well as from the curtain walls themselves. Here you have it: representing quality plus longevity (architectural metal products since 1870).

You'll see this new emblem all around—Watch for it on our new curtain wall systems of aluminum, bronze and stainless steel.

Documentary Series issues and **Curtain Wall** details are now available. Write . . .

MICHAELS ART BRONZE COMPANY
P. O. Box 668, Covington, Kentucky





Because
it's *mobile*...



ACTUAL PHOTOS TAKEN AT THE ROOSEVELT SCHOOL, REDFORD UNION DIST. NO. 1, DETROIT, MICH.

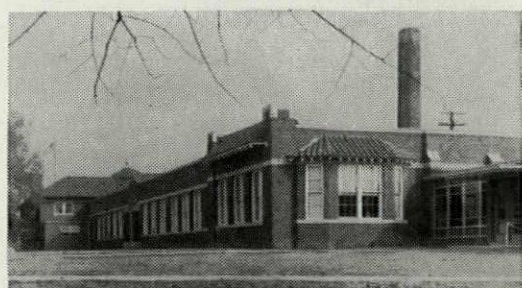
Samsonite furniture can be arranged in any classroom grouping!

Gone are the days when a classroom had to be confined to a rectangular seating plan. Samsonite mobile furniture can be conveniently arranged in any grouping...whether for lectures, discussions, or work groups. Samsonite design creates a pleasing atmosphere conducive to class work and study. As for comfort, Samsonite's propor-

tioned back support and extra-large seat make a child more responsive, less restless...actually help correct poor posture. Super-strong desks and chairs take any abuse—tubular-steel frame is amazingly strong, yet surprisingly light. Our free catalogue gives you full information, specifications, and prices. Write for it today!

Samsonite... strongest ... lasts longest

Shwyder Bros., Inc., Institutional Seating Division, Dept. AF-11, Detroit 29, Michigan
In Canada through Samsonite of Canada, Ltd.



Paul Shoemaker, Asst. Supt., Redford Union Schools, Dist. No. 1, Detroit, Mich. says: "Samsonite's functional designs and color have given our classrooms flexibility of use, tending to create an excellent pupil-teacher working relationship."

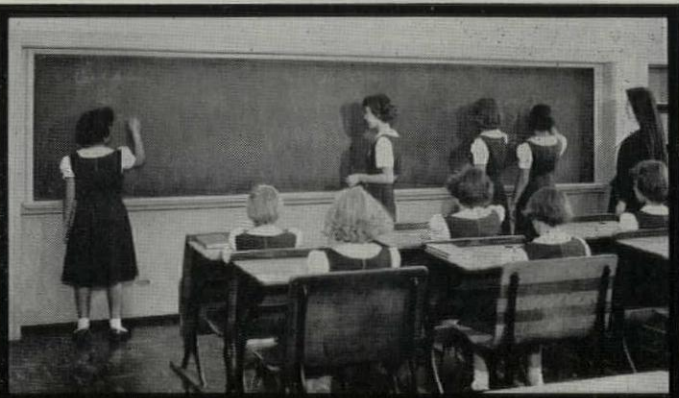
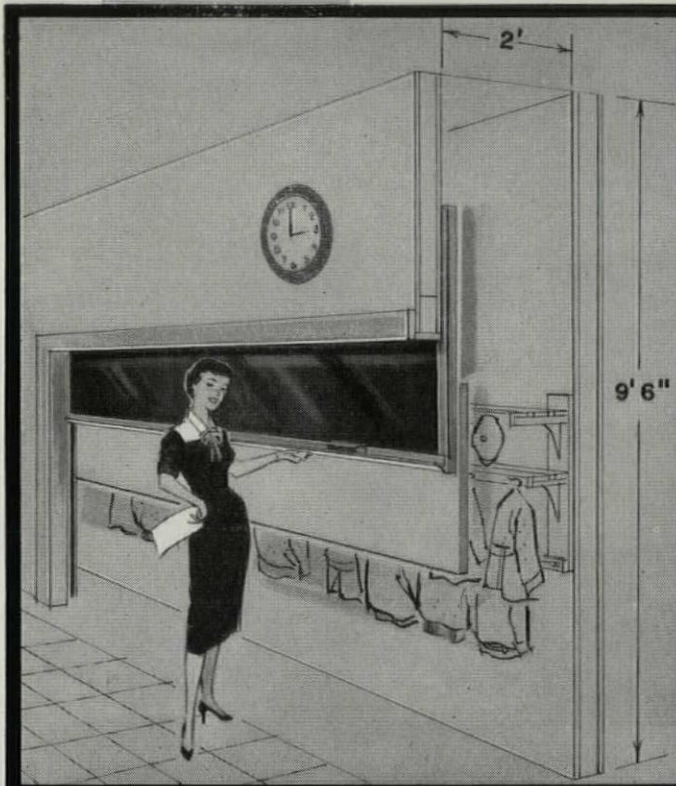
THE MARK OF QUALITY



New easy-operating

Barcol WARDROBEdoor only \$240*

Free -- Complete Manual now ready; send for yours!



(Left above) Compact, easy-operating WARDROBEdoor is teacher's choice for spacesaving built-in cloakrooms. (Upper right) Sturdy construction and firm installation, plus wide continuous surface, make ideal mounting for chalkboard or tackboard. (Lower right) Upward-acting door leaves opening completely clear. Teacher has full view and control. Traffic is unobstructed — nothing for pupils to walk around or trip over.

Here are the advantages teachers need in a low-cost classroom wardrobe

Important features of the new Barcol WARDROBE-door are based on actual interviews with teachers in a range of localities. Here are the advantages teachers say they need for efficient classroom management.

Spacesaving upward action. Classroom side of WARDROBEdoors is fully usable wall space. And, *open or closed*, the complete wardrobe requires only 2 ft depth, yet provides ample room for coats, footwear, books. Class has full use of contingent floor space at all times. Teachers say exposed coat-racks and other types of wardrobes often create traffic problems and limit desk placement in the surrounding area.

Easy operation. Precision engineering of counter-balanced action gives fingertip control. Teacher or pupil raises and lowers new WARDROBEdoor with complete ease.

Double utility. Upper section of WARDROBEdoor offers unbroken mounting surface for chalkboard, chalkrail, and tackboard. Firm, sturdy construction

completely eliminates rattle when chalkboard is in use. WARDROBEdoors *save* on building costs, *add* to room efficiency.

Full access and control. Open, WARDROBEdoors offer *no* obstruction to pupil traffic or teacher's visibility and control. Many teachers prefer WARDROBEdoors for this reason. Absence of pivots and hinges on floor also facilitates cleaning.

Neat appearance. Teachers emphasize importance of eliminating cloakroom clutter. WARDROBEdoors preserve businesslike, attractive uniformity in class environment. Sections are highly scuff-resistant and have excellent finishing qualities.

Send for Manual

Contains application photos, detailed drawings, sample specifications, building requirements, and letters reporting users' experience. Free.

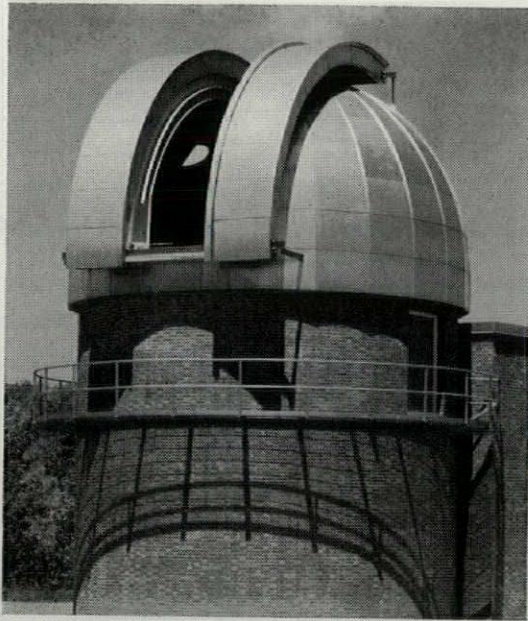
* 10 ft x 6 ft WARDROBEdoor, f.o.b. Rockford, Illinois. Price subject to change without notice.



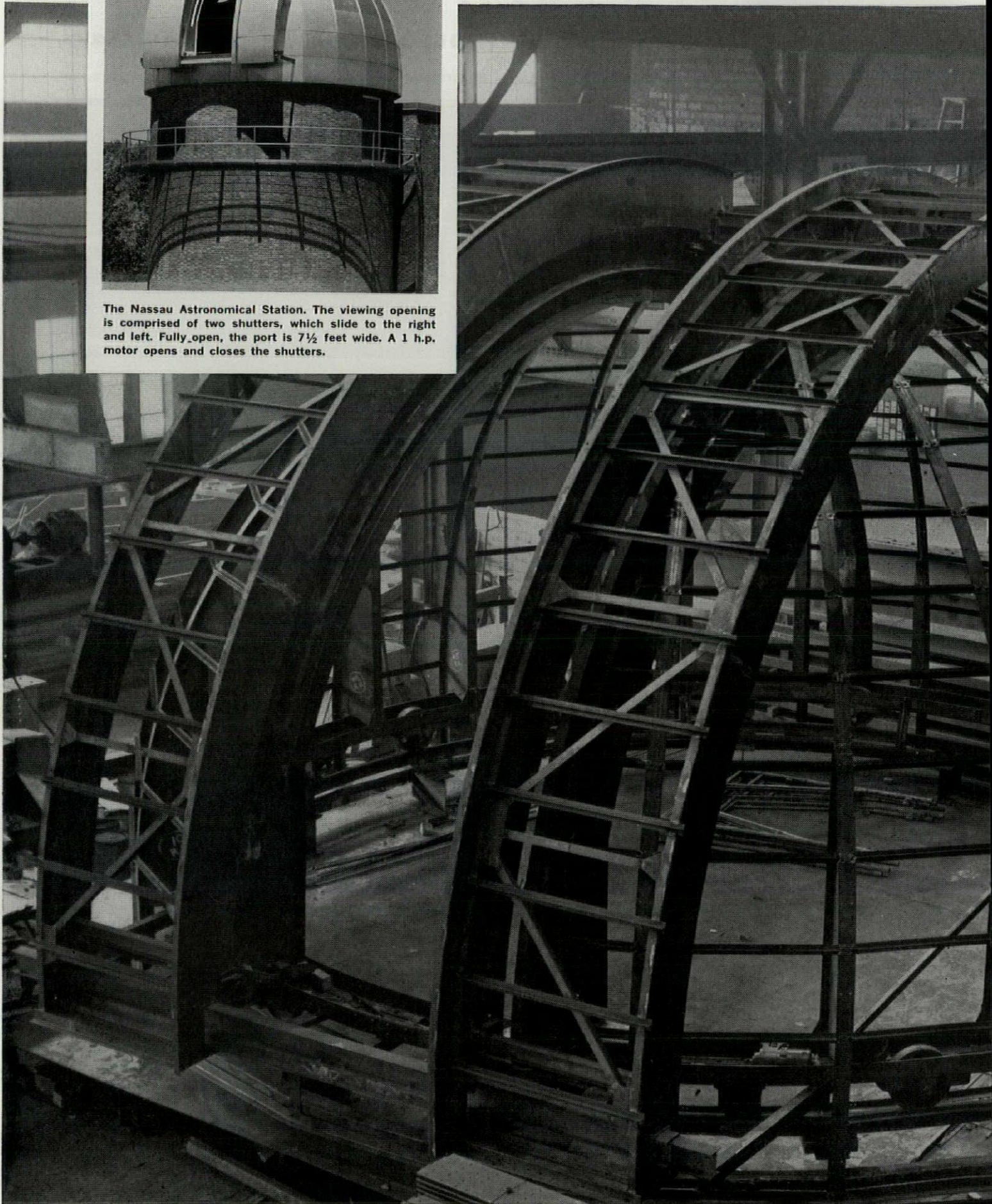
BARBER-COLMAN COMPANY

Dept. U711, Rockford, Illinois, U.S.A.

Rotating dome for



The Nassau Astronomical Station. The viewing opening is comprised of two shutters, which slide to the right and left. Fully open, the port is 7½ feet wide. A 1 h.p. motor opens and closes the shutters.



Case Institute Observatory

**fabricated from USS
STRUCTURAL STEEL**

ON A 160-ACRE SITE, 1,250 feet above sea level in Northern Ohio, is the Nassau Astronomical Station, established by Case Institute of Technology to analyze the structure of the stellar system.

The observatory building houses a darkroom, a workshop, and living quarters for two observers. Topping the structure is a rotating dome, containing the 24-36-inch Schmidt-type telescope, one of the largest instruments of its type in the world.

The Structural Steel dome was prefabricated to specifications at the Cleveland, Ohio, plant of The Paterson-Leitch Company, then shipped to the observatory site. Although approximately 17 feet high and 28 feet in diameter, the dome is so well-balanced that a mere 5 h.p. motor is all that is needed to rotate it. The dome revolves about a circular track on steel wheels mounted on the underside of its base ring.

Here is another application which points up the precision with which Structural Steel can be used, the ease with which it can be fabricated, and the almost limitless number of ways it can be shaped and formed. Structural Steel is one of the strongest of load-bearing construction materials—yet, paradoxically, it is the most economical. It possesses excellent mechanical properties, effectively resisting tension, torsion,



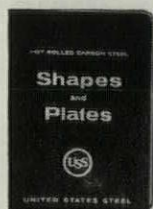
The dome being erected at the observatory.

compression and shear. Enclosed in buildings, it lasts indefinitely—requiring no maintenance. It may be riveted, bolted or welded—erected in any weather. And Structural Steel members can be fabricated indoors, where weather will have no effect on the quality of workmanship. We suggest that you fill out and return the attached coupon.

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors
United States Steel Export Company, New York

USS STRUCTURAL STEEL

GET THIS INFORMATIVE BOOK, FREE!



The Structural Steel dome, prefabricated and assembled in the plant of The Paterson-Leitch Company, Cleveland, O.
General Contractor:
The Austin Company
Cleveland, Ohio

United States Steel Corporation
525 William Penn Place, Room 5674
Pittsburgh 30, Pennsylvania

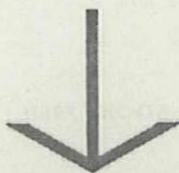
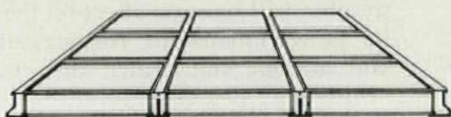
Please send me a free copy of Hot Rolled Carbon Steel Shapes And Plates—a handbook containing details, dimensions and weights of USS Shapes and Plates.

Name
Company Title
Address
City State



An answer . . .
to the requirements of modern educational
leaders. A school design that provides:

- . . . space for the core or block curriculum plan
- . . . space for research, co-operative planning and
the development of skills
- . . . space with extreme flexibility
- . . . space with an excellent visual environment

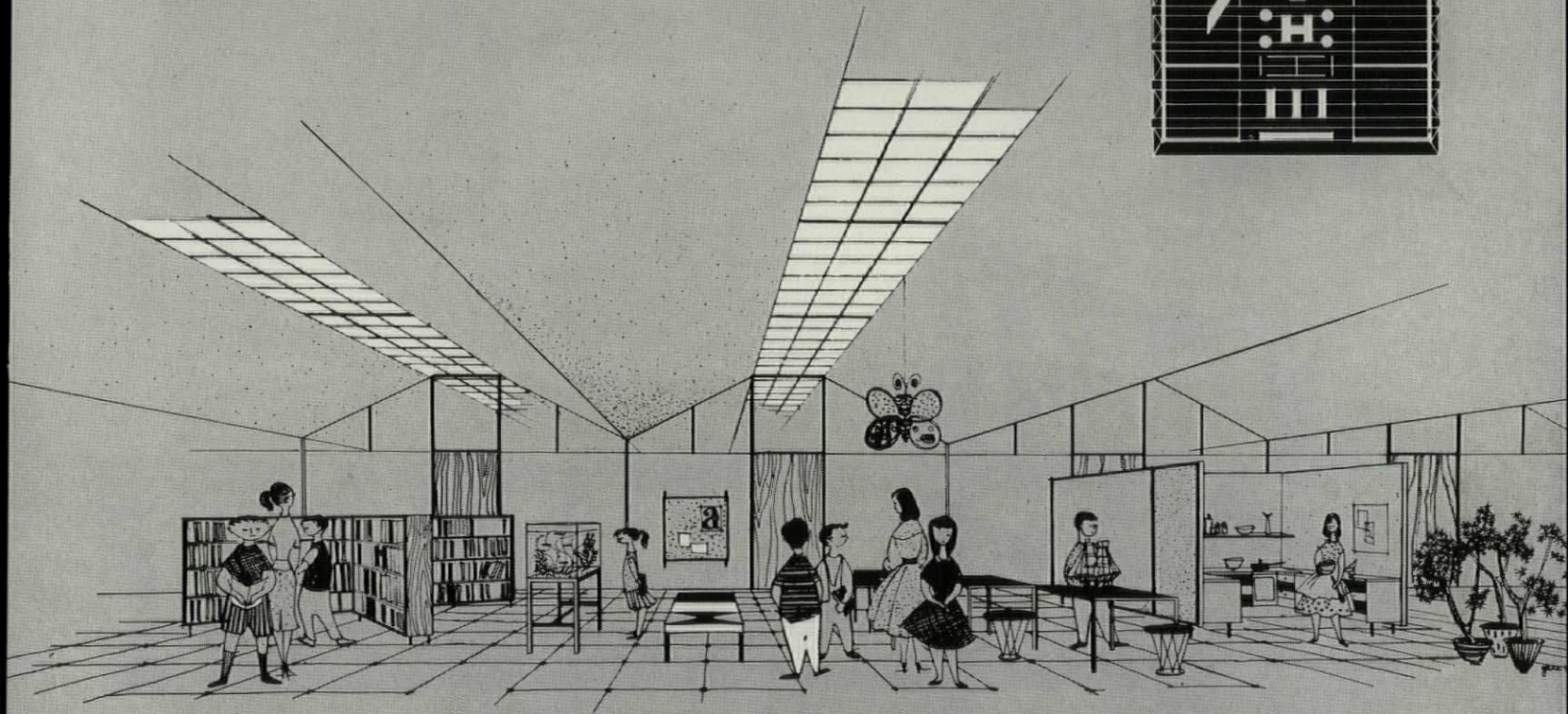
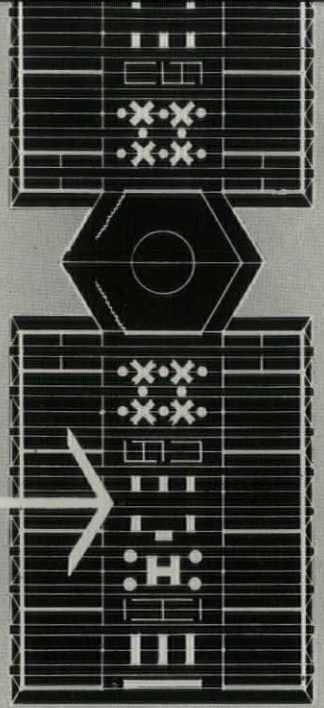


Key to the school's unusual flexibility and visual environment is this Toplevel Panel which brings daylight in through the roof. Continuous strips of these panels permit excellent light distribution *without* solar heat gain or glare.

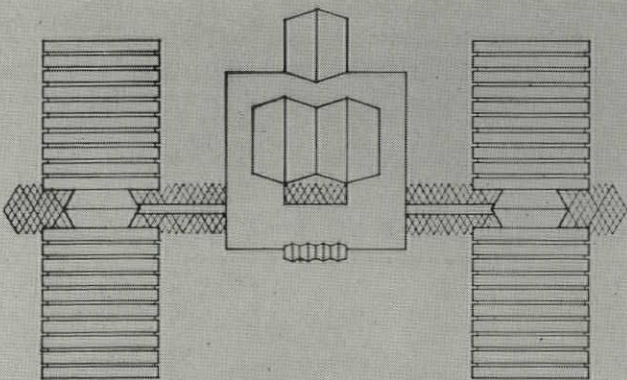
Toplevel Panels are available in two distinct styles—curb-type or flashing flange-type, depending on job conditions. For complete information on both styles, send for the new Toplevel Data File. Write Kimble Glass Company, subsidiary of Owens-Illinois, Department AF-11, Toledo 1, Ohio.



TOPLITES AND TEENAGERS

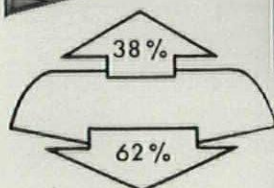
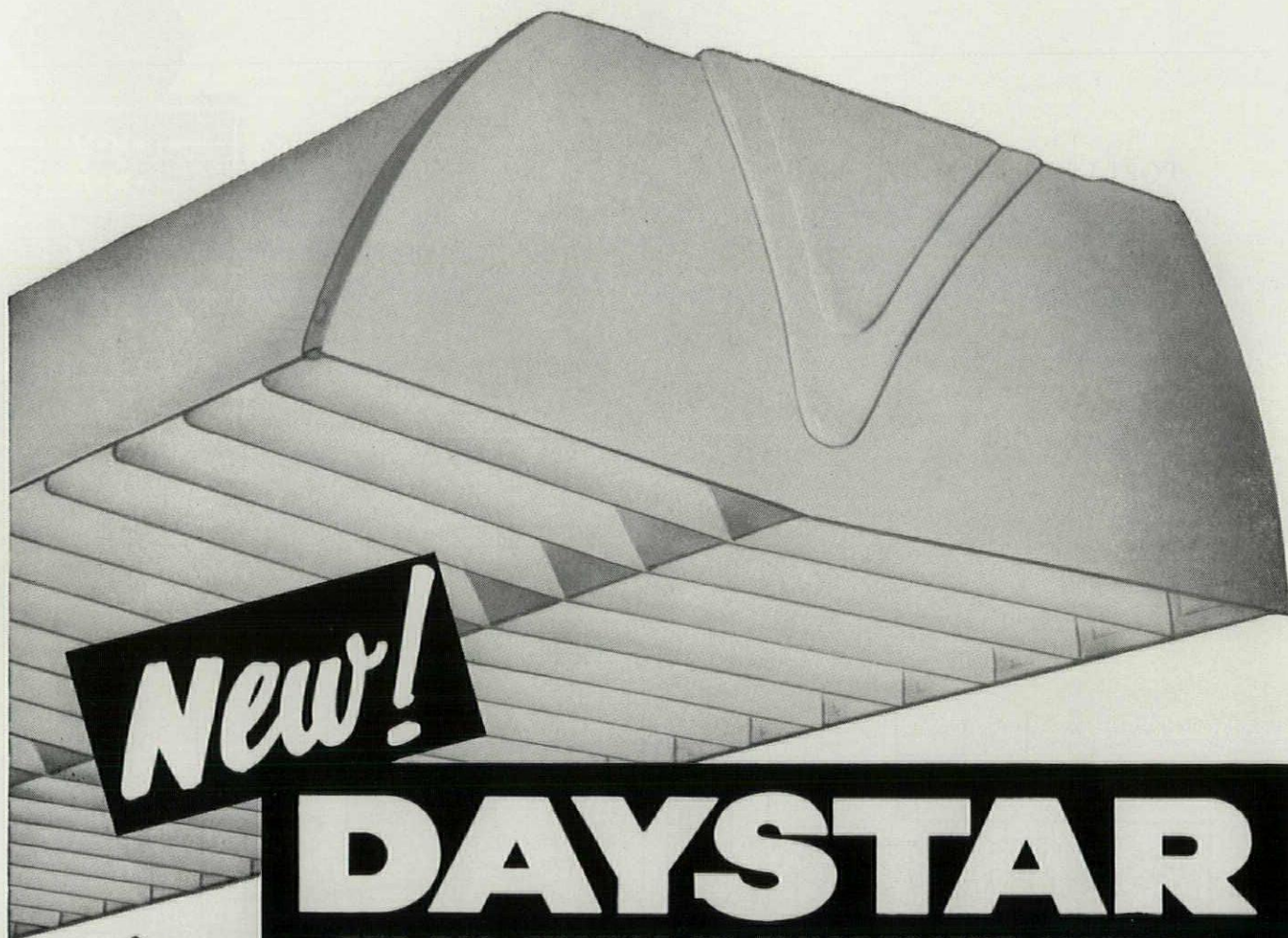


OWENS-ILLINOIS TOPLITES bring daylight to large interior spaces of new intermediate school. Four teen-age "neighborhoods," each formed by a cluster of academic classrooms focused around an activities core, branch out from a central special activities unit containing the gymnasium, pool, band and choir rooms, etc. Building designed by SMITH, TARA-PATA, MACMAHON, INC. of Birmingham, Michigan.



TOPLITE ROOF PANELS
AN **I** PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO



DAYSTAR

THE BIG CHANGE IN FLUORESCENT LIGHTING

A NEW DIRECT--INDIRECT LUMINAIRE for 4 ft. 430 M.A. Rapid Start and 4 & 8 ft. Slimline Lamps

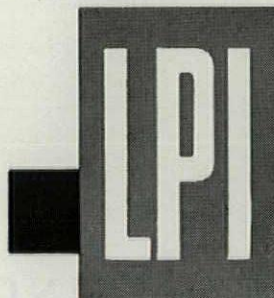
Now Lighting Products Inc., pacesetter to the lighting industry, presents **DAYSTAR** a revolutionary new luminaire designed for better lighting in class rooms, offices, commercial and industrial areas . . . wherever high levels of quality illumination are desired.

The New **DAYSTAR** is available in 48 and 96 inch length with 35° crosswise and 25° or 45° lengthwise shielding. 62% of the light is directed down and 38% up.

The side panels are of steel or plastic. The steel panels are permanently attached. The polystyrene plastic panels are readily removable without the use of tools. Eight foot units utilize both side panels and louvers that give an uninterrupted continuity of design. Louvers have a special snap-in catch and are suspended from the channel by safety chains for ease of relamping and maintenance. All metal parts are finished in high reflectance baked white enamel over a phosphatized surface.

The New **DAYSTAR** is completely described and illustrated in color bulletin No. 1503.

MAIL COUPON TODAY!



LIGHTING PRODUCTS INC., Dept. 2-N, Highland Park, Ill.

No. 1503

Name _____

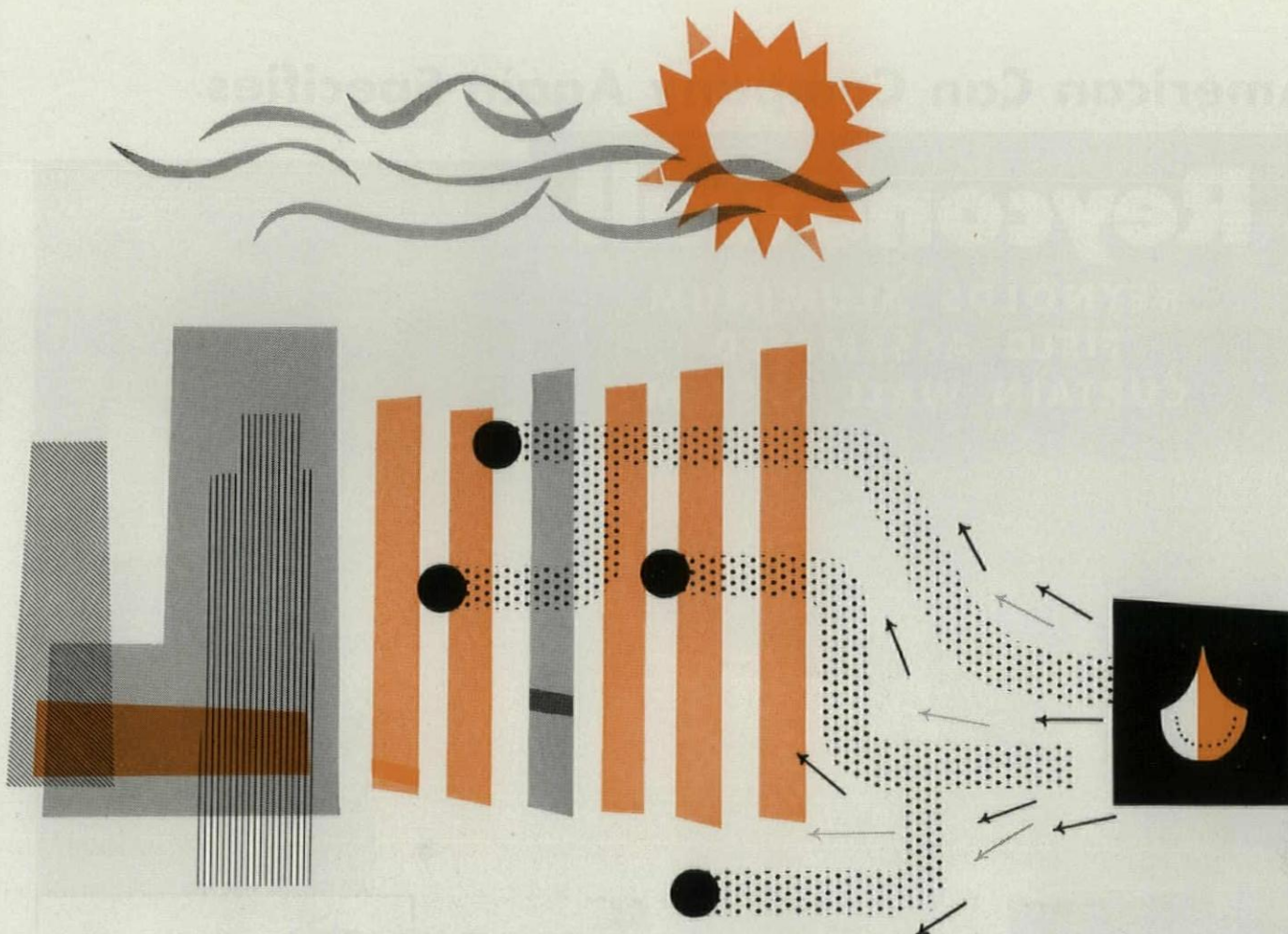
Address _____

City _____

State _____



LIGHTING PRODUCTS INC., Highland Park, Illinois



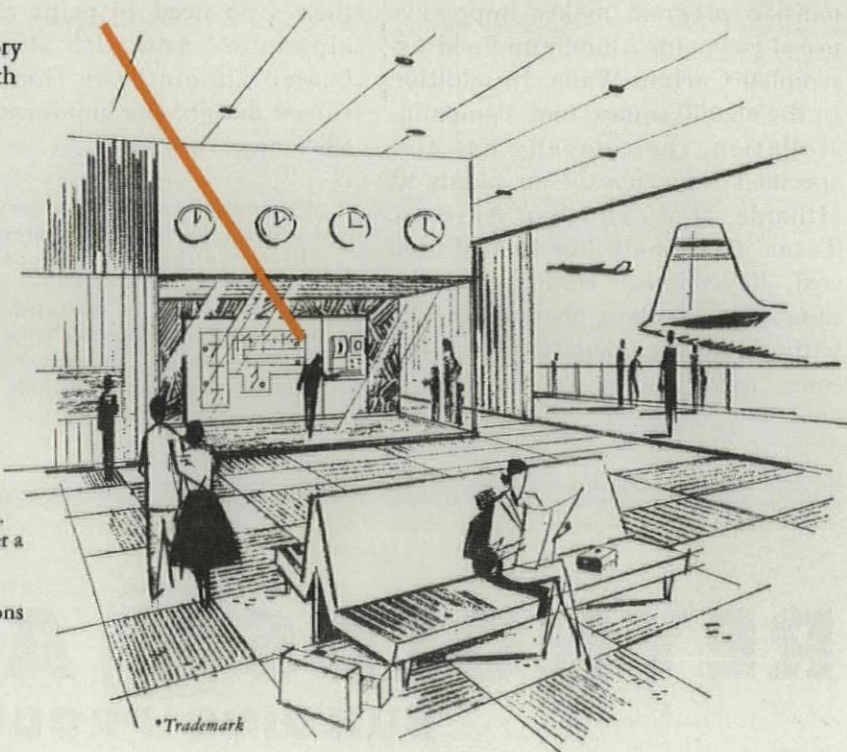
SUPERVISORY DATACENTER*

Starting point for centralized automation in buildings

NEW IDEAS that significantly affect building design are rare—and important. The Supervisory DataCenter control panel perhaps represents such an idea. For by completely centralizing air conditioning control, it shows the way to similar economy and integration of many another mechanical function. Conception, housing and installation of the DataCenter involve creative design factors that are of first concern to the architect. Your local Honeywell man has full details.

Minneapolis-Honeywell Regulator Company

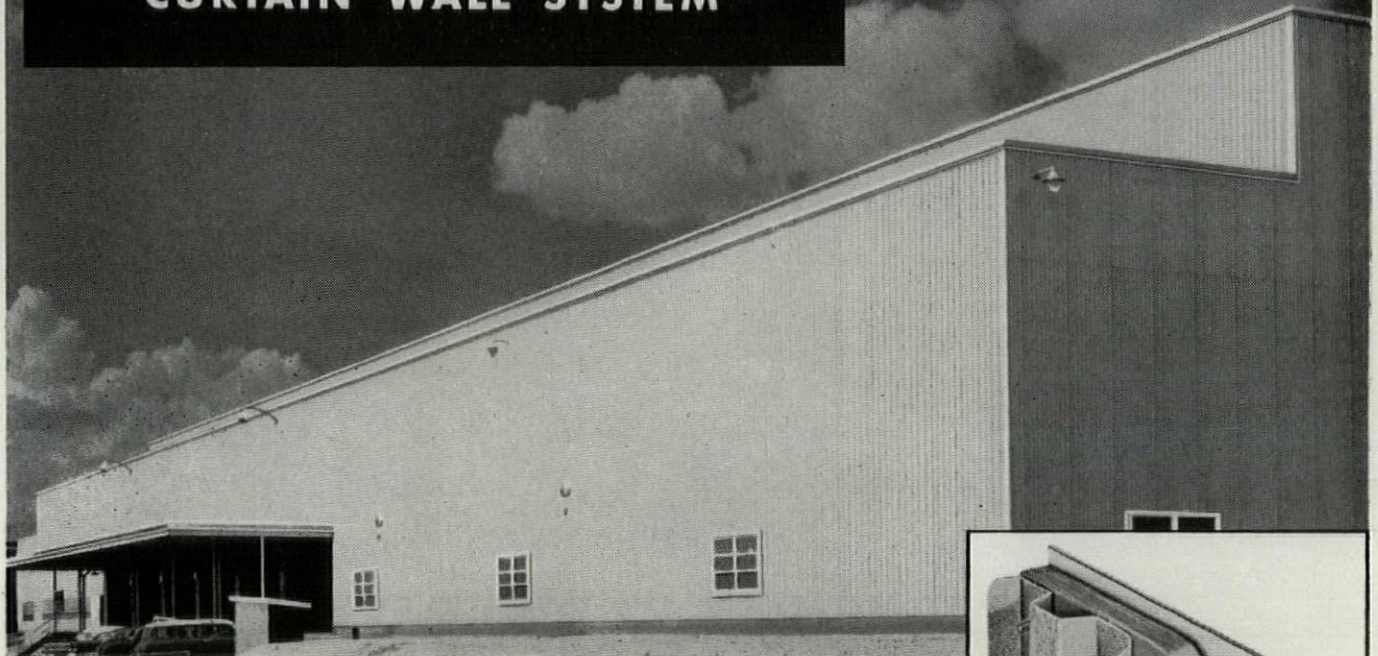
Visualized at right is a DataCenter as it might be integrated into the design of a modern airport terminal. On public display, it oversees comfort, gives the engineer a constant picture of air conditioning system operation, provides major operational economies. For passengers, the panel might show weather conditions in major cities. A DataCenter similarly displayed is planned for the Queen Elizabeth Hotel, Montreal, Quebec. Architect: G. F. Drummond, Chief Architect, CNR; Engineer, N. S. B. Watson, CNR.



American Can Company Again Specifies

Reyconowall®

REYNOLDS ALUMINUM
FIELD ASSEMBLED
CURTAIN WALL SYSTEM



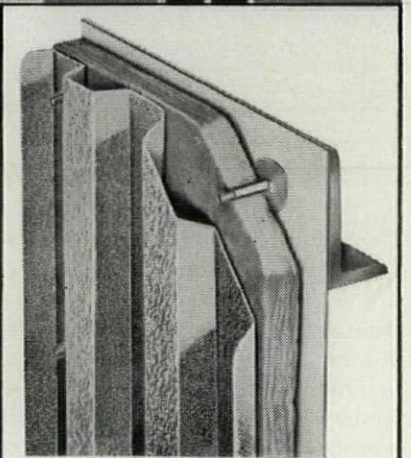
American Can Company Coil Cutting Plant, Tampa, Fla.

Jobber-Erector: Florida Steel Buildings, Inc.

American Can Company's great expansion program makes impressive use of Reynolds Aluminum Field Assembled Curtain Walls. In addition to the 46,300 square foot Tampa installation, the company has also specified *Reyconowall* on plants at Hillside, N. J., and San Antonio, Texas. Extremely low in installed cost, *Reyconowall* combines aluminum's 95% radiant heat reflectivity with glass fiber insulation for minimum heat transmission. Lowest

maintenance cost is assured because there's no need to paint rustproof aluminum. And with stucco embossed aluminum in this modern ribbed design, the buildings look as efficient as they are!

A complete installation service is available. For name of nearest franchised Jobber-Erector, call the Reynolds office listed under "Building Materials" in classified phone books of principal cities. Or write to Reynolds Metals Company, Building Products Division, Louisville 1, Ky.



In this *Reyconowall* installation the exterior is Reynoside 4" Rib .032" thick. The insulation is 1" glass fiberboard. The interior is flat sheet.



Drawings at left show *Reyconowall* using Reynoside 4" rib and 8" rib with 1" glass fiber board; interior sheets are Reynolds Aluminum Industrial Corrugated. Ribbed Embossed Reynoside is available in lengths from 5' to 22' 5".

REYNOLDS ALUMINUM

BUILDING PRODUCTS

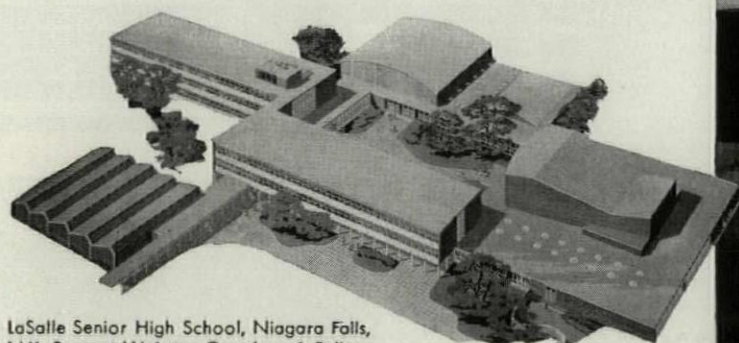
Watch Reynolds all-family television program "Disneyland", ABC-TV.

it's

RIXSON

throughout

AT LASALLE HIGH SCHOOL



LaSalle Senior High School, Niagara Falls, N.Y. Sargent-Webster-Crenshaw & Folley, Syracuse, N.Y.—architects. Cannon, Thiele, Betz & Cannon, Niagara Falls, N.Y.—associate architects.

nearly 400 doors pivotal hung offset style . . . an achievement in modern uniformity

In keeping with the contemporary design of this outstandingly well planned high school, all of the doors have a uniform simplicity in hanging style. Regardless of the door's function or size, a suitable offset style RIXSON floor type closer or pivot set was specified. Many more RIXSON offset style closers and pivot sets are available for doors ranging from the heaviest lead lined x-ray room door to the lightest interior door. And with each, a variety of top and side jamb pivots for varying problems in construction and material.

write for details and templates of offset type closers

THE OSCAR C. RIXSON COMPANY

9100 west belmont avenue • franklin park, ill.

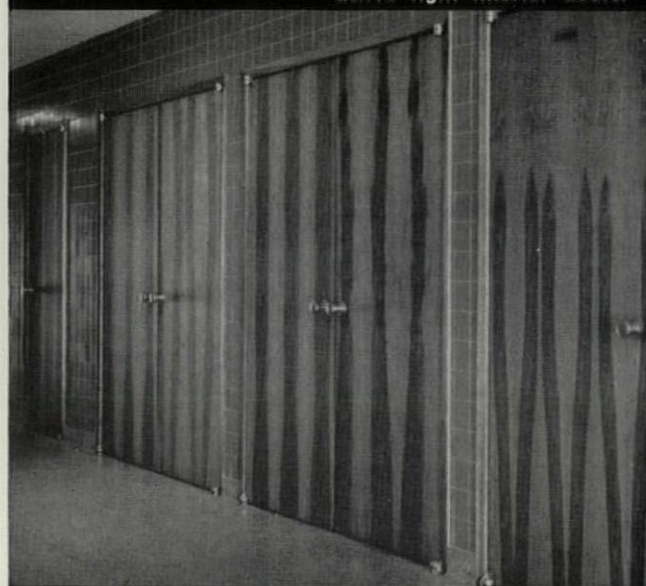
CANADIAN PLANT: 43 racine rd. • rexdale, ontario



no. 25 closers for entrance, vestibule and other heavy duty doors.

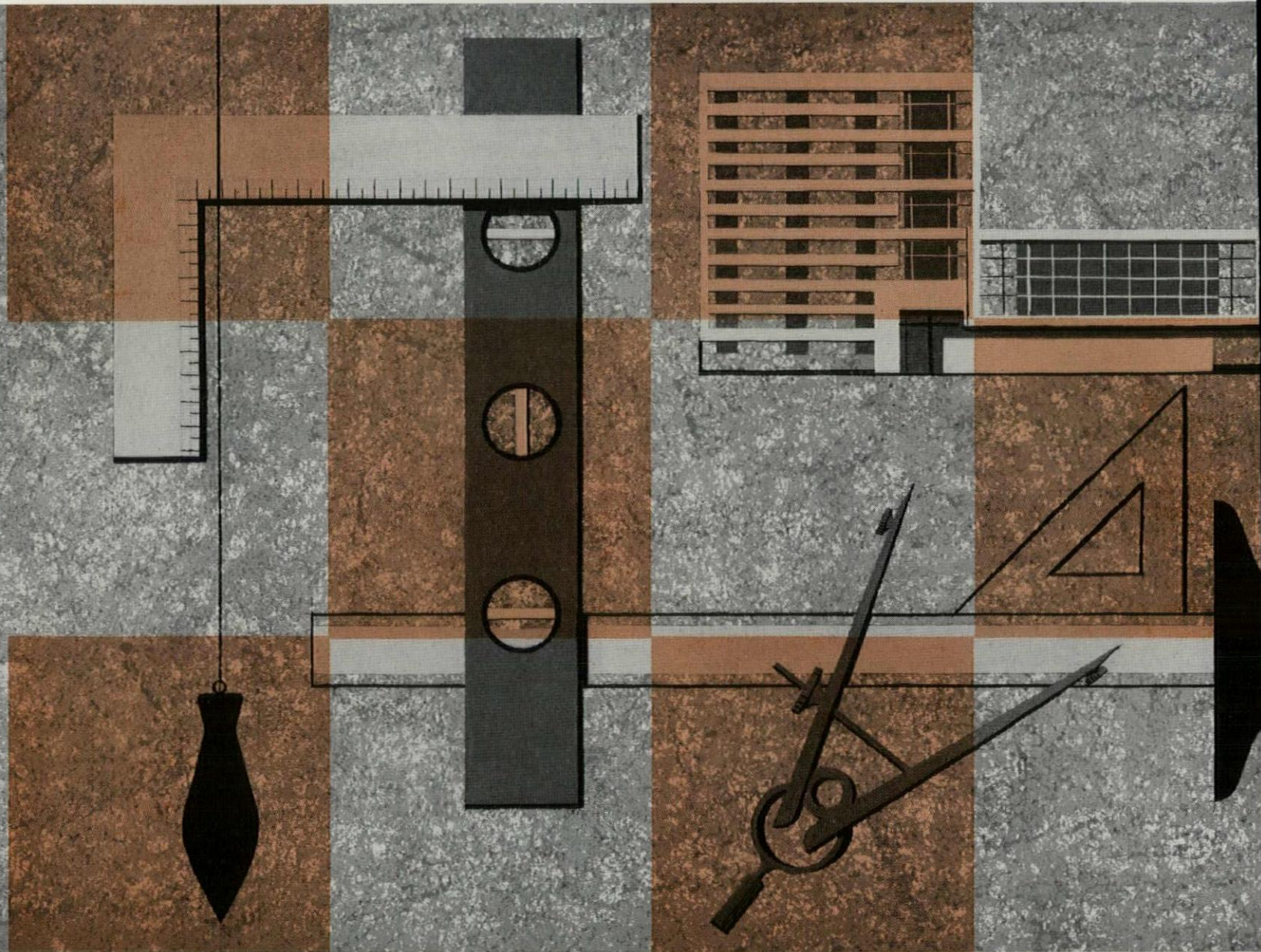


UNI-CHECK closers for classroom and other active light interior doors.



no. 117 1/4 pivot sets for supply room and other inactive doors.

GOOD PORCELAIN IS ONLY THE BEGINNING



Quality must be consistent through every stage of an architectural porcelain installation. In other words, *quality of service* and *quality of attention to application of material on the project* are just as important as porcelain quality. Whatever the installation, it is *only as good as the people who supply and erect it*.

For that reason, the Davidson distributor service organization has been carefully built — literally hand-picked — to insure consistent

quality of service and attention to customers' needs.

The result — a distributor organization of four hundred eighty Davidson people, available for service through every state from the Rockies to the Atlantic Ocean... each and every one thinking and working alike... trained and qualified to know, and to do quality work at every stage of erection on most every type of installation.

What it takes to insure

QUALITY PORCELAIN CONSTRUCTION



ADVISORY ASSISTANCE—To carry out original ideas or to meet any special requirements, consult your local Davidson distributor. Experienced engineers, with imagination, are available to discuss plans and to work with you in determining the most effective and economical way to apply porcelain panels on new existing structures. Continuing research by Davidson, in the field and laboratory, regularly produces new ideas that can benefit you.

CLOSE COOPERATION WITH ARCHITECTS—Extent of the Davidson field service organization assures opportunity for close, local contact, plus familiarity with local building codes and requirements. Davidson membership in Producers' Council and participation in programs for product and service improvement further assures awareness of, and readiness to meet current requirements.



EXPERT FIELD MEASUREMENT AND SHOP DETAILING—Careful attention to field measurements, one of the most critical phases of any porcelain installation, assures fast, economical erection, and perfection of detail. Detail shop drawings are prepared on the basis of these measurements, showing exact location and dimension of each panel.



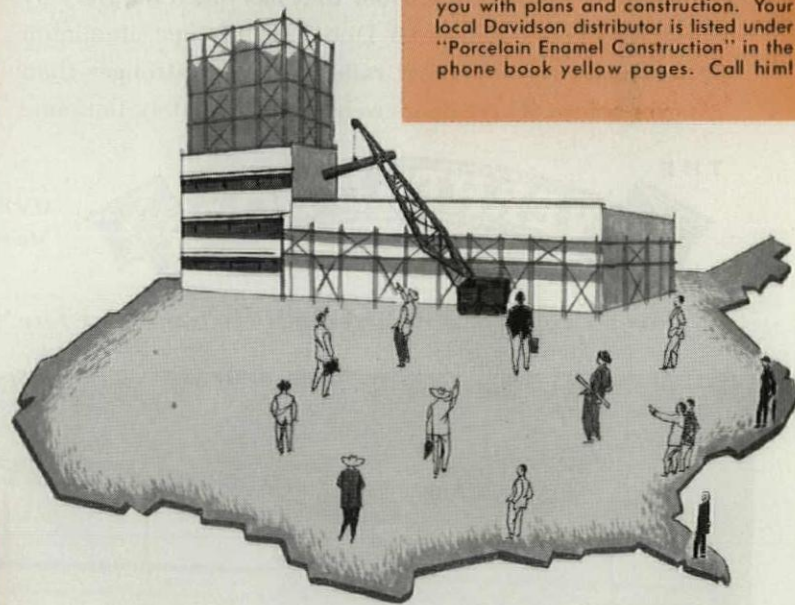
ACCURATE TRANSMITTAL OF JOB DATA—Shop or production drawings are prepared from field measurements, with special care given to comprehending and anticipating individual job needs. Example: Davidson panels to which signs or sign letters are to be fastened are marked to be pre-drilled by the factory, before enameling. Another example: adaptation of panels to encase or enclose air conditioning units or other operating mechanism. Shop drawings also include all details of attachment, jointing, etc., to insure that panels fit as designed.

WRITTEN 12-YEAR GUARANTEE—Davidson provides a written 12-year guarantee that panel colors will not excessively fade or flake and that all material and erection conforms to or exceeds Standard Specification No. 1 of the Porcelain Enamel Institute. Davidson Architectural Porcelain quality is AA and A—never less.

THE DAVIDSON FIELD SERVICE ORGANIZATION... 480-plus sales engineers and field mechanics... standing by to assist you with plans and construction. Your local Davidson distributor is listed under "Porcelain Enamel Construction" in the phone book yellow pages. Call him!

EXPERT ERECTION BY TRAINED, LOCAL FIELD CREWS—Each Davidson panel is accurately placed and lined up, plumb, flush, level, and true by factory trained specialists. Permanent, local Davidson erecting teams gain two advantages—less time lost "getting to the job", plus the advantage of men who are familiar with local codes and requirements. Joints and joint spacings are sealed with polyvinyl chloride plastic gaskets or with Davidson caulking material.

Panel separation is not less than $\frac{1}{8}$ " nor more than $\frac{1}{4}$ ". Thorough cleaning of each panel completes the required steps for a quality job. All installations are made in accordance with Porcelain Enamel Institute Standards, with stainless steel screws and clips, all wood and metal supports protected against moisture.



ACCURATE CODING OF PANELS FOR ERECTION—There is no guess-work or delay in erecting Davidson panels. Each panel is coded for exact location in the building structure according to master setting or erection drawings which are used at job site by field mechanics.



Member,
Producers' Council
Member,
Porcelain Enamel Institute

Davidson

ENAMEL PRODUCTS, INC.
1105 E. KIBBY STREET, LIMA, OHIO

World's Largest Exclusive Manufacturer of Architectural Porcelain

New Doors of LIFETIME ALUMINUM

for Commercial and Industrial Buildings

*Almost Maintenance-Free—Aluminum Designs
Blend with Modern Planning*

Now . . . magnificent doors of lifetime aluminum, built to your own specifications, can add functional beauty to the buildings that take shape from your plans! Constructed in the same time-saving, money-saving way* as the new Panoramic Door that has taken industry by storm, The "OVERHEAD DOOR" in lifetime aluminum has narrower stiles and rails, yet is far stronger than ever before. These doors weigh approximately the same

as wood doors. Slightly greater initial cost is offset by the savings in maintenance! The gleaming anodized finish, inside and out, is permanent—never needs paint. Keyway construction permits easy replacement of components if damaged. For details of construction, sizes, special features, see pages 38-39, Sweet's Architectural Catalog $\frac{16i}{Ov}$ or write us for 56-page hard-bound catalog with traceable drawings.

*Patents Pending



OVERHEAD DOOR CORPORATION, Hartford City, Indiana
Manufacturing Divisions: Hillside, N. J.; Nashua, N. H.; Cortland, N. Y.;
Lewistown, Pennsylvania; Dallas, Texas; Portland, Oregon.

For 36 Years . . . Architects Have Specified The "OVERHEAD DOOR" More Than Any Other Brand!



◀ New PANORAMIC Aluminum Door—handsome, maintenance-free, weathertight—blends beautifully with modern design—was an instant hit with the oil industry. Gives attendants full vision of traffic, parking areas and pumps.

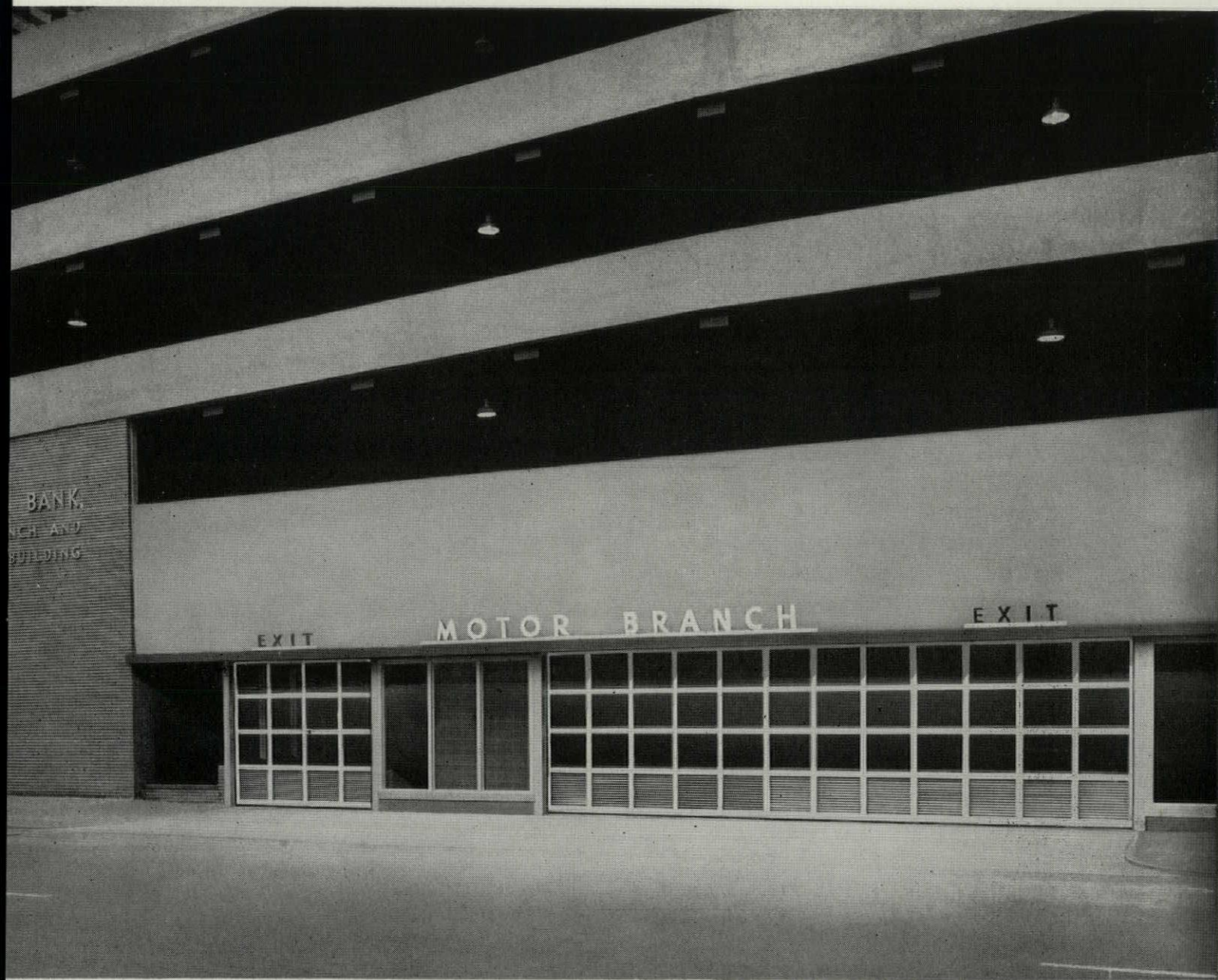
1957 A. I. A. Prize-Winning Design—Middlesex Mutual Trust Building at Waltham, Massachusetts, uses this special flush aluminum "OVERHEAD DOOR." Door shown opens into the receiving room of the insurance company's office building. Another door is in the basement garage.




Architectural

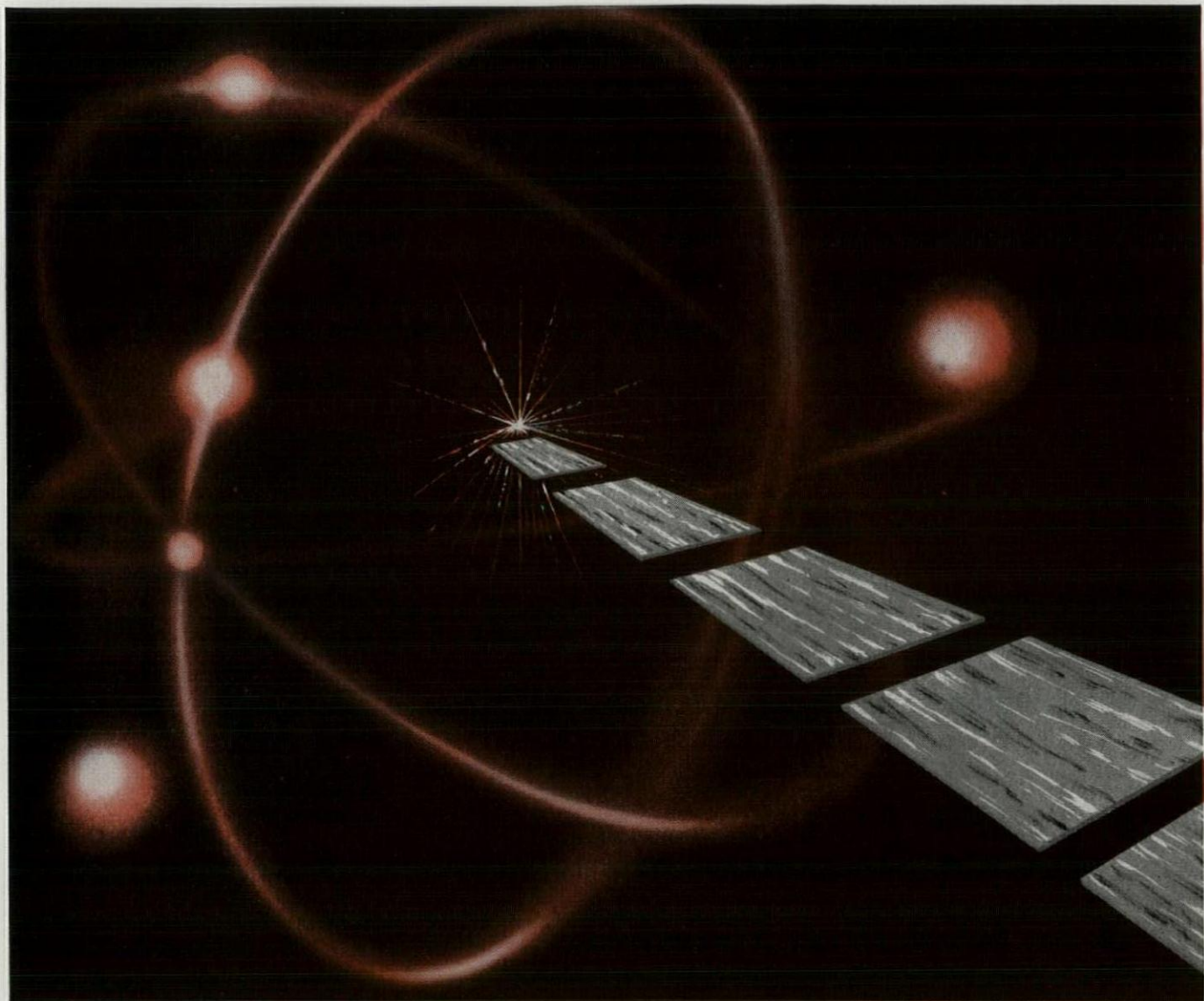
$\frac{16i}{Ov}$

© 1957, O. D. C.

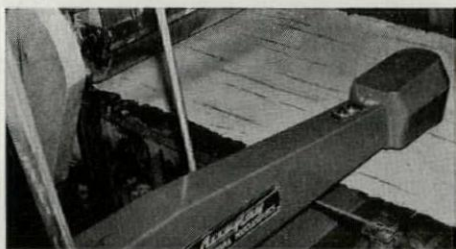


Merchants National Bank at Mobile, Alabama, provides drive-in facilities with the addition of a new Motor Branch and Parking Building. Two aluminum "OVERHEAD DOORS," with bottom sections louvered to permit escape of exhaust fumes, give an attractive "store front" appearance to the building. The larger door, 26'9" wide, is matched by a door of the same size and design on the entrance side of the building. 





Now Nuclear Science Assures MATICO Quality



Nuclear gauge continuously inspects tile and controls production processes to achieve desired uniformity. Deviations are corrected instantly.



Automatic recorder charts tolerances. This visual "profile" of quality allows constant improvements in formulation for an ever-better product.

MATICO USES *AccuRay*®

TO ACHIEVE NEW HIGH IN TILE UNIFORMITY

With AccuRay on the job, MATICO achieves the greatest product uniformity in tile history! By keeping tolerances within plus or minus 1%, MATICO gives you uniform thickness, tighter surfaces, improved dimensional stability. This means MATICO Tile looks better . . . wears better . . . even installs better, for it's always "on square."

AccuRay beams electrons at the tile, automatically adjusts the production process to maintain pre-set standards. MATICO gives you tile quality controlled by AccuRay, another mark of leadership for the tile you can always depend on.

MASTIC TILE CORPORATION OF AMERICA

Houston, Tex. • Joliet, Ill. • Long Beach, Calif. • Newburgh, N. Y.

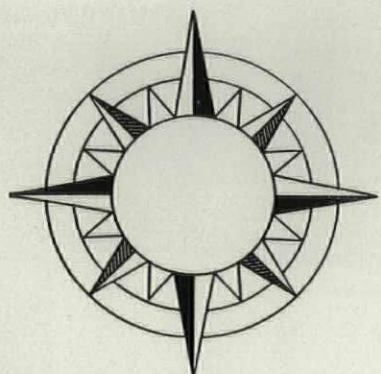
Rubber Tile • Vinyl Tile • Asphalt Tile
Vinyl-Asbestos Tile • Plastic Wall Tile



AccuRay T.M. REG. BY INDUSTRIAL NUCLEONICS CORPORATION, COLUMBUS, OHIO

74477

Are we ready to... *air condition* our school rooms?



which way comfort?

Nesbitt

...comfort all ways

Syncretizer Unit Ventilator

Series *Wind-o-line* System

Mainline System

Year'round Air Conditioners:

Syncretizer and *Mainliner*
for classrooms

Roommate for offices

AudiCon for auditoriums

Thermovent Auditorium Ventilator

Nesbitt Cabinet Heater

Sill-line Radiation

Are school boards ready? While many schools have not yet installed an adequate system of heating and cooling by controlled ventilation, many others find such protection indispensable—and even think of adding mechanical refrigeration for cooling at certain times of year. Needs vary in different parts of the country; but wherever school buildings are to be used all year round—and in areas where outside temperatures are often above 60° during the normal school term—a complete system of heating, ventilating, natural cooling, and air conditioning is the only assurance of a comfortable learning environment at all times. Therefore many school executives and board members are giving serious thought to air conditioning in tomorrow's schools.

Are taxpayers and bondholders ready? The people who supply the money for public education will have many questions about the cost of installing and operating year-round air conditioning, but the facts will be weighed against the benefits to students and community.

Are architects and engineers ready? Is contemporary school building design well suited to the employment of summer air conditioning? What effect upon design will the growing desire for year-round comfort protection have? How best design the system—for installation all at once or in successive stages?

IS NESBITT READY? With more than a quarter-century of experience in the manufacture of air conditioning components, Nesbitt is prepared to offer its Year'round Air Conditioners (*Syncretizer* and *Mainliner* for classrooms; *Roommate* for offices; and *AudiCon* for auditoriums). All Nesbitt Year'round units may be installed initially for heating and cooling by controlled ventilation, and the summer cooling components may be added later.

Are you ready? Whatever your relation to the school field, you probably have questions: What is involved in air conditioning a school? What are the initial and the operating costs? What must be considered before deciding to install controlled ventilation now and mechanical refrigeration later? These and many other questions are answered in the treatise by Nesbitt engineers, "An Analysis of Air Conditioning for Schools." Mail this coupon for your free copy.

An Analysis of
AIR CONDITIONING
FOR SCHOOLS

this free
publication
will answer
many of your
questions

JOHN J. NESBITT, INC., DEPT. L
PHILADELPHIA 36, PA.

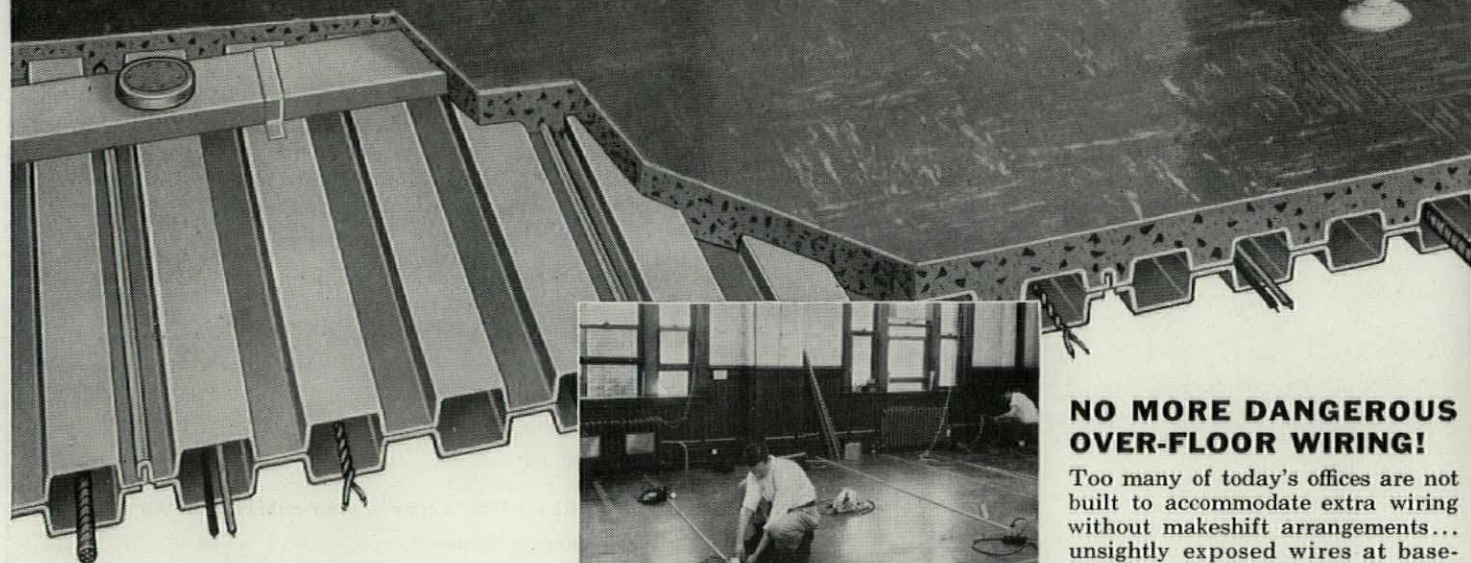
Gentlemen: Please send me a copy of your publication, "An Analysis of Air Conditioning for Schools."

Name _____

Affiliation _____

Address _____

City _____ State _____



NO MORE DANGEROUS OVER-FLOOR WIRING!

Too many of today's offices are not built to accommodate extra wiring without makeshift arrangements... unsightly exposed wires at baseboards and dangerous raised wiring strips across floor areas. Don't let this happen to *your* buildings!



INLAND STEEL PRODUCTS COMPANY
DEPT. W, 4031 WEST BURNHAM STREET • MILWAUKEE 1, WISCONSIN
ATLANTA • BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND
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C-3

MILCOR[®]

DEPT. I, 4033 WEST BURNHAM STREET • MILWAUKEE 1, WISCONSIN



It takes connections to do business...

electrical
and the best [^]connections are made through Milcor Cellufloor

Today's offices use up to *three times* as much electricity as they did *only 10 years ago*—according to a metropolitan power study. This growth will multiply in the years ahead. How vitally important it is, then, that your clients be protected from electrical obsolescence!

Milcor Cellufloor permits complete electrification of floor areas. Its cells, spaced six inches o.c., provide ample capacity for complex cable systems of power, communications, and other electronic circuits. Circuits can be changed and service outlets

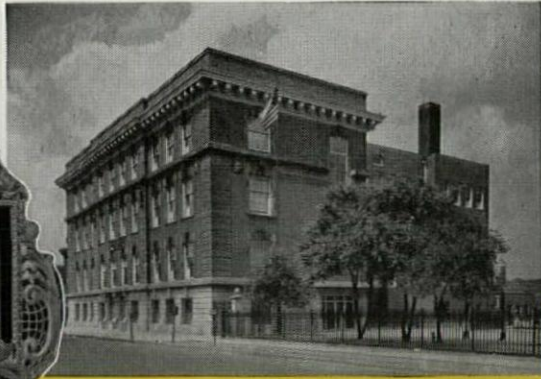
can be installed — or relocated — simply and quickly, without costly alterations.

During construction, Cellufloor saves time and money by speeding schedules and providing safe work platforms for all trades. Because it is light in weight, Cellufloor makes possible important foundation savings.

Specify Milcor Cellufloor in your plans, to give clients the electrical flexibility they need. For more information, write for our catalog 270, or refer to Sweet's File, section 2a/In.

CELLUFLOOR

POWERS Type-IC
Pneumatic
Thermostat



in 1901

The old DRAKE SCHOOL, built at the turn of the century, was one of Chicago's best. It is located in the famed Prairie Avenue district and was completed in January 1901. Temperature of the forced warm air heating and ventilating was regulated by a

POWERS gradual acting Pneumatic Control System

Like earlier Powers systems installed in Chicago's schools, in 1895-96, the thermostats in each room were unique. Their Gradual action in controlling the mixing dampers that supplied tempered air to each classroom was a decided improvement over positive-on-off type of control widely used at that time.

Since the Gaslight Era...

56 Year Old Powers Control System still gives dependable performance shown on temperature charts below



Mr. Edward Barrett,
Engineer, Custodian

in 1950

On its 49th Birthday recording thermometer charts like the one above showed the good control obtained with this old Powers system.

in 1957

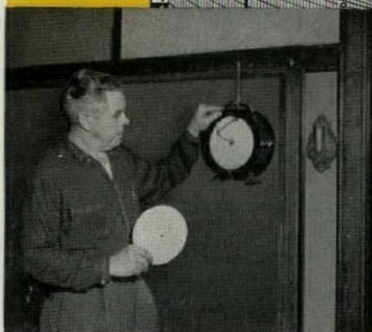
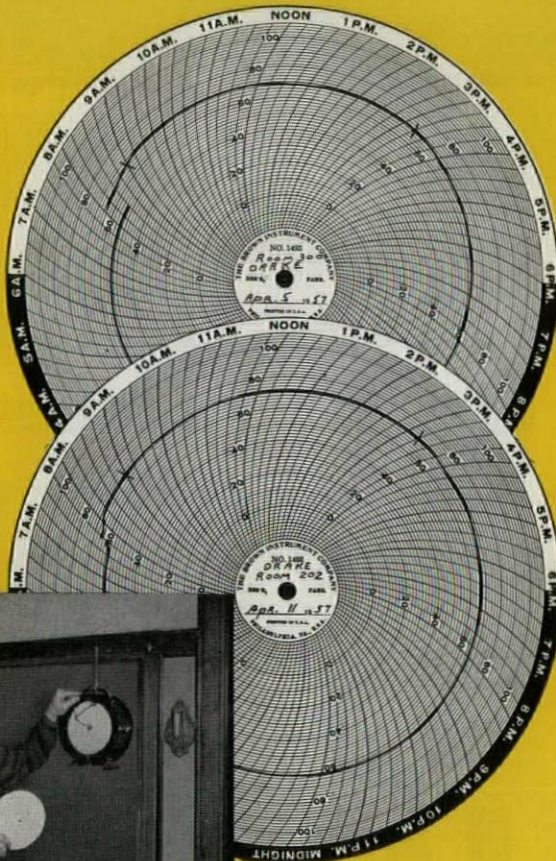
On its 56th Birthday—still not acting its age—Powers control produced temperature recording charts like those at the left. All charts on this page were made in rooms regulated by Powers Type IC Pneumatic Thermostats.

Will the Temperature Control Systems You are Specifying or Buying Today give better, or as good control as this 25 to 50 years from now? Users of Powers control report such performance with low cost for upkeep.

Taxpayers

get their money's worth. The charts show No Fuel is Wasted due to OVER-heating. Dependable Powers Control combined with the maintenance program of the Chicago School system team up to provide greater classroom comfort, fuel economy and performance records like the one cited above.

- Only two of many Chicago schools controlled by Powers are illustrated here.

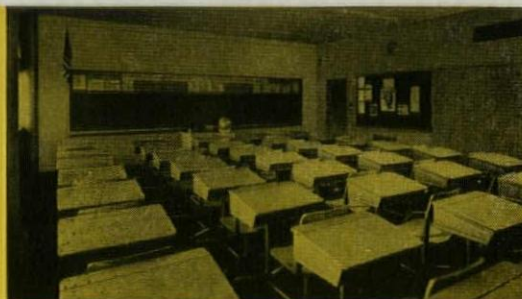


Mr. George Casey, Engineer-Custodian.

Chicago Taxpayers benefited from the Economy of

POWERS quality systems of Pneumatic

TEMPERATURE CONTROL



SKINNER ELEMENTARY SCHOOL, CHICAGO



Benjamin C. Willis
General Supt. of Schools

Edwin A. Lederer
Associate Supt.
In Charge of Operation Services

John C. Christensen
Asst. Supt. in Charge of
Architecture

Schmidt, Garden & Erikson
Associated Architects on
Skinner School

Thomas J. Brett
Asst. Supt. in Charge of
Plant Engineering

The NEW and FORWARD LOOK in Chicago Schools is exemplified by the new colorful Skinner School

A Favorable Environment for Learning. Located in a drab old neighborhood the pleasing use of colored glazed brick and other materials for exterior and interior, plus many contemporary features, helps teachers operate at peak efficiency and aids pupils desire for learning.

In This Well Designed 35 Room School are 26 classrooms, two kindergartens, library, lunch room, home economics, clinic and adjustment rooms, gymnasium and offices.

Powers Control Provides Thermal Comfort and Fuel Economy. Thermostat in each room regulates reheat coil in ventilating duct. Forced hot water heating in concealed finned radiation is controlled by a Powers MASTROL system.

Are you Planning a New Building? Ask your architect or engineer to include a Powers Quality system of pneumatic control. You'll help insure utmost comfort, fuel economy and lowest cost for upkeep.

THE POWERS REGULATOR COMPANY

SKOKIE, ILLINOIS

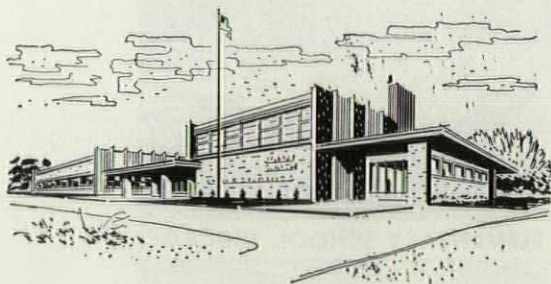
Offices in Chief Cities in U.S.A., Canada and Mexico
See your phone book

Over 65 Years of Automatic Temperature and Humidity Control



There's "Idea Potential"

in these Ceiling Materials for Schools

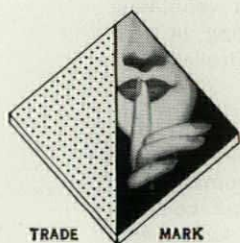


Today's materials must go beyond merely providing basic products for the architect to work with. They must suggest new directions for him to take in designing a project, toward economy, utility, and style.

That's why architects appreciate Acousti-Celotex Sound Conditioning materials. Through these versatile materials, a high degree of flexibility is possible in entire area layouts. Space above the ceiling is readily accessible, light fixtures and tile can be interchanged, partitions rearranged.

Celotex acoustical materials are available in an ever-widening range, designed to meet your diversified needs. In the planning stage of your next project, consult your Acousti-Celotex Distributor. Let him show you how his new products, plus his service and experience, can help you.

FOR INFORMATION and specification data on Celotex Acoustical Products and translucent panels, write The Celotex Corporation, 120 S. LaSalle St., Dept. A-117, Chicago 3, Illinois.



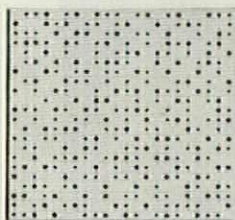
ACOUSTI-CELOTEX

REGISTERED

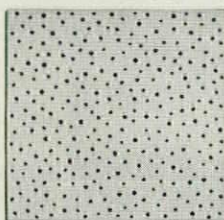
U. S. PAT. OFF.

Sound Conditioning

Products to Meet Every Sound Conditioning Problem . . . Every Building Code—The Celotex Corporation, 120 S. LaSalle St., Chicago 3, Ill. In Canada: Dominion Sound Equipments, Ltd., Montreal, Quebec



PERFORATED CANE FIBER TILE*



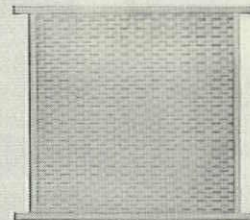
PERFORATED MINERAL TILE*



CELOTONE®



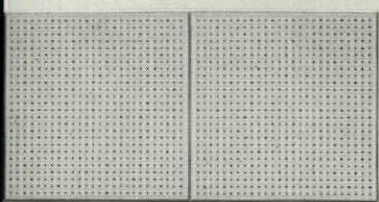
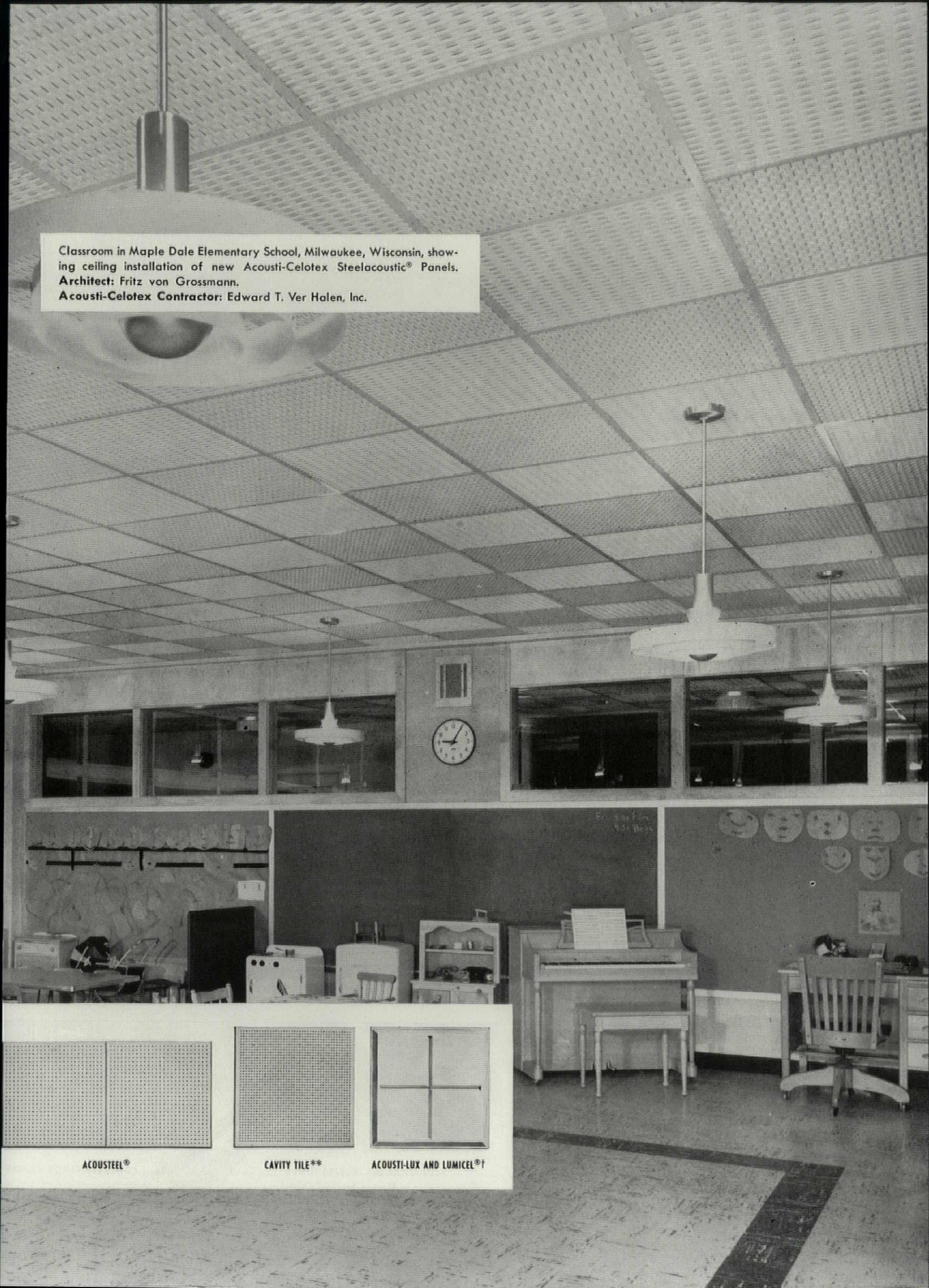
STRIATONE®



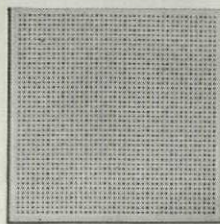
STEELACOUSTIC®

*U. S. PAT. NO. D-168,763 **U. S. PAT. NO. 2,159,488 †U. S. PAT. NOS. 2,218,992 AND 2,710,335

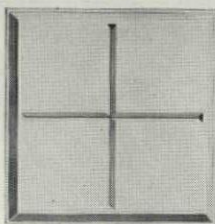
Classroom in Maple Dale Elementary School, Milwaukee, Wisconsin, showing ceiling installation of new Acousti-Celotex Steelacoustic® Panels.
Architect: Fritz von Grossmann.
Acousti-Celotex Contractor: Edward T. Ver Halen, Inc.



ACOUSTEEL®

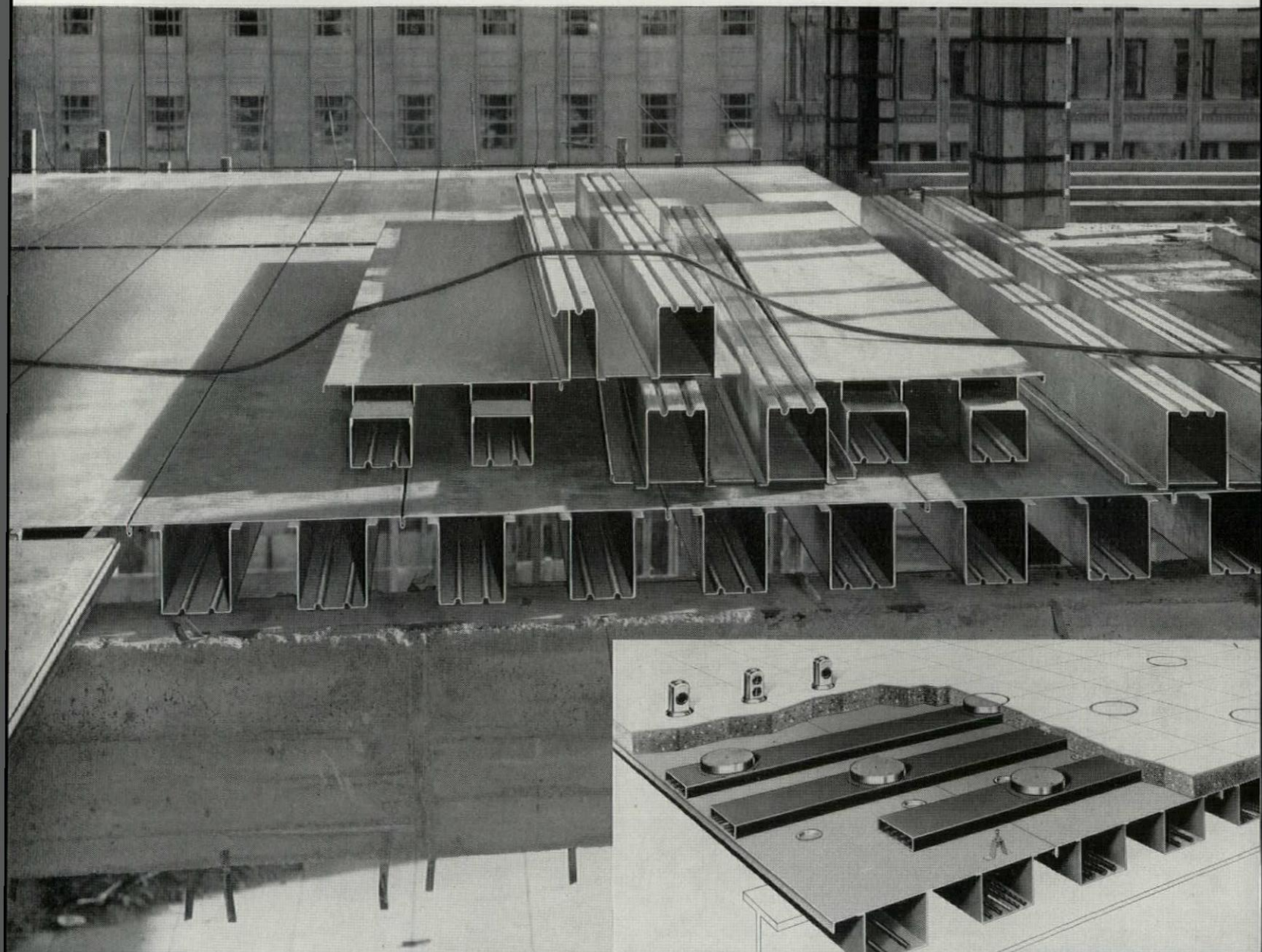


CAVITY TILE**

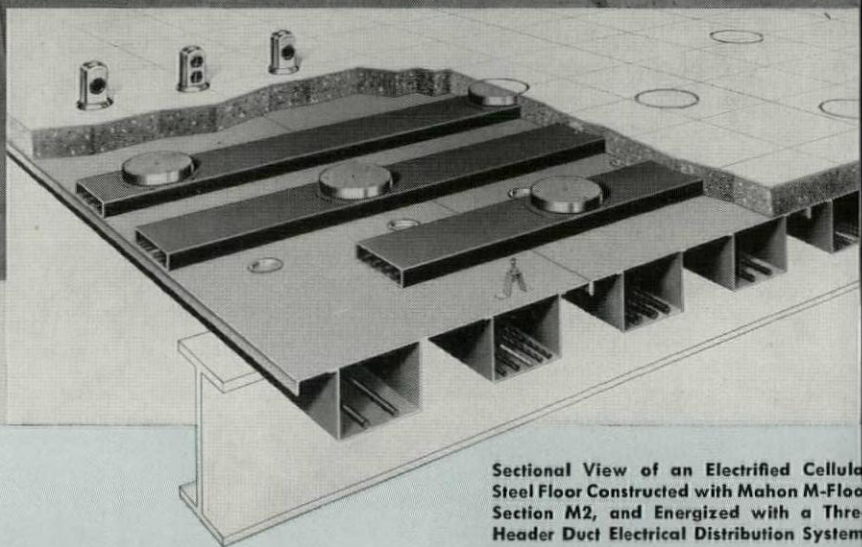


ACOUSTI-LUX AND LUMICEL®†

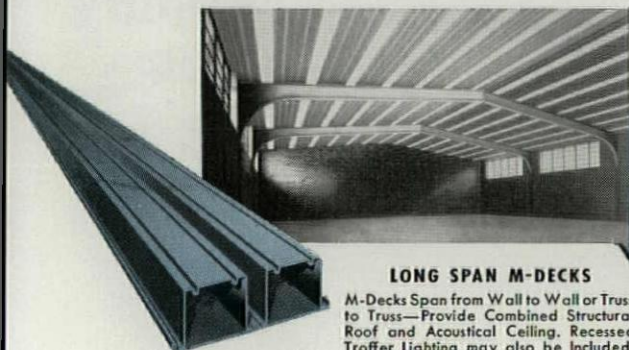
M-FLOORS Provide Built-In



Above is a typical Mahon M-Floor Installation. It is One of Six Similarly Constructed Electrified, Cellular Steel Sub-Floors in the Ultramodern George Robert White Fund Office Building, Boston, Massachusetts. Owner: City of Boston, Thomas McDonough, Architect, John Bowen Company, Inc., General Contractors.



Sectional View of an Electrified Cellular Steel Floor Constructed with Mahon M-Floor Section M2, and Energized with a Three-Header Duct Electrical Distribution System



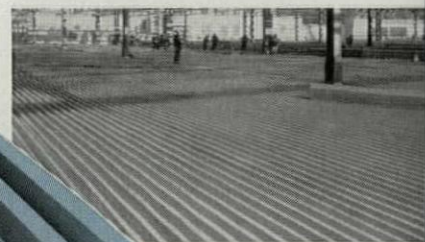
LONG SPAN M-DECKS

M-Decks Span from Wall to Wall or Truss to Truss—Provide Combined Structural Roof and Acoustical Ceiling. Recessed Troffer Lighting may also be included.



ACOUSTICAL and TROFFER FORMS

Provide an Effective Acoustical Ceiling with Recessed Troffer Lighting—Serve as Permanent Forms in Concrete Joist and Slab Construction of Floors and Roofs.



CONCRETE FLOOR FORMS

Mahon Permanent Concrete Floor Forms in various types meet virtually all requirement in concrete floor slab construction over structural steel framing.

Assurance Against Electrical Obsolescence in Another New, Modern Office Building!

In the multiple-story office building shown under construction at the left, deep Mahon M-Floor Sections were employed for the Electrified, Cellular Steel Sub-Floors which were designed for an unusual load of 250 lbs. per sq. ft. In selecting this particular Mahon M-Floor Section, the architect assured himself, and his client, that the building would have adequate underfloor raceway capacity to meet requirements of any type of occupancy, and that it would remain electrically competitive in the rental market throughout its entire life.

The 6" wide Cel-Beam Raceways in M-Floor construction provide further electrical advantages . . . they allow greater latitude in the location and installation of Floor Service Fittings, and they permit the use of 4" diameter Hand-holes between Header Duct Access Units and the Cel-Beam Raceways. This is important . . . the larger access hand-holes save time and labor costs, not only in the initial electrical installation, but year after year, whenever changes in electrical circuits are required or additional circuits become necessary.

In the M-Floor Cel-Beam Section you get a better balanced, more efficient structural unit . . . you get electrical availability in every square foot of floor surface . . . you get greater raceway capacity, greater latitude in location of floor service fittings, and greater convenience, electrically, for the life of the building.

When you select a Cellular Steel Sub-Floor for your next building, you will want all of the structural and electrical advantages that have been engineered into Mahon M-Floors. Comparison will convince you that the basic functional requisites of a Cellular Steel Sub-Floor are more fully realized in the design of Mahon M-Floor Cel-Beam Sections.

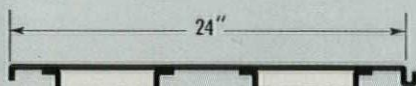
See Sweet's Files for information, or write for Catalogue M-57.

THE R. C. MAHON COMPANY • Detroit 34, Michigan
Sales-Engineering Offices in Detroit, New York and Chicago
Representatives in all Principal Cities

MAHON

MAHON M-FLOOR SECTIONS

CEL-BEAMS, WHICH ARE UTILIZED AS
ELECTRICAL RACEWAYS, ARE 6" WIDE



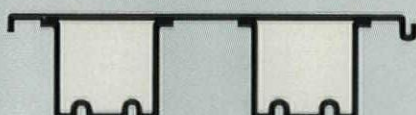
SECTION M2-1.5
CEL-BEAM DEPTH 1 1/2"



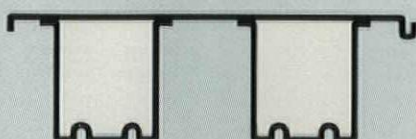
SECTION M2-3
CEL-BEAM DEPTH 3"



SECTION M2-4.5*
CEL-BEAM DEPTH 4 1/2"



SECTION M2-6
CEL-BEAM DEPTH 6"



SECTION M2-7.5
CEL-BEAM DEPTH 7 1/2"



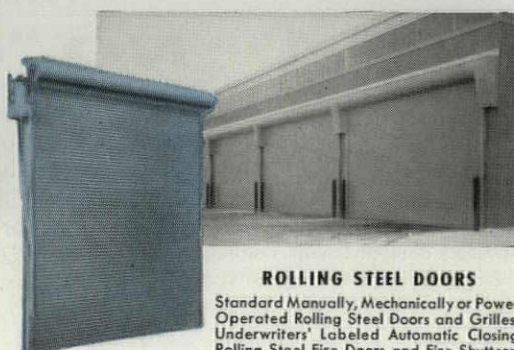
INSULATED METAL WALLS

Three Distinctive Patterns with "U" Factor Superior to that of Conventional Masonry Wall with Lath and Plaster. Erected up to 60 Ft. in Height without a Horizontal Joint.



UNDERWRITERS' RATED FIRE WALLS

Mahon Metalclad Fire Walls carry two hour Rating by Underwriters' Laboratories, Inc., for Use as Either an Interior Dividing Fire Wall or an Exterior Curtain-Type Fire Wall.



ROLLING STEEL DOORS

Standard Manually, Mechanically or Power Operated Rolling Steel Doors and Grilles. Underwriters' Labeled Automatic Closing Rolling Steel Fire Doors and Fire Shutters.



Elevator doors open promptly for waiting passengers



Courteous doors allow ample time for passenger loading



Doors stay motionless until car is loaded



Doors close quickly after last person enters



At the Bank of New York Building,
530 Fifth Avenue, Westinghouse operatorless elevators equipped with Traffic Sentinel doors pay dividends in better service and over-all operating economy. Owner: Metropolitan Life Insurance Co.; Architects: Voorhees, Walker, Smith & Smith; Contractor: Starrett Bros. & Eken Inc.; Managing Agents: Cross & Brown Co.

J-98747CA

THANKS TO WESTINGHOUSE TRAFFIC SENTINEL® NO "JITTERY" DOORS HERE

In cosmopolitan New York, Westinghouse operatorless elevators with magic Traffic Sentinel doors are ideally timed to the pace of busy buildings. At 530 Fifth Avenue where above photos were taken, for example, operatorless elevators go where they are needed, when they are needed—with Traffic Sentinel electronically taking over the courteous operation of the doors.

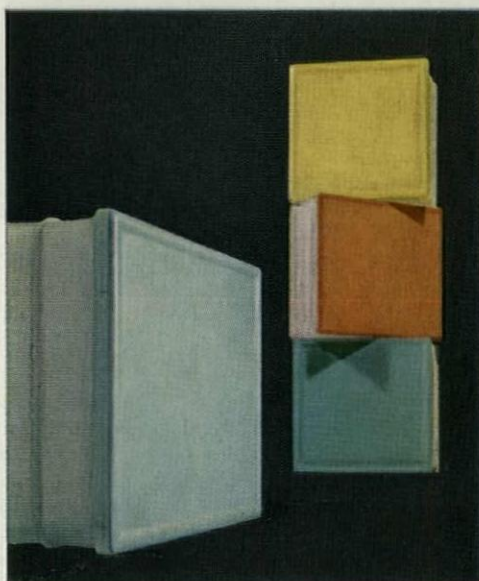
Traffic Sentinel doors are open the instant the car reaches your floor. They stay open until

every passenger is safely aboard. No threats of too-quick closings . . . no "jittery" doors that frighten passengers. Ask the Westinghouse Elevator Division representative nearest you to show you Traffic Sentinel in action.

YOU CAN BE SURE...IF IT'S
Westinghouse

In the first five months following their introduction in May 1957, Color Glass Blocks by Pittsburgh Corning have been specified by more than 50 leading Architects. Projects include schools, churches and commercial buildings. This product, pioneered by PC, comes in a variety of ceramic face colors and is translucent.

*It is available on Architect's
Pittsburgh Corning*



*specification only.
Corporation*



*For complete information on this new design medium for Glass Block Curtain Walls,
write Pittsburgh Corning Corporation, Dept. E-117, One Gateway Center, Pittsburgh 22, Pa.
In Canada: 57 Bloor Street West, Toronto, Ontario*



MODULES THAT DON'T LIMIT YOUR CREATIVE FREEDOM

Here is a refreshing new approach to modular construction. It is a system of building that gives you, the architect, control over both the structural form of the building and the finished appearance. It is the Butler Building System.

In the Butler Building System, the module is a unit of space—a building bay. This bay is comprised of pre-engineered, mass-produced, load-bearing structural components, and die-formed, tight-fitting metal roof panels. It is available in a wide variety of heights, widths, lengths and roof slopes. Use of the Butler bay module reduces drafting room time, and brings to the construction site the economical control of quality attainable only on the production line.

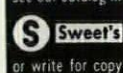
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Romany-Spartan Tile sparkles in new exhibition pool

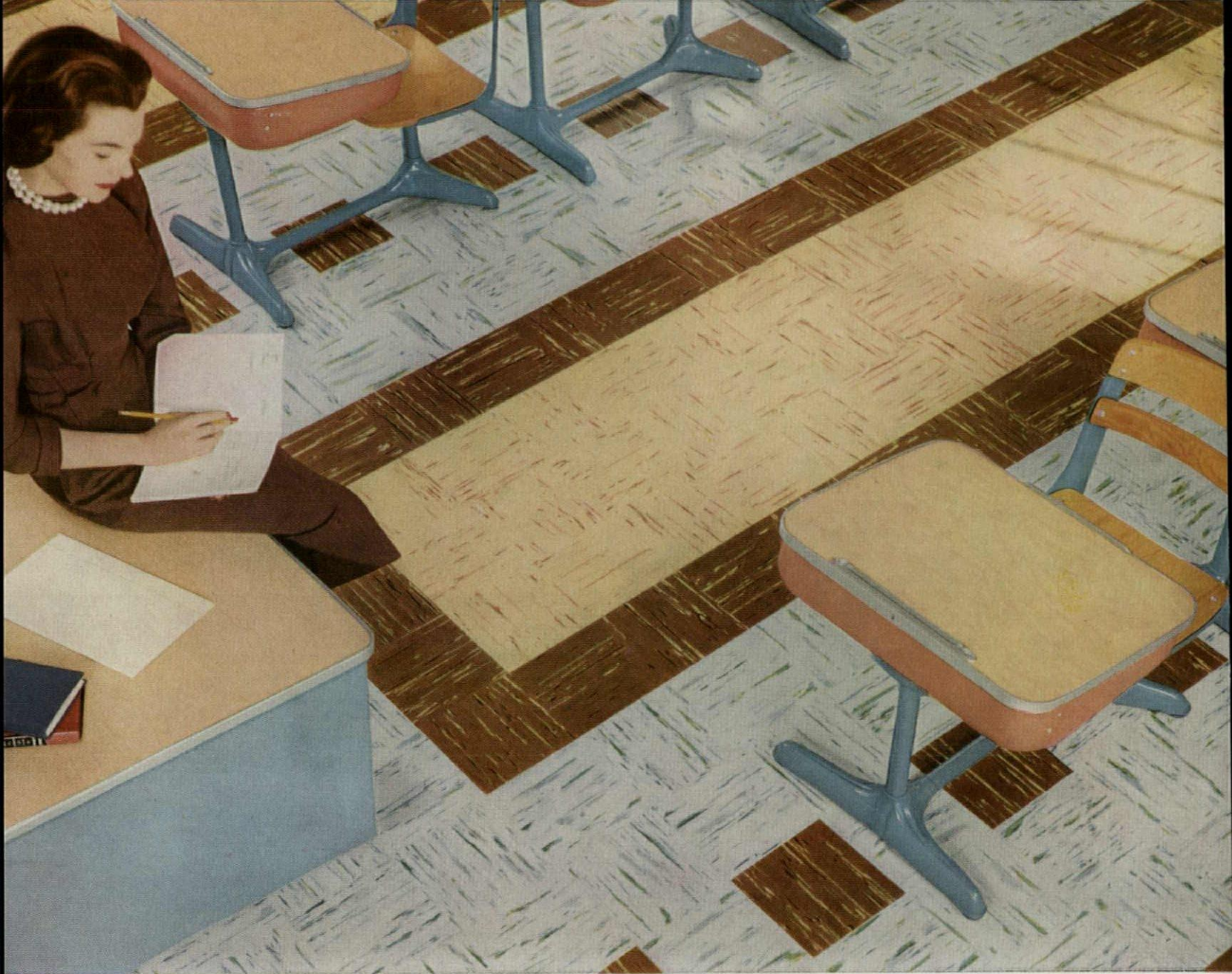
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PROFITABLE

Forum:

I have read "Architecture at a Profit" (FORUM, Sept. '57) and have the magazine on my desk to read it a second time. More of these articles would certainly be appreciated by our office. And if more architects would approach their work from a business point of view, the profession of architecture would be more stabilized.

W. H. TUSLER

*Magney, Tusler & Setter, architects and engineers
Minneapolis, Minn.*

Forum:

I congratulate you on the lucid treatment of the subject, and Perkins & Will on their good sense in furnishing you the information. Most architects, I find, have a tendency to veil their operations in a thick mist of perfectly useless secrecy.

T. TRIP RUSSELL, architect
Miami, Fla.

Forum:

I have admired Perkins' & Will's work for many years and really enjoyed your look "inside." So will other architects.

I certainly hope you continue this kind of objective reporting on other colleagues in the future.

W. L. PEREIRA, architect
*Pereira & Luckman
Los Angeles, Calif.*

Forum:

... most interesting and informative. I hope you will continue your intimate business reports.

W. G. LYLES
*Lyles, Bissett, Carlisle & Wolfe,
architects and engineers
Columbia, S.C.*

INTERBAU

Forum:

When reading your excellent September issue, I was shocked to find the flippant report on the "Interbau-Exhibition" in Berlin. The presentation of the enterprise as a "happy free-for-all" is completely misleading, as all buildings have been erected under the strict auspices of the "Soziale Wohnungsfuersorge" (Public Housing Program) with its formidable price ceilings, so that the architects could by no means indulge in untried experiments within the meager appropriation. That this restriction did not lead to a dull and humdrum result is much to the credit of the participating architects who strained

all their resources to produce high-standard housing for the average family.

Where in the US is such a display of attractive housing for what amounts to a rent of \$25 to \$30 a week for a four-room apartment with kitchen and bath? What other country has had the courage and imagination to invite such a prominent group of internationally known architects to participate alongside the best German architects in such a large-scale venture?

To be sure, I am far from happy myself about the planning approach of the whole. But when a city like Berlin, saddled with postwar reconstruction and rehabilitation problems that stagger the imagination, goes ahead to give a tremendous boost to confident, optimistic housing projects like the "Interbau," then she deserves respect and applause in spite of the shortcomings.

WALTER GROPIUS, FAIA
Cambridge, Mass.

FICTITIOUS

Forum:

I believe that your editorial about fictitious architects (FORUM, July '57) forgot one of the most famous architects of all time: O'Neill's the Great God Brown. In the play of the same name, he is the central character. I submit he is worthy of a great deal of your respect.

CHARLES LORD
Grosse Pointe Farms, Mich.

■ As a literary figure, yes.—ED.

METROPOLITAN

Forum:

Your article on metropolitan planning (FORUM, Aug. '57) was a model of clarity and incisive writing. It is just what has been needed for a long time.

IRA S. ROBBINS
*Citizens Housing and Planning Council
New York, N.Y.*

Forum:

How did FORUM ever fall into the pretentious malapropism of "metropoli"? Let's say metropolises and let it go at that.

ALBERT MAYER
*Mayer, Whittlesey & Glass, architects
New York, N.Y.*

Forum:

Congratulations on your fine article on metropolitan government.

It could not be more timely for us in
continued on p. 98



Another architectural achievement using Altec Lansing

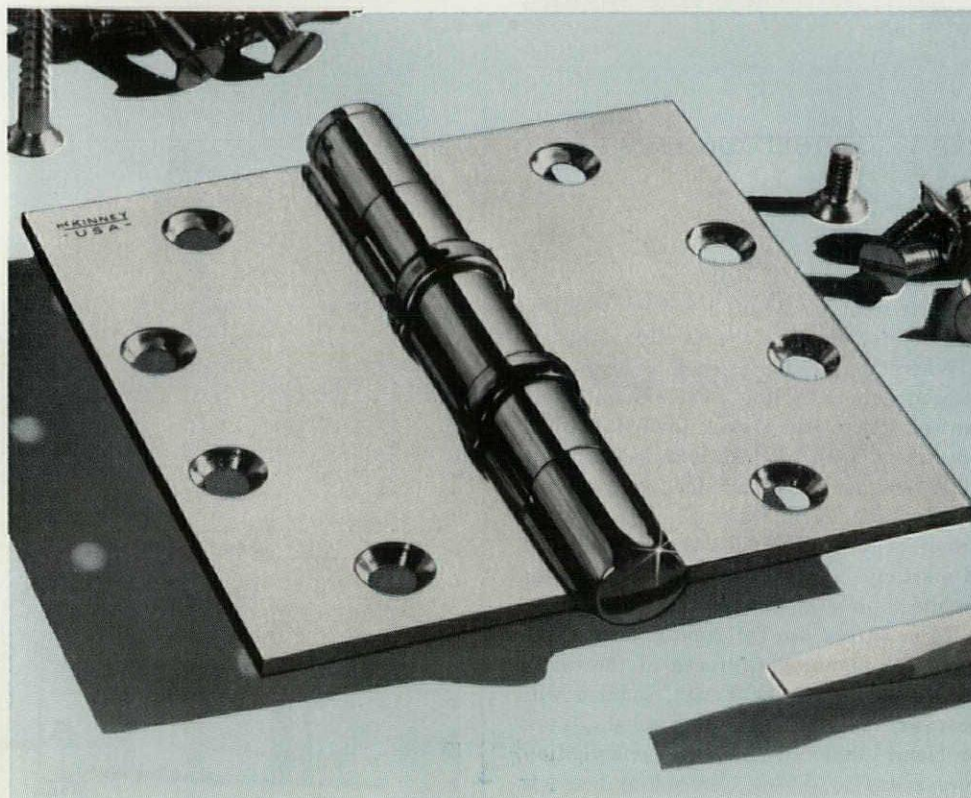
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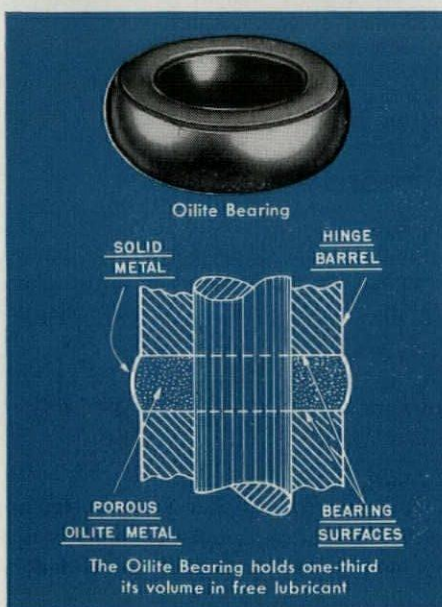
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the Denver area. You will be amused to find out how we were precipitated into the big issue. We adopted a municipal income tax, which taps the earnings of fringe residents and which motivated the suburban commissioners to declare themselves in favor of some metropolitan form of government (in order to recover somehow the benefit of metropolitan taxation). Strangely enough, only the tax issue could excite such interest, even though the amount of money is relatively small compared to all the other changes implied in reorganization. For years a few technicians in planning and engineering have been studying and proposing reorganization to little avail; then this tax issue came along and turned the tables.

GEORGE NEZ, *director of planning City and County of Denver Denver, Col.*

Forum:

To me the idea of a state's performing what are essentially local functions is as undemocratic as is the resultant proliferation of agencies.

An independent metropolitan authority can, I admit, be very high and mighty, particularly if it is made up of outsiders appointed by the governor. But at least it is primarily concerned with the area it serves whereas a state agency not only lacks adequate local representation but also is concerned with the whole state.

A state agency is dependent for appropriations on a legislature which is usually dominated by rural or small-town people. Only in a few small, highly urbanized states do the legislators understand or care about metropolitan problems.

What the states can and should do in my opinion is to revive the state planning function. Part of the state planning job would be to delimit metropolitan areas and other socio-economic regions. More important, the state could tie together the parts of the urban string and provide the integration with rural areas which a metropolitan agency finds difficult to do.

T. LEDYARD BLAKEMAN, *planning consultant Cataumet, Mass.*

Forum:

I have read your article "Metropolitan Government" with a great deal of interest.

I agree that a "fourth layer" of government, while theoretically undesirable, is practically the only way we can obtain the political machinery necessary to deal with metropolitan area problems.

One of the most frustrating things about the whole matter is the enormous amount of political lag found at upper levels of government. Action does not seem to be forthcoming until the case is critical.

continued on p. 100

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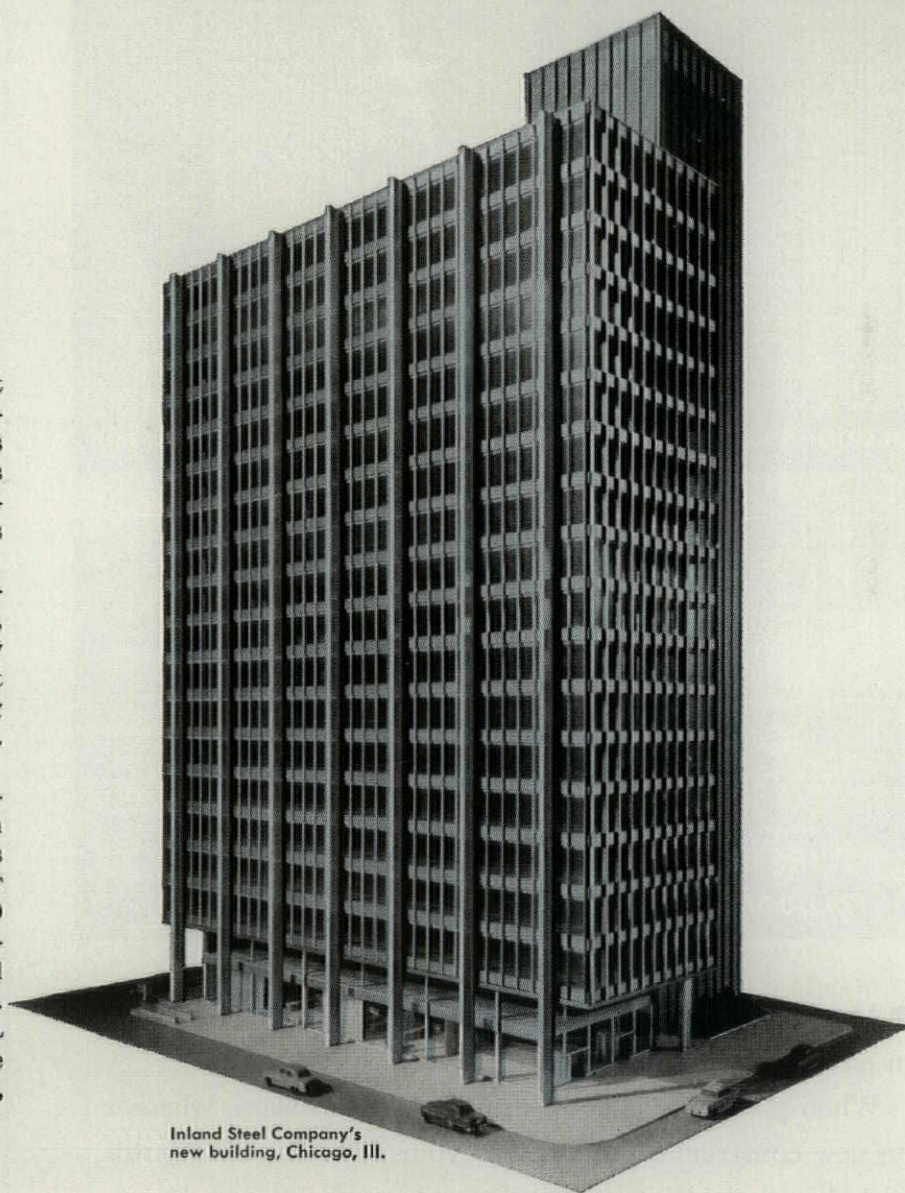
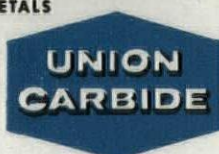
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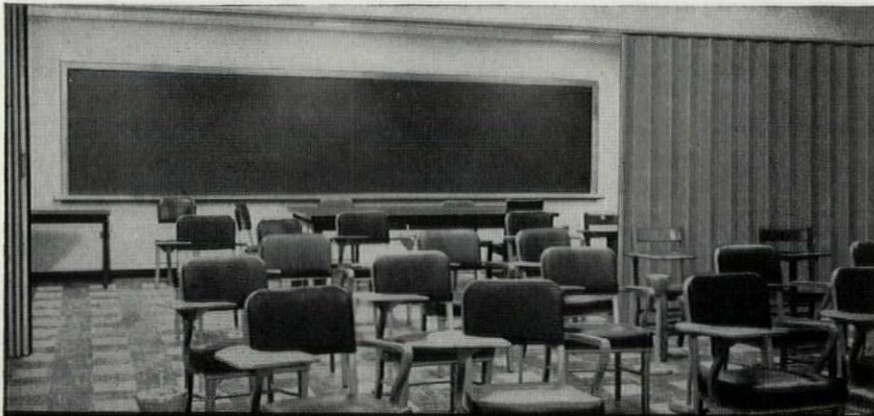
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THE SMARTEST THING IN DOORS

Some, but not all, of this is due, I think, to the preponderance of rural representation both in state and federal governments.

It might be worth-while to take again to the US Supreme Court the question of whether the malapportionment of legislative and congressional districts within a state without regard to compactness of territory and approximate equality of population violates the "equal protection of the laws" clause of the 14th Amendment. In *Colegrove v. Green*, 328 U.S. 549, the Supreme Court in 1946, by a four to three vote, refused to entertain jurisdiction of a bill in equity brought to set aside the re-districting of congressional districts in Illinois on this ground. Of the judges still on the court when *Colegrove* was decided, Frankfurter and Burton were with the majority; Black and Douglas dissented. It might well be that the new members of the court, Chief Justice Warren and Judges Clark, Harlan, Brennan and Whitaker, might take a different view. It might also be argued that state statutes which gerrymander legislative election districts violate the requirements of Article 4, Section IV of the Federal Constitution under which the US guarantees to each state a republican form of government.

You have made a real contribution to the discussion of a knotty problem. We must keep attacking that problem until it is solved, probably in many different ways in many different areas. The alternative would be a breakdown of civilized living in America.

JOSEPH S. CLARK, senator
Pennsylvania

■ FORUM readers may purchase reprints of "Metropolitan Government," while they last, for 20¢ each.—ED.

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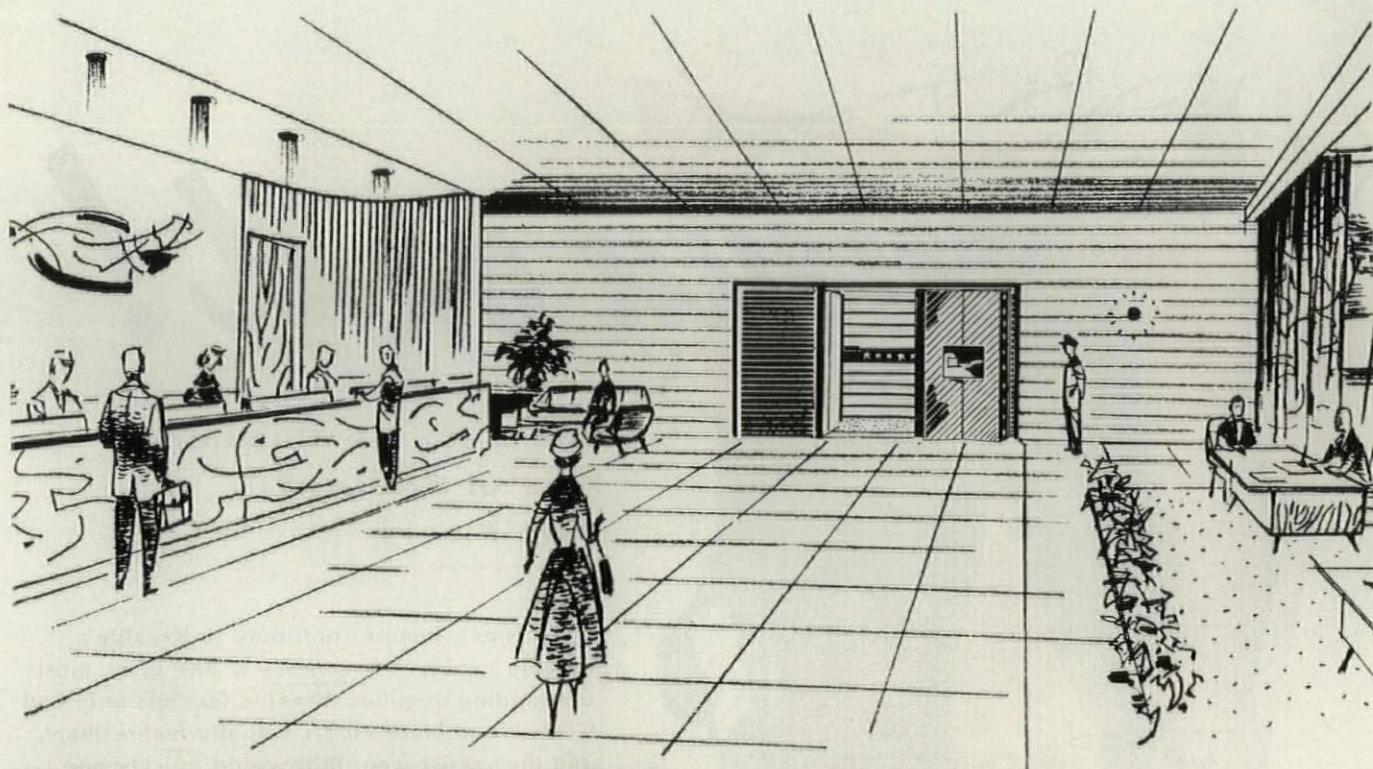
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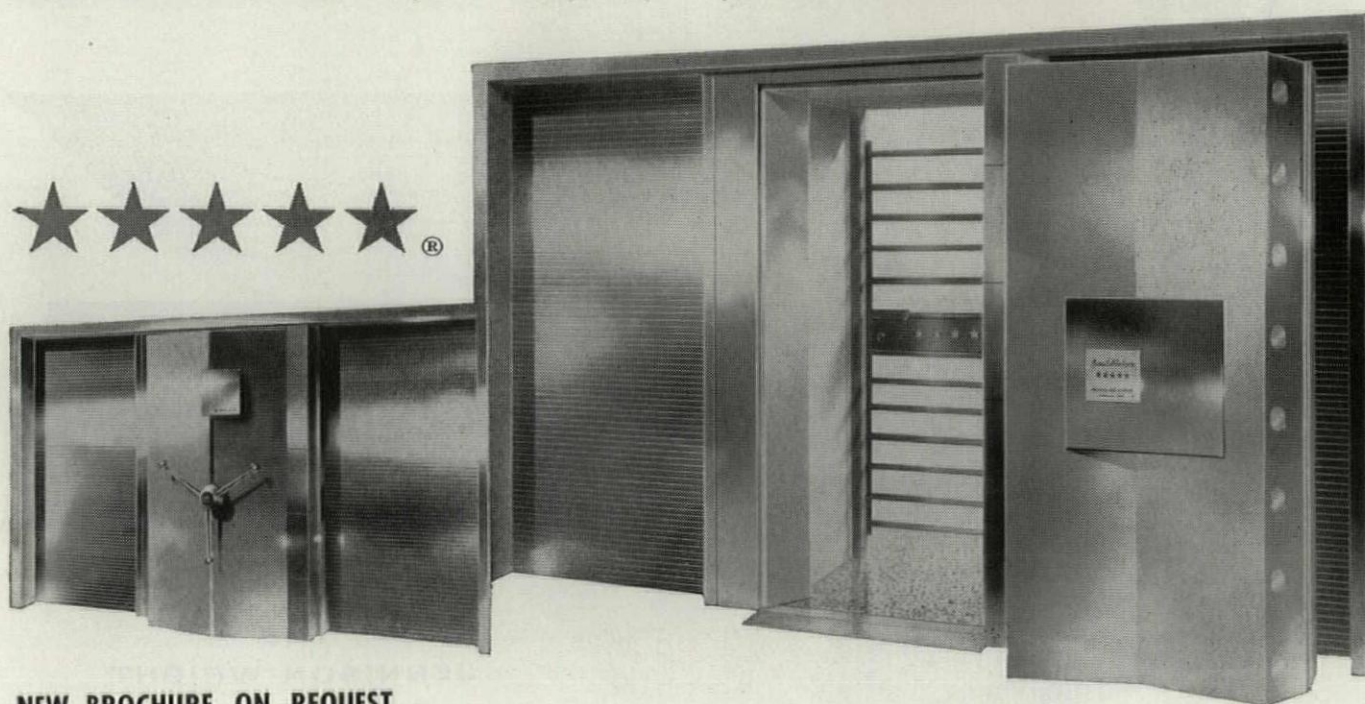
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Alexander Robinson joins Capital plan commission; Paul Nelson to teach at Pratt Institute



ROBINSON

TROUT-WARE

To his own considerable "surprise," retired Cleveland Architect **Alexander C. Robinson 3rd**, 66, was appointed by President Eisenhower in September to a six-year term as a member of the National Capital Planning Commission in Washington. He succeeds Chicagoan **Joseph D. Lohman**, whose term expired April 30.

Robinson, who was chairman of the committee for the AIA centennial convention in Washington last May, met NCPC Chairman **Harland Bartholomew** on that occasion for the first time. His civic and planning activity has included membership on the Cuyahoga County (Ohio) Planning Commission from 1934 to 1946. He was graduated from Princeton in 1914, from the Columbia University School of Architecture in 1917. From 1920 until he retired last January he was a member of Garfield, Harris, Robinson & Shafer, who also included **Abram Garfield**, architect son of President Garfield. Robinson also has served as national AIA secretary, chancellor of its College of Fellows, and chairman of this year's Jury of Fellows. Last month he also became the first nominee for AIA president in the election to be held during the 1958 convention in Cleveland next July. Four chapters—Cleveland, Cincinnati, Eastern Ohio and West Virginia—nominated him to succeed **Leon Chatelain Jr.**, of Washington, now serving his second term.

ON AND OFF CAMPUS



NELSON

LIFE: EDDY VAN DER VEEN

Starting to teach at the age of 62, Architect **Paul Nelson** has joined Pratt Institute, Brooklyn, as Visiting Professor for the current term. Now in the US on a \$10,000 fellowship of the Graham Foundation, of Chicago (AF, Feb. '57), Nelson has done most of his work in France, where he is best known for his Health City, in Lille, and the new Memorial Hospital opened last year in Saint-Lô. His "suspended house" model, based on his prefabricated housing research studies in the thirties, is on permanent exhibition in New York's Museum of Modern Art.

At the University of Michigan, **Wells Bennett**, 69, retired as professor of architecture and dean of the College of Architecture and Design, and was succeeded by

New York Architect **Philip N. Youtz**, inventor of the Youtz-Slick lift-slab process. Bennett, who will travel for several years (wants to study at first hand the New Towns in England, and rebuilding in Italy with special reference to traffic and parking problems), joined the University of Michigan in 1912 as an instructor in the college, was named dean in 1938.

Columbia University appointed **Jan Hird Pokorny** as Associate in Architecture, in charge of evening classes in the School of Architecture, succeeding the late **Bruno Funaro**. Pokorny has been an assistant and visiting critic at the school intermittently since 1941, and in 1955 received an AIA Award of Merit for his student union building and library at Centenary Junior College, Hackettstown, N.J. (AF, Mar. '55). Columbia also appointed Prof. **Kenneth A. Smith**, over 20 years on its staff, as the school's assistant dean.

On a sabbatical leave as head of the Department of Architecture at Pennsylvania State University, **Milton S. Osborne** is serving as acting director of the School of Architecture at the University of Toronto.



HELDENFELS

SAINT GOLD

ELECTED: Corpus Christian **Fred W. Heldenfels Jr.**, former president of the AGC Texas branch and member of one of that state's leading highway contracting firms, nominated (tantamount to election) to be national president of AGC for 1958, to succeed **Lester C. Rogers**, of Chicago; **Louis R. Howson**, of Chicago, former president of the American Water Works Assn., installed last month as president of ASCE, succeeding **Mason G. Lockwood**, of Houston; **Marcus S. Carlson**, building officer for Alameda County, Calif., elected

continued on p. 105



*Edgemont
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Town of Greenburgh,
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*Architect: Warren H. Ashley
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president of the International Conference of Building Officials; **Robert B. Pamplin**, advanced from executive vice president to president of the Georgia-Pacific Corp., succeeding founder **Owen R. Cheatham**, who will continue as chairman and chief executive officer of this \$200 million plywood, lumber and wood products firm; **Everett W. Smith**, vice president of Owens-Corning Fiberglas, elected president of the National Mineral Wool Assn.; **Thomas K. Creal**, former owner of the Paramount Furniture Co., Warren, Pa., since 1952 vice president of Faneher Furniture Co., elected 1957-58 president of the National Assn. of Furniture Manufacturers.

NAMED: **Karl S. Brown**, market analyst, writer and former assistant to HHFA administrator **Albert M. Cole**, appointed by Urban Renewal Commissioner **Richard L. Steiner** to the new post of Director of Public Affairs to help answer a constantly growing demand from all quarters for information on the federal rehabilitation, slum clearance and redevelopment program; former Republican Congressman **Jesse P. Wolcott**, of Michigan, who was in charge of housing and redevelopment legislation for many years on the House Banking and Currency Committee, appointed as a member of the Federal Deposit Insurance Corp.; Architect **Raymond C. Ovresat**, formerly of the Perkins & Will office, named to the newly created position of Executive Director of the AIA Chicago chapter, and editor of its new magazine *Inland Architect*; New York Architect **William Lescaze**, born in Geneva but now a naturalized US citizen, named to design a new Chancellery building for the Swiss government in Washington, D.C.; **Arthur D. Cole**, appointed as executive secretary of the new International Council of Shopping Centers, which has established headquarters at 165 E. 72d St., New York City.

HONORS AND AWARDS

At the Biennial Exhibition of Modern Arts in São Paulo, Brazil, New York Sculptor **Seymour Lipton** was awarded the top acquisition prize of 100,000 cruzeiros (about \$5,440 at the official exchange rate, or \$1,260 at the free rate). No São Paulo first award for architecture was made this year, but Brazil's **Salvador Candia** won 50,000 cruzeiros for his plans for a 16-story São Paulo apartment building, and Italian Architects **Gian Antonio Bernasconi**, **Annibale Focchi** and **Marcello Nizoli** received a similar award for the

Olivetti Headquarters building in Milan (AF, Oct. '55).

The 1957 Frank P. Brown Medal of the Franklin Institute of Philadelphia has been won by Italy's Architect-Engineer **Pier Luigi Nervi**, "a man who has defied the accepted concepts of reinforced concrete construction and has produced a wide range of unique yet architecturally sound reinforced structures over the past 25 years."

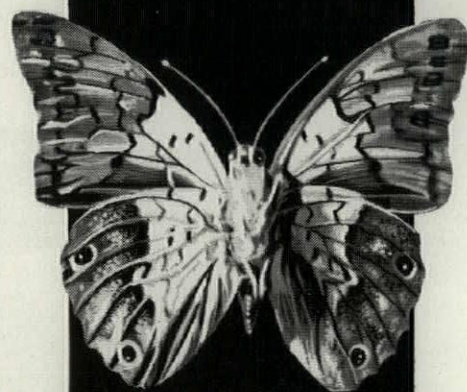
Five building industry leaders have been chosen to receive the annual modular measure awards of the American Standards Assn.: for design, Architect **John R. Magney**, Minneapolis; for education, **William Demarest**, now with the Manufacturing Chemists' Assn., Washington; for production of modular products, **Neill Boldrick**, vice president, Acme Brick Co., Fort Worth; for construction procedures, Builder **Andrew Place** of South Bend, Ind.; and for promotion, **P. I. Prentice**, editor and publisher, HOUSE & HOME.



COBO

DIED: Mayor **Albert E. Cobo**, 63, who played a major role in Detroit's rejuvenation by pushing its \$112 million civic center redevelopment and its pioneering \$195 million central city expressway system, former president of the American Municipal Assn. and a trustee of the US Conference of Mayors, Sept. 12 in Detroit, after a heart attack; **Theodore E. Mueller**, 72, former president and board chairman of American Radiator & Standard Sanitary Corp., Sept. 24 in Louisville, Ky.; Industrial Realtor **Joseph J. Garibaldi**, 67, former director of the Thompson-Starrett Construction Corp., of New York, Sept. 15 in Orange, N.J.; **O. A. (Tom) Kroos**, 76, executive vice president of the Kohler Co. since 1940 and former chairman of the Enameled, Cast Iron Plumbing Fixtures Assn., Sept. 3 at Land O'Lakes, Wis.; retired Washington, D.C., Building Contractor **Samuel J. Prescott**, 90, former president of the Washington Board of Trade, the Master Builders Assn. and the Builders and Manufacturers Exchange, Aug. 31 in Washington; Architect **Christian H. Ziegler**, 76, hospital designer and former commissioner of the Jersey City and New Jersey State Housing Authorities, Aug. 31 in Jersey City.

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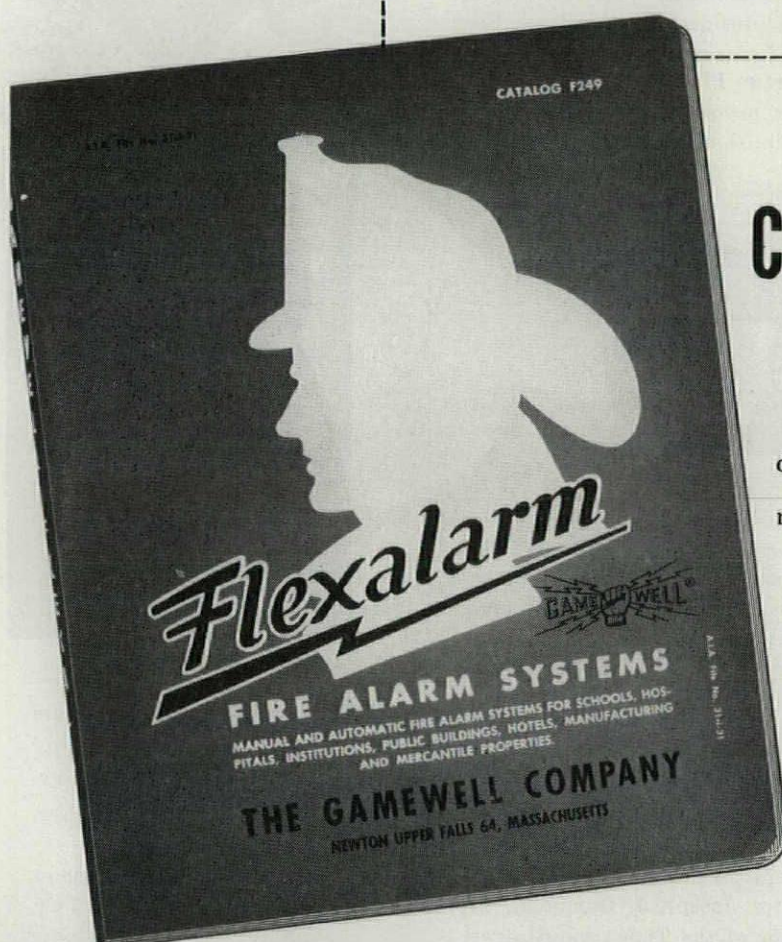
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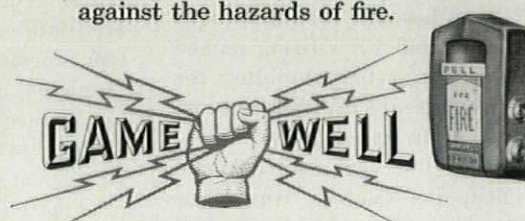
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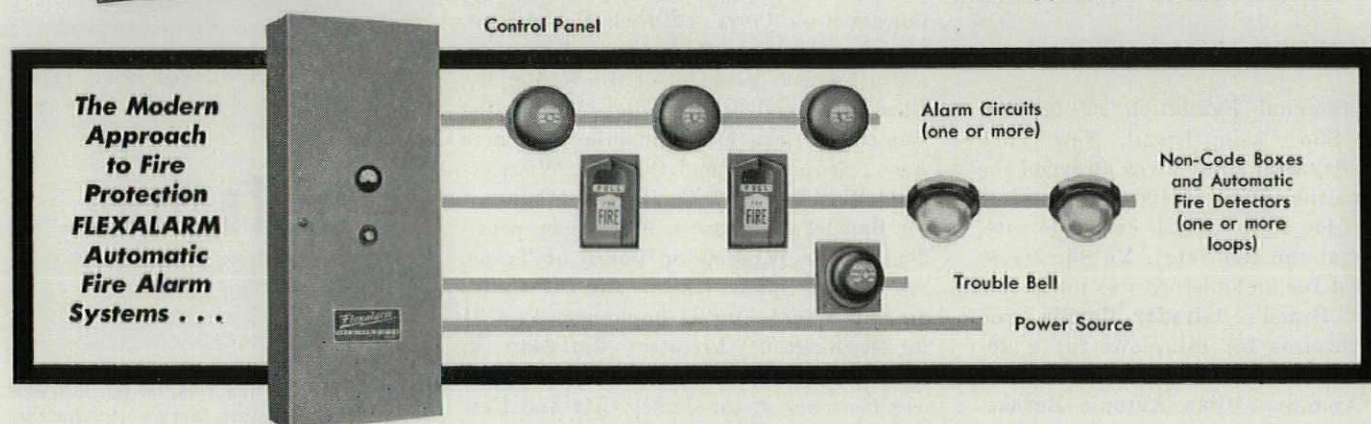


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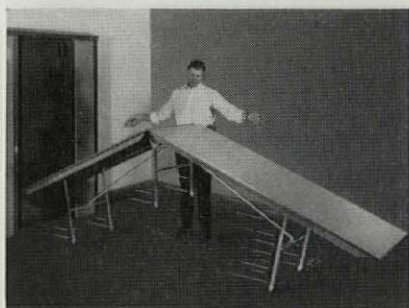
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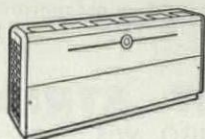


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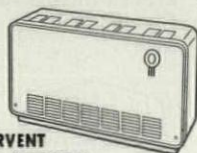
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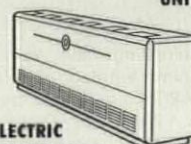
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Editorial

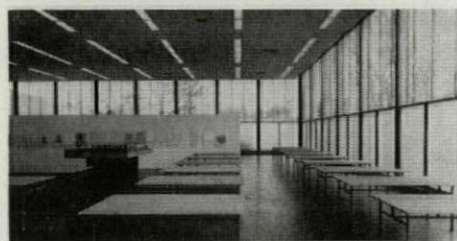
The new image of architecture

A fantastically fast film put out by the Eastman Kodak Co. helps explain the way architectural photography is going. Pictures of buildings are rapidly beginning to be populated with people. This is becoming possible because the new films help to eliminate the enforced choice between photographing "action" (which happens fast, and usually in a single plane) or photographing "views" (which stand still but have to be sharply drawn in depth). The new film is so "fast" that normal

human movement, at 1/25 second, can be snapped even in an average courtroom and without special lights if the right equipment is used; if the photographer has lights, the people can be allowed to move naturally through a much deeper space, which can all be sharply pictured; the space itself can be shown and still the people don't have to "freeze." (The "index" of 1600 for the film tells the technical story.)

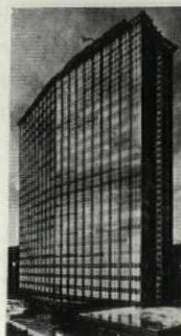
In part, however, the change in architectural pictures comes out of a new viewpoint rather than a new technique. The people are wanted in the picture not only because the camera can now more easily get them there but because many of us are so tired of architecture as an abstraction. We want to see it as a setting, a setting for people. Architecture is a unique kind of art which is not complete in itself; it has to be occupied.

Then again there is a new tendency in architectural photographs to show the building not by itself but in its setting. Again, this is a different way of seeing. The building



Mies van der Rohe's Crown Hall at Illinois Tech: without people it is a composition; with people, a setting.

BC Electric building: without entourage it looks as if it were in New York City; with entourage, it is where it belongs, in Vancouver. Architects: Thompson, Berwick & Pratt.



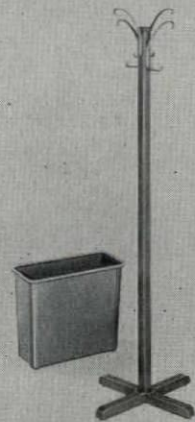
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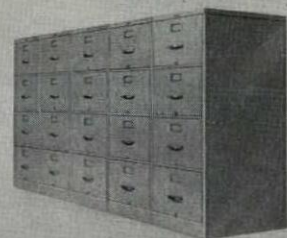


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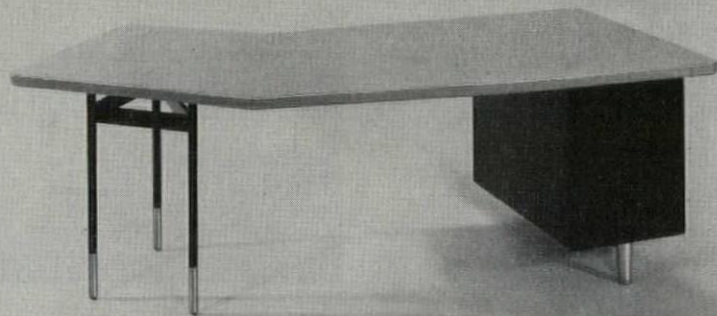
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is no longer a separate event, with a life all its own; it is noted among its neighbor buildings, accidental as these may be in the modern city. Not until we start opening our eyes—eyes which have not been looking—can we start building the new, finer, more beautiful city, because not until then will we be alert to its great variety of combinations, actual or hinted. Quite naturally, FORUM being especially concerned with cities has been concerned with this.

These two major developments—the candid inclusion of people in the building, and the inclusion of more of the environment that surrounds the building—may not be the only

changes in architectural photos, but they are the important ones.

How differently the same building will be seen by different picture makers is an endlessly amusing experience offering ever fresh insights.

Here for example is a view inside a church in Mexico City designed by Felix Candela. Many people have commented on the remarkable similarity of these views to pictures by Cézanne, the nineteenth-century French painter. But a postcard photographer goes into the room, and lo it becomes a childlike "primitive." The feast for the eye in any good piece of architecture is ever changing; that's part of the joy of it.

real questions about the "standard rental housing" that has absorbed nearly 33% of those that were relocated. Given the fact that the majority of these families are low income and nonwhite, it seems unlikely that they could have moved into suburban areas, or into more desirable urban—meaning higher rental—quarters. Most likely, they moved into slum areas adjoining the slums to be cleared.

Federal aids for relocation have so far worked badly or not at all. Public housing has absorbed many such families, some of them unwillingly, and is certainly better than rehousing them in slums. But public housing's own problems (AF, May, June '57) make it obvious that it is not the final answer to relocation.

Section 221 of the National Housing Act was passed in 1954 to aid private redevelopers to build rental housing specifically for relocation families. But no multifamily housing has yet been built under this provision. It has been an abject failure in relocation.

Making the problem still more acute is the fact that few, if any, displaced families will be able to relocate in their old neighborhoods. Rents in new housing built on urban renewal sites are far beyond the reach of most of them.

Many localities have done an excellent job in relocating their displaced families. The federal government has done too little. By next year at the latest, Congress should enact a workable program to make relocation housing a feasible undertaking for either public or private enterprise, or both. Meanwhile, many localities should make still greater efforts to rehouse families torn from slum areas. There are no people more deserving of aid right now. If we as a nation could afford to help house, clothe and feed millions of displaced persons throughout the world after World War II, we should be able to provide some decent housing for our own DP's.



In Lang's photo, like Cézanne . . .

in postcard, like a primitive.

America's DP's

Every working day, some American families in some American cities—or urban fringes—are being pushed out of their homes. Mostly, they are pushed out of substandard slum dwellings that will be demolished to make way for something better. Sometimes, they are moved because of a new highway, or public building, or some other reason of the public good.

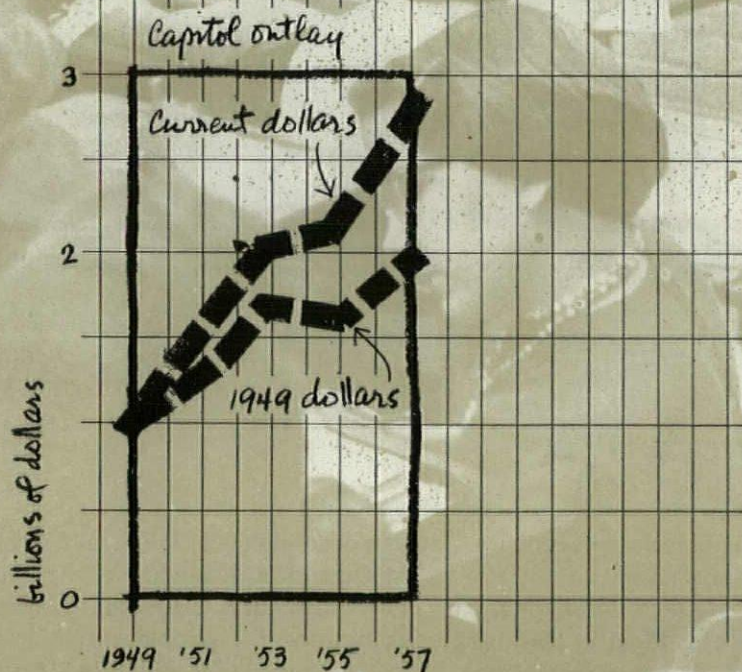
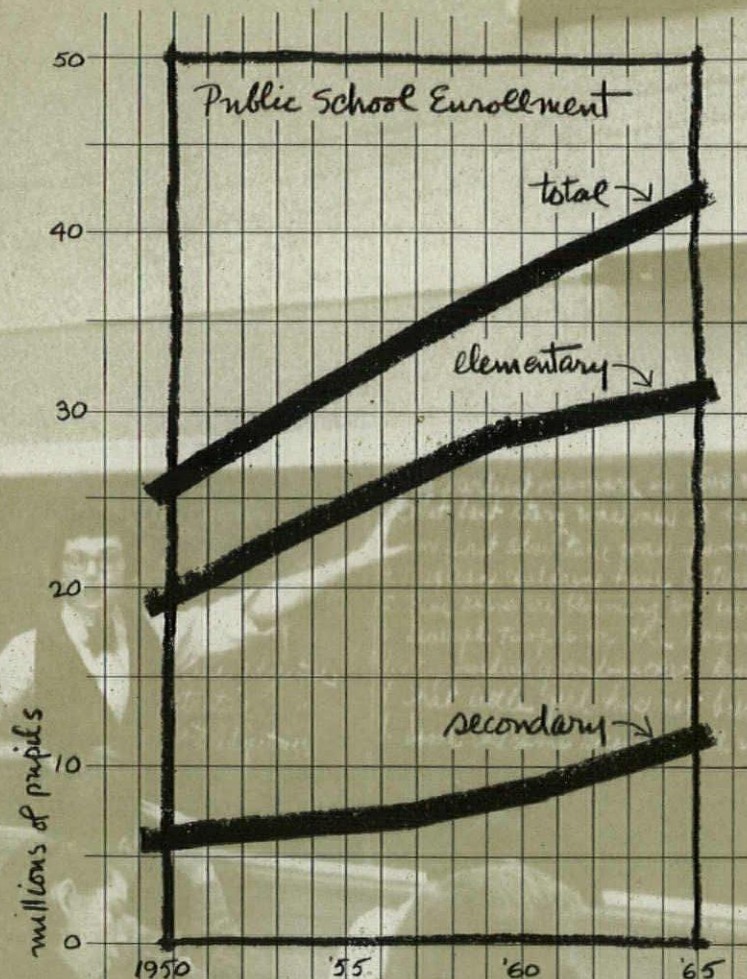
Urban renewal is the biggest uprooter of families. It has already displaced more than 40,000 families, and another 120,000 are still to be moved from areas that have been approved for federal aid but haven't

yet been cleared. The great majority of these families are low income and nonwhite, and both these elements compound the problem.

Of the 40,000 displaced families, the URA says over 80%, or around 33,500, have been rehoused. Over one-fourth of these have gone into public housing. Nearly one-third have moved into what the local agencies call "standard rental housing." About 12% have been able to buy homes.

This leaves over 20% of all families in these areas either unrelocated or rehoused in substandard housing. And, there are some very

Schools for teen-agers



The challenge: school enrollment continues upward but the curve for kindergarten through Grade 8 will slow down until 1965 (thereafter likely leaping again); meantime the curve for Grades 9 to 12 is now beginning to mount (upper chart). The number of new classrooms (not shown) constructed annually has increased fairly steadily from 25,000 in 1948-49 to 69,000 this year, up 176%. Meantime capital outlay, measured in constant (uninflated) dollars, has increased only 86% (lower chart).

Sources: US Office of Education; *Engineering News Record* (Construction Cost Index); US Bureau of Census.

Obligations for 1958

The great American fact of life is the birth rate—continued high.

This year 1.2 million more children are in public elementary and secondary schools than last year. And by the time today's three-year-olds enter first grade in 1960, we may expect still another 4 million additional pupils, scrubbed, combed and on hand to be provided for. The children are here, more are coming; there can be no question of the responsibility to educate them. Nor any question that the responsibility cuts right across the board—from educational, architectural or administrative specialists to the great body of taxpayers.

Against the background of overall responsibility for meeting huge and increasing enrollments, two specific problems arising out of the birth rate loom especially large:

► How do we plan and design for teen-agers?

► How do we conquer the school cost problem?

Planning for teen-agers is of urgency because the great postwar wave of babies, which swept into the elementary schools in 1950, is now sweeping upon the secondary schools. The 7.4 million students in grades 9 through 12 this year represent a 7.6% increase over last year, whereas the 26 million children in kindergarten through eighth grade represent a 2.9% increase over last year. The youngsters making up

that 7.6% increase in teen-age students are but the verge of a steadily rising torrent to follow. In short, a disproportionately high percentage of enrollment increase is now hitting the high schools and will continue to do so, with the junior colleges next. (In the mid-1960's, the elementary schools will get their second shock wave, as the postwar babies begin sending *their* babies to school.) The teen-age design problem is acute also because this great urgency of demand happens to coincide with drastically changing educational and architectural concepts about the high school and its nature.

On costs, there are now other things to be reported than the important but oft-told tales of how to cut school building costs. If the reader will dig out FORUM for Oct. '53, he will find the exhaustive suggestions for economy made there are still valid and still cover most of the ground.

In 1957-58, another critical and more mysterious question is: How do we finance schools? And, related to that question: How do we measure school costs, and compare costs among schools meaningfully? With cost of money high, and resistance to new school bond issues high also in many districts, these questions are vital. How *not* to deal with the question of school costs is equally important because the entire subject of cost comparison is at present in

such confusion (some of it deliberately induced), it is needlessly hampering the big job to be done.

There is no means of wishing away the truth—the job is big, bigger than the effort thus far. The estimated 69,000 classrooms to be added in 1957-58 represents the best annual showing yet, but this will do little more than meet the additional 45,000 classrooms needed for this one year's increase in enrollment plus one year's replacement of 20,000 classrooms put out of service by fire or obsolescence. Thus, new construction will make only a 4,000-classroom dent in the 159,000-classroom shortage accumulated during the depression and war. At this rate of progress, that shortage, with all its dismal consequences of half-day sessions, unwieldy classes and make-shift space, will take 40 years to overcome!

Arising not out of the birth rate, but out of historical development, comes still another great issue: the issue of schools for everybody, for people with dark skins as well as light ones. It is time to examine the effects of desegregation on school building.

This 1957 special issue on schools is thus devoted to the most urgent problems now facing those who must somehow meet the inescapable responsibility for providing schools adequate to a responsible nation with a self-governing population.

That "Reader's Digest" article

Lest it dupe unsuspecting school boards, here is a critique of the article itself and a fuller account of the 16 buildings it praised and panned

In September, *Reader's Digest* published an article called "Do School Pupils Need Costly Palaces?"

This article, by a *Digest* staff writer, Holman Harvey, charges widespread extravagance in school construction. It further implies—indeed this seems to be the point of the article—that current school taxes are exorbitant and if the money were only properly used instead of being squandered on palaces, it could overcome the classroom shortage and raise teachers' pay.

The *Digest* creates the impression of a lonely and beleaguered little group of architects and educators putting across economies here and there—while the great majority of school districts and taxpayers are duped by "a powerful group of educators styled 'liberal' or 'modern' [which] is preying on school boards in thousands of communities."

Buttressed by figures which sound convincing—\$80,000 per classroom or \$7.24 per sq. ft. or the like—the article reads fast and plausibly. So plausibly, that it is being widely used as gospel truth by worried taxpayers, trustful school-board members, self-interested manufacturers, and opponents of school bond issues.

It is good to remind the public, as the *Digest* does, that classrooms are short and teachers ill paid; it is also useful to acquaint the public, as the *Digest* does, with widely practiced economies in schoolhouse construction. But the *Digest's* remedy (cut out "luxury") for the classroom shortage is so disconnected from reality, and its discussion of economies is so indiscriminating, that the article can only set back attempts

to overcome the school shortage and to aid communities in getting their money's worth for every school dollar spent.

FORUM, therefore, feels obligated to set the record straight.

The *Digest's* thesis, as we shall see, is mistaken. And its plausibility rests on figures that are often incorrect, or only partly correct, or misapplied; some points rest on misleading comparisons and some involve quotations taken out of context.

On the following pages the specific schools cited by the *Digest* are pictured and discussed. Those cited for extravagance were not identified in the *Digest* article, and Author Harvey and the *Digest* now prefer not to name them. But in the majority of cases it has been possible to identify these schools with a considerable degree of certainty, either by tracking down the person who gave Harvey the reference, or by pinpointing the only school in a named area to which the accusation seems to have relevance.

The *Digest's* case for extravagance in school building proves to be a very thin one. Here is what its nine specific examples of wasteful or extravagant schools amount to:

▶ Three are not in accord with the facts.

▶ One has some truth, but it is exaggerated and then used to fix responsibility where it does not belong.

▶ Two are unidentifiable; of these one would appear to be an example of thrift; the other a freak.

▶ One is true as far as it goes, but

the omissions could make the difference between seemingly indefensible folly and reasonable judgment.

▶ The remaining two, although given two different geographical locations, are actually one school. This is very interesting because most of the *Digest's* argument and logic rest on the existence of this one exceptional school, which the *Digest's* writer has made to appear as two, and hence, by implication, has multiplied into a trend. Without this school the *Digest* would hardly have had an article.

Exhibit A

This chief exhibit is Heathcote elementary school in Scarsdale, N.Y.

Heathcote is one of the finest and most complete public schools built in the US since the war (FORUM, Oct. '52 and July '54). Scarsdale, long noted for its excellent school system (including good pay for teachers), sets a high value on education and can afford fine schools. It is one of the richest suburbs, possibly the richest, in the nation. According to the May 1957 *Survey of Buying Power*, published by Sales Management, it has an average disposable family income of \$21,505. Scarsdale's Heathcote school is important to communities that have never heard of it by name for, like several other schools in wealthy suburbs, it has pioneered new ideas in design to fit new ideas in education. In Heathcote's case, the great advance was demonstration of the cluster plan of classroom organization. Because this device couples great opportunities for

economy with educational advantages, it has been adapted to many a hard-pressed community. From Connecticut to Texas, taxpayers and children are beneficiaries of ideas first demonstrated at Heathcote.

This value the *Digest* ignores, for it has another point to make. Immediately following a characterization of Heathcote, the *Digest* states: "While school funds are lavished on facilities befitting an exclusive club, America is in a desperate plight for sheer lack of classrooms."

If this statement means anything in its context, it means that money spent on special educational facilities in Scarsdale could have been better spent on plain classrooms in communities lacking them. This has a fine emotional and moral ring to it and it is the point on which the article's main argument swings.

The hard fact is that under local autonomy, which is the foundation of the American public school system, austerity in Scarsdale would not add one penny to the resources of any other school district. Inequality of resources among school districts and among whole states is so pressing a problem it has given rise to President Eisenhower's proposals for federal aid to education. How far inequalities should be resolved, and by what means, takes serious thought—not the pretense that funds are miraculously transferable from the rich to the poor on the basis of classroom needs, or that it is somehow depraved of the well-off to provide their children with the best schools they can. Does the *Digest* perhaps have a plan for sharing the wealth of Scarsdale, after income taxes, with Mississippi—or even with the school district next door to Scarsdale?

It is little wonder the *Digest's* case for "lavishness" and "costly palaces" is so thin and so dependent on one single suburb's good fortune and high standards. School building—not just here and there, but as a rule—is a prize US example of low costs of construction. Compared with 1925-26, also a period of prosperity, school building and rising population, school construction costs on a square-foot basis have only doubled. During the same period, house-building costs have tripled, and industrial-commercial costs have risen

175%. This remarkable school record has not been achieved, as the *Digest* would have it, by "a small group of economy minded specialists." It has been achieved by the hard work of massive numbers of architects, engineers, contractors, educators and school-board members. It has also been achieved, unfortunately, by a certain amount of penny-wise, pound-foolish compromise with quality, and for this reason the astonishingly low record on school costs is probably, in fact, already *too* low for optimum economy.

First costs only

Discussing economies, the *Digest* is no more consistent than in its discussion of "lavishness." There is a great story in economy of school design, but you do not find it in the *Digest*. What you find is a confused use of figures. These figures dwell on one item and one only—first cost. The first cost of a 15-year roof—an instance of what you get in a *Digest*-admired example—is indeed less than of a 20-year roof, but in the end, over the expected life of the building, better roofs are cheaper to the taxpayers. Window frames that must be kept painted are not considerate to taxpayers. But the *Digest* gives indiscriminate approbation to one school whose economy derives in part from high-maintenance materials and lack of amenity, to another whose economy derives largely from very clever design (ignored by the *Digest*) plus advantages of a warm climate (also ignored), and to a third pretty close to typical in cost and in quality. The reader is not told enough to know what represents valid economy, what does not, and what is customary.

Even more serious, the *Digest's* play with square-foot figures leaves quality of educational design and function wholly out of consideration. A school so skimmed in its classrooms that work in them is severely circumscribed may boast a low apparent cost if you omit to see what the money bought. Quality also has its intangibles: Is a school library which is oppressive, rather than inviting, to young readers a bargain at any cost? Does a school which visibly advertises cramped meanness of spirit render full value to

the community for the sacrifices it took to build it?

Even beyond these basic omissions, there is error. In one case, for example, a figure of \$11.82 per sq. ft. is lauded in a building in a campus-plan high school without any information that the costs per square foot of other buildings in the school group are \$22.85, \$11.73, \$12.63 and \$16.77, averaging \$13.83. The figure given is, of course, for one of the least expensive units of the school but since nothing is made of that vital fact, the effect is to cause trusting school boards elsewhere to cry: "What can be wrong with us!"

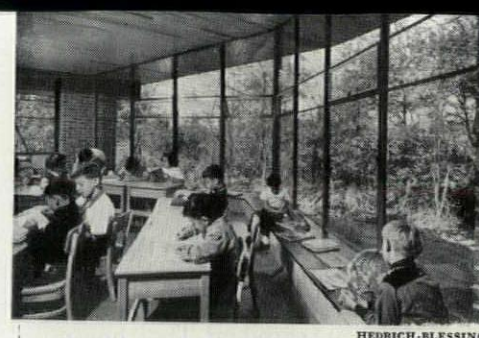
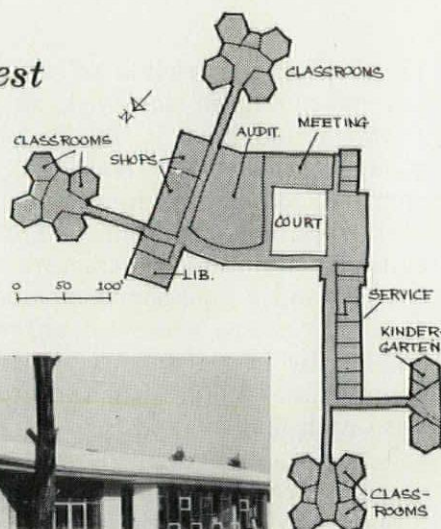
Costs per classroom are used just as misleadingly. For instance, Heathcote is tabbed as an \$80,000-per-classroom school (14 classrooms divided into the total cost) and this is specifically compared with a \$28,000-per-classroom school (again 14 classrooms divided into the total cost). No mention is made of classroom size nor of the fact that Heathcote happens to include eight other educational spaces of classroom-or-larger size. What other facilities the second school contains remains a mystery, for the reference is generalized and anonymous, although it sounds not unlike Ardsley school (p. 120), which has but two other educational spaces of classroom size or larger. Indeed, if a classroom is special in any way—such as a remedial reading room, manual training shop or music room—it counts no more in the *Digest's* figures than if it were a stair or so much excess corridor.

Apples and oranges

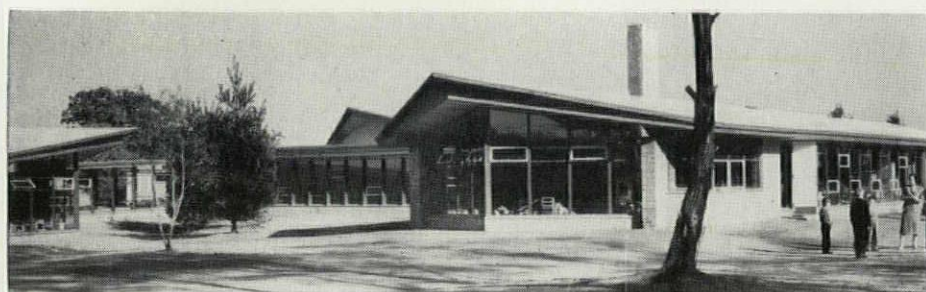
Comparative cost figures are useful only if they compare comparable things. Naturally school districts are interested, and they should be, in seeing how the buildings they have bought, or are thinking of buying, compare in value with what other districts are achieving. Such comparisons, if they are to mean anything, are extremely complex. If used without understanding of first costs, long-term costs, space efficiency and educational values bought, they can make School A look like more of a value than School B when in reality it is less. (For detailed

Text continued on p. 246
Case studies on pp. 118-121

These are the schools the *Digest* accused of waste



HEDRICH-BLESSING



HEDRICH-BLESSING

■ This comment in the *Digest* follows a description of a "\$28,000" per classroom school in New York State:

"Several days later I visited a second school not far distant. It also had 14 classrooms designed for 350 grade-school children. This school cost well over a million dollars, or around \$80,000 per classroom. One half of the entire space in the first school was devoted to actual teaching space—to classrooms. In school number two, less than 25% of the space was in its 14 classrooms. . . .

"Over one million dollars is being raised in one New England town to build, for children through 12 years of age, a school which will have only 14 classrooms—but will boast a large auditorium to which is attached a three-stage theater; a two-story-high gymnasium; a 'meeting room'; two kitchens in stainless steel; a library with an open fireplace and 'sprawl corner'; a teachers' smoking lounge, capacious quarters for the principal and his staff; a separate room for arts and crafts (which can be taught in any ordinary classroom); another for music instruction; a different one for piano alone.

"The children in this school will travel through long, glass-walled corridors and peer through colored panes so they may 'see the world in many colors.' Here they will find a school 'home away from home' and can 'curl up with a book' in the sprawl corner, at a cost to the taxpayers of over \$3,000 per child just to build the school. To maintain this palatial building will put a heavy burden on the taxpayers. There are a thousand or so windows to be washed, some 60,000 sq. ft. of floors to be scrubbed and waxed. Yet soon these same taxpayers will be called upon to build another school—this one doesn't have enough classrooms."

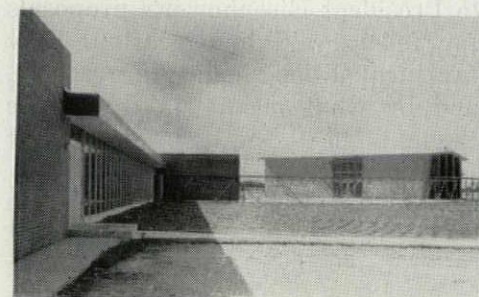
Both these seemingly separate references are probably to Heathcote School in Scarsdale, N.Y.; Perkins & Will, architects. It is misleading to characterize Heathcote in terms of 14 classrooms (and particularly for the *Digest* then to define classrooms as "actual teaching space"). Heathcote has eight other "actual teaching spaces," all very fully used, and these are sized for an expansion of eight classrooms.

The only reason Heathcote has 364 pupils, rather than more, is that it is Scarsdale's policy to keep classes small. Classrooms are sized to take 38 pupils if need be. Putting six special classroom-type spaces into regular classroom use, with full classes, could bring Heathcote's present capacity up to 760 pupils if necessary. Why Scarsdale does not need to pack Heathcote to "capacity," and the irrelevance of its small classes to the classroom shortage elsewhere, are explained on p. 116.

Heathcote's special facilities are "waste" only to the extent that special education in such subjects as music, shopwork and the arts represent "waste." In space efficiency, it is very respectable. Corridors, including the long glass ones to classroom clusters (enclosed because the cluster idea was so experimental at the time), come to 20% of space as compared with 26% for a conventional school with comparable facilities in the same community.

The *Digest*'s description is not very fair. What it refers to as a separate room for piano alone is, as the photo shows, a piano storage closet off the gym floor. The "three-stage theater" is the stage proper and its two unwalled wings, which represents an outright economy as well as an ingenious multipurpose design. Stainless steel is virtually standard in institutional kitchens today because it is a long-term

economy. The colored glass added less than \$600 to cost. And the last thing Heathcote is or will be is an undue maintenance burden to the taxpayers. It is built of high-quality, low-maintenance materials, chosen to last. There is nothing the least shoddy about materials, workmanship or equipment; custodial care, the only "maintenance" considered by the *Digest*, is also lessened because of the building's good quality materials and workmanship.

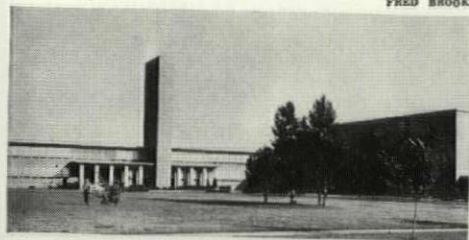


■ This comment follows a description of a school in Clearwater, Fla., costing \$224,000:

"A school in the same area and being built at the same time to the same requirements, cost \$298,000."

This reference is to the Madeira Beach elementary school, which was originally bid in Sept. 1956 at \$298,000, but was then revised, bid again in Dec. 1956, and built for \$241,635. The "requirements" were not the same for the two schools compared by the *Digest*. Madeira Beach has an especially difficult site (a gift) which required \$14,200 extra abnormal expenditure for fill and foundation, included in the general contract. Also the kitchen had to be sized and the "cafetorium" adapted for use in conjunction with a future junior high school.

FRED BROOKS



■ "A decorative false chimney containing 128,000 bricks—enough to build 12 good-sized classrooms!"

The school referred to is a 1950 high school in Salina, Kans. (a community notable, incidentally, for its conscientious attention to economies in school building). The architect reports the 52' chimney is not false; it is a ventilating tower with a purposely high air intake, and it contains dust filters and mechanical equipment. It could have been an eyesore; its design was calculated, instead, to enhance the building and the neighborhood. A 4,000 sq. ft. enclosure like this takes 28,000 face bricks, 86,000 back-up bricks, costs about as much as one classroom.

© EZRA STOLLER



■ "In a recently completed grade school for 350 children near White Plains, N.Y., I saw an immense two-story gymnasium large enough to accommodate three times that number; a spacious cafeteria used only at lunchtime; and three separate lounging rooms for fewer than 20 teachers, several of whom said they would rather have had a pay raise."

The reference is almost certainly to Ridgeway School in White Plains. Ridgeway was originally built in 1954 for 380 pupils with its general purpose facilities sized for expansion. In 1955, as planned, it was expanded to a capacity of 658 pupils. According to New York State requirements, a gymnasium for more than 375 children must be a minimum of 52' x 72' and divisible into two sections. The Ridgeway gym is 8' longer and 8' wider so it can accommodate adult groups evenings and week ends. At the time Ridgeway was built, the cafeteria doubled as an art room. Now, an art room having been

added in the classroom expansion, it doubles as music room. The school has two teacher rest rooms, one for men and one for women. At the request of the teachers, a workroom (apparently the *Digest's* third "lounge") was also provided, but it has been used instead as a remedial teaching room.

HARNEY KERR



■ "A new school in suburban Buffalo with a clock tower costing enough to build many classrooms. . . . Many architects still perch parapets and cupolas on school roofs; they parade Grecian pillars at entrances; build flights of entrance steps . . . and pile on ornamental stone 'trim.'"

The school referred to is probably Williamsville Central High School near Buffalo, built in 1949. According to the architect's detailed cost breakdown, the bell tower (not clock) cost \$11,700. The "cost per classroom" in this school was \$30,600. The tower cost a little more than a third of a classroom; $\frac{3}{4}$ of 1% of the total construction cost.

Many architects still do build nostalgic towers and columned entrances, and this is, of course, misguided. But instead of being put over on the taxpayers by architects, as the *Digest* implies, such features are more often the result (as in Williamsville) of community sentiment that this type of monumentality is eminently desirable.

■ "In the Middle West a \$300,000 auditorium was built into a new high school. At the same time . . . grade-school children were limited to half-a-day schooling."

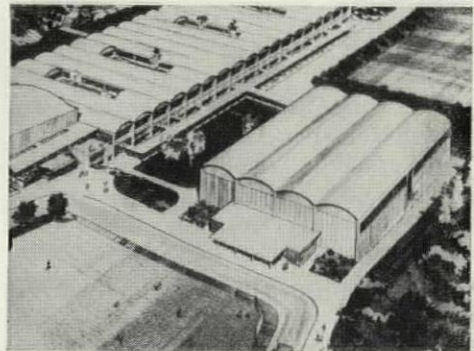
This reference cannot be identified. But \$300,000 is a rather modest figure for a high school auditorium, indicating that the town in question is probably not splurging. As for the alleged cheating of grade school pupils, two possible points must be considered. It is possible, for one thing, that the high school district and the elementary school district are separate entities, each with its own tax and bonding limitations; money saved in one thus could not be transferred to the other. There is no way of judging this or other pertinent factors on the information given. The second point concerns

the question of who uses the auditorium. The need for a community meeting hall—a service most high school auditoriums perform—is a fundamental need in a democratic society, as fundamental as the need for classrooms, and is usually a factor in the taxpayers' decision.

■ "Another architect, accustomed to building churches, designed a grade school with windows of 17 different sizes. They had to be cut to order, and cost three times as much as standard-sized windows."

This reference cannot be identified. If a fixed glass curtain wall is meant, going into a gable, the 17 sizes would not be unusual nor the cost excessive. If operating windows are meant, as it sounds, this school would be a real freak, meriting rebuke and amazement.

HOWARD STAPLES



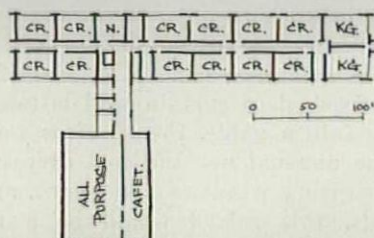
■ "A school board in the Far West recently put up a high school containing a \$750,000 gymnasium with bleacher seats from which 3,000 spectators might watch the basketball games."

This cannot be identified with any certainty, but the new Chief Sealth High School in Seattle, to open next month, will have a \$734,540 gymnasium building, not including sales tax or fees, and can serve as an example. This facility, the first new high school gymnasium in Seattle in 30 years, will be a community center in addition to providing the physical education program for 1500 students. It is therefore in a separate building and includes four gyms, a large and small one for boys or men, a large and small one for girls or women, plus two balcony areas for remedial work and special classes. The two large gyms can be thrown together for big spectator events (seating for 2,000). Whether Chief Sealth is the school meant or not, a community's recreational situation and the particular needs a gymnasium serves must be understood before judgment is passed on the wisdom or unwisdom of the cost—whether it is one-quarter or three-quarters of a million dollars.

These are the schools the *Digest* cited for economy



R. A. GREEN



■ "Not long ago in the village of Ardsley, in New York's Hudson Valley, a 14-classroom grade school was built on the relatively new principle of 'unit construction.' It won the highest award of the New York State Society of Architects. About one-half of its area—an unusually high percentage—is devoted solely to classroom space. It is solidly built of well-set masonry, with all of its fittings of high-quality materials. The Ardsley school cost \$13.70 per sq. ft. and \$25,100 per classroom."

Ardsley elementary school, Ardsley, N.Y.; Robert A. Green, architect. Bid in 1953; construction cost \$390,316; \$13.33 per sq. ft.* Cavity bearing walls of brick and integrally colored concrete block backup; integrally colored block partitions; long-span, precast concrete plank roof deck with 20-year built-up roofing; aluminum windows; radiant-heated slab on grade. "Unit construction" for schools (a core to which more classrooms can be added) is widely practiced, dates back to 1940.

GENE HEIL

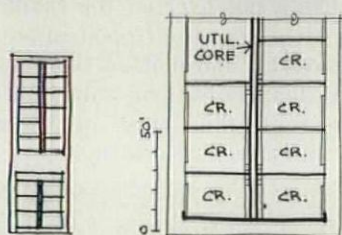
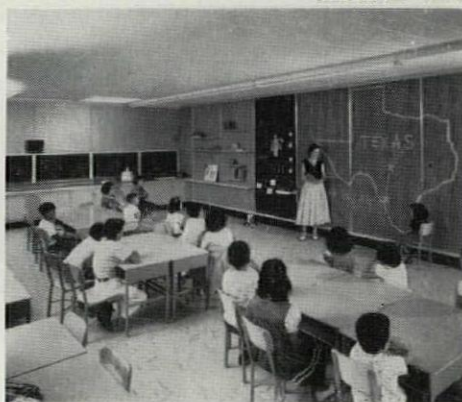


■ "The Walt Whitman elementary school at Woodbury, L.I., another prize-winning school by Architect Green, cost only around \$13.50 per sq. ft. in a high-cost area, largely due to its 'modular construction.'"

Walt Whitman elementary school, Woodbury, L.I.; Robert A. Green, ar-

chitect. Bid in 1954; construction cost \$450,970; or \$13.46 per sq. ft. Cavity bearing walls of brick and integrally colored block; interior partitions colored block; roof, steel bar joists with insulating slabs finished with cement at exterior overhang; 20-year built-up roofing; aluminum doors, steel windows; slab on grade with trench for forced hot-air heating. "Modular construction" means that all measurements are based on one measurement unit or its multiples, and does contribute to economy if the module is chosen intelligently for the purpose and its advantages are not canceled by the design restrictions it imposes. However, the main economy in both Walt Whitman and Ardsley schools is an accumulation of many small construction economies, based on standardized design and avoidance of innovation or adaptation to local differences.

ULRIC MEISEL—DALLAS



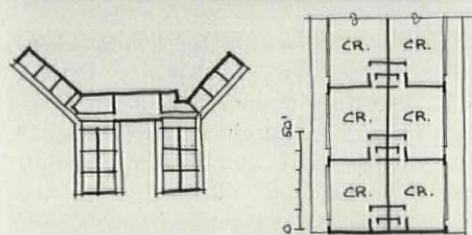
■ "In Laredo, Tex., the school board cut down the traditional 12' ceiling of a new school to 8'-10", saving 27% of cubic space and 27% of heating volume."

Four Laredo schools, a junior high (FORUM, Oct. '53) and three elementary schools were designed with 8'-9" ceilings, a saving impossible in many states because of obsolete regulations still based on old unilateral lighting schemes. Caudill, Rowlett, Scott & Assoc., architects; A. A. Leyendecker,

*All cost figures are as reported by architects, excluding fees, sitework and furnishings. They cannot be vouched for by FORUM; nor have they been tested against the cost measurement formula given on pp. 136-137.

associate architect. The representative elementary school shown, John Z. Leyendecker school, was bid in 1952; construction cost \$207,716; \$9.50 per sq. ft. Concrete lift slab roof on steel columns, plastic bubble toplighting; curtain walls mainly glass jalousies floor to ceiling; opaque wall panels are 12" brick cavity; interior partitions are movable panels of tackboard, chalkboard, dowel board and perforated board, doubling as teaching surfaces; deep back-to-back classrooms about central core which contains ventilation baffles with noise filter, also plumbing chase in above-grade pipe tunnel, above-grade heating pipes, heating units and housing for all built-ins such as lavatories, sinks, storage. The architects note: "Cutting off 26% of the cubage does not cut off 26% of the cost. Effective cost cutting is cumulative. One planning technique will not do it."

THE DYSART STUDIO



■ "Sikeston, Mo., saved money by building classrooms back to back with one wall dividing two classrooms."

Lee Hunter elementary school, Sikeston, Mo.; R. Paul Buchmueller, architect. Bid in 1953, construction cost \$301,915; \$10 per sq. ft. Steel frame, brick cavity walls with block backing; partitions painted block; glass block clerestories with aluminum ventilating sash; steel roof joists with poured gypsum over glass-fiber insulation; 20-year built-up roofing; forced air ventilation and heating through below-grade tunnels. Back-to-back classroom schemes with outdoor corridors offer good possibilities for economy; such

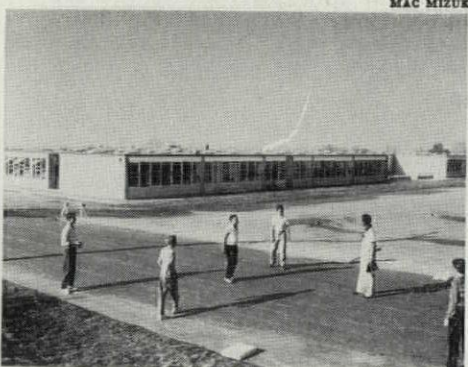
designs are apt to yield most for the money when the plan is integrated with services and also devised for future maintenance advantages (see, for example, the Laredo plan on opp. p.).



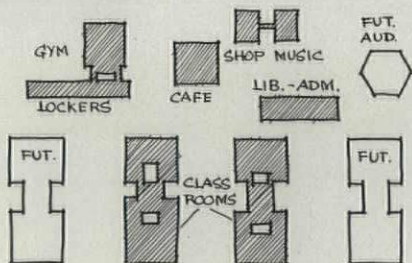
BOB MORELAND

■ "In Clearwater, Fla., Architect K. Whitney Dalzell Jr. has just completed an elementary school at a square-foot cost of \$8.35. It cost \$224,000."

Ponce De Leon elementary school, Clearwater, Fla.; Dalzell & Dalzell, architects; Robert A. Green, associate architect. Bid in 1956; construction cost, \$224,000; \$8.35 per sq. ft. Specifications and construction are similar to Ardsley and Walt Whitman schools except painted block was used instead of integrally colored block. Average square-foot school costs in Southeast US were \$9.24 in 1951-52 (see p. 135).



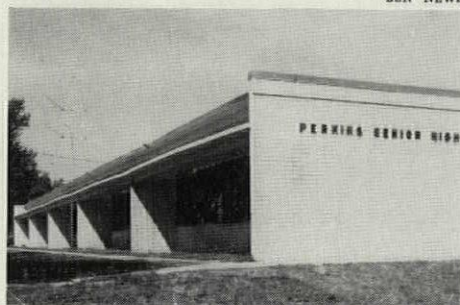
MAC MIZUKI



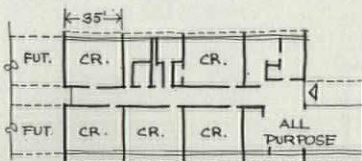
■ "In the St. Louis area, where current school-building costs are around \$14 per sq. ft., Architects Hellmuth, Obata & Kassabaum produced the award-winning design for the Riverview Gardens high school, the first completed unit of which has cost \$11.82 per sq. ft."

Riverview Gardens high school, St. Louis; Hellmuth, Obata & Kassabaum,

architects. Construction costs per sq. ft.: first classroom unit, bid in 1955, \$10.85; second classroom unit, bid in 1956, \$12.63; cafeteria and boiler plant, bid in 1956, \$22.85; music and shops unit, gymnasium and lockers, bid in 1956, \$16.67; library, administration, business classrooms, bid in 1957, \$11.73. Total for all units built or started thus far, \$1,801,467, averaging \$13.88 per sq. ft. The classroom unit illustrated has end and interior bearing walls of 8" masonry block with brick facing on ends. Spandrels are masonry block faced with ceramic tile; steel mullions, aluminum sash. Roof is steel bar joists, gypsum board, poured gypsum, rigid glass fiber and tar and gravel; double-skinned plastic toplights with adjustable light controls. Oil-burning hot water heater with underwindow convectors. "This is not a stripped-down school," the architects report. "It includes such items as terrazzo flooring in corridors, cut stone sills and marble stools and much built-in equipment."

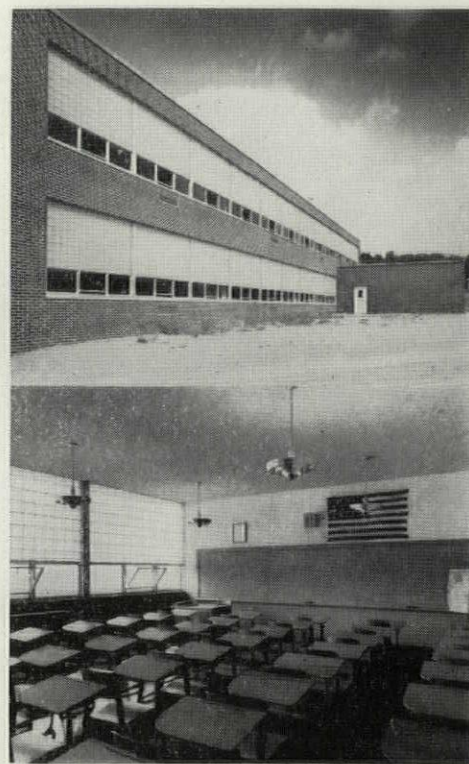


BEN NEWBY



■ "Architect A. Blaine Imel has built the high school at Perkins, Okla. for \$7.12, using a newly developed clay brick."

Senior High School, Perkins, Okla.; A. Blaine Imel, architect. Bid in 1956; construction cost, \$79,440; \$7.12 per sq. ft. Bearing walls and partitions are 6" thick, comprised of oversize, double-faced brick; precast concrete roof planks, 7/8" rigid insulation, 15-year built-up roof; steel doors and windows; individual classroom heaters, gas fired, with forced air perimeter ducts. This is an untypically small high school with minimal facilities.

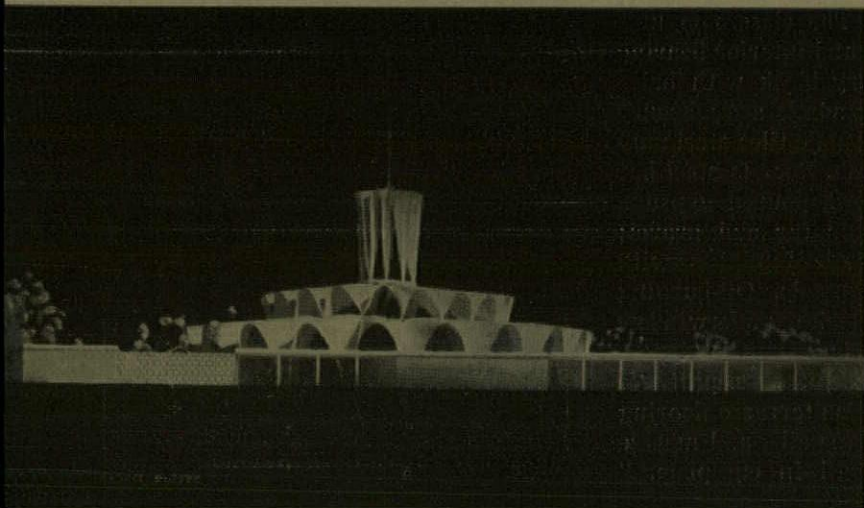
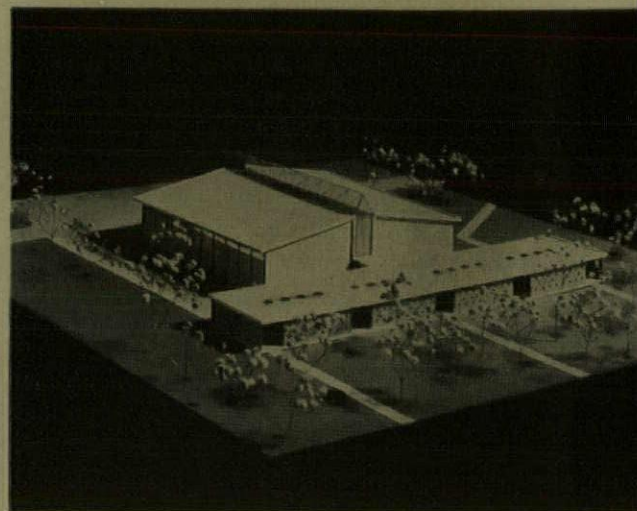


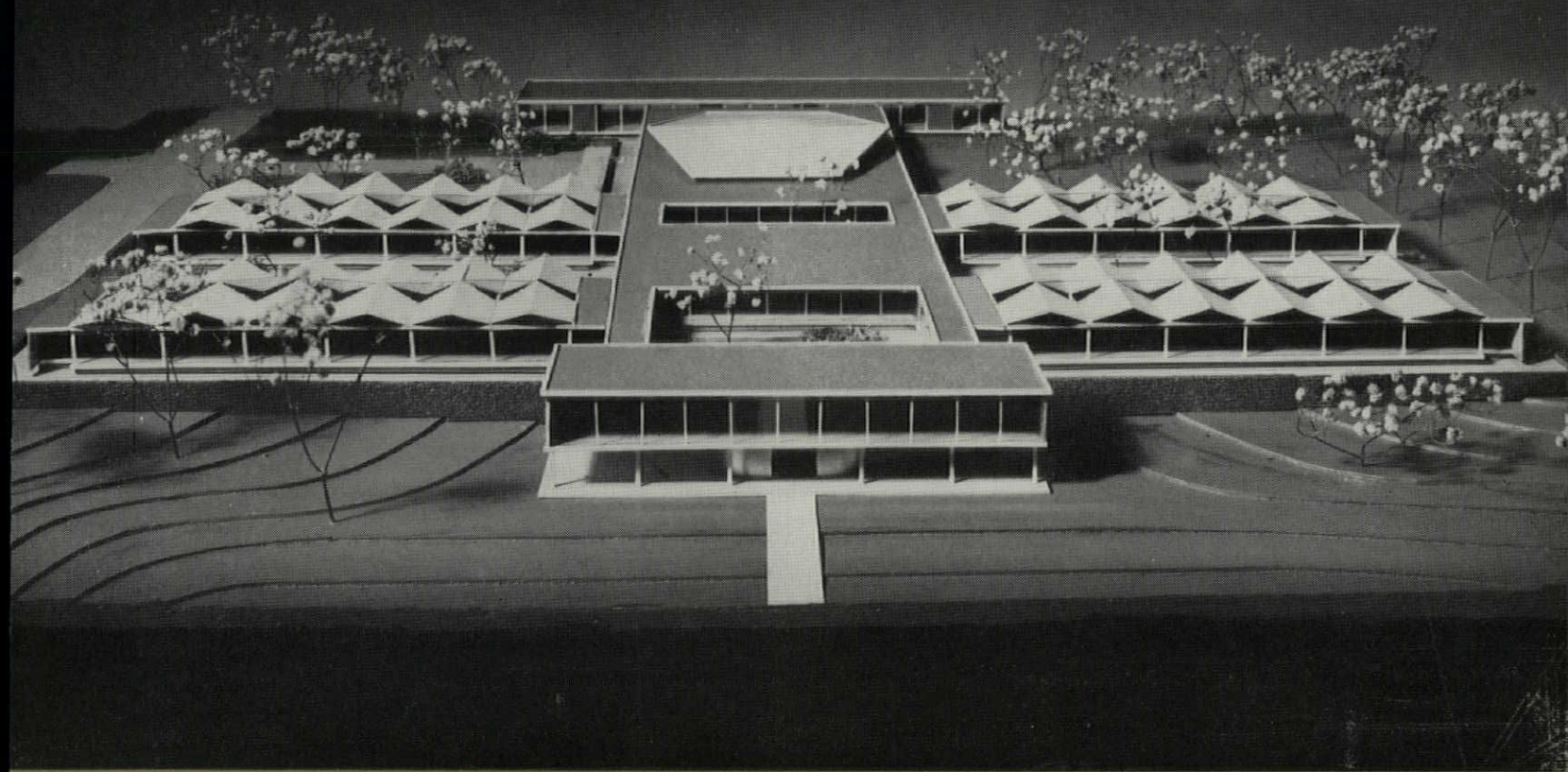
STUDIO HOUSE

■ "Springfield local high school in rural Youngstown, Ohio, cost \$7.24. It is built of face brick, glass block and heavy aluminum framing."

Addition to Springfield local high school, Petersburg, Ohio; Arsene Rousseau, architect. Bid in 1954; construction cost, \$240,372; \$7.24 per sq. ft. Cavity brick and concrete block bearing walls; plastered block partitions; steel columns with aluminum covers doubling as mullions; steel joists supporting reinforced concrete floors and steel roof deck, 1 1/2" glass-fiber insulation, 20-year built-up roofing; wood door frames, doors and trim; glass block, aluminum vision strips; forced hot water heating with classroom unit ventilators. The architect reports three major factors affecting the very low cost: 1) the project was an addition to an existing structure; 2) all utilities were at close proximity; 3) a large list of contractors bid, giving the advantage of lowest possible costs. (Presumably contractors locally were short on work at the moment.) The winning bid, reports Architect Rousseau, "was 20% below my most optimistic estimate." He adds: "Theories for reducing costs credited to me, such as 'simplification of materials and labor,' 'avoid trick construction,' 'avoid frills,' 'simplicity,' are true, fundamental and most certainly recognized and understood not only by us, I am sure, but by the architectural profession at large."

PRIORY OF ST. MARY AND ST. LOUIS, St. Louis, Mo.
 BENEDICTINE MONASTERY AND BOYS' SCHOOL
 ARCHITECTS: Hellmuth, Obata & Kassabaum, Inc.
 CONSULTING ENGINEER: Pier Luigi Nervi
 STRUCTURAL ENGINEER: John P. Nix
 LANDSCAPE ARCHITECTS: Hideo Sasaki & Assoc.





PHOTOS: MAC MISUKI

In the new St. Louis Priory, great traditions
summon forth great architecture—for teaching and for prayer

A school in praise of God

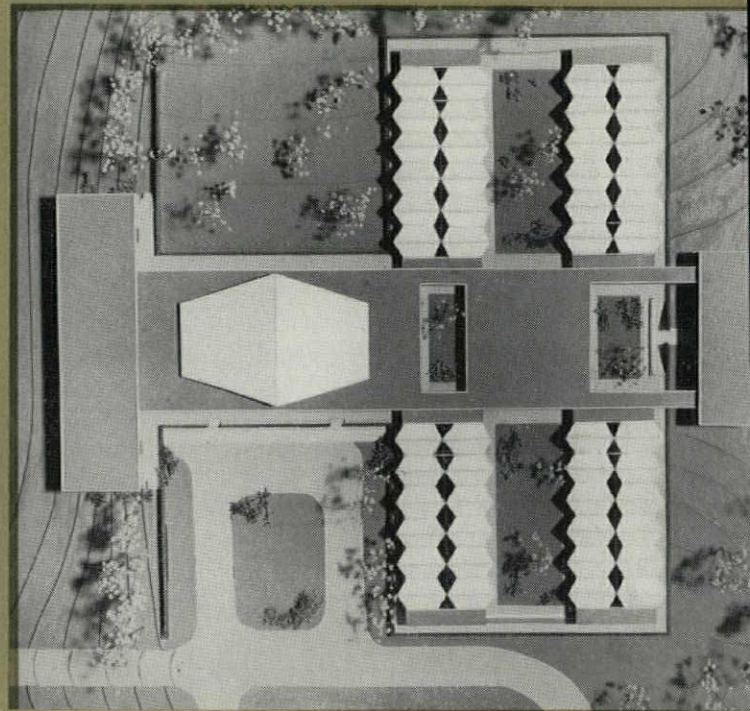
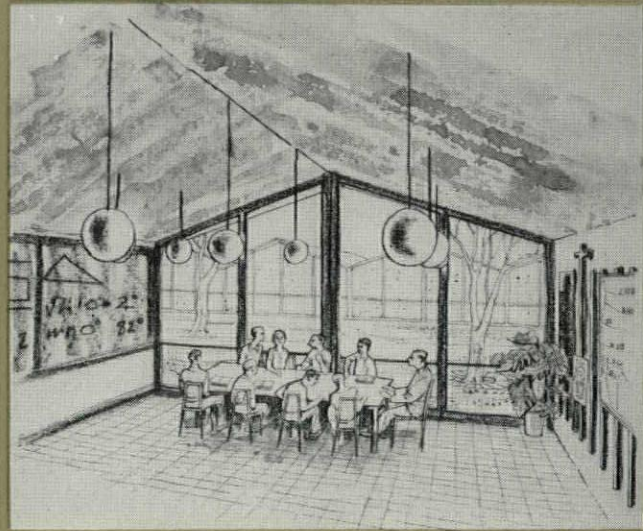
On Sept. 29 in suburban St. Louis, Mo., ground was broken for a project that could become one of the most remarkable contemporary achievements in US religious and educational design: the Benedictine Priory and School of St. Mary and St. Louis. At the focal point and entrance to its campus, on the highest of three partly wooded hillocks, will stand the monastery of St. Louis Priory, arranged in courts surrounding a striking circular church, which will rise from its high plaza in ruffled collars of thin concrete (opposite and p. 127). Near the church and refectory will be a school for 400 to 500 boys, its classrooms sheltered under folded concrete roofs, its library opening toward a

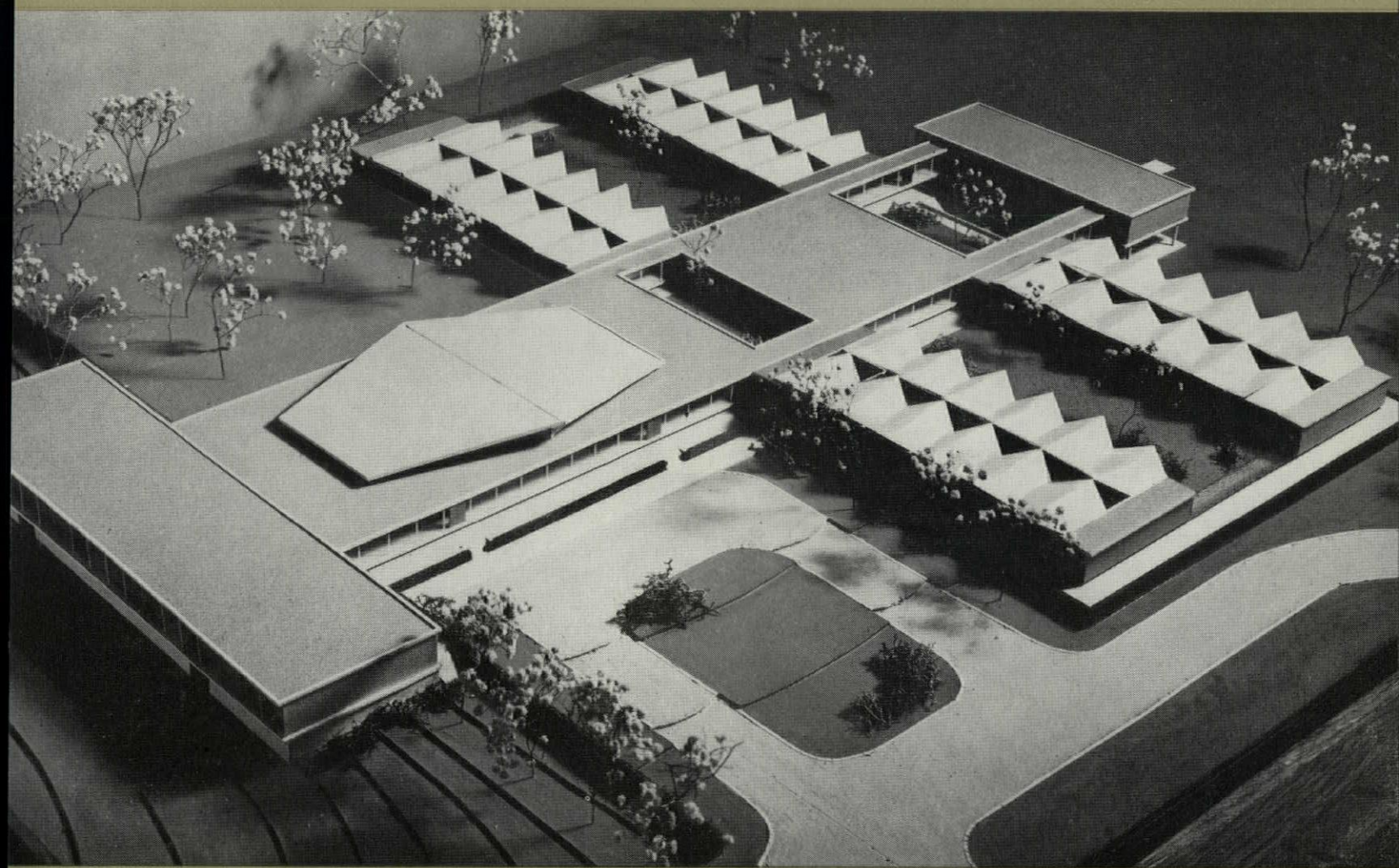
lake (above and overleaf). To the east models show a gymnasium spanned by single skylight truss; to the south a lower school will someday complete the circle.

The idea for the new school originated with a group of Catholic community leaders, who set out to enlist the help of the monks of Ampleforth Abbey, seat of the English Benedictine Congregation. The scholars of Ampleforth had precedent for working abroad. From their original monastery at Monte Cassino, St. Augustine had led a mission that converted England to Christianity and built Westminster Abbey. In more recent times, Benedictines had built two priories in the US, Washington and Portsmouth.

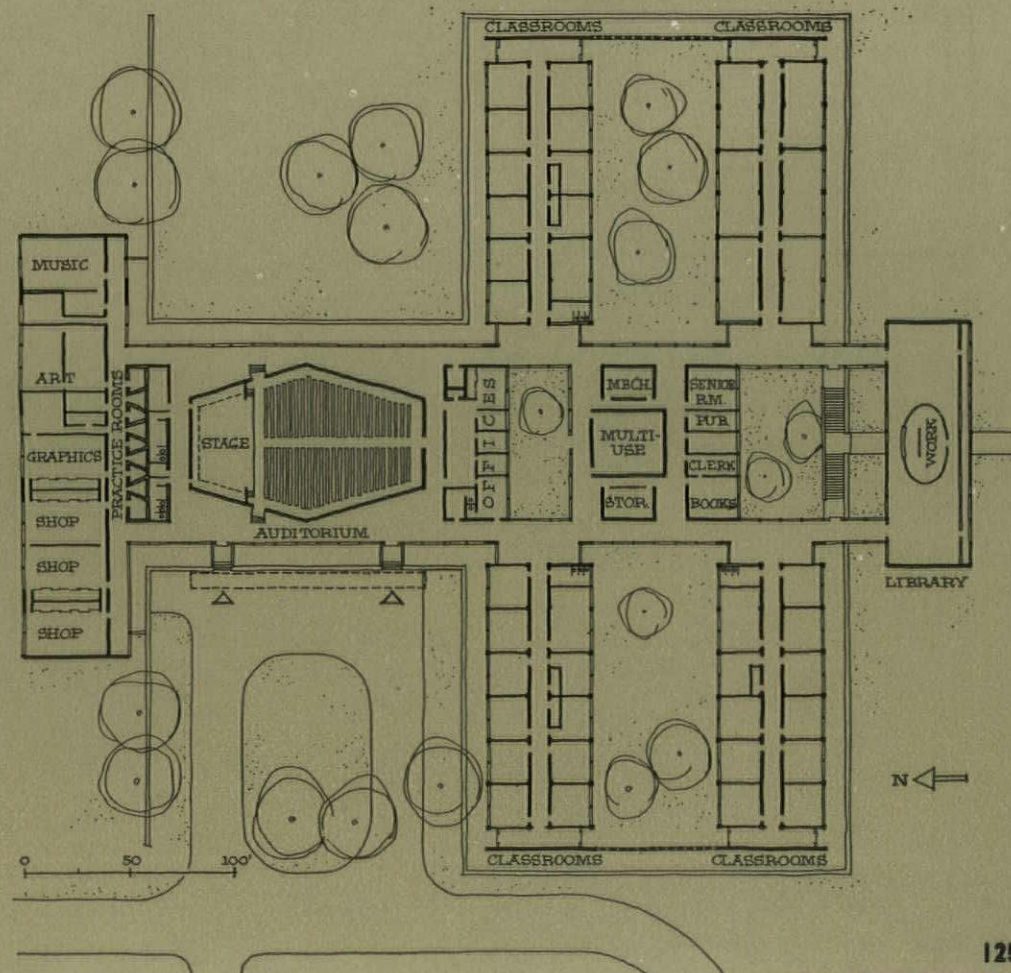
When he arrived in St. Louis in 1955, the newly designated Prior, Dom Columba Cary-Elwes, took his fellow monks to visit as many famous examples of American architecture as they could. The one they felt best expressed its own particular purpose was right in their own new home: the new St. Louis air terminal. And so were some of its original architects.

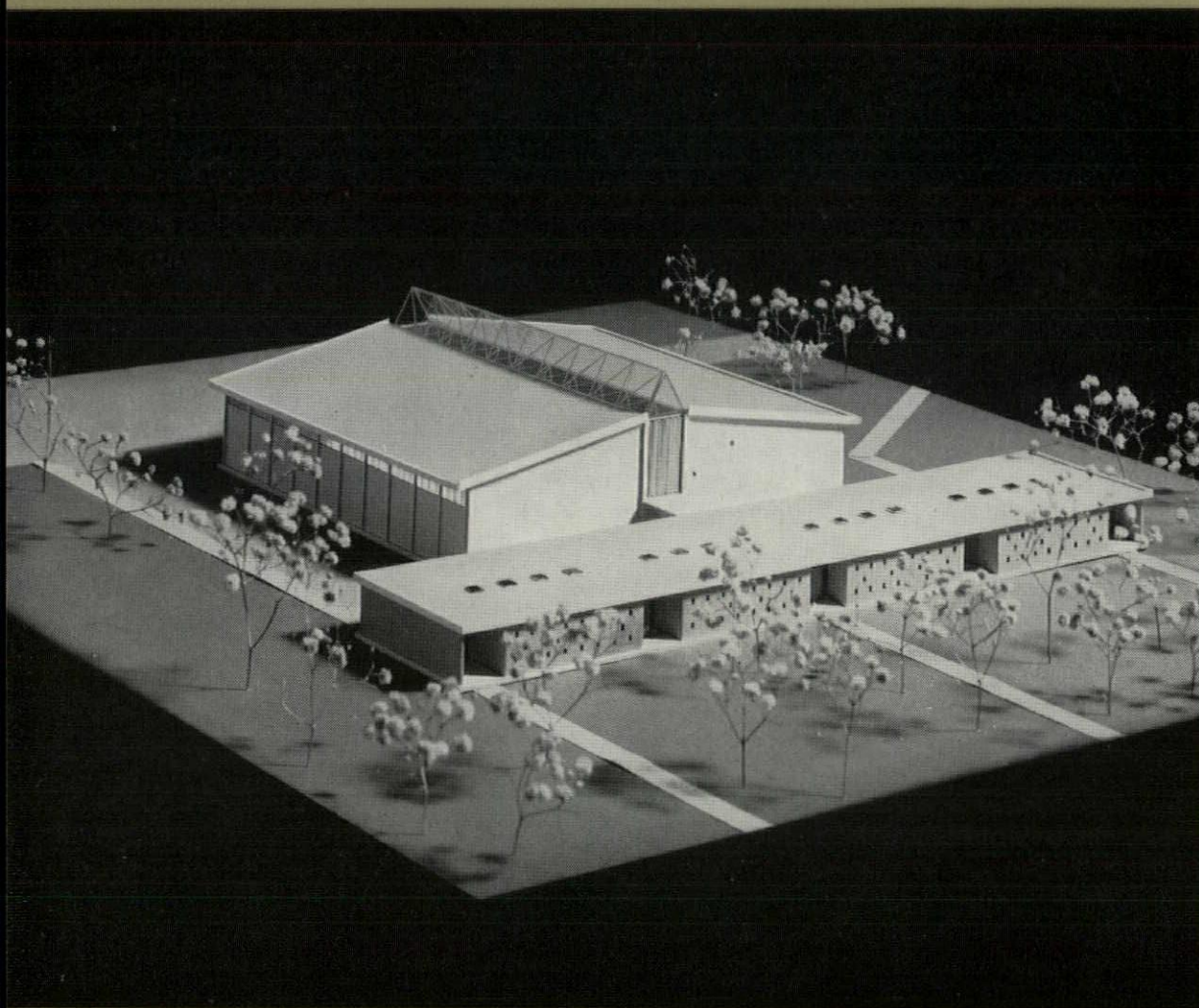
For their program, the monks had mainly to build upon their ancient credo—to praise God and to serve man. With the monks' own self-demand of excellence as example, and aided by concrete mastery of the famous Italian Engineer Artist Pier Nervi, the architects worked to put this credo into form.





Upper school of the new St. Louis Priory, to be built in stages, will take the shape of a double-armed cross, pierced at the center by two courts that open up inner offices and corridors. Educational emphasis is on a large number of small, simple classrooms for 10 to 15 students and a teacher, often seated at a round table; the monks wanted neither bleak modern cells, nor an environment that would detract from intellectual concentration. Where the folded concrete roofs of the classrooms meet over the corridors (far left), they are cut back to expose a bright skylight gable. At the end of the school away from the main campus (above) noisy areas of music, art and shops form a T beyond a hexagonal interior auditorium for 600. At the other end, toward the lake, are areas for contemplation: the library, built around an oval core, above a shaded terrace.

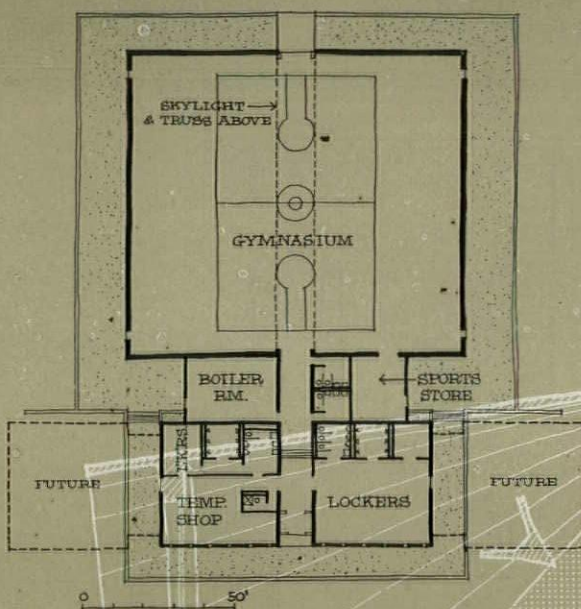


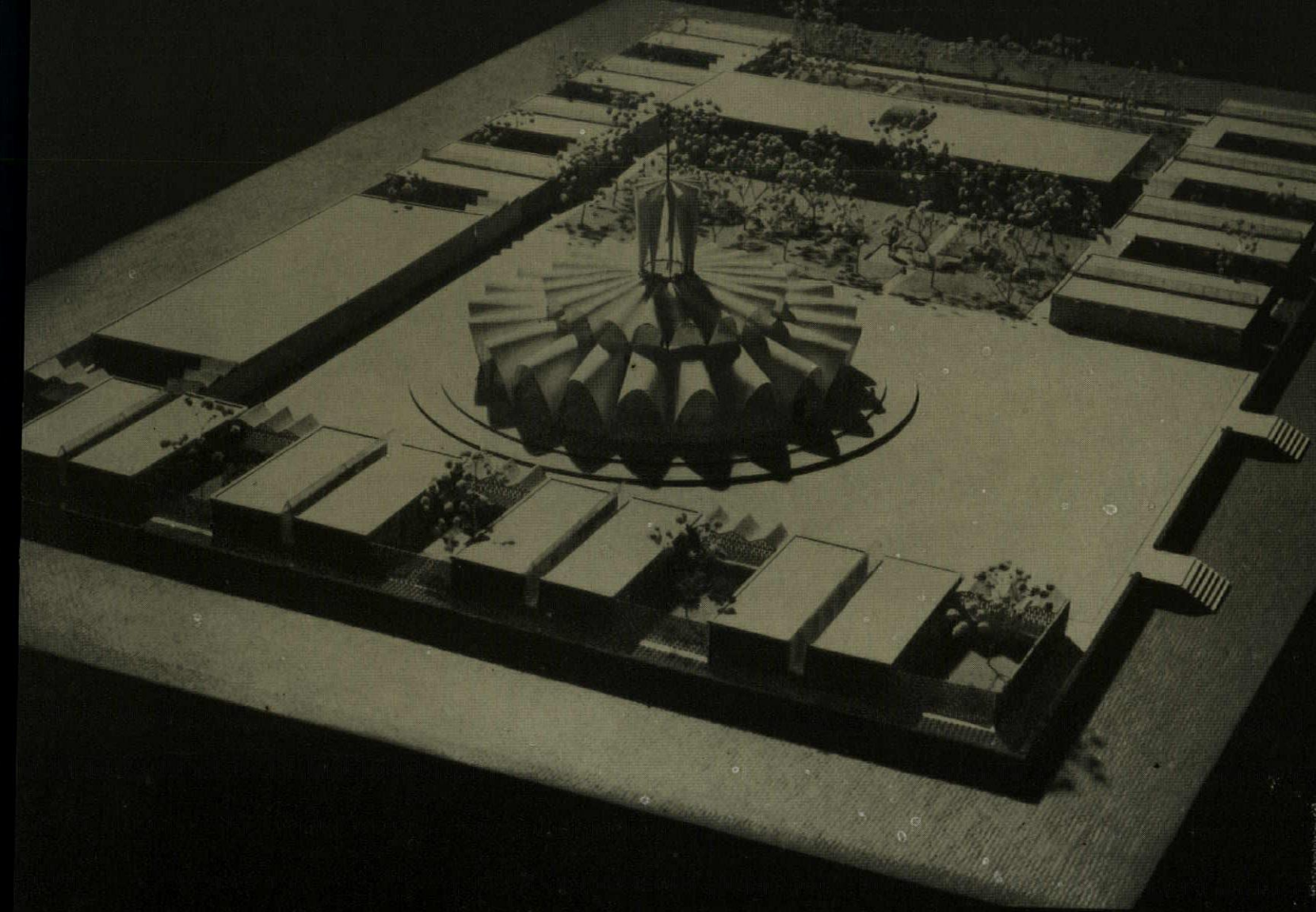


Gymnasium, which will also serve as a refectory and meeting hall until other units are completed, will be 100' square, spanned and lighted by a single 11' high triangular truss of light steel sheathed in glass and resting on four columns that frame the doors. In front is a separate low building for lockers, showers, offices. Unlike many new high schools, the Priory will not be dominated by its gym, which is placed beyond trees far behind the focal church,

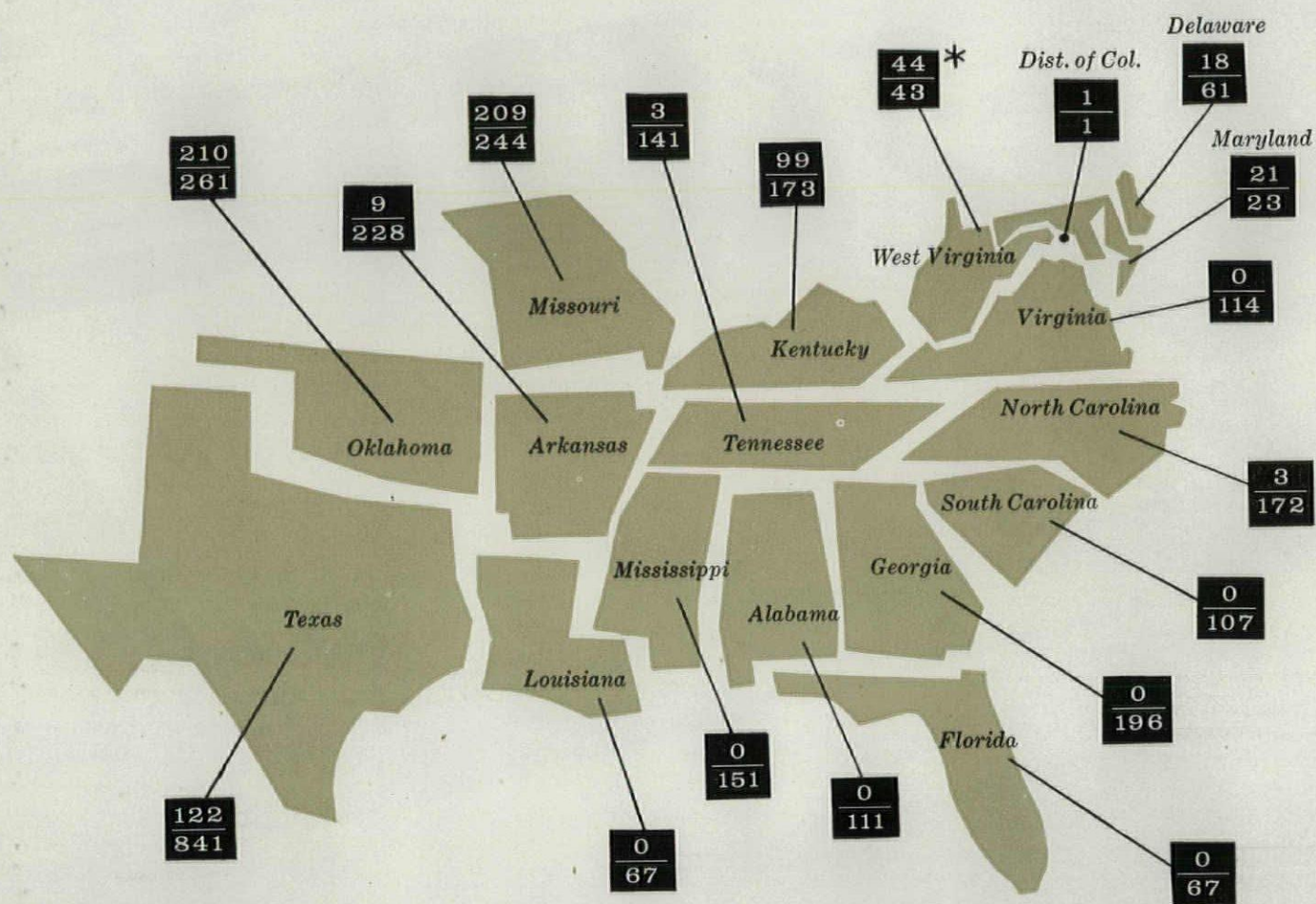


Monastery elaborates on the traditional hollow rectangle, ranging low buildings and courts around a high church plaza open to the west. Beyond the two-story monastic library is a secluded garden for the monks, flanked by their cells and smaller screened gardens. The church, rising and falling in a graceful fountain of shells, groups 20 peripheral chapels under thin-concrete parabolas 21' high. Above a tension ring a 12' clerestory lights the circular nave, and a third shell cluster 30' tall forms a lantern over the altar. In section, the church itself is a parabola.



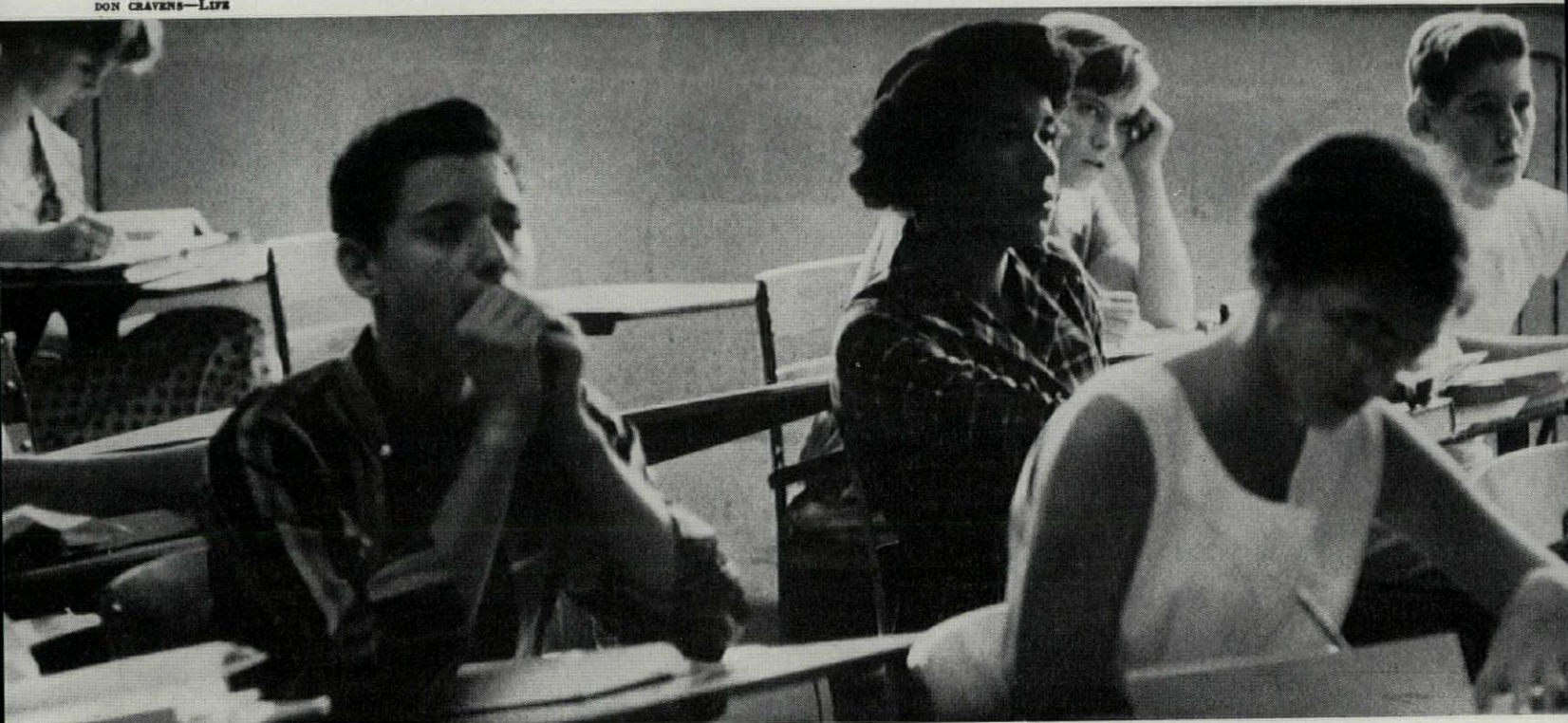


Desegregation's impact on schooling



*One all-white district stated voluntarily that it would accept any Negro who wanted to enroll.
Source: Southern Education Reporting Service.

DON CRAVENS—LIFE



The Supreme Court's decision has had a marked impact on southern school programs. But the biggest change is some distance ahead

Progress of desegregation in the South and border states has been rapid but confined. Figures above the lines show the number of school districts in each state which have either started or completed desegregation; figures below indicate the total number of bi-racial districts. Biggest strides have come in the District of Columbia and the border states. Within the mid- and Deep South, only 15 districts are in compliance with the Supreme Court's edict.

When the Supreme Court ruled in May, 1954, that the doctrine of "separate but equal" has no place in public education, it struck directly at the segregation laws of 17 southern and border states and the District of Columbia. Today, with the nation well into its fourth school year of desegregation, two facts are inescapable: no other court decision of this century has had comparable repercussions; its vast political and social consequences, so evident this fall, have all but obscured what it has done to schools and school building.

Just how much has the desegregation decision affected school construction? At first glance, it would seem hardly at all. Sifting out the 17 states involved, contract award figures of F. W. Dodge Corp. show that, with some yearly variations, the South and its borderland has been pushing along its school building since 1954 in much the same way the rest of the country has. The region's school awards, which amounted to \$625,279,000 in 1954, moved up 3% in 1955, rose another 4% last year and, in the first half of 1957, outdistanced the national average with a 9% gain as against the first six months of last year. (For the country as a whole, the rise in the first half of 1957 was 6%.) Even when broken down for the states which have complied with the decision and for those which have resisted it, the figures show no significant deviations, and a conclusion might be that the court's decision has yet to be felt in southern school building. But the conclusion, as we shall see, wouldn't stand up.

As early as 1951, James F. Byrnes, then governor of South Carolina and often a spokesman for the Deep South states, said he hoped his legislature would act to "influence the court" by providing schools "substantially equal for both white and Negro pupils." We should do it "because it is right," said Byrnes, and also because "it is wise in view of the suit." Byrnes' view, which was

that of most of the South's leaders at the time, was that the region's main defense against the segregation suits rested squarely on the separate but equal doctrine and on a showing that it was ready to assume the full burden for providing "equal" educational facilities for the two races. To make the showing, the states themselves would have to build. And, starting about 1950, build they did. (State and local outlays for school construction, which came to only \$94 million for 13 of the states in 1947-48, jumped to \$295 million in 1950-51.)

In 1951, South Carolina, on Byrnes' advice, put through a 3% sales tax to push "equalization" and local school construction, set up an Educational Finance Commission and provided for a bond program which has since channeled \$175 million of state funds into local schools. Nearly 8,500 new classrooms were added (roughly 60% of them for Negroes), and an estimated 45% of the state's school children are now in classrooms built within the last six years. Georgia, which passed a Minimum Foundation Program in 1949, created a School Building Authority in 1951 to finance the plan and act as its construction medium. Four bond issues by the authority poured \$179 million of state money into local districts, and by this summer, state education officials could term "equalization" of facilities as substantially complete. (Some Negro educators go further in their appraisal, say that in many cases colored facilities are now obviously overbuilt.)

In Virginia, the 1950 legislature started a four-year Battle Fund, so named because it was a campaign pledge of ex-Governor John S. Battle, and the fund distributed a total of \$75 million of construction funds to school districts before it died. North Carolina voted about \$100 million in state money to aid local building between 1950 and 1955, while Mississippi, in 1954, implemented an ambitious 20-year construction program estimated to cost



\$120 million and financed through a state sales tax.

None of these programs, of course, came about solely because of segregation. Quite apart from racial considerations, the South had, and still has, a tremendous need for schools for all its population. Off to a late start in education—a public school system did not really begin to emerge until the Reconstruction Era—and handicapped by a chronic lack of resources and inadequate year-to-year spending, the South through the years acquired a truly staggering classroom deficiency. In 1949, reports of 11 of the states to the Office of Education put a dollar sign of \$2.8 billion on their classroom needs, and this covered current needs only, the spending required to put all pupils in satisfactory facilities by September, 1952. As late as 1951, only 5% of the pupils in North Carolina were housed in schools rated as satisfactory by the state. In Alabama, the percentage was 15%, in Florida 31%, and in Texas 45%.

Still, it was not so much the needs of its school systems as it was the threat to segregation that set the Deep South moving almost as one on its building program. And though the states have now bid and lost in the high court, they are reluctant to accept the decision as final or, unless recent events bring a change, to take it as cause to alter their building ways.

Deliberate speed

By this fall, somewhat less than one-fourth, or 740, of the 3,000 biracial districts in the South and the border states had actually begun to comply with the court's decision either by starting or completing desegregation.* Of the 740, 15 districts were in states unquestionably classed as southern—Arkansas, Tennessee and North Carolina. The rest, by the count of the Southern Education Reporting Service, were

* Outside the South, the decision has had only a limited impact on schools. One of the few exceptions is New York, where proposals have been drawn and in part implemented for reducing *de facto* segregation caused by residential districting. In all, 22 out of 24 elementary and junior high schools to be built within the next three years near Negro neighborhoods will be placed so as to reduce the segregation pattern.

in the border states of Delaware, Kentucky, Maryland, Missouri, West Virginia, and, in the Southwest, in Texas and Oklahoma. Including the District of Columbia, where about 75,000 Negro children are now in mixed schools, a total of about 120,000 colored students were actually sitting in mixed classes when the fall term began (total Negro enrollment for Washington and the 17 states: 2.8 million).

Against this, in seven states—Virginia, South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana—there was no desegregation at all in public schools at the elementary and secondary level and except for two, Virginia and Louisiana, no Negroes were enrolled in tax-supported colleges. Only in private schools, notably those of the Roman Catholic Church, has there been any break at all in these states in the solid line of segregation in grade and high school classes. Parochial schools, backed by the firm antisegregation stand of the church's hierarchy, were among the first to integrate in many of the border states (St. Louis Catholic schools began mixing in 1947) and today there are integrated Catholic schools in

Richmond, Rock Hill, S.C., Nashville and in two towns in Alabama, where colleges are desegregated. New Orleans, with a heavy parochial school population—an estimated 77,000 pupils out of a total enrollment of 159,000—has delayed integration again this year, but the position of Archbishop Joseph F. Rummel is firmly for it.

On the whole, the Deep South has presented a front of massive resistance to the court's decision. It is here that the racist White Citizens Councils have had their greatest growth, and it is here, in the states where the ratio of Negro to white population is often at its greatest, that most of the 141 laws to circumvent the court's ruling have been passed. Yet even here, state school building programs have been going along much as usual since 1954, even though there have been temporary cutoffs, and some programs have now about run their course.

Nowhere does this show more clearly than in Mississippi. Its "equalization" program, passed before the ruling, has been carried along in spite of it, largely because of a feeling that if the state could make real progress toward achieving equal facilities for the races, Negroes would be less apt to press for desegregation. On this premise, Mississippi has been spending about \$6 million a year of state money for school construction since 1954, compared with \$1 million a year before then. And by far the biggest chunk of this money, about 75%, has been going into Negro schools.

There are, of course, instances at the local level where new schools have been vetoed, if only temporarily, for reasons that stem, at least in part, from the 1954 decision. Voters in Virginia's Chesterfield County turned down a \$3.5 million construction bond issue last year, and at least one of the elements was an appeal not to "mortgage our children's future until we know what will happen to our school system." Charleston, S.C., defeated a \$1.1 million issue last June, and in this case the Negro vote was apparently a factor. The proposed schools would have been segregated, and the

colored community appears to have felt it could do quite nicely without them. But these instances are scattered and were it not for one factor one might argue that the Deep South's school building programs have been left almost untouched by the events of the last three years. That factor is finance.

Unquestionably, many southern communities and some states have found it increasingly hard to sell school bonds at the rates they want. In part, this is the result of tight money (see school finance, p. 166), but it also reflects a genuine uneasiness by northern investment bankers about the future of southern schools and the solidity of their bond issues, particularly in those four states which have passed laws to cut off aid payments to any school or school district which integrates its classes. Virginia, which put through such a law in the fall of 1956, immediately ran into financing difficulties. The city of Hopewell in December got not a single bid on \$1 million of school bonds offered at 4%; South Norfolk did get a bid, resulting in a rate of 4.99%, but it rejected it as too high. In the opinion of some Virginia bond men school money from outside the state is now costing communities $\frac{1}{2}\%$ more than it should, a fact which they attribute squarely to "legislation which has left the state's school system vague and confused."

Though New York investment bankers shy from generalities, they admit they are not interested in handling many southern school offerings unless the states or districts involved are willing to boost their interest rate by $\frac{1}{4}$ to $\frac{1}{2}\%$. "Look at it this way," says one Wall Street man. "We can do a nice volume without even touching southern issues. Why should we get involved in anything that looks the least bit shaky unless there's an added something to make it worth our while?" This attitude certainly does not apply across the board—Tennessee issues, for one, are still rated highly, possibly because of the state's willingness to comply with the desegregation edict—and it is definitely not the feeling of south-

ern brokers (who in Virginia joined forces to shore up local issues and agreed to bid on all bonds offered for an indefinite period). But it very much applies to most of the Deep South states and where it does, it has meant delays, if not actual cancelations, of school projects.

Mississippi is a good example. Its "equalization" program authorized unlimited state expenditures for school buildings, with the only proviso being that outstanding bonds could at no time exceed \$60 million. Since 1954, the state has allocated \$18 million for school construction. But last May, when it offered \$10 million in full-faith bonds, the best bid it got was 3.15%. Since other full-faith obligation bonds had sold several months earlier for 2.52%, the State Bond Commission felt compelled to reject the offer as too high. Several months later, Governor J. P. Coleman was to say that, given the high cost of borrowing, the state equalization program would be forced from now on to stick strictly to essentials and that, while there was no chance of halting the program, "a more conservative approach" was necessary.

Proving ground

Outside the ten states of the Deep and mid-South the situation, of course, has been different. There the pattern has been one of generally widespread compliance, rather than resistance or limited acceptance of the court's decision. Here, indeed, should be the proving ground for the long-held concept that segregation has been both an economic and educational waste, and a waste which the South could ill afford. What has happened in the border states to school building needs and programs since the court ruled?

When FORUM asked this question in West Virginia, a state which has

now desegregated in whole or in part all of its counties which have both white and Negro children, the answer it got was something less than enlightening. Said State Superintendent of Schools Virgil Rohrbach: "It would take a state-wide survey to answer the question, no survey has been taken, and it probably wouldn't be in the public interest to take one." Integration has proceeded so well, he said, that "I don't want to stir anything up."

Whether such a survey would really stir anything up is arguable. But the fact is that no state which has accomplished a significant amount of desegregation has felt compelled to reveal publicly what racial mixing has meant in terms of utilization of present facilities and, more important, what it has done to building programs and future needs (one thing is known: about 500 teaching jobs have been eliminated as a result of desegregation).

To be sure, there is some important, though fragmentary, evidence and much of it is from West Virginia itself. In Kanawha County, which is the largest integrated unit in the state, desegregation has opened up ten Negro schools for vocational and other uses. The largest, a former high school, is now a vocational school; another, a junior high, has been converted into a warehouse, while several former one-room schools have been sold off. Clay County, which had only 14 Negro pupils in an over-all enrollment of about 4,200, figures that the closing of a one-room Negro elementary school and the savings from not having to board Negro high school students outside the county has amounted to about \$4,300 a year. Marion County, which is now using only one of its former Negro schools (no teachers have

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NORTH KANSAS CITY, MO. SCHOOL DISTRICT

■ SCHOOL SITES

□ PARKS & PLAYGROUNDS

The booming suburbs north of Kansas City have married their school and park plans and are now buying the land with a new kind of tax

School in the park

Like many another rapidly growing suburban area, Kansas City North three years ago woke up to the fact that its countryside was disappearing. And along with the countryside, potential park land and school sites were also vanishing over the northern horizon. The community was turning into just another featureless victim of suburban sprawl. Schools, residential developments and open areas ran into one another without meaning. Neither the disorganized protests of individual citizens nor the existing zoning ordinances, introduced in 1950, were sufficient defense.

Today Kansas City North is, by contrast, well prepared to meet the demand for future school sites in ordered neighborhoods. An integrated study of emerging school and park needs (projected to the point of the community's full development) has been prepared to guide future land purchases. This study, which provides for buying the land with bonds and a new kind of local assessment, works in phase with the master plan of Kansas City's metropolitan development. It is most impressive in terms of school district planning and neighborhood looks. But it is also impressive in terms of economics: instead of buying sites in developed sections at prices near \$10,000 per acre, the school board can see far enough ahead to buy undeveloped land at about \$2,000 an acre; and instead of having to acquire extensive playgrounds for its schools, the city can build on small sites next door to the strategically spread-out park system, thus gaining free recreational space.

How did this neat pattern come out of disorder? It came because an

assignment was given to Philip E. Geissal, Kansas City's chief planning engineer. He was commissioned to save the school system by defining the community.

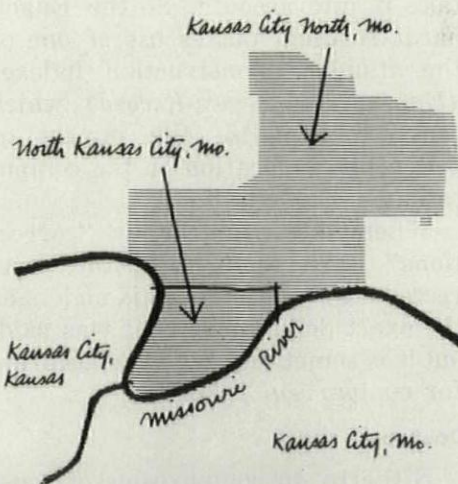
Geissal, a former architect, had been in the planning office since 1944. Like all good Kansas Citians, he regarded the parks and gardens of the more established sections as the essence of the city, as what made it civilized. It was with equal parts of personal concern and professional conviction, therefore, that he approached the parkless situation in Kansas City North.

His solution: a network of neighborhoods, each of which would have as its center an elementary school and park facilities.

His report, presented to the Board of Park Commissioners in June, 1954, was as shocking as creative acts are apt to be. The acquisition of some 1,500 acres of land for parks of various sizes was proposed, at an estimated cost of \$1.1 million. The parks, fanning out into existing neighborhoods, giving new life to old schools (see map, left), also stretched into undeveloped areas, awaiting the day when new schools would be needed there. And long before that day actually arrived, school sites could be purchased with some foreknowledge of the neighborhood pattern.

Radical as the land purchase proposal was, it was stodgy compared to the neighborhood-by-neighborhood plan of park and school cooperation and the suggested financing methods that were at the heart of the report. By being imaginative, it seemed to some that Geissal risked the criticism that not even schools

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School sites and parks: a plan of the North Kansas City School District shows the close relationship of the two. The park and play areas are laid out to benefit the existing schools and to prepare the way for future school sites as neighborhoods grow in undeveloped sections. Above is map showing the confusing cities that live side by side. In 1950 Kansas City, Mo., moved north across the river, annexing Kansas City North but bypassing North Kansas City. To the west is Kansas City, Kan.

At long last, a reliable basis for measuring the relative construction costs of schools of various kinds and sizes in various parts of the country

How to compare school costs

"Smithville's school cost a lot less than this, and they tell me it's mighty good. Why will our new high school cost so much? Who's wasting our money?"

Everybody asks this kind of question, because values are established by comparison. And yet the honest, complete answers have been few, because nobody has yet worked out a usable index that would quickly yield revealing comparisons—with a minimum of error and of misleading.

Today's three rough-cast "measures" of school cost are certainly shaky.

"Cost per pupil" leads to wholly misleading comparisons if we do not know how much *service* per pupil different schools have been built to give. "Cost per classroom" means next to nothing, if we do not know what kind of a classroom it was, and how much auxiliary space, of how great an efficiency, was or was not prorated to it. "Cost per square foot" is subject to a dozen variables, some of which are controllable and some of which are completely beyond the control of school board and architect. Not even the method of *measuring* square feet has been consistent from one case to the next.

Under these circumstances, an experienced school consultant, Nikolaus L. Engelhardt Jr., of the highly respected firm Engelhardt, Engelhardt, Leggett & Cornell, has worked out a formula, which is neither too elaborate nor too abbreviated. It will appear in his forthcoming book on planning school buildings, but is

released herewith through FORUM (pp. 136 and 137) in the hope that it can be refined through field testing by FORUM's readers to expand the testing which the author has already given it.

The variables

In the long list of cost influences which determine the comparison of two schools, some are inherent in the individual school plant, and some are external. Here is a breakdown:

Inherent cost influences

1. Educational specifications
2. Nature of site
3. Design: function and efficiency
4. Design: architectural character
5. Labor and materials
6. Type and quality of construction

External cost influences

7. Financing expense
8. Geographical location
9. Time of bidding
10. Market conditions generally
11. Value of the construction dollar.

In setting up useful comparisons, which give a real clue to value received, it is necessary, of course, to minimize the effect on the comparison of all those factors which are not really controllable.

For example, sites vary widely from school to school and the amount of site work that is done at once, compared to site work deferred, varies widely too. Consequently, although it is highly useful to tabulate site work in detail, so that marked differences between site costs for one school as against another can be

traced, it is not very useful to include site work in broad simplified indexes. In the Engelhardt formula the site factors are listed in detail for the sake of closer comparisons, but they are ignored in setting up relative construction indexes.

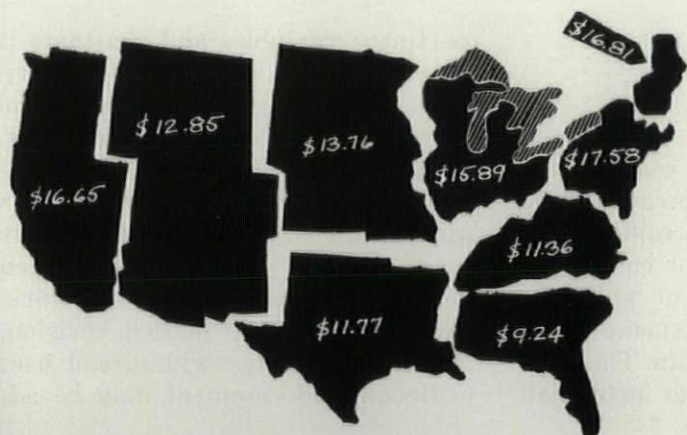
Geographical location as a factor affecting cost is of a slightly different kind. It is just as uncontrollable as the characteristics of the site, but no index is possible that does *not* take it into account. So the Engelhardt formula makes use of one of the standard construction indexes (*Engineering News-Record*) which seeks to equalize the impact of geographical location on the computations.

When these and other "corrections" have been made, the "corrected cost" in the index is no longer the exact dollar price that was paid, but it is something far more accurate for comparison purposes.

Cost per pupil

Hitherto, in comparisons of "cost per pupil" there have been wild variations, because some people have stuck with the "design capacity" of a room of stated size while others have credited it with a more crowded population. The effect of the second procedure is, of course, to wring a more favorable cost showing "per pupil" out of inferior conditions.

It is in order to get a standardized comparison that the Engelhardt formula insists that the actual capacity of the room be ignored, and a standardized set of "norm" figures be used. Remember, the object



REGIONAL VARIATIONS in school costs compound the problem of comparing schools. In 1951-52 they ranged from an average of \$9.24 per sq. ft. in the southeast to \$16.81 in the northeast. The Engelhardt formula makes adjustments for such regional variations.

here is not to compare how good the classrooms are in one school as compared to another, but to bring some kind of enforceable order into "cost per pupil" comparisons. The school board that has the better rooms can still say: "Yes, but look how much bigger ours are."

And, in setting up square-foot comparisons, again a definite unalterable method of measurement was considered the most important desideratum; consequently Engelhardt's instructions (in the table) boil down the best rule—that of the New York State formula—from several pages to one short paragraph, which covers it all.

The end result of the Engelhardt formula is that two schools can be compared, on a really comparable basis. There are a reliable corrected cost figure, an adjusted cost figure per pupil, per gross square foot and net square foot, and a design efficiency ratio.

Next: quality

Two all-important quality items still escape these simple end-figures, and still have to be treated in a separate column. One has to do with the *quality* of the educational program, and the other with the *quality* of the construction. At some future date, Engelhardt hopes to find certain "index" keys to the latter. Meanwhile, the table at the right shows how important is this quality factor, measured primarily in square feet per pupil for each element in the program.

School size and quality vs. capacity: Two buildings for 900 pupils each

Spaces	School "A" 73 sq. ft. per pupil		School "B" 144 sq. ft. per pupil	
	No.	Sq. ft.	No.	Sq. ft.
Classrooms ¹	18	12,600	25	21,000
Auxiliary areas			5	800
Science laboratories	4	4,200	7	6,550
Auxiliary areas	..	..	6	1,050
Business education rooms	4	3,360	2	1,600
General education laboratories	2	2,400	2	1,800
Homemaking	1	1,200	3	2,550
Art	1	1,000	1	1,200
Mechanical drawing	..	..	1	900
Shops	1	1,800	3	4,500
Auditorium for 1,000 ²	(assembly in cafeteria)		1	9,100
Music				
Instrumental room	1	1,200	1	1,500
Choral room	1	840	1	1,100
Library-practice rooms	2	100	4	550
Library	1	2,250	1	1,500
Auxiliary areas	..	350	..	850
Physical Education				
Gymnasium	1	7,452	2	13,215
Lockers, etc.	..	3,000	..	8,400
Game rooms	..	..	2	3,500
Cafeteria				
Seating area	..	3,000	..	4,400
Kitchen, etc.	..	1,000	..	1,800
Stage and chair storage	..	800	..	..
Administration ³	..	1,610	..	3,800
Total educational area	..	48,162	..	91,665
Approximate gross area	..	66,000	..	130,000

¹ English, social studies, mathematics, languages.

² Including stage and stagecraft.

³ General offices and health and guidance suites.

► To get all the children in the building, School A requires class sizes of 30 or more pupils; School B, about 25.

► In School A the larger classes are accommodated in smaller classrooms.

► School B, with seven laboratories and six auxiliary areas, provides a full science program; School A cannot.

► School A saved space by omitting an auditorium, using the cafeteria for assemblies; since other facilities for speech, presentations, drama, etc., are apparently omitted also, this part of the education program is probably restricted.

► The library in School B is de-

signed for regular library work only; in School A the larger library is also a study hall, which is not considered good practice.

► In School B there is emphasis on physical education, especially after-school intramurals; locker rooms are designed for this heavy afternoon demand. In School A locker facilities are minimal. Note also that School A can offer physical education only once per week per class, two classes per hour, while School B has space for six classes per hour, three times as much. Music facilities can be similarly compared.

► Area allotted to administration, health and guidance is twice as great in School B as in School A.

For Engelhardt's formula
see next page

A formula for comparing school building costs developed by N. L. Engelhardt Jr.

Heretofore, school cost comparisons have been misleading because there has been no standard, accepted basis for computing square or cubic feet, number of classrooms or pupil capacity; and little agreement as to use of even such poor data. This first attack on the problem to include all

pertinent variables and constants is based upon the many year's experience, with many hundreds of school plants, of Englehardt, Englehardt, Leggett & Cornell, Educational Consultants. Although the formula's application to date has necessarily been limited, its value has been demonstrated in the author's work. For full test and, if needed, revision, the author invites widespread use; criticism and comment may be ad-

1. COMPONENTS OF TOTAL COST

LAND PURCHASE PRICE \$_____

SITE DEVELOPMENT

Grading \$_____

Drainage _____

Roads _____

Paved play areas _____

Paved parking _____

Athletic fields _____

Fencing _____

Water supply _____

Sewage system _____

Electric & gas service _____

Outdoor equipment _____

Landscaping _____

Site subtotal _____

EQUIPMENT

Auditorium seats _____

Bleachers _____

Movable partitions _____

Draperies _____

Stage lighting _____

Laboratory tables _____

Chairs & desks _____

Equipment subtotal _____

PROFESSIONAL FEES

Architect _____

Consultant _____

Clerk of works _____

Engineer _____

Other _____

Fees subtotal _____

ADMINISTRATIVE COSTS

Board attorney _____

Bond attorney _____

Advertising _____

Other _____

Administrative subtotal _____

BUILDING CONSTRUCTION

Exclude all costs except:

General construction _____

Plumbing _____

Heating & ventilating _____

Electrical work _____

Cabinet work _____

Painting _____

Elevator _____

BUILDING CONST. COST _____

(Total actual cost \$_____)

2. CORRECTION FACTORS

External influences on construction costs represented by three indices

TIME INDEX

1949 1.00

1950 1.07

1951 1.14

1952 1.18

1953 1.22

1954 1.27

1955 1.33

1956 1.39

1957 (Sept.) 1.47

REGION

Northern New England 1.06

Northeast 1.33

Middle East .83

Southeast .66

Great Lakes 1.15

North Central 1.00

South Central .86

West .93

Pacific 1.22

REGIONS. No. New England: Me., N. H., Vt.; Northeast: Mass., Conn., R. I., N. Y., N. J., Pa., Del.; Middle East: Md., D. C., Va., W. Va., Ky., N. C.; Southeast: S. C., Tenn., Ga., Ala., Miss., Fla.; Great Lakes: Ohio, Mich., Wisc., Ind., Ill.; North Central: Minn., No. Dak., So. Dak., Ia., Nebr., Mo., Kans.; South Central: Ark., Okla., La., Tex.; West: Mont., Id., Wyo., Colo., Utah, N. Mex., Ariz.; Pacific: Wash., Ore., Nev., Calif.

TYPE OF COMMUNITY

Rural .90

Suburban 1.00

Metropolitan 1.10

COMPOSITE INDEX

Time x Region x Type

_____ x _____ x _____ = _____

CORRECTED COST =

BUILDING CONSTRUCTION COST

COMPOSITE INDEX

(COST) _____

(INDEX) _____

CORRECTED COST _____

3. COST PER PUPIL

PUPIL CAPACITY

No. of Units Unit Capacity Total Capacity

TYPE OF SPACE

Classroom _____ x 27 = _____

Kindergarten (on double sessions) _____ 40 _____

Science laboratory _____ 25 _____

Commercial education _____ 25 _____

Home economics _____ 25 _____

Art _____ 25 _____

Shop _____ 20 _____

Band or chorus room _____ 35 _____

Gymnasium or playroom with partition _____ 70 _____

Swimming pool _____ 25 _____

General education laboratory or study hall _____ 35 _____

Total No. of Pupils _____

INDEX SOURCES:
Unit capacities (above) are those currently considered good practice. They must be used (regardless of actual capacities) if school comparisons are to be valid.
Regional indices are developed from average square foot costs of elementary and secondary schools from July 1951 to Sept. 1952. Median average: North Central region.
Time index is Engineering News-Record Building Cost Index.

ADJUSTED COST PER PUPIL =

CORRECT COST

TOTAL NO. OF PUPILS

(COST) _____

(PUPILS) _____

ADJ. COST PER PUPIL _____

dressed to him in care of the FORUM. Periodic revision is anticipated in any case.

Mandatory Procedures. Col. 1: Building construction: only the listed items may be included; other items too often appear elsewhere in the building budget. **Col. 2:** Construction costs vary with time, place and locale; divide actual construction cost (from Col. 1) by composite index (a

percentage) to correct the cost to a constant base. **Col. 3:** Cost per pupil is the corrected cost (from Col. 2) divided by total pupil capacity. To find the capacity, use only the listed educational spaces; omit those not existing in the school being compared. Multiply each by the unit capacity shown in the formula. *Using any others invalidates the comparison.* **Col. 4:** Gross area is measured, according to New York

State formula, to outside faces of enclosing walls. **Col. 5:** Net educational area is measured to inside faces of walls and partitions, including cabinets in the measured area. Include only listed spaces. **Col. 6:** Efficiency ratio (bottom of column) is the percentage of the educationally useful area, from column 5, to the gross area, from column 4; 65% is minimum acceptable in any case; 80% or more is unusually efficient.

COSTS PER SQUARE FOOT

4. GROSS AREA

This is the total square-foot area of the floors, including stairways and developed basement areas, plus one-half the total square-foot area of the other areas listed below:

Floor areas (incl. stairs):	
Developed basement	_____
First floor	_____
Second floor	_____
Third floor	_____
Porticoes	_____
Bicycle sheds	_____
Porches	_____
Open, covered play areas	_____
Passages	_____
Sheltered bus loading platforms	_____
Subtotal, divided by 2	_____
	2 _____
Gross area =	_____

5. NET EDUCATIONAL AREA

This is the total square-foot area (inside dimensions, wall to wall, including cabinet space) of all spaces listed below:

Classroom	_____
Kindergarten	_____
Science laboratory	_____
Commercial education	_____
Home economics	_____
Art	_____
Shop	_____
Band or chorus room	_____
Gymnasium or playroom	_____
Swimming pool	_____
General education laboratory or study hall	_____
Auditorium seating area, stage, stagecraft rooms, dressing rooms—not lobby	_____
Music practice rooms	_____
Cafeteria seating area—not kitchen and auxiliary spaces	_____
Library reading rooms	_____
Gymnasium locker and shower rooms	_____
Administrative offices, health suite, guidance and conference rooms, teachers' workrooms, student organization rooms	_____
Net educational area	_____

Note: for comparison of educational programs divide each area by total pupil capacity (col. 3). This will indicate the differences between schools in availability of educational facilities.

6. PROGRAM & MATERIALS

In comparing two or more schools the unit cost per pupil per gross or net square foot may vary because of differences in any or all of the following factors:

EXTENT OF EDUCATIONAL PROGRAM

Make separate comparisons of spaces in each category:

Regular classrooms, science laboratories, physical education, music, etc.

CHARACTER OF PLAN AND SITE

Size of site, number of buildings, number of stories

CHARACTER OF STRUCTURE AND MATERIALS

Fire and earthquake resistance
Framing: wood, steel, concrete
Exterior walls: brick-block, block alone, steel, aluminum
Interior: floor finish, wainscot, walls, ceiling, toilet room walls, locker room floors
Lighting: fluorescent, incandescent
Heating
Ventilating

Note: the factors above are not now reducible to dollar index figures, for comparative purposes. It may soon be possible to work out some broad quality classifications based on a) completeness of facilities, and b) standard of quality in materials and equipment. For example, a school with science laboratory rooms, art and music rooms, separate gym, auditorium and cafeteria might be called Class A educationally; one with separate gym, auditorium, cafeteria, Class B; with multipurpose room embracing two of the above functions, Class C; classrooms only, Class D. (Nothing invidious is meant, for example a new wing with classrooms only may make great sense; but it would still be unfair to compare its cost index with that of a complete new school.)

At some time a similar rating by construction groups, as A, B, C, or D, may be worked out.

ADJUSTED COST
PER GROSS SQUARE FOOT =

CORRECTED COST
GROSS AREA (SQ. FT.)

(COST)
(GROSS AREA) =

ADJ. COST PER GROSS SQ. FT. \$ _____

ADJUSTED COST
PER NET SQUARE FOOT =

CORRECTED COST
NET EDUCATIONAL AREA (SQ. FT.)

(COST)
(NET AREA) =

ADJ. COST PER NET SQ. FT. \$ _____

DESIGN EFFICIENCY RATIO =

NET EDUCATIONAL AREA
GROSS AREA

Workable plans range from 50 to 80%
Good average for closed plan is 65 to 70%
Good average for campus plan is 75 to 80%

(NET AREA)
(GROSS AREA) =

DESIGN EFFICIENCY _____%



The package school has proved hard to sell.
Happily for education and architecture, the emphasis
is now shifting to package parts

Prefabrication's changing role

In the panic of too few classrooms and too little money to build new ones, of local debt limitations and of growing reluctance by economy-minded taxpayers to vote new bond issues, the prefabricated school suddenly commands new attention. It is not the first time, but never before has the idea been approached with such weight and purpose.

The American mind turns naturally to prefabrication. For in this idea in its broadest sense—the building of complete units of something in factories, ready for use—is embraced the whole forward-moving technology and economy of American mass production, the productive wonder of the world. And in the last year or so, to attack the classroom problem, have come such giants of mass production as US Steel and Republic Steel, with school-building structural systems, and many producers of prefabricated components such as Owens-Illinois Glass, which is developing a new curtain wall system of clear glass and glass block for schools.

But the adaptation of prefabrication in widest form to the multivarious and sometimes crotchety uses of architecture and building is studied with failures. And in the school area the problem reaches its most intransigent form. For schools, despite the glib reasoning of some tax-bitten citizens, are not Chevrolets. No two schools are exactly alike in requirements, curricula, purposes, student pattern, size, site and other more subtle physical needs, even in the same community. Moreover, pre-

fab school design runs afoul of the vast diversity in code requirements from state to state and city to city. In fact, the school is one of the most subtle design problems. Moreover, Americans, in one of those contradictions that make the US the despair of logical positivists, have never really believed in the mass production of education. From a pioneer background in which each community shaped its own school, church, grange, often with its own hands, schooling is still a jealously guarded local matter, plain in its distrust of bureaucratic regulation, of any hint of federal control, even to get needed uniform reforms and needed funds. Local school boards tenaciously retain the power to shape their schools to their own needs.

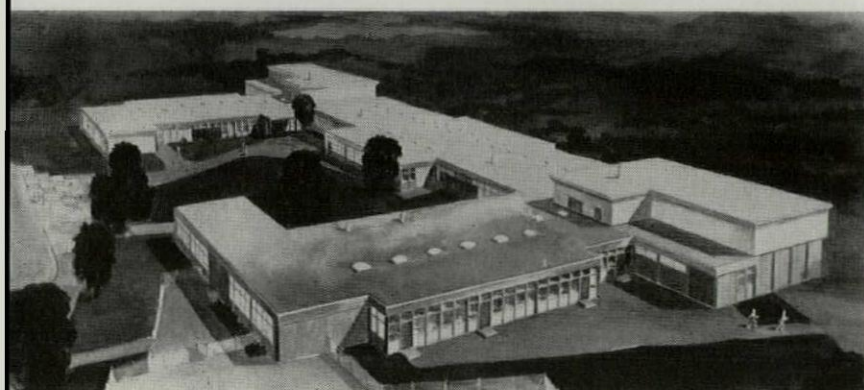
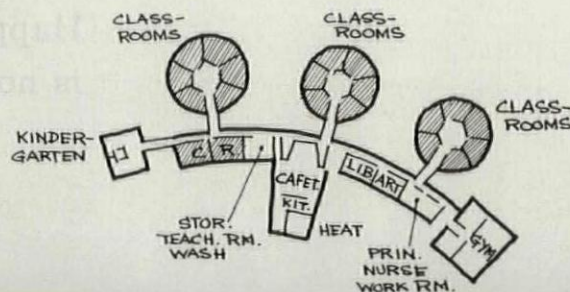
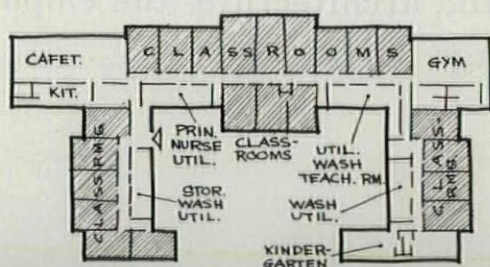
Thus far, therefore, less than 0.5% of all schools built are prefabricated in the commonly accepted sense (e.g., the factory-built house). Moreover, few of the prefabricated jobs have given any clear indication that they are much cheaper in the long run than roughly comparable conventional-built schools, the economics by which prefabrication stands or falls. Many industrial prefabrication schemes were ill-conceived in the first place. Others, learning from their mistakes, are already shifting to more solid ground. For there is no doubt that some form of prefabrication, in schools as in other buildings, is the route by which the advanced technology and economy of modern production must be incorporated in building. During the past ten years,

there has been a definite swing in this direction: toward standardization of components and prefabrication of such elements as walls and roof. Indeed, it is now common architectural practice to design and prefabricate standard modular units in order to speed construction at the building site. But it is not so simple a package as is too often first supposed, for standardization of building components is quite different from standardization of entire buildings, as many prefabricators have learned.

The first prefab schools, some dating from World War I, were simply boxes, shipped by truck to the site and assembled quickly, whole walls at a time. Some prefabs of today are much the same, deriving from warehouses, gas stations, industrial buildings, to meet the great demand for classroom space. And this kind of package school prefabrication will continue, filling the need of the despairing community which did not anticipate its heavy school burden, or which threatened at the last bond issue to vote down the next one. As a distraught New England educator says, sensing rebellion in his town: "Somehow, we must convince these people that they are getting their money's worth. The austere prefab may be the only way."

However, package prefabrication has the great disadvantages of design inflexibility, of boxlike monotony and sometimes high maintenance costs. Even in this period of acute shortages of space and funds, only about one school in 200 is built in

Which school for Westport?



Westport, Conn., chose this package school. . . .



rejected this "custom" design (see text).

this way. Educators generally abhor such schools, because they provide so few of the necessary elements for good education. Sometimes, as certain California communities have learned, the initial cost does not include such "extras" as blackboards, floor tile, clocks, or even heating units. Says Doyt Early, architect for the California Department of Education: "With a number of these prefabs, the superintendent is in for a rude awakening, because he will be forced to spend 75 to 100% more than anticipated before he is through."

Probably the most publicized of the prefabs were more sophisticated designs, "extras" included, by Structo Schools Corp. of Boston and National Homes Corp., the successful house prefabricator of Lafayette, Ind. In 1955, both launched national promotions, but neither got far with its package design: National Homes (FORUM, April, 1955), sold just three schools, two in Indiana, one in Illinois, and is now out of the field. Structo has sold seven, in Indiana, Ohio, Pennsylvania, New York, Maryland, and Connecticut, and has since switched to a different and more flexible prefabrication technique, described later. Relates one manufacturer of his experience with a standard design, since scrapped:

"We based our design on the best recommendations of some of the best school authorities in the country—including architects and educators, I might add. We thought, frankly, that we had a good plant. But everywhere we showed it, the architect said: 'Yes, but it isn't quite right in this respect,' or the school superintendent wanted the toilets put someplace else. We nearly went broke."

Why have such ideas failed? Mainly because of the necessity for compromise between prefabricator and educator. With compromise, sometimes only minor deviation from the standard classroom plan, comes a school which the educator will accept. He may feel that certain "intangibles" are lost in the prefabricated design; nonetheless, he accepts the building as a "good, workable school." But does this school cost appreciably less than a "custom" school? Not necessarily, because the moment one begins to make modifications—to compromise—in a prefabricated design, cost must go up. A case in point is the Burr Farms Elementary School, in Westport, Conn. Originally, this was to have been a "custom" school, designed by Hartford Architect Warren Ashley. But town officials rejected the plan when it came in with a total cost of \$1.14 million. Instead, Westport

chose a prefabricated design by Structo Schools Corp. (see sketches above), which, when completed this month, will cost something in excess of \$1 million, including \$47,655 for revisions and a \$44,900 fee for the rejected plan. If Ashley's original design had been reworked, eliminating certain high-cost elements, there might have been no difference in cost between the two schools. Of course, this is not a comparison between a "bad" school and a "good" school. Westport School Superintendent Gerhardt E. Rast says: "We think this school will work satisfactorily for us." But of the original design by Ashley, which was to be a campus plan, with five buildings (see sketches above), Dr. Rast says: "We really fell in love with that school."

Structo did have one real advantage to offer Westport: its school could be built in less time than Ashley's. Completion was promised for the start of the 1957 fall semester, or five months after start of construction; actually, seven months were required. Ashley's school would have taken 17 months. However, if construction of the Ashley school had begun on schedule—in August, 1956—it could have been ready at about the same time. The Structo design called for ready-made steel

curtain wall panels produced by US Steel Homes, a division of US Steel Corp., and structural elements from US Steel's American Bridge division. Structo had established similar agreements with other suppliers, heating, lighting, *et al*, representing in this instance, a total of about 62% of the school's components.

The same factor which caused the cost to exceed \$1 million also caused delay in construction: compromise. Westport could not accept the design of the Structo auditorium. Also, the heating units for two large areas, gymnasium and auditorium, had to be relocated to meet state fire requirements. So costs went up and time was lost, just as Structo had prophesied: "Any deviation from basic Structo design can influence costs upward. Speed and economy can only be achieved by adhering to standard Structo design."

In an engineering way, there was nothing unsound in the Structo system; it had been worked out in the most painstaking fashion by Structo, US Steel, and the Boston engineering consulting firm, Anderson, Nichols & Co., which founded Structo in 1955 and which still holds controlling interest in the company. Indeed, in its engineering detail, the system was a remarkable example of prefabrication. Its shortcoming was inflexibility; major modification was virtually impossible.

Planned prefabrication

If the package school does not answer the great demand for more classroom space at reasonable cost, what is the alternative? For most manufacturers it is modular design, an idea which has been used for a full generation by school architects to simplify custom work. This means standardization not of buildings but of building *components* which can be incorporated in virtually any architectural design: framing members, wall panels, floor and ceiling panels, lighting, chalkboards, storage partitions, etc., all designed to fit together. It is not an ideal alternative, by any means, because a "modular" school does take longer to build than a package school. However, it has proved to be the most workable technique, allowing the widest latitude in establishing a design which meets the needs of

an educational system, and at the same time permitting extensive use of prefabricated components.

After two years of labor with its old system, Structo has concluded—as had others before—that a modular scheme is vastly more suitable to the market's diverse requirements. Since Westport, Structo has developed a system of standard components with dimensions based on a 4' module. This is important, for it marks the end of one of the boldest ventures ever undertaken into the field of school prefabrication.

Structo's new idea is also important because of its ambitious goal: standardizing as many as 100% of a building's components, with Structo acting as the middleman for all. Pleased with the potentialities of the new system, Structo's Sales Vice President Clint Howell has set a target of 1,000 classrooms for next year, a whopping increase over the 69 sold to date. Currently, only one other company in the US is approaching this: Schoolmaker, Inc., of Ann Arbor, Mich., which has sold nine schools, but all in the Michigan area. Countless others, such as Fenebra, Owens-Illinois and Truscon steel division of Republic Steel Corp., have long accepted the tenets of modular design, but none has attempted to take on so many components.

Structo's new supercoordinated system has some of the elements for which school boards and architects have been searching. Faster construction, for instance: Structo estimates that a 24-room school of the new modular type can be erected in 193 working days, saving as much as a year over more conventional construction. Easier cost estimating: on the schools built to date, Structo has been able to estimate the cost of the building package within 1½ to 5%.

Taking the new system's 4' module as the standard, room size can vary from a minimum clear-span width of 8' to a maximum of 48'. In length, it can vary from 8' to any maximum. Such structural elements as girders, which had been custom-made in the old system, are now standardized in four sizes, from 8' to 16'. Wall panels are 4' wide, 12' high, and are now placed on the exterior side of the columns, rather than between col-

ums, in order to avoid certain insulation and joining problems. As for areas which are difficult to standardize, such as large auditoriums and gymnasiums, Structo will be happy if these are designed conventionally, using non-Structo materials. Thus, Structo believes the new system has design flexibility which the old system lacked.

There are also subtle faults in any system like this, inherent elements within the concept which, unless guarded against, could compromise both good architecture and good education. For example, this approach to school design—of letting the engineering concept influence the educational facility—could ultimately exert a conservative influence on school architecture. This could happen if a school board were inclined to select the "safe" design: the design which was most predictable in cost, in appearance, in construction time. It could happen if the shortsighted board were more concerned with lower first costs and quicker construction than with the best-planned educational facility. It could happen if the board were hard-pressed financially and were most interested in the attractive financing scheme offered by the prefabricator and his allied banking organization (see "Money for Schools," p. 166). None of these expedients, of course, has anything to do with whether or not the school is proper educationally and will be so recognized by any school board guarded in the principles of good business and good education.

Granted, a good quasi-original design can produce a good school. (All architects who deny quasi-originality please rise.) And such designs, on a national level, can probably raise the standard of school construction by encouraging those communities which now are satisfied with inferior schools to select better ones. But quasi-original design will probably never create great school architecture, because the bold new idea does not spring from the piecing together of predesigned components of rigidly fixed dimensions.

The best examples of school design derive directly from education's requirements, deftly changing as education changes. Thus, it is education which dictates the architecture of

education. Is this fact in opposition to the philosophy of prefabrication, which demands standard components, stacked by the thousand for quick delivery? In part, it does oppose, for there can be no guarantee that today's stockpile will be wanted tomorrow. As William Caudill says: "It would be tragic if manufacturers stockpiled materials for five years, because, inevitably, somebody will come along with new materials which are better."

On the other hand, there is no need or justification for a five-year stockpile. The need is for a multitude of standard components, in even greater variety than exist now. Cost-conscious architects will continue to snap them up, as they have for years. And market-conscious manufacturers, tuned to the immediate needs of building, will continue to modify, to improve, to redesign these components, in order to reduce their costs or to make them more facile elements at the site.

But in this architectural approach to standardization it is the design which determines the materials to be used, not the materials dictating the design. Indeed, if there is no standard material to meet a particular design requirement, the creative architect will invent one; in time, it too may well become a standard.

Some of the most economical and most lauded schools built in the US during the past decade have come from this kind of design: Georgia's Riverbend Elementary School, by Stevens & Wilkinson; the Bar Harbor High School, in Maine, by Alonzo J. Harriman; the schools in Bellevue, Wash., by Naramore, Bain, Brady & Johanson. If it were not for the architect's ability to integrate standard components into a new design, the cost of the "custom" school would now be as out of reach as the tailor-made suit. But, like the tailor-made suit, they do take longer to make—even those which use a great number of standard components. (A typical high school, costing \$3 million, may require 1,500 shop drawings, and many conferences between the structural engineer and the steel fabricator.) This sort of negotiation takes time, whereas a prefabricated school of fixed dimensions can avoid weeks of such delays.

Prefabrication tomorrow

If we were set up as the British are, with a federal Ministry of Education which assists local authorities in their school-building programs, we might avoid a few of these pains of an evolving school-building technology. In Britain, where prefabrication is now well-established, there is no serious conflict between education and prefabrication. But there are basic differences between the American and British philosophies of education and production. For example, the British Ministry of Education sets a ceiling on school-building costs, determines space per pupil, assists local groups with financing. Also, the Ministry is engaged in research to develop more economical building methods, including prefabrication. With its authority, the Ministry has been able to reduce schoolbuilding costs by 20% since 1949, while building costs generally have risen 50%. In cooperation with architects, local authorities, and a manufacturer—who might be a specialist in aircraft construction with no experience in building—the Ministry sets into motion a whole new prefabricated school system: structural elements, panels, utilities. It is a contractual arrangement, with no bidding among manufacturers. The objective is simply to get more schools built, to stimulate new ideas in school design, and to reduce building costs. Since 1946, when the program got under way, about 15% of Britain's school facilities have been prefab.

Although the British plan cannot be transplanted to the US, lessons in engineering can be learned from it. One American observer, Architect John McLeod, of Washington's McLeod & Ferrara, proposes an American-British round table on prefabrication, which would include American and British architects and prefabricators and the Ministry of Education. (In England this summer, McLeod talked with a British architect, who was unaware of the make-up of the American school board and equally hazy on the board's important role in the creation of every new US school. Startled, the British architect said: "But this is not a problem for the ordinary citizen. This is a problem for specialists.")

It may be years before we work out an American version of prefabrication, combining mass production and rapid construction with good design, i.e., that which meets specific community needs. And as we juggle these three little balls, we must also learn to juggle a fourth—the most fragile of all—competition, meaning competition among many manufacturers, many contractors and many design ideas, the element which is missing in the British system. Current US techniques, which make use of certain of these elements, represent an important advance.

"Eventually," says William Caudill, "we should be able to write our specifications—design the building and select the materials we want to use—and then, with automation, the manufacturers will give us the necessary elements. In other words, further development of mass production methods, both in the factory and at the site, will result in new materials of limitless shapes, and savings in time and cost on the job." Caudill feels that the next great step by American industry will lead to the creation of whole integrated building sections "with heating, lighting and textural elements contained in them."

It is the architect, often industry's greatest critic, who now applauds industry for its progress, though tempering praise with warnings of pitfalls. Says John McLeod, for example: "What I would propose to industry is this: concentrate on producing more and more complete assemblies of component parts of structures and accessories, so that advantages of mass production in reduced costs and accelerated delivery schedules will benefit all. The advantages are obvious: a wide range of selection among products, retention of traditional practices of competitive pricing and public bidding, and, most important of all, freedom to plan a school building, using these standard components, but in such a way that it will function for the betterment of the educational processes, rather than to strangle them."

Next month, FORUM will show one architect's approach to school prefabrication: Ernest Kump's Miramonte (Calif.) High School.

There are three approaches to prefabrication. Which will be used for tomorrow's schools?

1. Classroom prefabrication:

Rooms of fixed size fit together like blocks. Construction time: about three months. But fixed design cannot be altered to meet special educational needs, because design changes increase school cost.

2. Component prefabrication:

A pre-engineered system of prefabricated parts, based on a fixed module, usually 4' or 5'. More flexible than No. 1, but design must conform to system's limits, must evolve

from fixed module. Construction time: four to ten months.

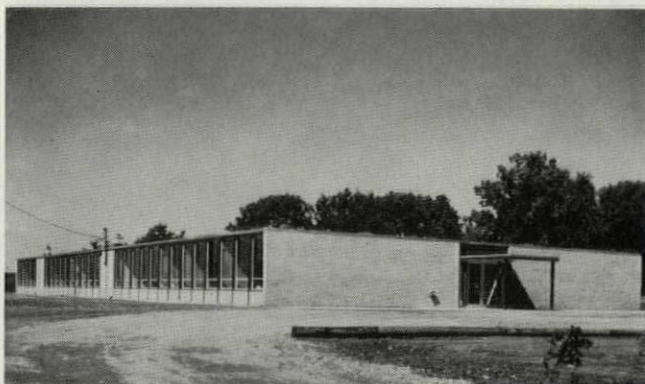
3. Custom prefabrication:

The most flexible approach, starts with educational needs, evolves a basic design, then a standard module. Because many components are standardized, they can be prefabricated to architect's specifications. This technique costs no more than others, when quality is comparable, but usually requires more time. School here, by Eberle Smith, took 12 months.



JASON HAILEY

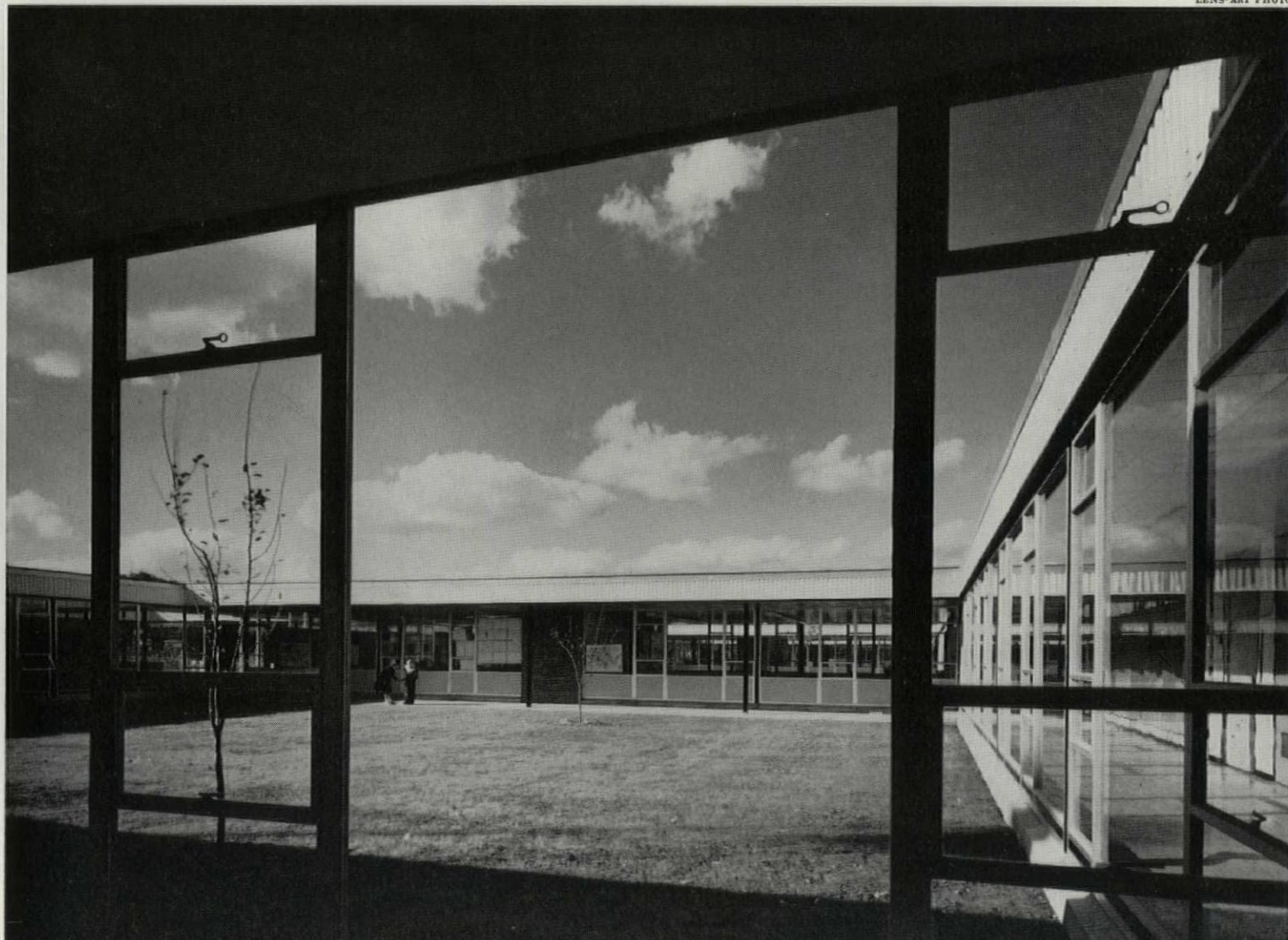
1.



2.

3.

LENS-ART PHOTO





The next 14 pages highlight ten new buildings which make important contributions to the emerging revolution in high school organization and appearance

Design for teen-agers

The postwar rise in the birthrate is just 12 years old, which means it is lapping at the high schools. In fact, it is lapping at a great many high schools that do not exist yet—which is why the next few years will have to be the greatest period of high school construction in our history. An estimated 154,000 additional high school classrooms, plus the general and activities areas to go with them, will be needed just to accommodate the 4 million increase in high school enrollment by 1965.

The next few years may well prove to be a great period of high school construction in another sense too. For at last, 15 years behind the design revolution that has transformed the elementary school, the high school has entered upon its own design revolution. About time too, considering the changes in educational philosophy and practice and the vastly different composition of the student body since the days of the old "academy" which once, twice or thrice removed has continued to serve as the prototype for most secondary school buildings.

Many of the visible signs of emerging revolution in high school organization and appearance may be seen in the photographs and drawings on the following pages.

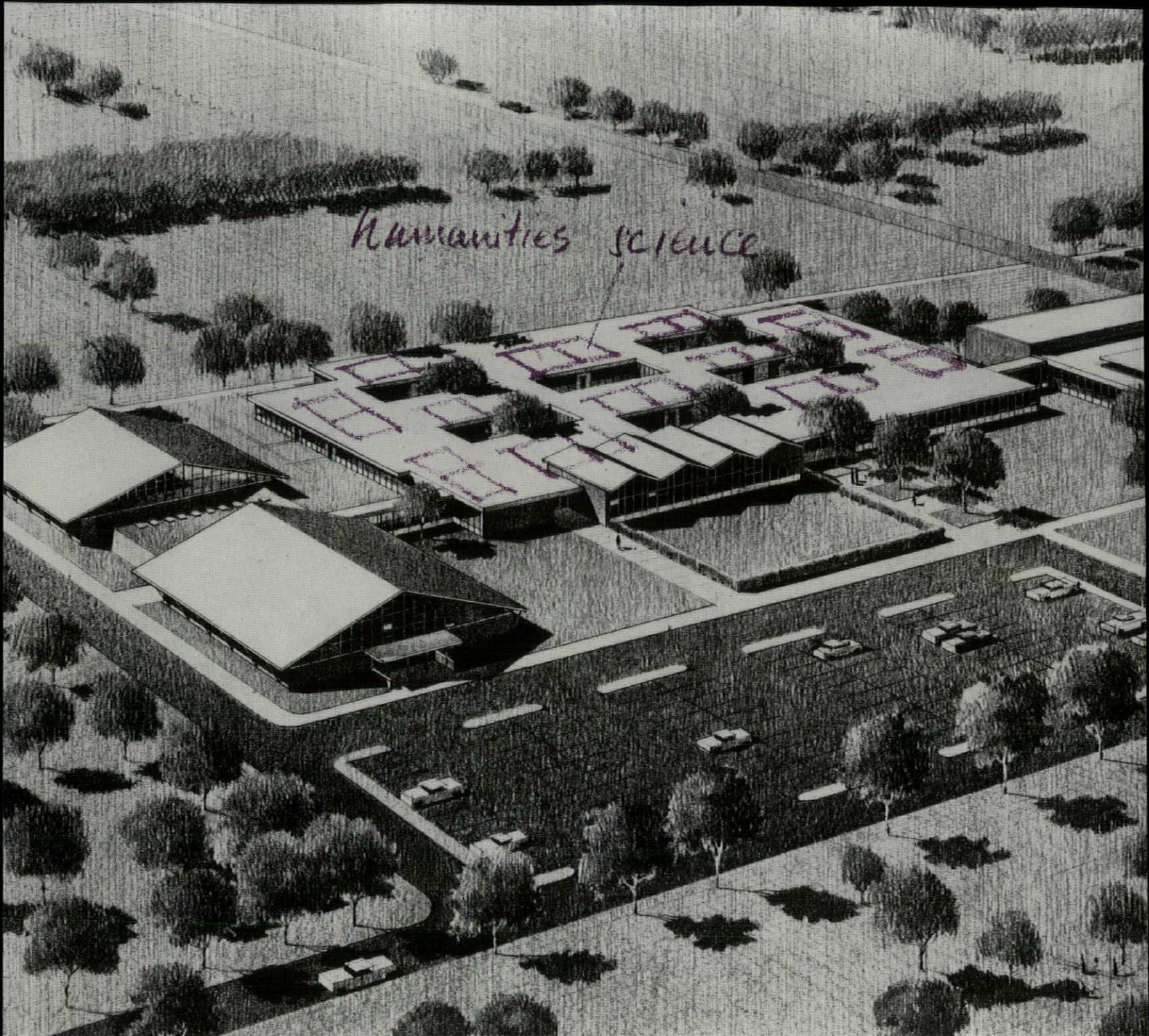
Outdoor forum is the central feature of Tantasqua High School. For more on this school and its site, see p. 154.

Behind these strikingly visible changes—indeed the reason for them—is the fact that architects and their official clients on school boards and educational staffs have been giving some new and intensive thought to the nature of the high schools' ultimate clients, the teen-agers, on the premise that a school which works with the adolescent's grain, instead of at cross-purposes to it, will do a more successful job of educating him.

Here are some of the observations influencing the design of new high schools such as those shown on the succeeding pages: teen-agers are sociable to the point of being herd creatures; they want and need congregating and milling areas. But they are also socially uncertain and need strong hints from their surroundings on the manners expected of them. They want independence but decidedly not the independence that results from anonymity, so they need chances to assert themselves in a rooted, intimate grouping. When they need help, they need it from an adult close to them, not from a front office. They are everlastingly curious, and the school ought to take constructive advantage of this trait. They are painfully self-doubting and need wide and encouraging opportunities to test out their talents. Above all, they need to feel status and pride, the sense that "I count," that there is some dignity involved in being what they are.

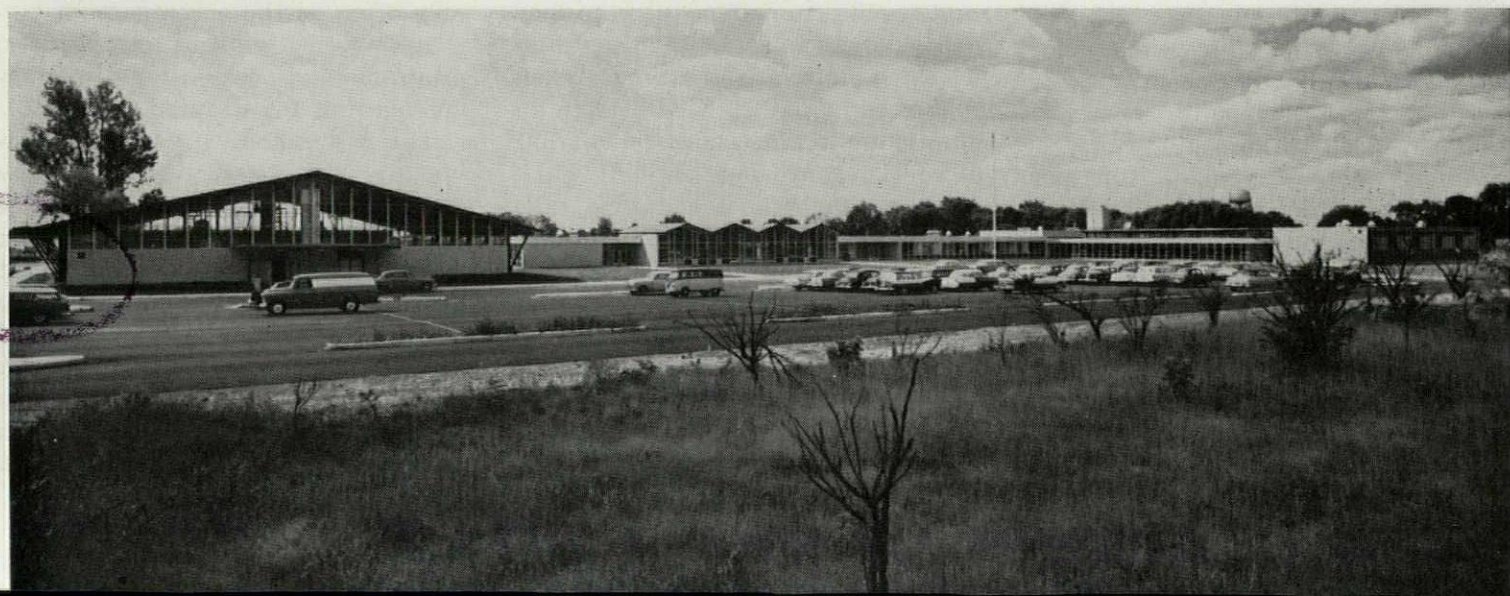
If schools designed to take account of what a teen-ager is and needs proved to be more expensive than schools designed from a customary program of secondary school facilities, there would be no hope of the newer approach making a dent, however desirable it might be. But the fact is that the rethought high schools rate consistently higher in space efficiency (the fundamental item in economy) than the routine high schools, and are frequently, though not necessarily, lower even in costs per square foot, too. This is not because there is anything inherently either cheaper or more expensive about designing around the teen-agers' natures and needs. Rather, it is because any new approach to an architectural problem inescapably leads to hard new thoughts about *all* aspects of the problem. Real economy never comes without hard thought; it does come remarkably often as the accompaniment to a basic reassessment of purposes, programs and possibilities—to taking nothing for granted.

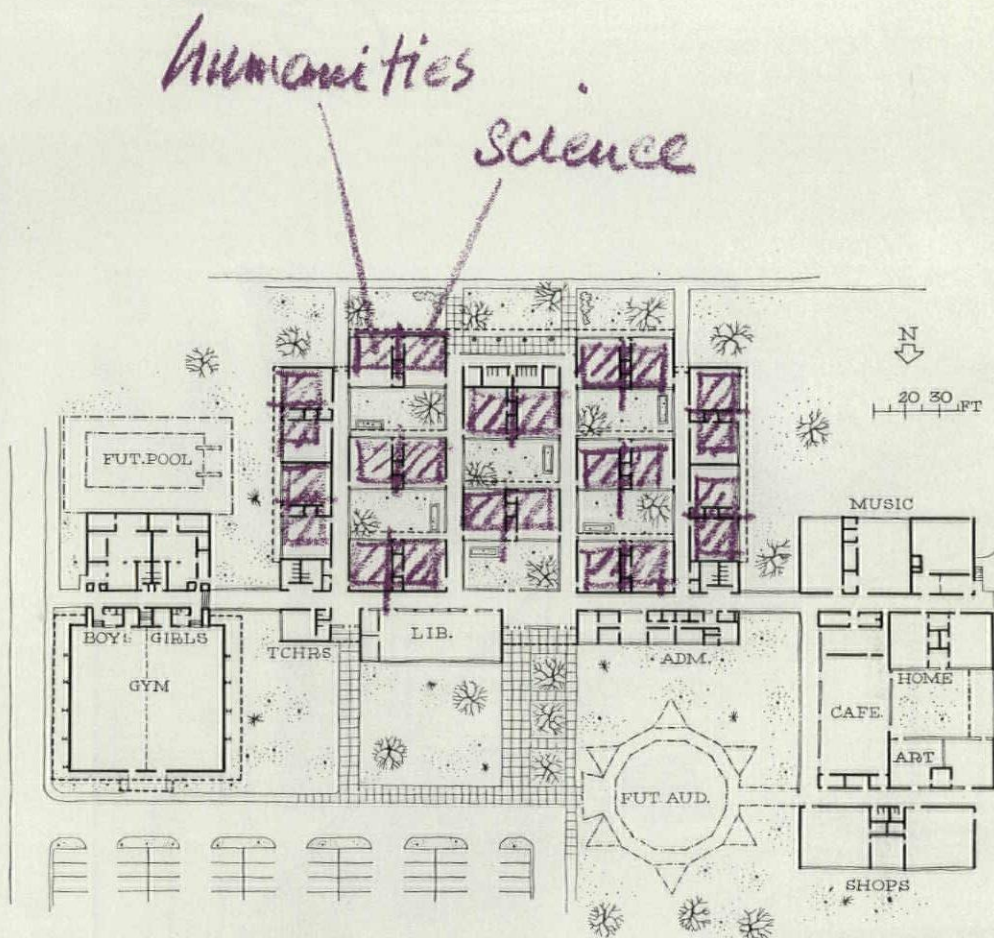
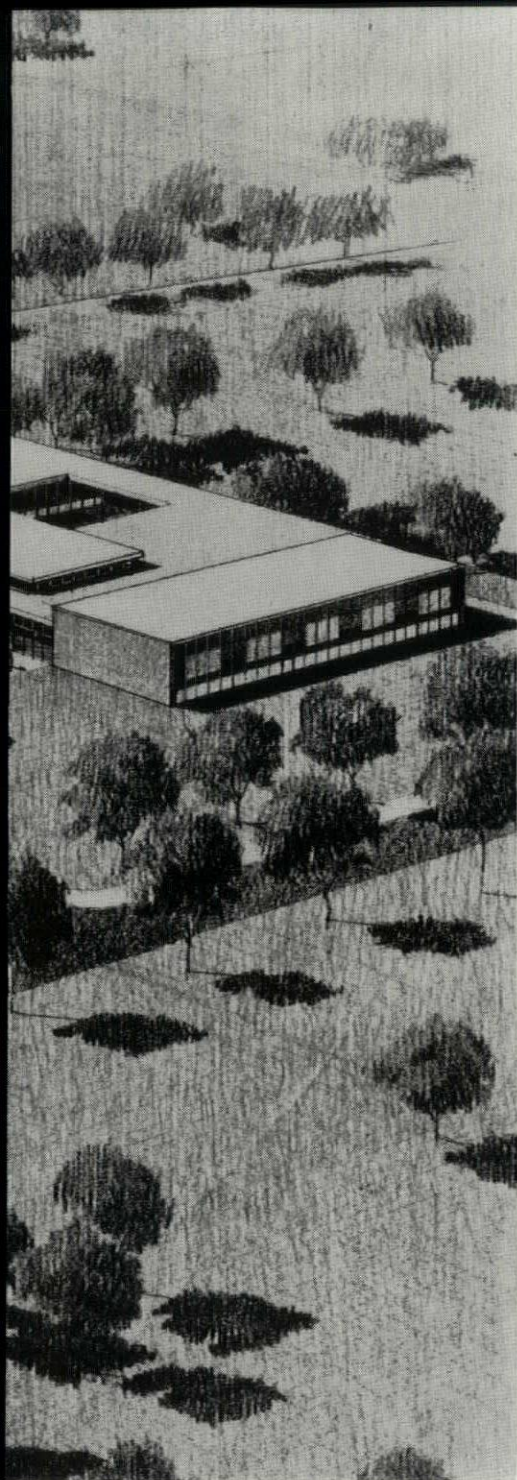
The new schools are already convincingly demonstrating that they lead to quite a different category of economy—reduction of vandalism. This is without doubt the most heartening type of economy they could yield, not only as a matter of money and morals, but also as a signal that the new concepts of how to work with the teen-agers' natures are probably on the right track.



RENDERING (ABOVE): F. KUBITZ; PHOTO (BELOW): LENS-ART

This school makes a new kind of home





base out of the old idea of the home room

Home rooms in this 1,000-student junior high are in pairs—each pair has a humanities classroom and a science classroom and its own distinctive court. Students belonging to one of these home-room groupings spend about a third of the day in each of the paired classrooms, and the other third in specialized areas such as shops, music and gymnasium.

The point of this arrangement is to gentle down the abrupt transition of the junior high student, who is jumped from the elementary

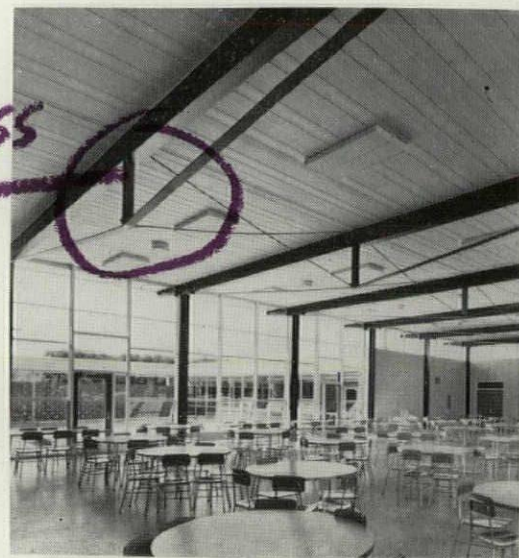
classroom, in which he spent the school day, into the sometimes bewilderingly mobile high school program. Another advantage is the scheme's efficiency. Classes of less than 30 pupils are feasible without an increase in square footage or in teachers because the scheme permits what the administrators call "maximum utilization of facilities."

Courts and classroom pairs are checkerboarded, yielding pleasant corridors along which one side or the other is always open to a court view. The home-room pairs have

brick and block bearing walls and bar joist roof framing.

Outside the central "village" of home rooms, each department has its own character, and the school as a whole is a particularly nice example of structural differences based on economy being employed for architectural emphasis. The special areas make maximum use of steel in tension to reduce cost: in the gym by exterior ties to balance girder moments; in the library by channel diagonals from which center gabled beams are hung; in the cafeteria

King post truss

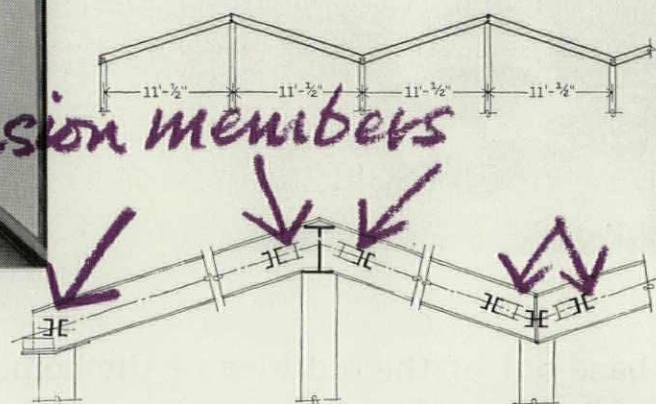


CAFETERIA



LENS-ART PHOTOS

tension members

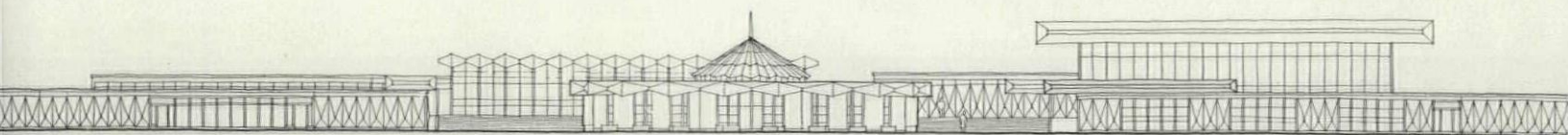


LIBRARY

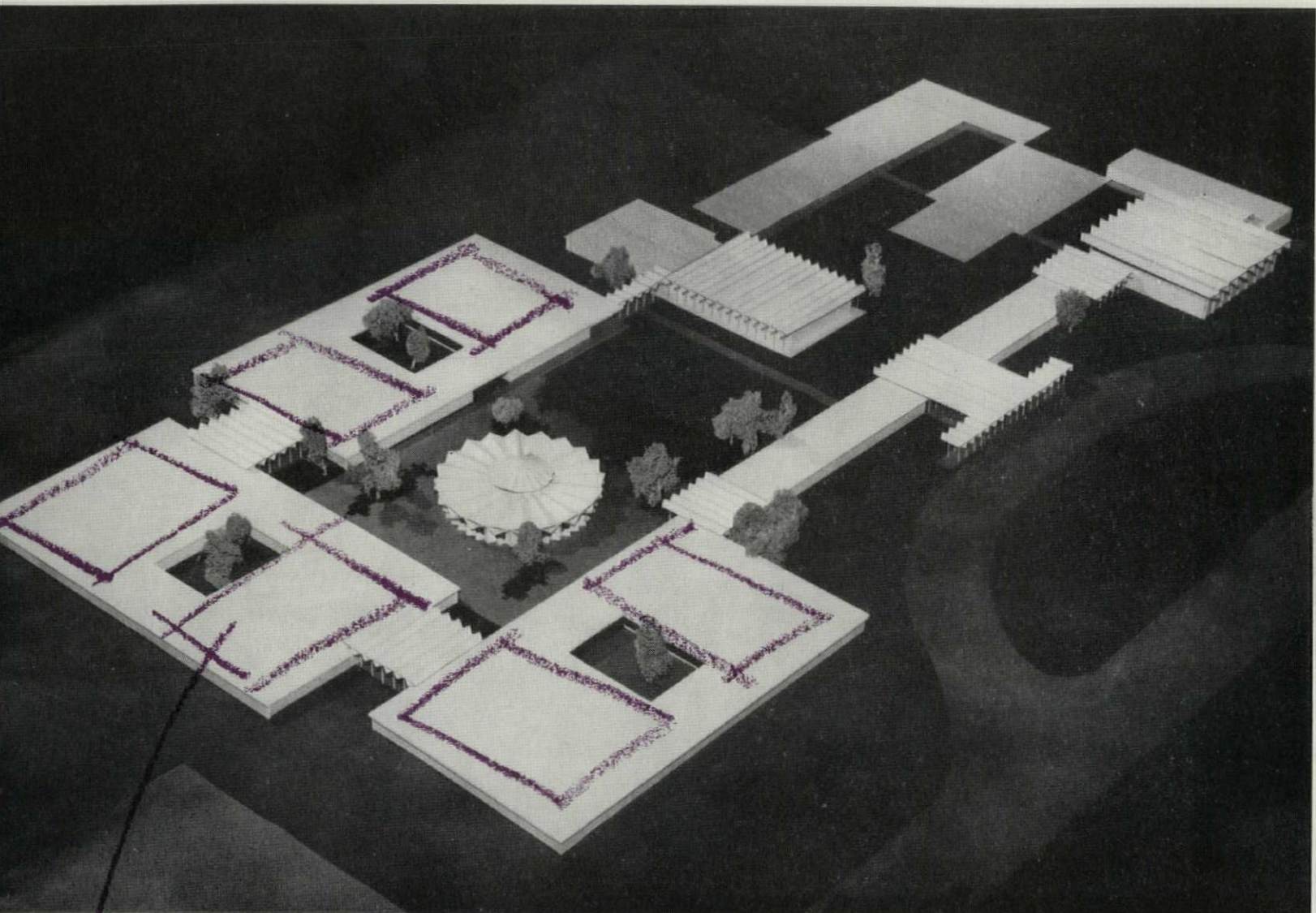
by kingpost trusses. In each case the exposed tension members are painted in brilliant red, blue, yellow or turquoise so that students, whether or not they understand the principles, will at least be aware that the emphasized members are distinctive and special elements in the structure. Besides, the color looks good, though the lights are clumsy.

Plymouth Community Junior High School, Plymouth, Mich. Architects and engineers: Eberle M. Smith, Assoc. Inc. Contractor: Palmer-Smith Co.

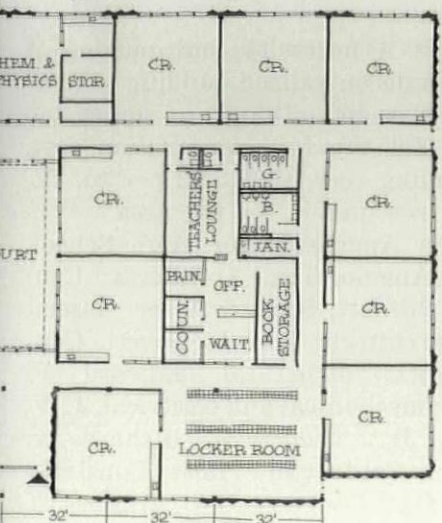




EAST ELEVATION



Home bases here are three high schools in miniature

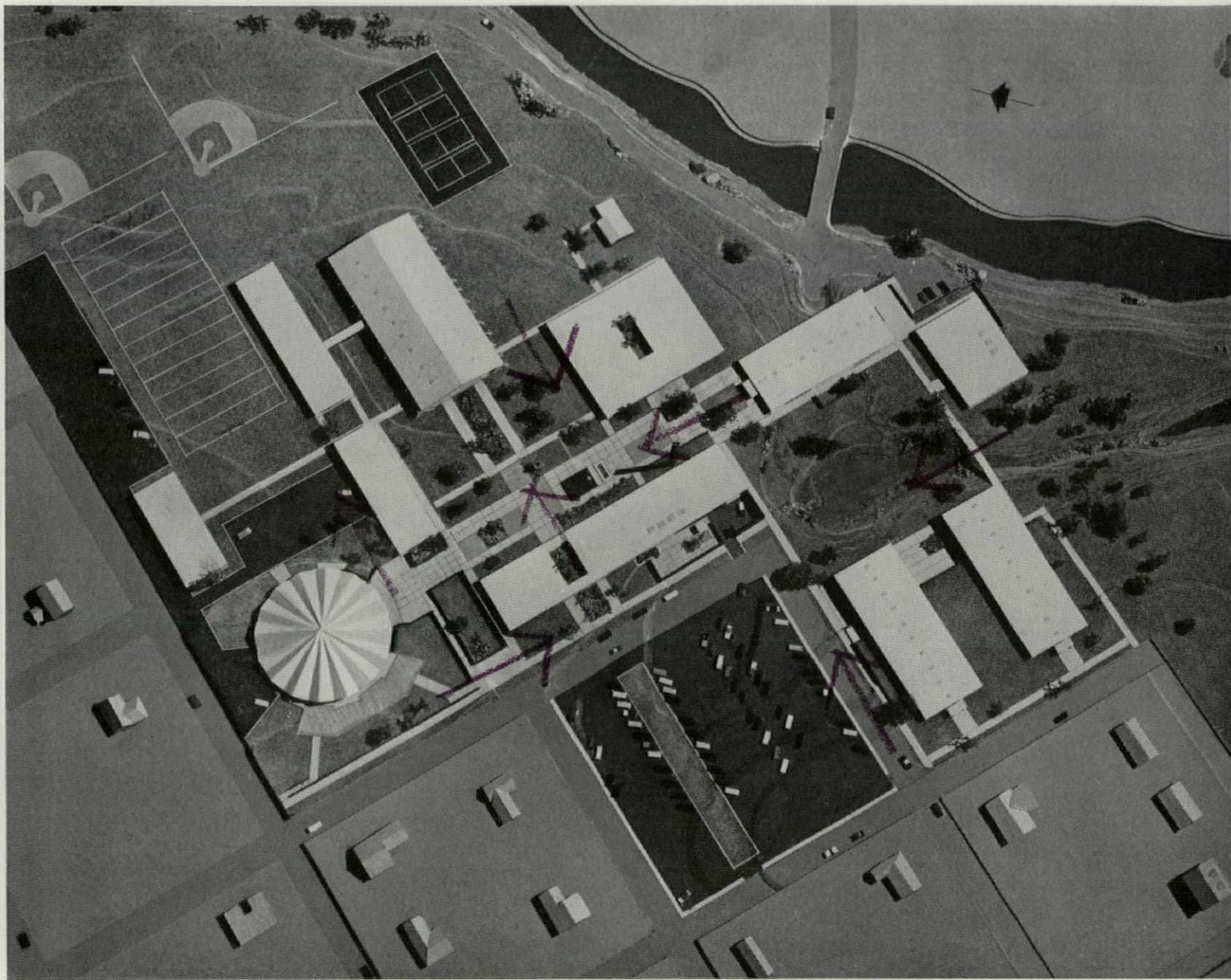


Like other across-the-board "little school" schemes, this plan for a senior high school aims to keep student groups reasonably small and intimate; but at the same time the scheme assures a range of ages by maintaining a three-grade-level society for each group.

Here an enrollment which will eventually reach 1,800 or 2,000 is separated into three little schools of 600-plus students each, not by grade level, but by cross-section of the school as a whole. The little-school units are complete, each having even

its own home economics room. The three truss-framed link-buildings beside the little schools are student common areas equipped for TV teaching; the central TV antenna is atop the circular library which is centered in the academic quadrangle. (Activities quadrangle is at the other end.)

Garinger High School, Charlotte, N.C. Architects: A. G. Odell Jr. & Assoc. Consultants: educational, Engelhardt, Engelhardt, Leggett & Cornell; mechanical, W. P. Wells; electrical, John Bolen.



ROLANDO CHATAM

Vistas and variety are calculated to instill pride

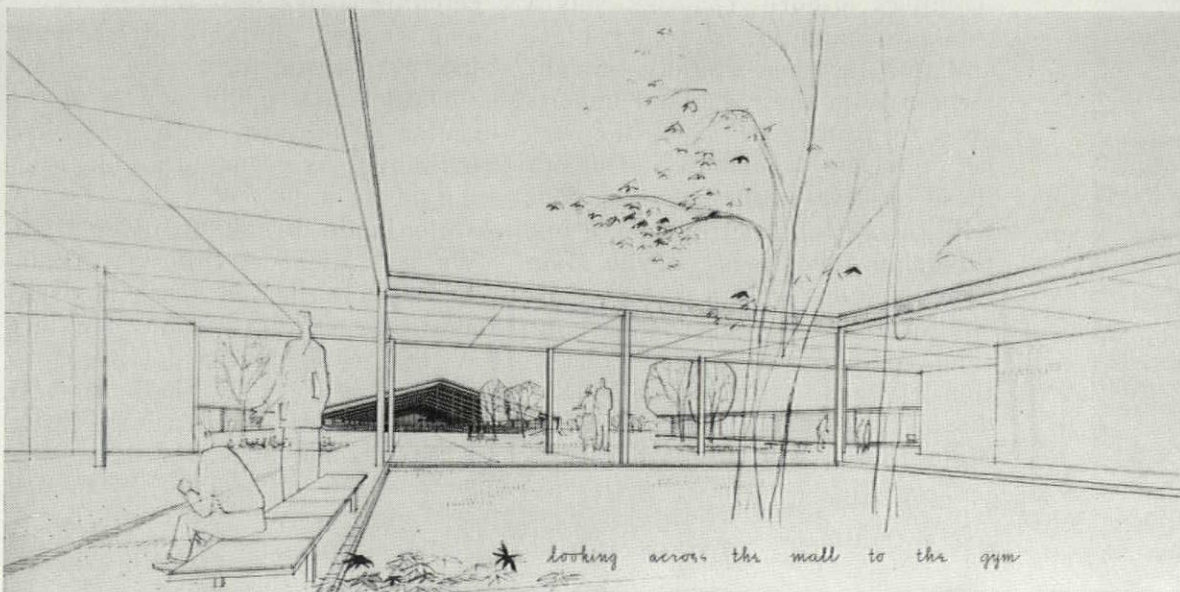
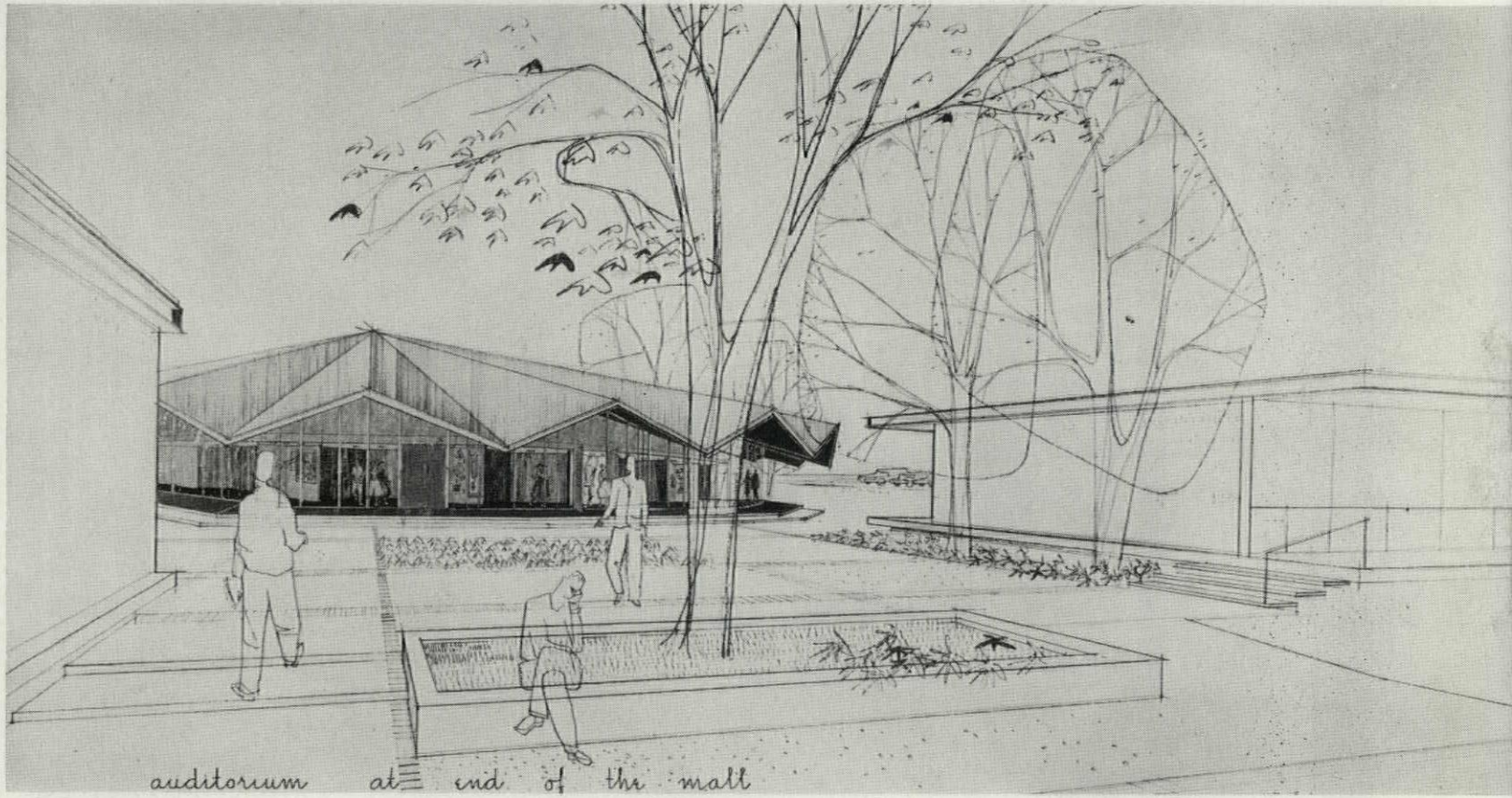
San Angelo's high school, now under construction, would be notable in any case as one of the first air-conditioned high schools, and most especially as an air-conditioned campus plan. But it is equally noteworthy for demonstrating that large size, together with the most demanding technical requirements, need not entail sacrifice of first-rate educational planning or of amenities.

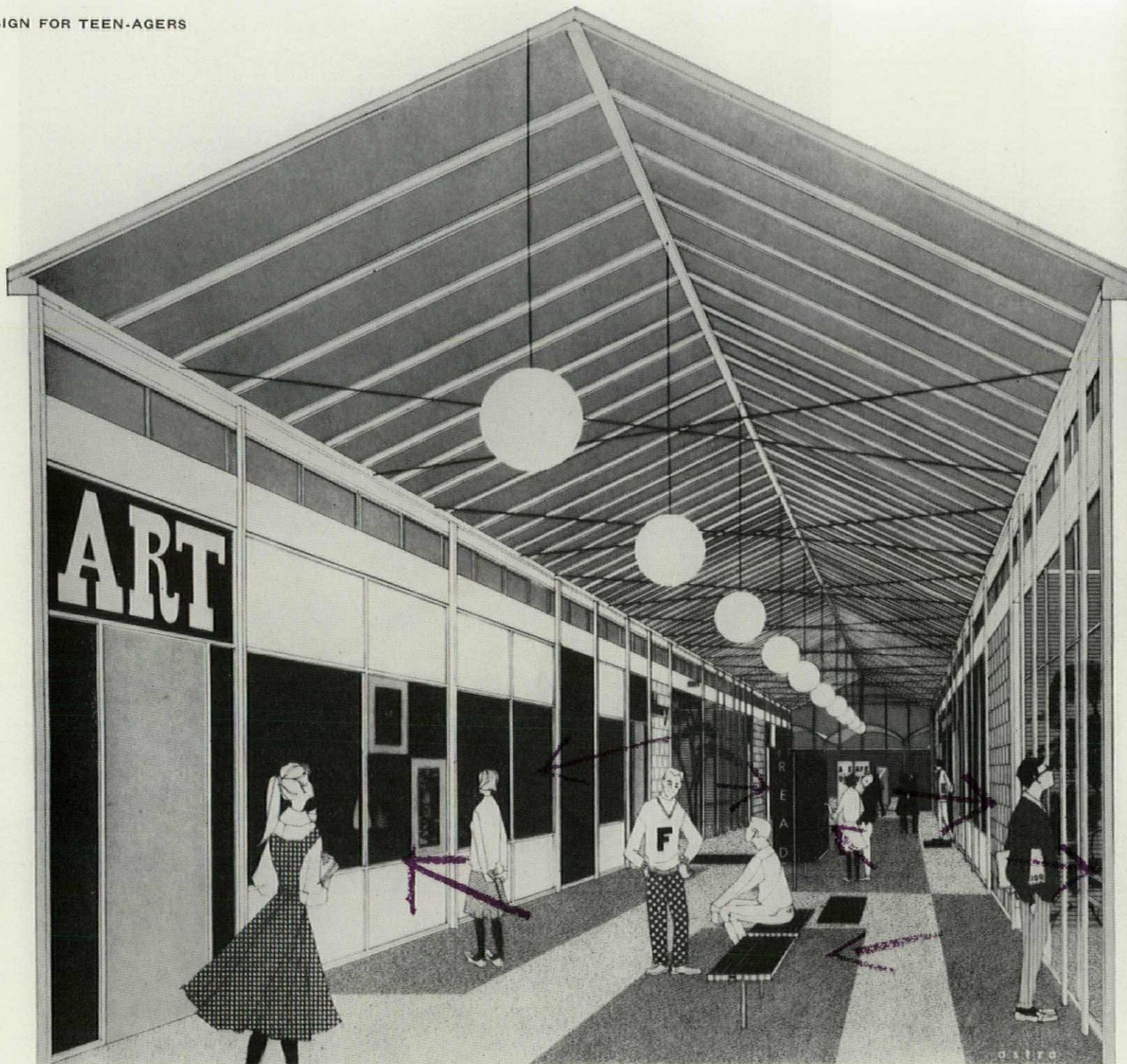
San Angelo's 2,000 students will be organized by grade level into separate academic buildings having special facilities in common. Not

only were the buildings themselves carefully studied, but so were the spaces between, so each vista would excite pleasure and instill pride. Among the prospects are a lake in the academic area, a garden court for the electives unit, an outdoor terrace for dining, a river view from the library. Most classroom view windows (gray glass) are at right angles to the exterior walls, in spacious sun-protected recesses. (See p. 168 for this and other data on school air-conditioning design.) In hot San Angelo, air conditioning is

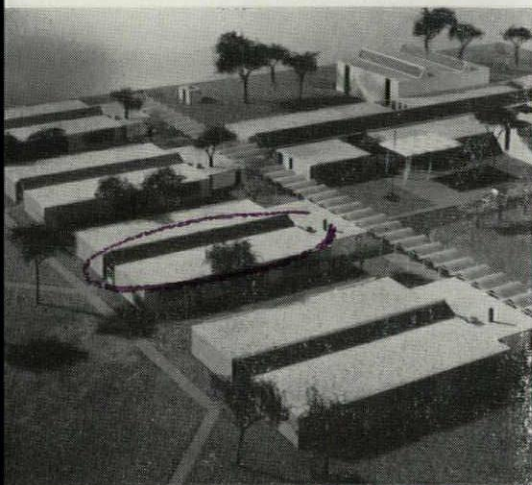
almost a necessity, but putting it into a decentralized building scheme might seem, offhand, as going too far. Yet the full construction cost, including fees, is \$13.82 per sq. ft., very reasonable for the area.

San Angelo Senior High School, San Angelo, Tex. Architects: Caudill, Rowlett, Scott & Assoc. Associate architect: Max D. Lovett. Consultants: structural, Edward F. Nye; mechanical and electrical, J. W. Hall Jr.; acoustical, Richard N. Lane. Contractor: Rose Construction Co.





A main corridor becomes a cohesive Main Street



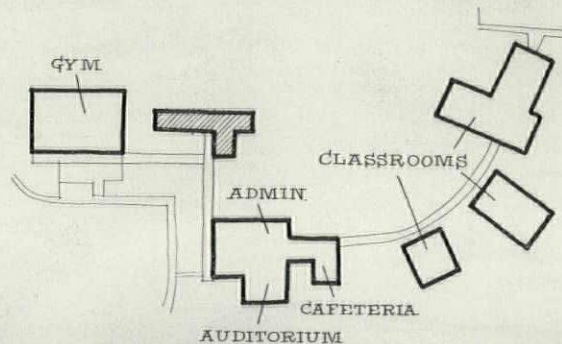
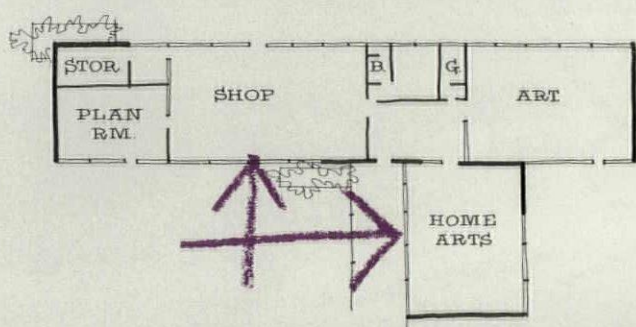
PHOTOS: (ABOVE) LENS-ART; (OPP. P.) JOSEPH W. MOLITOR

Architect Minoru Yamasaki has a teen-age daughter in junior high, and this fact has literally brought home to him the value and importance to teen-agers of by-the-way, between-class sociability. Out of these observations plus discussions with the school superintendent came this plan for a wide, skylit Main Street linking common rooms—gym, auditorium-cafeteria, homemaking, shop, art, library and administration. Livened with color, bold signs, display cases and center benches, Main Street will afford curiosity-

catching views into activity rooms and tranquil glimpses, at intervals, into garden courts.

Outdoors, a public square is the center of things, with classroom buildings, six rooms to a unit, leading off its walk.

Benjamin Franklin Junior High, Wayne, Mich. Architects: Yamasaki, Leinweber & Assoc. Consultants: structural, Richard McClurg Assoc.; civil, Mason L. Brown & Son; acoustical, Bolt, Beranek & Newman, Inc. Contractor: Darin & Armstrong, Inc.



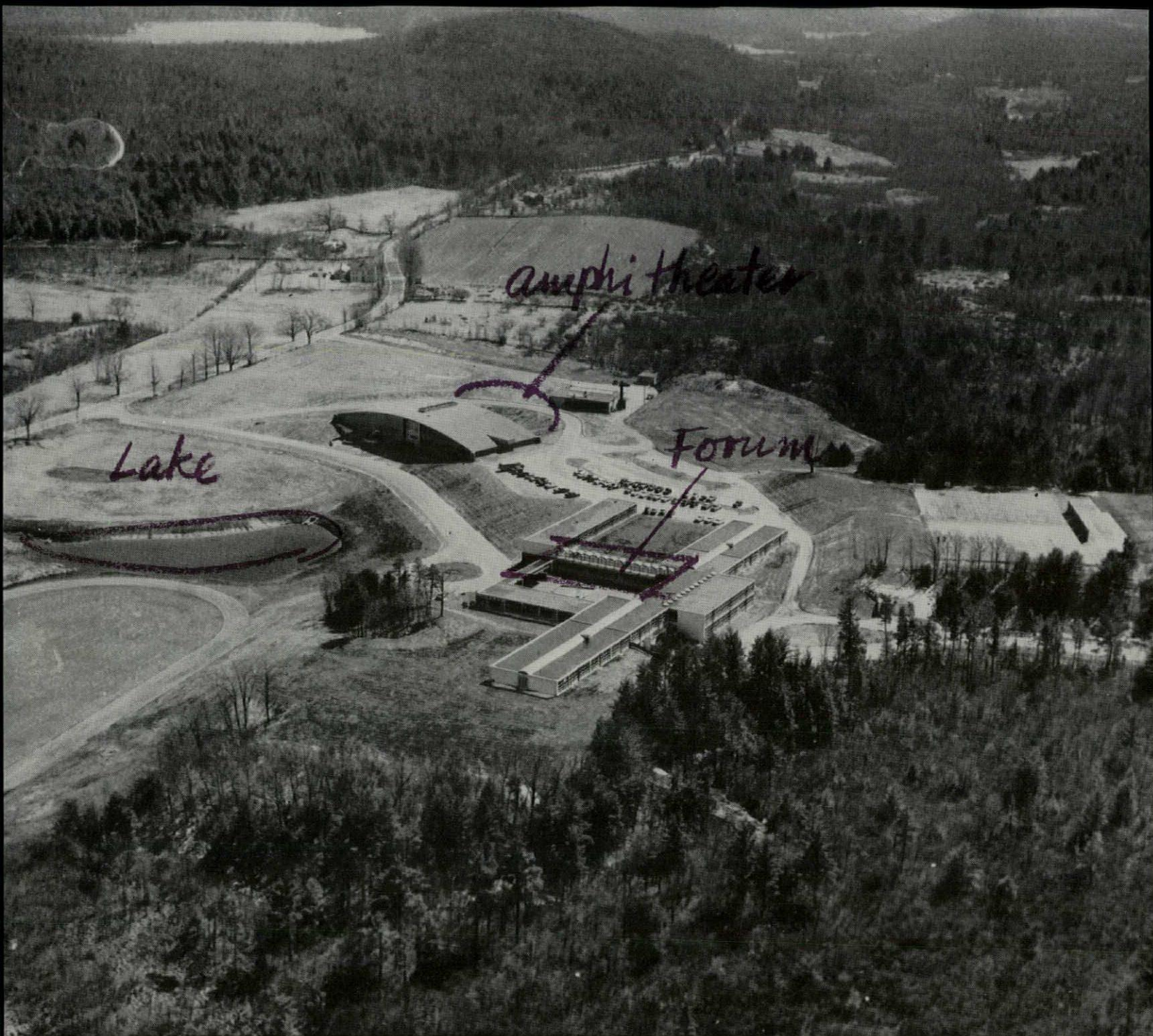
Curiosity, stimulated by design, creates a "course"

At Edgemont High, glass walls are designed for looking into, not just out of. This catering to the teenagers' curiosity has not led to disruption; on the contrary the superintendent credits it with aiding education. For instance, although the arts and shop unit was designed for separate courses — fine arts, homemaking and shop — students and teachers in each of these rooms became so interested in work in the others that the very wide-awake administration here devised a unified and very popular course called

"home arts" which uses the facilities of all three rooms in common.

This, incidentally, is one of the first applications of the unified "core curriculum" idea to subjects other than the humanities and sciences.

Edgemont Junior-Senior High, Greenburgh, N.Y. Architect: Warren Ashley. Site planner: Charles Currier. Consultants: educational, Engelhardt, Engelhardt, Leggett & Cornell; structural and mechanical, Marchant & Minges; acoustical, Bolt, Beranek & Newman, Inc. Contractor: Stewart M. Muller.



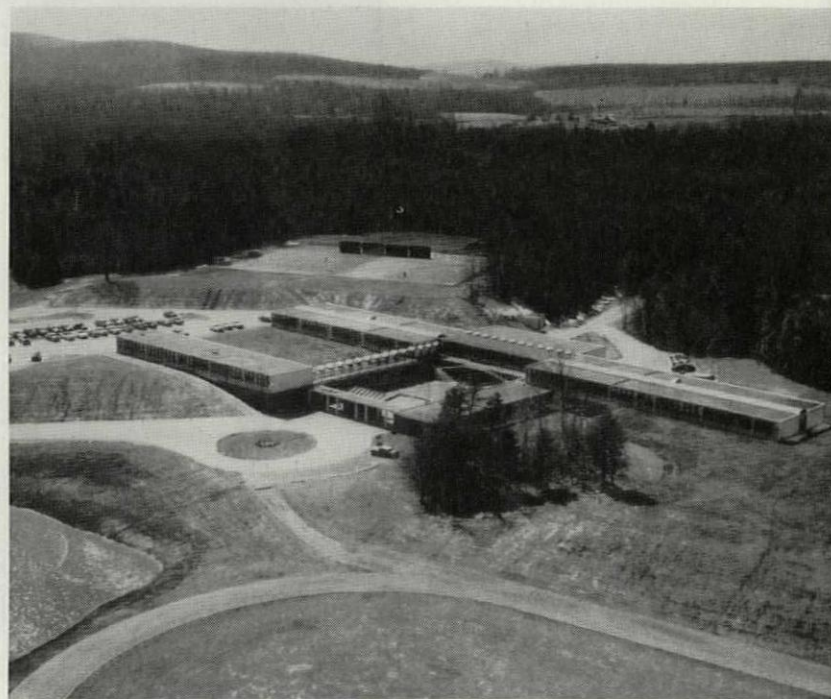
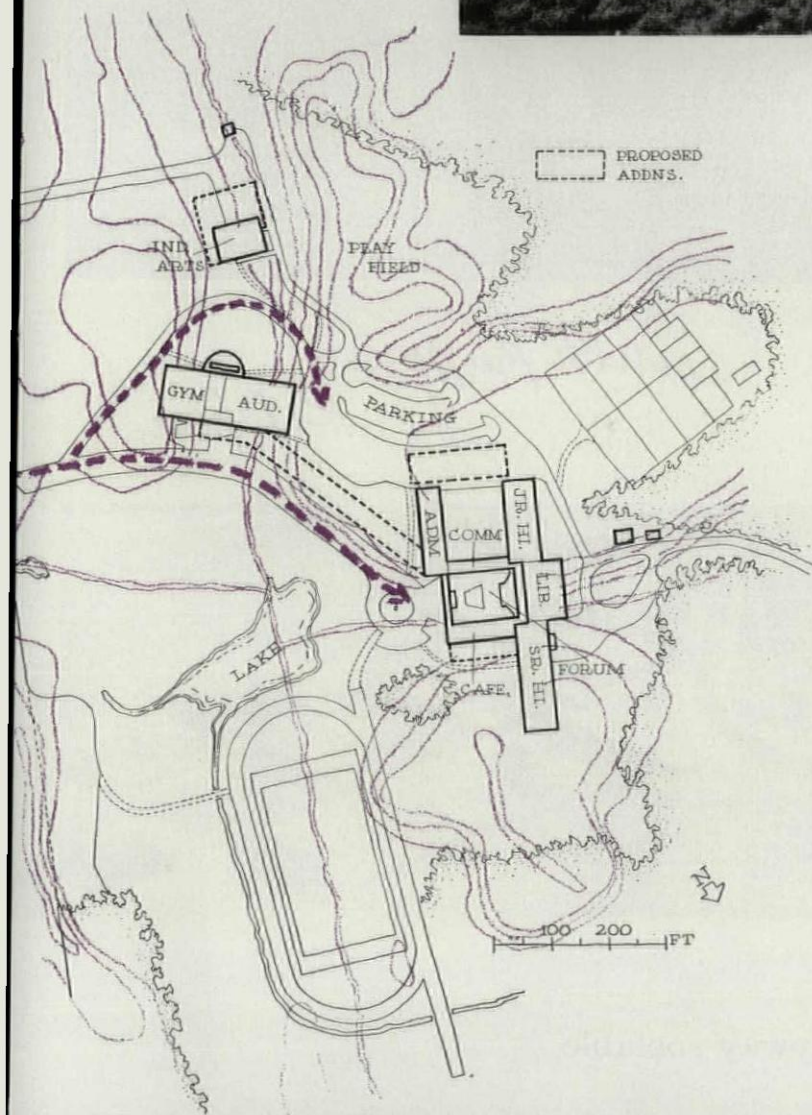
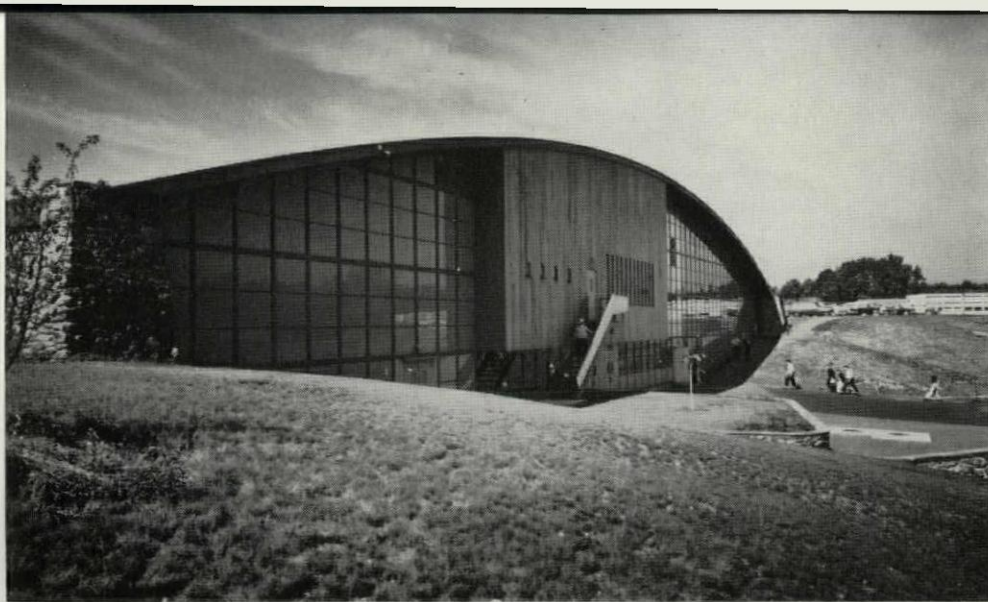
Site irregularities are natural places for outdoor congregation

PHOTOS (BELOW & TOP, OPP. P.): ALEXANDRE GEORGES



This New England high school makes very clever use of its site—with two exceptions, which will be dealt with later.

One slope between hillocks provides a central school forum, bordered on one side by an upper-level covered walk with store and student council headquarters beneath, on the other by the forum-level cafeteria, at the end by the upper-level library. This forum, although it has not yet come up to original expectations of service as a regional cultural adjunct for adults too, is being made



the most of by students for informal gathering, lunchtime milling and parties. The photo on p. 144 shows it in customary use. A second depression forms a big outdoor amphitheater behind the handsome backdrop of the earth-arching gym. To salvage this hollow, a brook had to be dammed and thereby still another asset was created, a pond usable for nature study part of the season, for skating the rest.

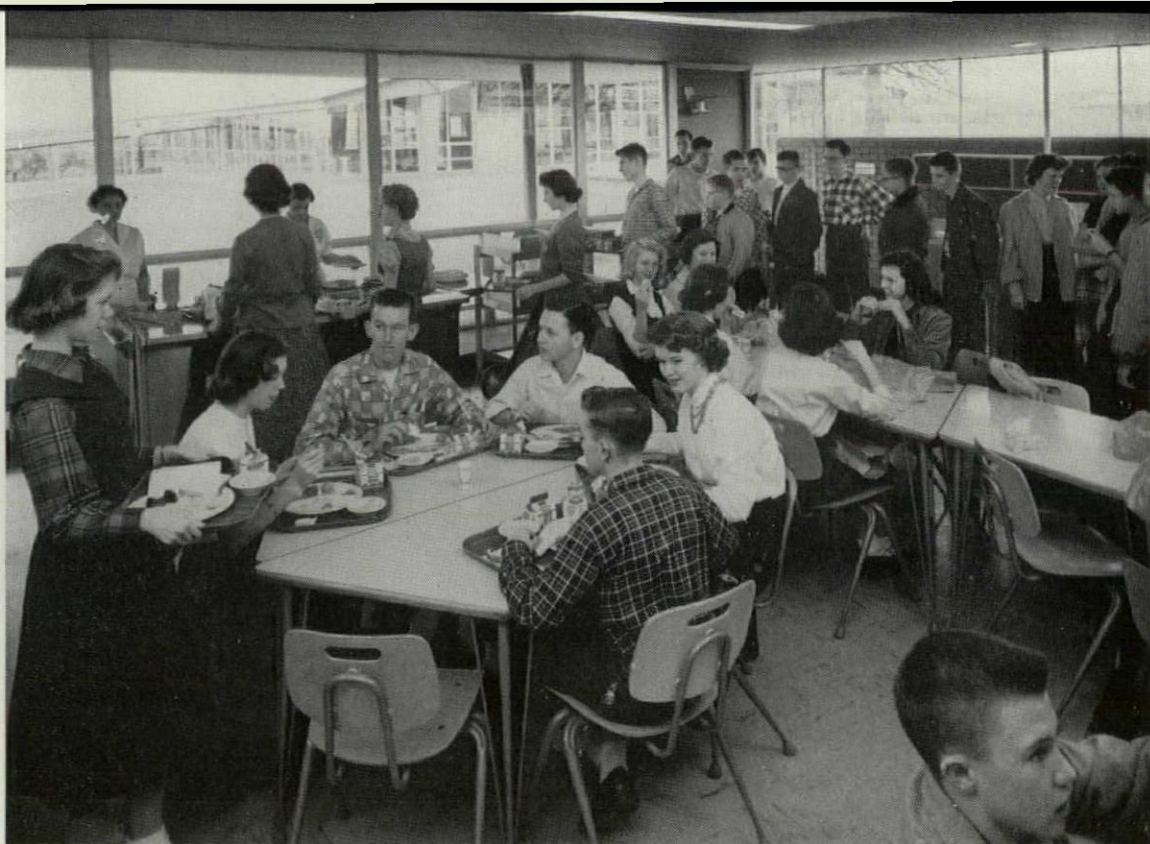
One exception to the sensitive site use is the formal drive and turnaround in front of the forum—it

misleads cars away from the real entrance and also separates the school visually from its little lake. It's a mental hangover from monumentality. Another exception is the silly stair down into the forum—the architect had drawn a full-width flight of steps that would have made a grandstand.

Otherwise the ideally large 116-acre site is laid out most intelligently with garden plots adjacent to home economics, construction space to shops, and unspoiled opportunity for forestry, surveying, hydrostatics

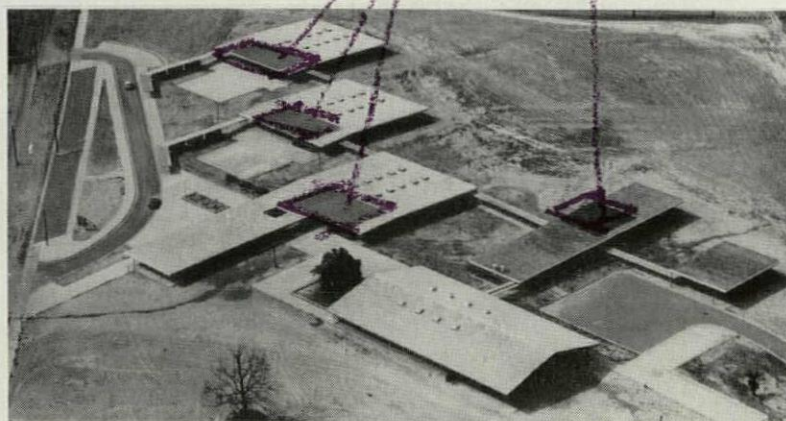
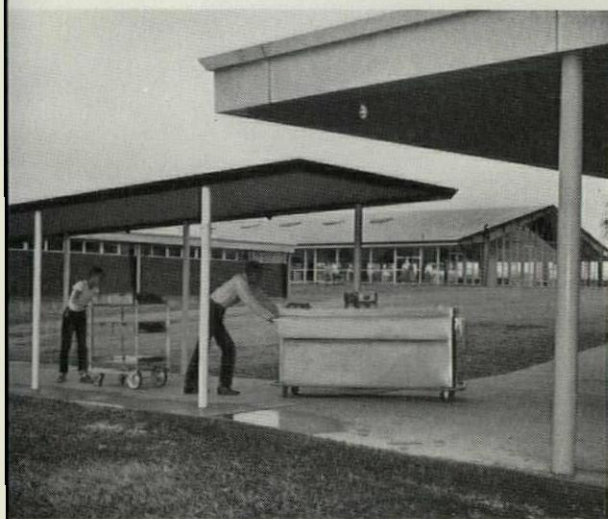
and natural history. Now that the big push is over to get the school built (five municipalities cooperating) the steam seems to have temporarily gone out of civic efforts to make the most of these potentialities. They await really creative use.

Tantasqua Regional High School, Sturbridge, Mass. Architects: George H. Stoner; Anderson-Nichols & Co. Consultants: educational, Engelhardt, Engelhardt, Leggett & Cornell; acoustical, Bolt, Beranek & Newman, Inc. Contractor: Louis Neri Construction Co.



PHOTOS: JAY OISTAD

*multi purpose
Kitchen*



Eating time can be a civilized time, or anyway sociable

If there is anything most teen-agers like to do, it is to eat. But mass eating is generally raucous, messy eating. In both these secondary schools, the way teen-agers themselves like to eat—socially—has been exploited to abet the way their mentors want them to eat: in polite and civilized fashion. The idea works well in both schools, although the two systems are quite different.

In Tyler, Tex. (illustrated above) food is supplied from a central kitchen but transported in carts to each of the three grades' multipur-

pose rooms instead of being doled out in a central cafeteria. Students push the carts, dispense the food, act as cashiers, return debris. Meantime other students have arranged furniture for dining and rearrange it later for academic use. The system has been in operation two years and is endorsed by the principal for speed, civilized atmosphere, quiet and general morale.

Incidentally, the use of carts did not impose a requirement of level walkways in this campus plan school. Walks ramp gently with level "land-

ings" only at intervals. This device has worked out fine.

Andrews, Tex. (illustrated on the opposite page) has something closer to the customary cafeteria. But changes in floor level, furnishings and atmosphere divide the room into an upper-level section with the beloved booths and a higher-toned lower level with tables, adjoining an outdoor dining terrace. Neither of these schools is by any means high cost, yet here effective, workable ways have been found to make what is often the most deplorable part of



PHOTOS: DEWEY G. MEARS

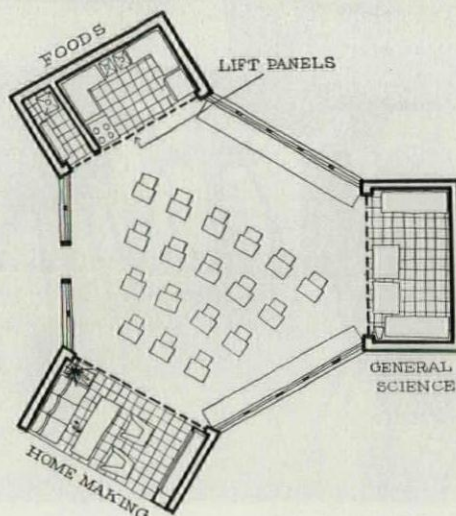
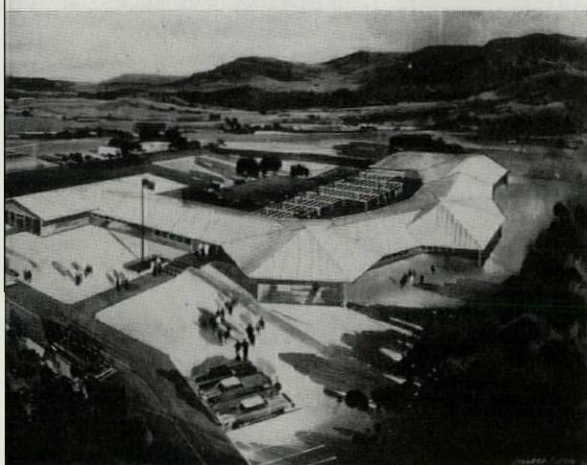
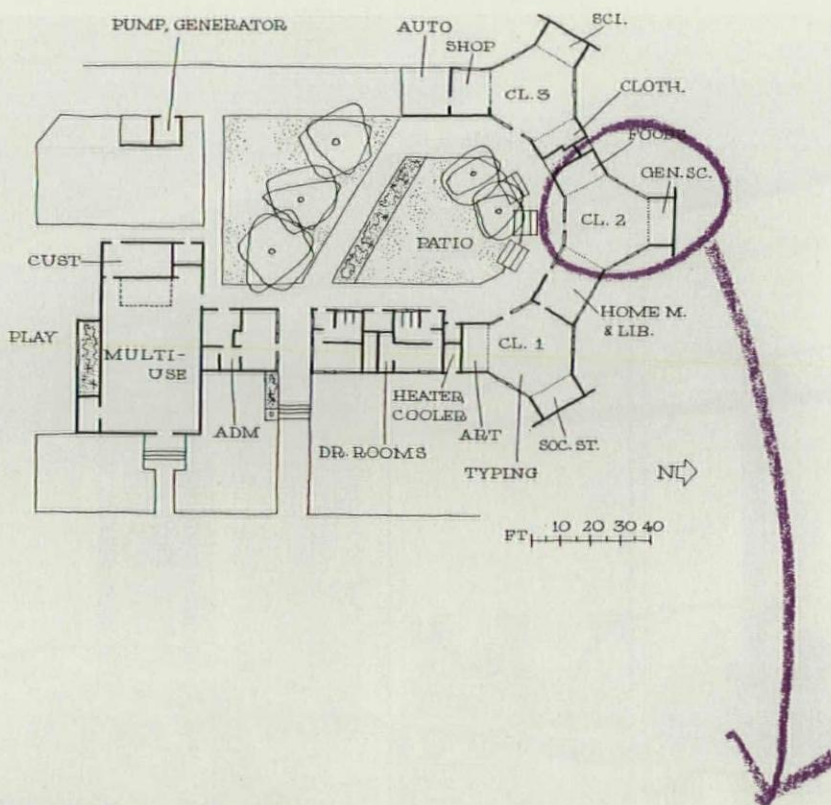
the school day a contributing part of the educational process.

J. W. Moore Junior High School, Tyler, Tex. Architects: Caudill, Rowlett, Scott & Assoc.; associated architects: Bruce & Russell. Landscape architect, Robert F. White. Contractor: Clanahan Construction Co.

Andrews Student Center, addition to Andrews, Tex. high school. Architects: Caudill, Rowlett, Scott & Assoc. Contractor: R. G. Farrell.

Consultants for both schools: mechanical, J. W. Hall Jr.; structural, A. M. Martin.





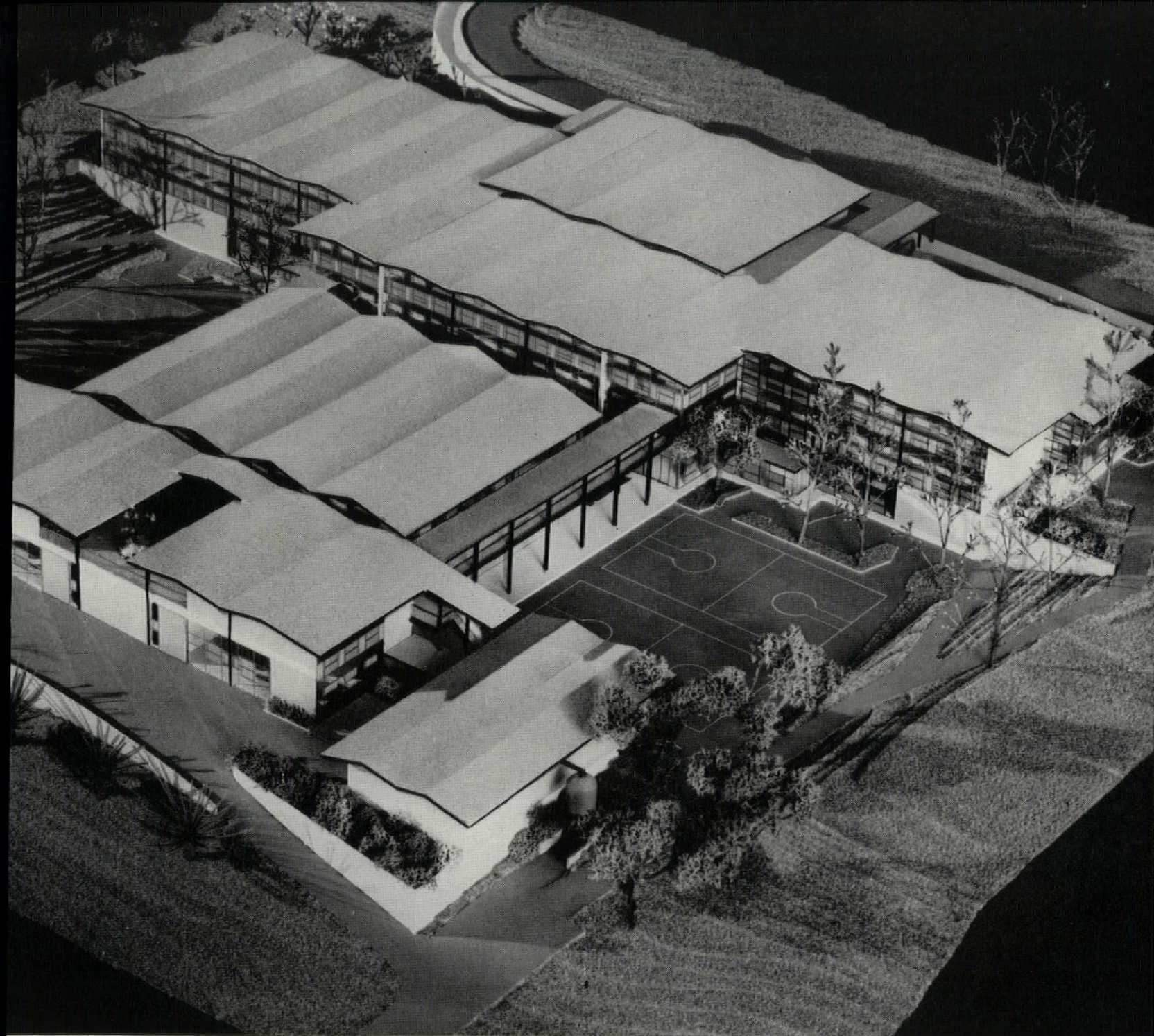
Much opportunity in little space

Death Valley (pop. 150) has the problem of the small high school, with a vengeance. How would you provide 21 students (gathered in from a 65-mi. radius) with a complete program, ranging from shop to college preparatory, along with the other activities of high school life?

The three ingeniously convertible, hexagonal classrooms each have three specialized alcoves which can be closed with slide-up chalkboard and tackboard panels. The multipurpose room is equipped for physical education, music, drama, lunch, as-

semblies and Saturday night movies. Tennis, archery, horseshoe pitching, golf and volley ball are pursued outside. The climate is as harsh as the rough, wild country, with severe, sand-laden cold winds in winter, so the plan curves in a sheltering J around the patio.

Death Valley Union High School, Shoshone, Calif. Architect: Robert Trask Cox. Consultants: S. H. Neilsen, structural; H. C. Vanden Bossche, civil; F. K. Sampson, electrical; Nack & Sunderland, mechanical. Contractor: Brennen Const. Co.

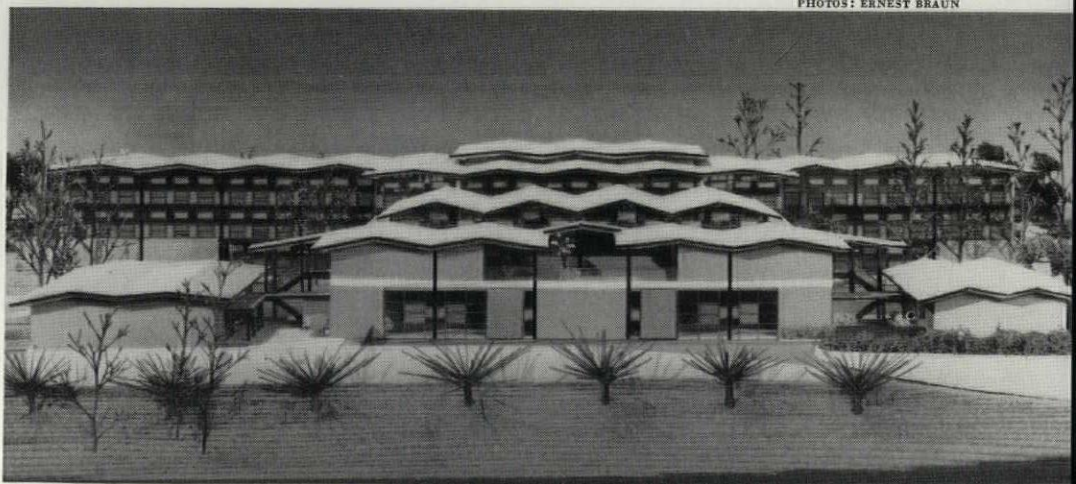


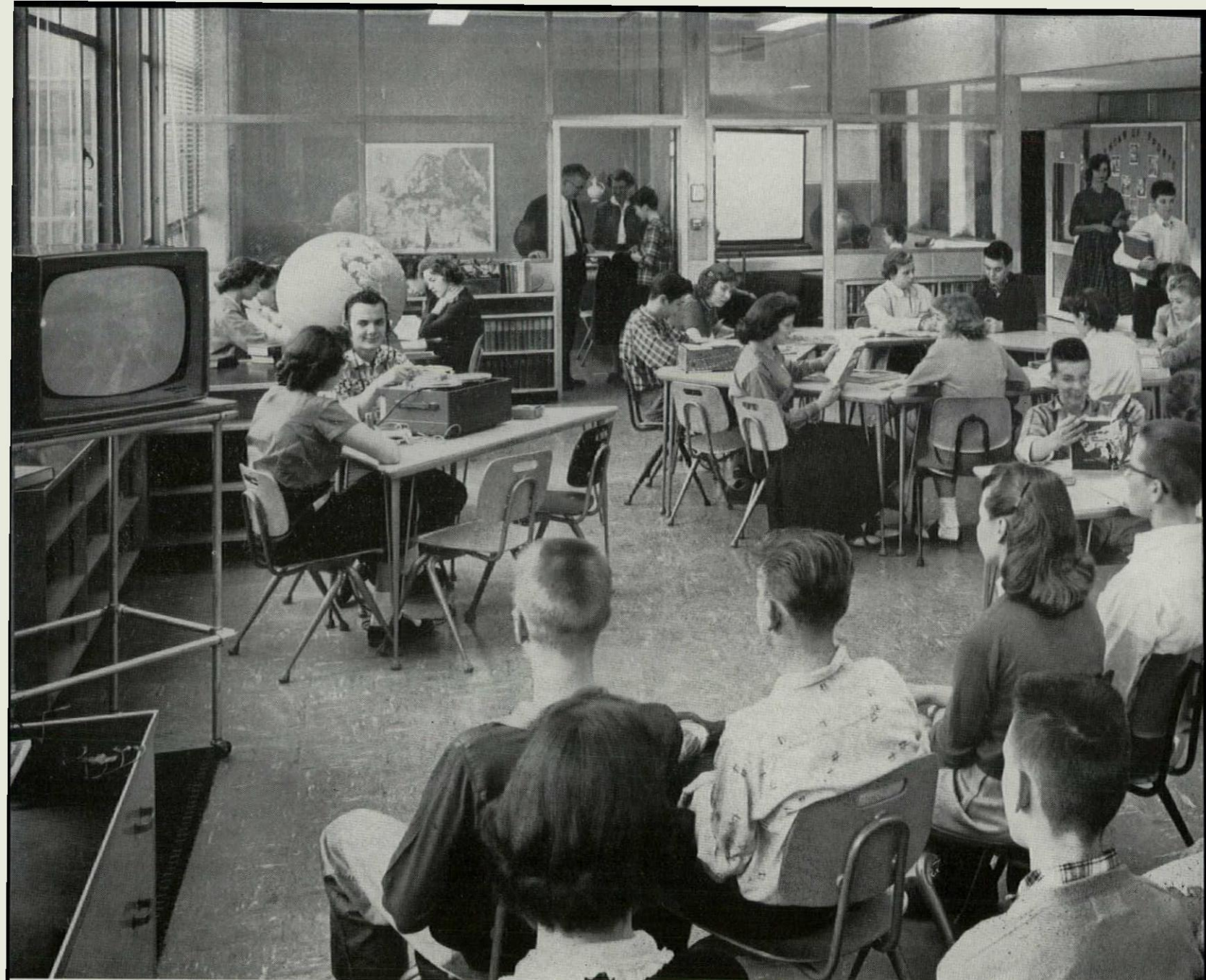
Much dignity and charm in little scope

For this 1,000-student junior high on a steep 8 1/4-acre plot, the architect used to the full the third dimension. Stepping the buildings reduced apparent bulk, let gardens into the mass, loosened circulation and saved meager level space for athletics.

Adams Junior High School, Richmond, Calif. Architect: John Carl Warnecke. Landscape architects: Eckbo, Royston & Williams. Consultants: structural, Wildman & Morris; mechanical, D. A. Coddington; electrical, Smith-Garthorne; acoustics, Bolt, Beranek & Newman.

PHOTOS: ERNEST BRAUN





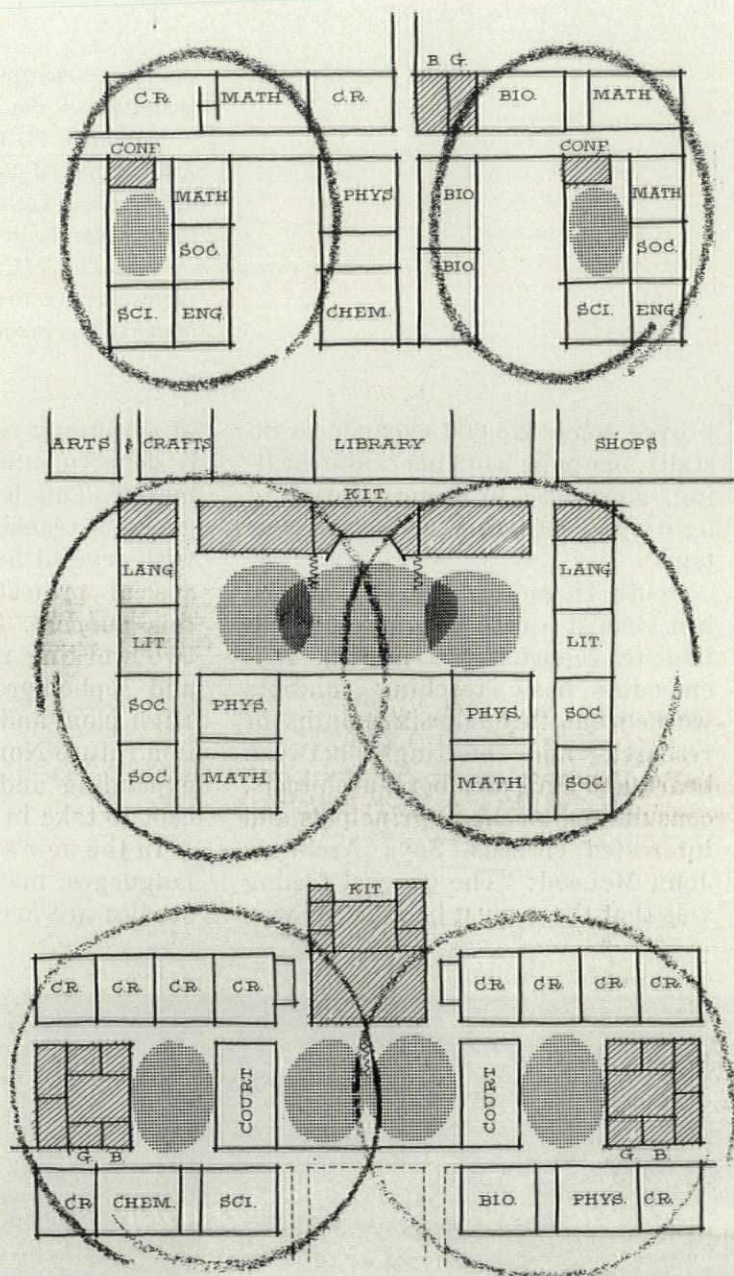
FRED J. MAROON

The Hagerstown experiment

A typical school system tries out a host of learning aids, from general education laboratories and "showcase" classrooms to the first full-scale teaching by closed-circuit TV

Perhaps the most closely watched educational plant in the US today is a collection of 48 elementary and high schools spread across the rolling piedmont of the Blue Ridge around Hagerstown, Md. For over a year now hundreds of professional visitors—teachers, administrators, architects, newsmen, training officers—have trooped through the little white frame headquarters of the Washington County Board of Education on the outskirts of town, to see for themselves what has been heralded as the educational wonder of the age: a whole public school system taught by TV.

With its first hectic year behind and some of the technical kinks worked out, Hagerstown's now famous experiment in closed-circuit tele-



Learning labs are the nucleus of Hagerstown's "little school" development. Well-equipped labs in the new South High (photo and top sketch) can be used by surrounding classrooms for research and discussion groups, tape recordings and visual aids, basic arts, crafts and science, dramatics (on folding stage), student or teacher conferences (in glass cubicles), remedial TV lessons. In North High under construction (middle sketch) larger labs can be merged into central dining-assembly area with stage. In proposed Boonsboro Junior High (bottom sketch) long general-use core between classrooms includes divisible dining-assembly hall with central stage, flanked by glassed courts. Beyond these are the labs, and end cores for conference, guidance, and toilet rooms.

vision suggests some interesting changes in education (see p. 164).

In the meantime, the school board, the hard-working superintendent of schools, William Brish, and Washington, D.C. Architects McLeod & Ferrara are quietly developing some provocative ideas in the design of schools themselves. Probably the most striking is the growth and metamorphosis of the "little school" idea in Hagerstown's big new high schools. In South High (photos) and in others under construction or planned, groups of classrooms are centered around flexible all-purpose spaces that each grade can use as its own workshop for joint projects, or transform into a little theater by means of a folding stage and curtain, or use as a TV classroom, a

meeting hall, or even a lunchroom, depending on the curriculum and time of day.

Hagerstown is also experimenting with the campus plan, breaking down high schools for 1,400 and 1,600 students into buildings and courts of manageable human scale, grouped around a central library and outdoor amphitheater (overleaf). In another development, special workrooms for arts and crafts, cooking and sewing are placed in key positions near cafeteria and auditorium and opened up with glass to show students passing in the hall what others are doing. Behind the scenes, school plants run smoothly on 480-volt electrical distribution stepped down to usable power where needed (which has

SOUTH HAGERSTOWN HIGH SCHOOL & JUNIOR COLLEGE, Hagerstown, Md.

WASHINGTON COUNTY BOARD OF EDUCATION: John M. Baer, president;

William M. Brish, superintendent of schools

ARCHITECTS: McLeod & Ferrara

EDUCATIONAL CONSULTANTS: Engelhardt, Engelhardt, Leggett & Cornell

ENGINEERS: Beall & LeMay (structural), Kluckhuhn, Cobb & McDavid
(mechanical, electrical), Bolt, Beranek & Newman (acoustical)

LANDSCAPE ARCHITECT: Donald Call

GENERAL CONTRACTOR: Norman S. Earley & Son

proved some \$25,000 cheaper to install), one-pipe 240° hot-water heating, automatic program control of lighting, ventilation and clock systems.

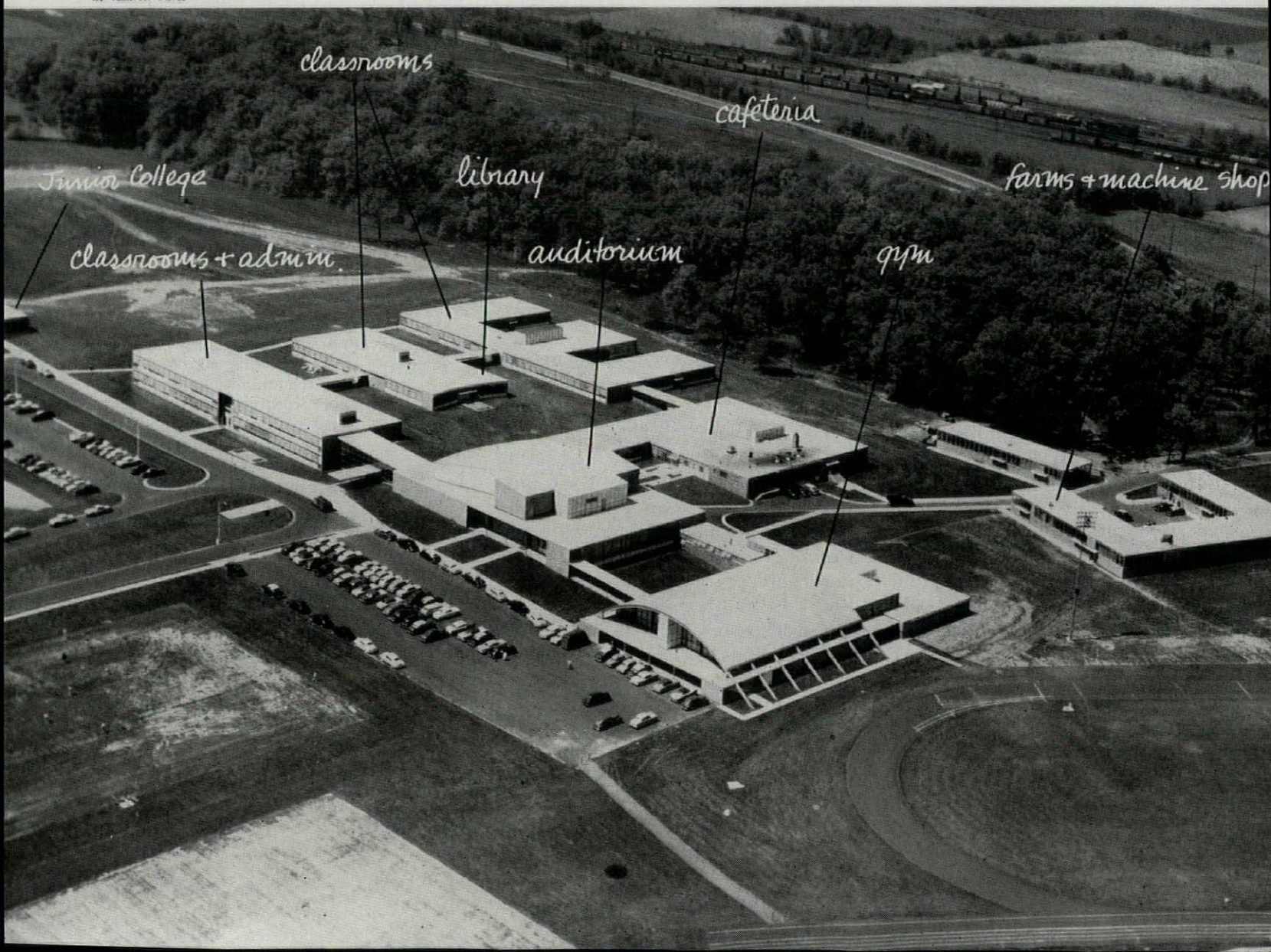
South Hagerstown High, finished last year at a cost of some \$2.5 million (a reported \$16 per sq. ft.), embodies basic teaching concepts worked out through six months of research and meetings between board and staff members, architects, consultants, teachers, principals and interested citizens. Says Architect John McLeod: "The general feeling was that there must be a better way

of arranging rooms than on a strictly departmentalized basis of subject matter. This led to the concept of a group of teachers working as a team with several hundred students, in a special projects area planned for this purpose. It was agreed to try two working models, for freshmen and sophomores, within the South High plan, and apply the experience to a future North High. Now we are expanding and improving the concept to take in all four grades."

In the new schools, classrooms for languages, math, science and social studies are arranged around a well-

equipped "general education laboratory." The four or five teachers involved operate as a small faculty under a "little-school" coordinator, holding their own staff meetings, planning correlation and coordination of the different subjects, mapping out individual guidance problems. Says Superintendent Brish: "It makes for a controlled and flexible program in which students begin to see how various subjects fit together. This way we gain the efficiency, variety and broad facilities of a large school, and the intimacy and flexibility of a small one."

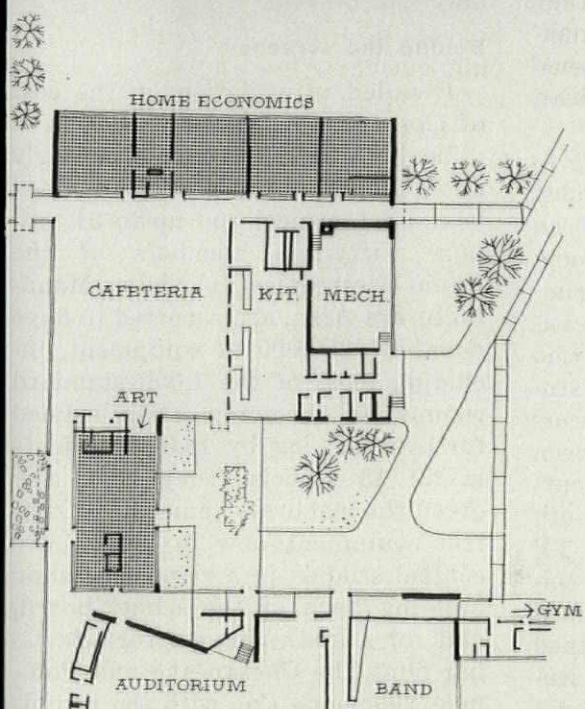
A. VERNON DAVIS





"Showcase" classrooms in South High invite interest of all students on their way to and from the cafeteria, auditorium and gym. Homemaking rooms seen at the left of the photo (above) have their own "shop window" facing the dining area. Behind the glass to the right, various types of home kitchens can be seen in use above the shelves where

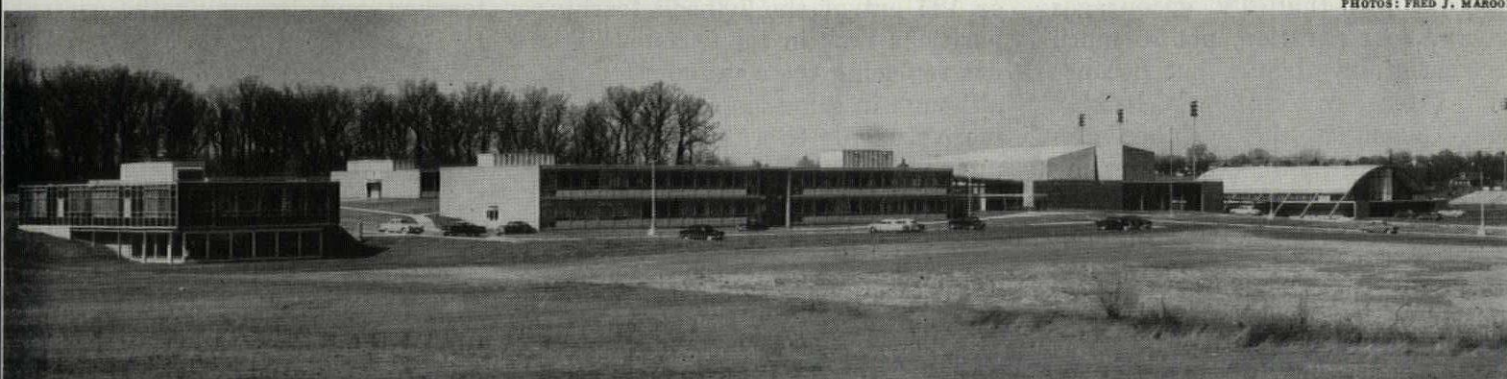
cafeteria-bound students stop to leave their textbooks. On the other side of the cafeteria, an arts and crafts suite (photo, below) with its own sculpture garden, attracts students passing on all sides. In the proposed Boonsboro school, still more classrooms will be opened up to central common rooms with glass above counter height.



Integral part of South High is the first unit of Hagerstown's new junior college (far left in photo below) which has six classrooms and administration on the upper floor and student lounge with sliding glass walls on the lower floor. Blue porcelain enamel curtain walls in-

stead of yellow set it off from high school, where its students use the library, cafeteria, gym, lab and shop facilities pending its own possible expansion on acreage to the left. Intermingling stimulates closer staff work, encourages the idea of a continuing education.

PHOTOS: FRED J. MAROON



Hagerstown's TV trial: better learning at lower cost?

At the new South Hagerstown High, and at 22 older schools in the Washington County system this year, some 12,000 elementary children and teen-agers are getting part of their daily lessons by 21" picture tube. Behind this rather remarkable fact lurk the multimillion dollar questions: can TV actually improve the quality of learning, and can it help offset the growing shortage of teachers and classrooms?

Of the increasing variety of educational television projects around the country, Hagerstown is probably the closest to finding out what TV can and cannot do for secondary education. After a year of operation, stimulated by summer workshops before and after, there are some interesting indications.

Livelier lessons

There is little doubt that Hagerstown's televised lessons, piped from central studios to outlying schools, can make a teacher especially talented in the presentation of ideas available to many students instead of just a few. Even more important, the handful of "TV teachers," freed from routine school duties, have had more time to concentrate on research, preparation and better ways to present their particular subjects. Most TV lessons, the Hagerstown staff feels, tend to have more stimulating introductions, more interesting developments and clearer conclusions than before, and ideas are animated by new kinds of visual props the teachers make up themselves. The most striking by-product of the television experiment, says Superintendent Brish, is that teachers are rethinking the whole educational process as they have not since college—criticizing techniques, inventing new "visuals," enthusiastically swapping ideas after class.

As for the students, Hagerstown teachers feel that TV encourages greater concentration, not so much because of its glamor, but because the TV teacher seems to be looking each student in the eye, has prepared a tighter and more interesting lesson, and cannot be distracted by the usual classroom interruptions. Said one teen-ager: "You have to pay

attention; if you don't get it while it's going on, it's gone." TV can also magnify objects difficult to see in the classroom: test-tube reactions, graphic matter, microscope slides.

Although no official progress report or interim evaluation of the scheduled five-year experiment has been completed as yet, teachers report that students in some TV classes have been able to cover as much as six or eight weeks more material during the school year than they were before. Other classes are making a higher percentage of good grades, and still others are making greater use of the library.

Hagerstown has also been able to tie into its regular TV courses guest appearances that would have been difficult to obtain on a one-classroom basis: local politicians, industrialists, weather, forestry and farm experts, even a local florist, who showed several hundred science students, in closeups, how to use decoratively the plant life they had been studying. Outside the regular curriculum, local church and youth leaders have held classroom TV series on adolescent problems, college representatives and armed forces recruiters have explained after-graduation choices to the students, and programs on languages and folk arts have been staged with the help of foreign visitors. As part of this broadening supplementary program, cable has been laid to the public museum, library and hotel, and schoolmen look forward to the untapped fields of adult education and school-community relations.

The cost of learning

Can TV save teachers? So far Hagerstown has had to add a handful of technical personnel rather than subtract teaching staff, but one outside estimate of the long-range potential saving runs as high as 100 or 125 out of the 700-odd teaching positions now in the system. TV is not replacing the classroom teacher, although in some instances it allows more students to watch a TV lesson under the supervision of a single classroom teacher, freeing other teachers for other duties. Classroom teachers are still very much needed

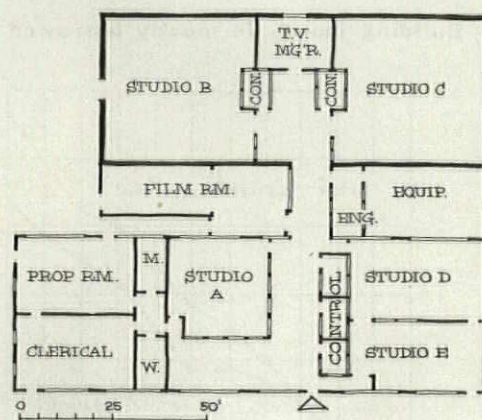
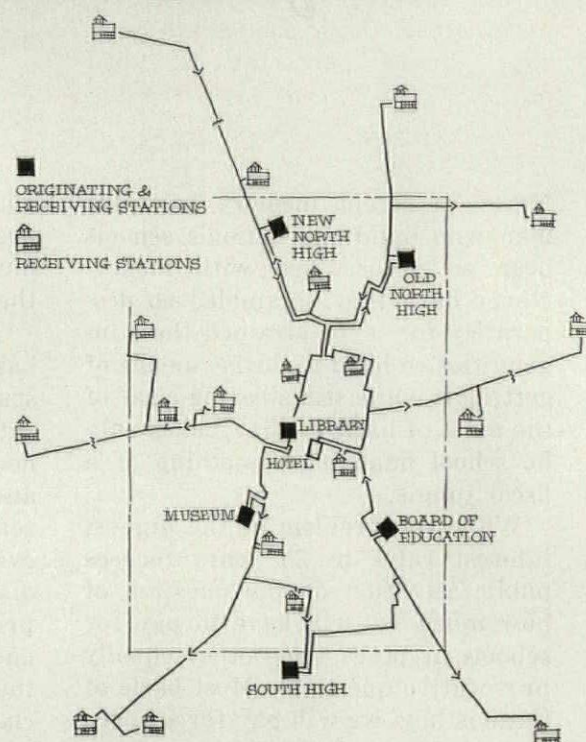
to lead discussion periods before and after the TV lessons (which average about 20 minutes), to provide individual guidance, to administer tests and to work out the over-all course with the TV teacher. They also fill out a "feedback" checklist after each telecast, criticizing content, presentation and reception. So far, no student receives more than three TV lessons during his six one-hour class periods a day, and most get only one or two.

Behind the screens

Detailed information on the cost of closed circuit school television is difficult to determine at this early date, though estimates of the five-year pilot project run up to \$1 million. Fifty-two members of the Radio Electronics Television Manufacturers Assn. are reported to have donated \$250,000 of equipment, including most of the 1,000 standard commercial receiving sets scheduled for eventual use by 18,000 students in all 48 schools. They have also given the elaborate camera and control equipment now in use in five central studios in a remodeled shop building back of the school board, and for a sixth channel for televising film. The Chesapeake and Potomac Telephone Co., with the technical help of Bell Laboratories, has strung much of the system's eventual 110 mi. of coaxial cable without charging rental rates, which the Hagerstown experiment could help determine. Washington County is paying "normal" remodeling and maintenance costs. The Ford Foundation's Fund for the Advancement of Education is contributing to the salaries of added staff and to the continuing evaluation of the project. Every Friday *TV Guide* magazine distributes free copies of a special Washington County school edition to all students, listing time, channel and teacher, and describing the content of each TV lesson to be given the following week—an educational innovation that has not gone unnoticed at school or at home. Equipment will soon be at hand to experiment with large-screen projection TV, and the cable has been tested and found capable of carrying color.



TV teacher Mildred Vance (above) now gives her special lesson on "Snow" to 554 sixth-graders instead of one classroom of 30, using as many as 28 new "visuals" she invented. A producer watches the monitors in an adjacent control booth, directs two cameramen and the prop assistant (usually local junior college students) according to teacher's prearranged TV script, and selects the image for transmission. Five studios behind the Board of Education headquarters (plan right) and a sixth channel for films can send simultaneously through the coaxial cable linking the schools (diagram). While Mrs. Vance is speaking, 80 students in a TV classroom at South High receive another telecast in 11th-grade history (below).



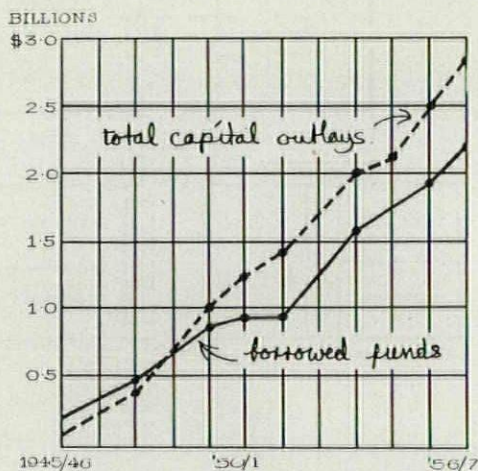
PETER STACKPOLE—LIFE



So far, tight money has not hurt school building. But high interest rates and a shaky local tax structure raise the question: How will we pay for our schools?

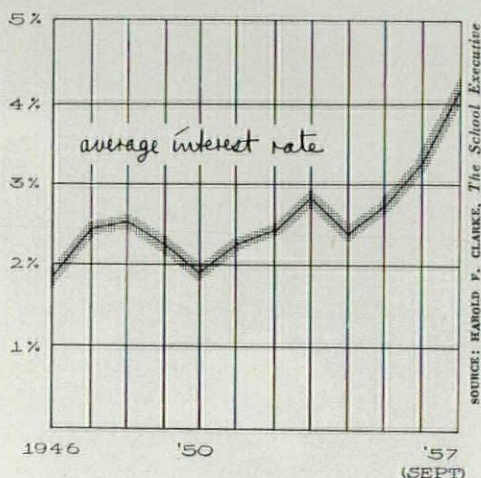
Money for schools

Building money is mostly borrowed



Capital funds for school building totaled over \$2.8 billion in the school year ended last summer, and nearly 72% of this money came from borrowed funds (chart, above). Although borrowing as a percentage of all capital funds has fallen off slightly in the past two years, total borrowings are at an all-time high. This puts more pressure than ever on local capital budgets when coupled with the highest interest rates on school bonds in 25 years (chart, below).

Rates on school bonds are over 4%



Never in recent memory have the men who build the nation's schools been so preoccupied with money. Never have they scrambled so desperately for it, or strained their ingenuities so hard to devise means of getting it while still steering clear of the maze of hazards that makes public school financing something of a fiscal jungle.

While the problem of the highest interest rates in 25 years focuses public attention on the question of how much we will have to pay for schools, it poses some other equally provocative questions. Most basic of these is how we will pay for schools, both in terms of raising money initially and the ultimate source of funds. The problem boils down to this:

► Is the traditional method of raising school building money, via long-term bonds, too costly, particularly now? And are various alternatives—short-term financing, leaseback arrangements—really advisable? They usually cost more, in the long run, than long-term bonds, and skirt the whole issue of unrealistic debt restrictions.

► Is the traditional source of school funds, local property taxation, really adequate to support our exploding school building program? There is increasing evidence that these taxes are not flexible enough to do the

whole job, and that the states, and possibly the federal government, must assume a mounting share of the cost of school building.

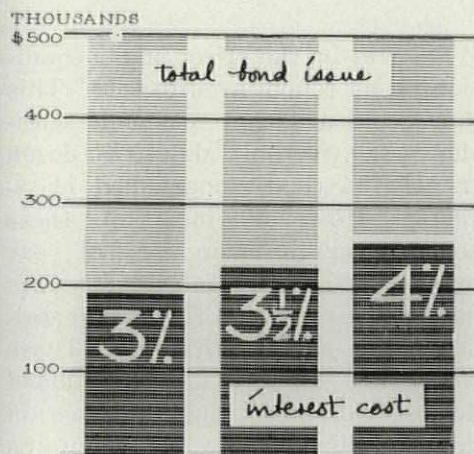
The latter question is the more basic of the two, yet it has been obscured by the concern over interest rates. This concern is greater than need be, say experienced economists and investment bankers. There is no real money shortage, they say, as evidenced by the fact that any school district willing to pay the market price can get its money. The figures back up this argument. This year there will be an estimated 69,200 classrooms built, at an estimated cost of \$2.8 billion.

The concern over interest is understandable, however, when you realize how large a factor public schools have become in most state and local capital budgets. This year's capital outlay of \$2.8 billion will total 25% of the whole state and local capital budget. (Only highways take a larger share of capital funds.)

Tight money, which means expensive money, hurts schools particularly because the biggest chunk of capital funds for new schools comes from borrowing. Through most of the postwar period, borrowings accounted for an average of 72% of all capital funds, the rest coming from current revenues and federal aid. For fiscal 1957, the Investment Bankers Assn. estimates that slightly more than \$2 billion was borrowed via school bonds. This was about 36% of all municipal borrowings

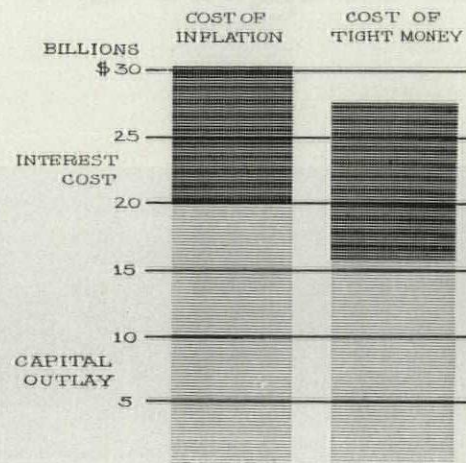
Some of the material for this article was gleaned from basic research done for a public service book on school building sponsored by the Aluminum Co. of America to be published next year.

The high cost of tight money



The cost of high interest rates should not be minimized, although it is frequently overestimated. On a hypothetical \$500,000 issue of 25-year serial bonds, a difference between 3 and 4% in interest rates could mean a difference of 13% in the total cost over the life of the bonds (chart, left). But, as steep as the price of money is, inflation can be even more costly. The Federal Reserve Board has figured that even interest rates at 5% until 1965 would not cost so much as 2 1/2% price inflation each year to that date (chart, right). The cost of inflation, figuring physical output half again what it is now, would be \$2.6 billion more than the cost of tight money.

The higher cost of inflation



and just about 72% of total capital outlays for the period (p. 166).

If states and municipalities were the only borrowers consistently seeking new money, the problem would still be tough. But at the same time population pressures and deferred building are forcing government to go into debt on an increasing scale, private business is enjoying the most massive prosperity of all time. In the past two years particularly, there has been an unprecedented demand for money, and for long-term funds most of all.

School districts have learned some hard lessons in the crush for capital funds. For one thing, they have learned that, as far as the money market is concerned, schools are no different than sewers, highways, or asphalt plants. All a school district has to sell when it approaches the great, coldly indifferent New York bond market—where the largest volume of school bonds are floated—is the past fiscal record and present financial condition of its taxpayers.

The price of money for school building has not moved up any faster or slower than the price of money for any other kind of municipal bond paid for from general obligation funds.*

Basically, there are four ways to finance a new school: 1) pay for it out of current revenue, 2) accumulate a reserve fund to pay for it, 3) short-term borrowing, 4) long-term borrowing.

Advantages and disadvantages

Each method has its advantages and disadvantages. The first two are cheapest, but they imply high taxes. And schools require such large expenditures and school debt is so high that few school districts could pay for them out of current revenue. Schools are needed so badly that few districts can take the time to accumulate any building reserves. Short-term financing, which has become a tight money stopgap for many school districts, is cheaper initially, that is interest rates are usually lower for shorter-term (up to ten years, but usually two to six) than for long-term (20 to 40 years, usually around 25) bonds. But short-term money isn't always easy to get, particularly when the demand for bank loans is high, as it has been for the past couple of years. And, too, borrowing short term means going to the market more frequently. The short-term issues must be smaller, therefore there are more of them. This means that a school official has to do a first-rate job of playing the tricky short-term money market, or else he may find that he has actually cost the district more in interest than he would have with one long-term issue.

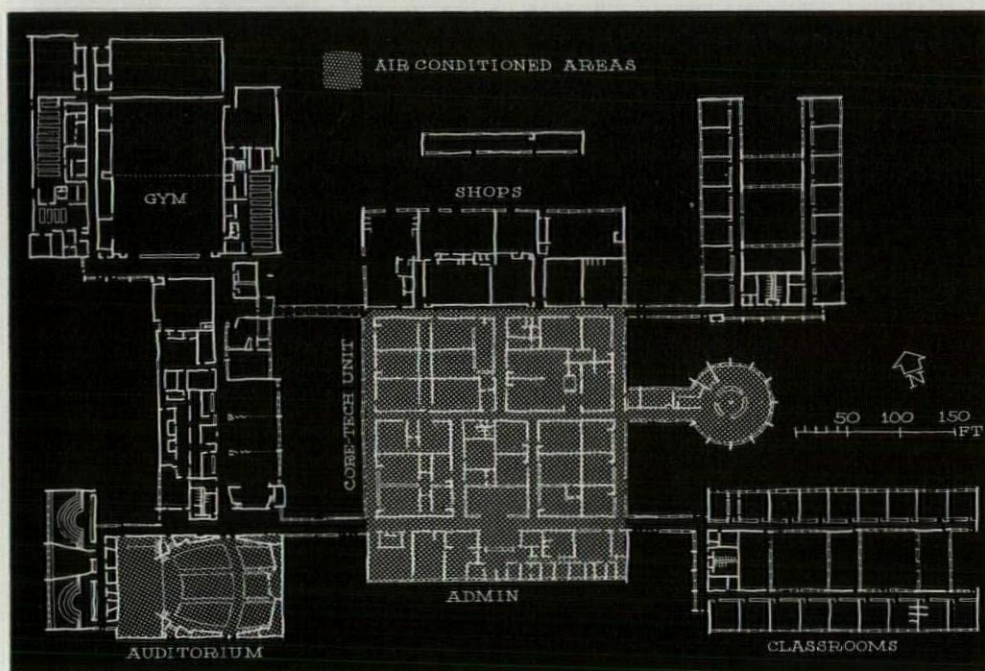
Most school districts, when faced with building a new school, really have only two choices: long-term or short-term financing. And the high long-term interest rates—now running well above 4 1/2 and over 5% for some districts—have frightened many school fiscal officers into some bizarre delaying tactics. Bond anticipation notes, which are just another type of short-term security, except that they must eventually be followed by a regular bond issue, are a fairly common dodge. These are floated for a short period, usually limited by law to less than two years, except in New York State which recently raised it to five years, to get money at least to start construction. They are usually used when the fiscal officer figures he can borrow long term at some future date cheaper than at present or when total building cost isn't firm, and, rather than borrow too much, he gets some short-term money just to start building. At almost any time in the past two and a half years, such guessing has been dead wrong.

Some bond issues have been postponed outright rather than accept the best bid offered by the underwriters who buy the bonds for resale to their customers, mostly wealthy individuals, commercial banks and fire and casualty insurance companies. When the postponement was made with the idea of getting lower rates later, the guessing has usually been wrong. Some school

continued on p. 238

* A noteworthy exception has been school bonds from southern segregated school districts (p. 131). As questions of legality and possible default have been raised about these bonds, many buyers have shied away from them. The result has been that these bonds often bear interest of 1/4 of 1% or higher than similar bonds from integrated districts outside the South.

Designed for air conditioning



Compactness of "Core Tech Unit" in Linton High School illustrates how air conditioning encourages extensive use of interior space in Perkins & Will design. Virtually all rooms are interior spaces.

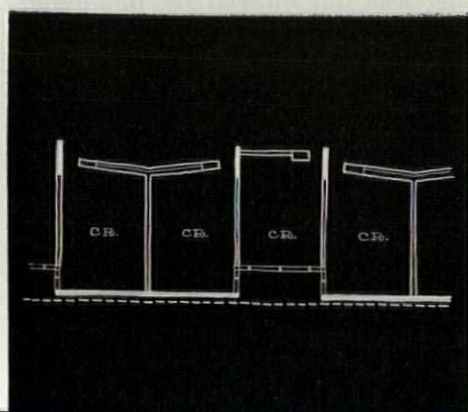
What will be the effect of air conditioning on school architecture? This may seem a rather academic question today, for only about two dozen schools have air-conditioned classrooms. However, most of these schools were built in the last year or two and many more new ones have made provision for later installation of air conditioning. Those which are already air conditioned demonstrate its strong influence on design: the window wall contains less glass, and much greater use is made of interior spaces.

An excellent example of this impact of air conditioning is seen in the Linton High School in Schenectady (plan, left), by Perkins & Will. The shaded areas are air conditioned; note that 25 of the 26 classrooms in this large block, called the "Core-Tech Unit," are interior spaces, with few or no exterior walls. Compare this with the classroom buildings which are not air conditioned; each room has an exterior wall and liberal window area.

Those windows which remain in an air-conditioned school will be smaller and shaded from the sun to reduce heat gain and required air-conditioning capacity, as in Caudill's San Angelo High School, at left.

Future schools may tend to be more compact, as at Linton High School, because this type of plan is more efficient in terms of air-conditioning needs. But air conditioning does not demand compactness, as Caudill demonstrates in his sprawling campus plan at San Angelo. Indeed, it should be noted that extreme compactness is possible only *with* air conditioning. In the Linton school, the educators chose this new and, to many, radical plan in order to mix students of different interests.

If compactness is to be an element in tomorrow's air-conditioned school, whether by education's choice or by efficiency's demand, then a new challenge will be put to the architect. For, without doubt, it requires an unusual skill to create habitability within four interior walls, a skill which few architects have had need to develop.



Campus plan of San Angelo (Tex.) High School by Caudill, Rowlett & Scott shows that air conditioning does not demand compactness. But window areas are smaller, recessed to reduce solar heat gain.



BELLIN NURSES HOME, Green Bay, Wisc. John E. Somerville, Architect. Jacob C. Basten Const. Co., Builder

Pleasing window proportions create rhythmic design here

Here, the architect selected PELLA CASEMENTS with 24" x 36" glass size and combined them into proportions that contribute to the over-all design pattern. The vertical shapes of the individual window units...the horizontals of the window groups...both are pleasing rectangles repeated within the rectangle of the elevation itself.



WOOD CASEMENT WINDOWS

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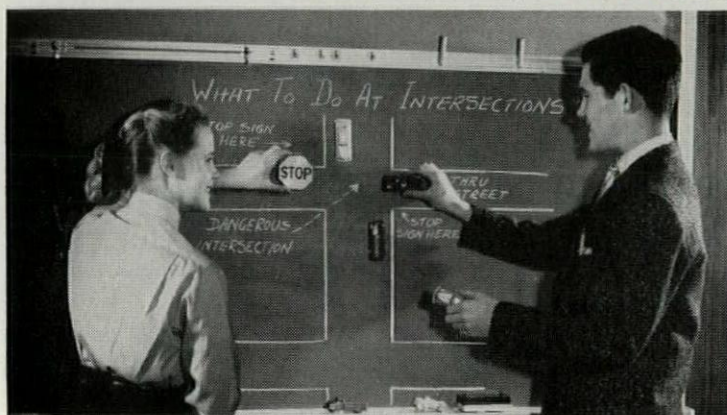
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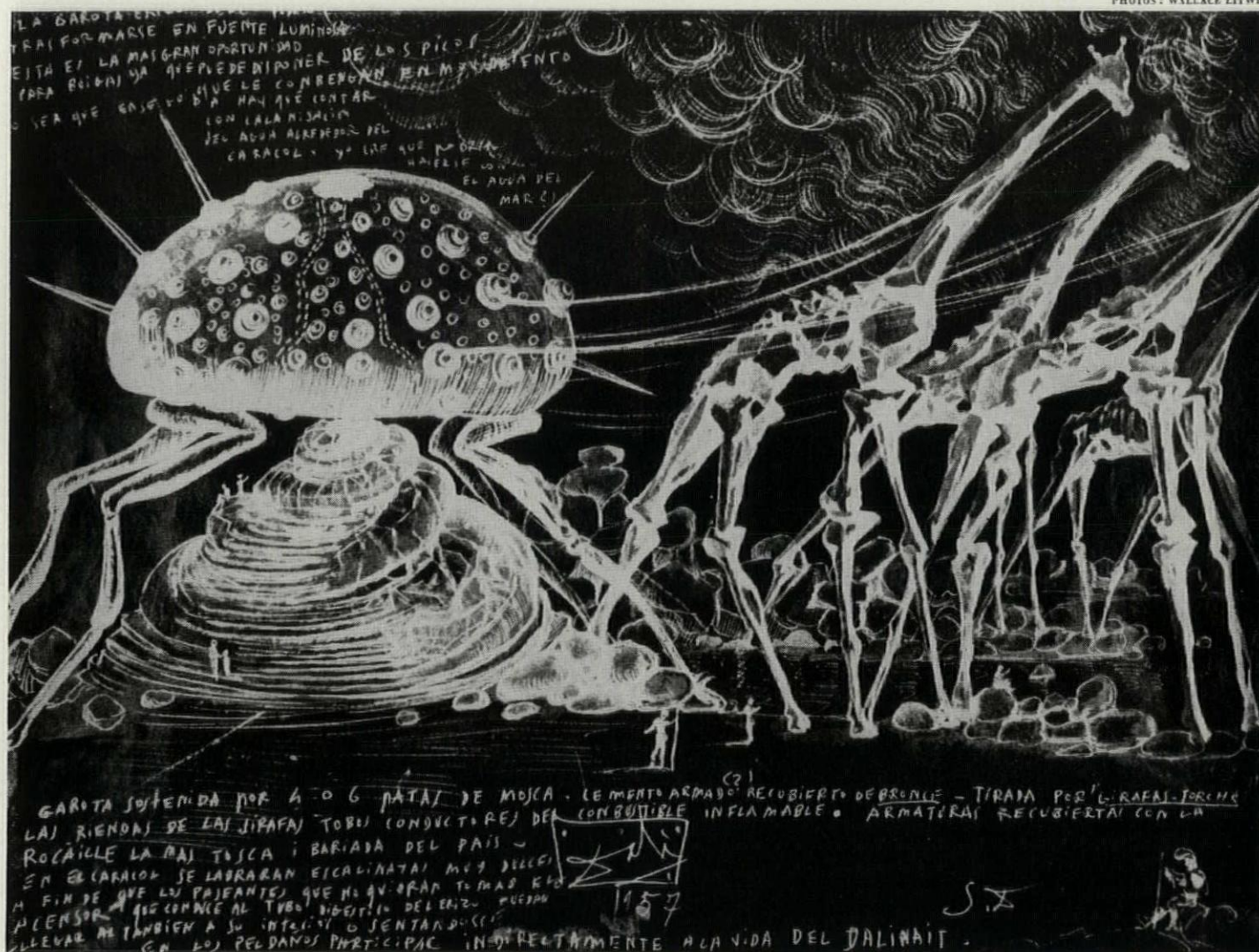
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GOOD NAIT DALI

"Recess is called," said Professor Thruigg, "and we are through for the day with serious subjects."

"What is *that*?" asked a student, pointing to the drawing on Thruigg's desk.

"Architecture by a painter," said Professor Thruigg.

"Not by a child?" was the question.

"By somebody who is trying hard to be one," said the professor.

"Do you mean they actually intend to build it?" asked the student. "It doesn't look much like a building that you could build by any rational construction."

"Alas, the engineers can build just about anything nowadays," answered Thruigg, "the more foolish the more challenging."

"But not from a drawing like that!" exclaimed the student.

"Oh, yes," said Thruigg, "that kind of a drawing is an integral part of the *mystique*—it would be just too bad if anybody thought he fully understood it. . . .

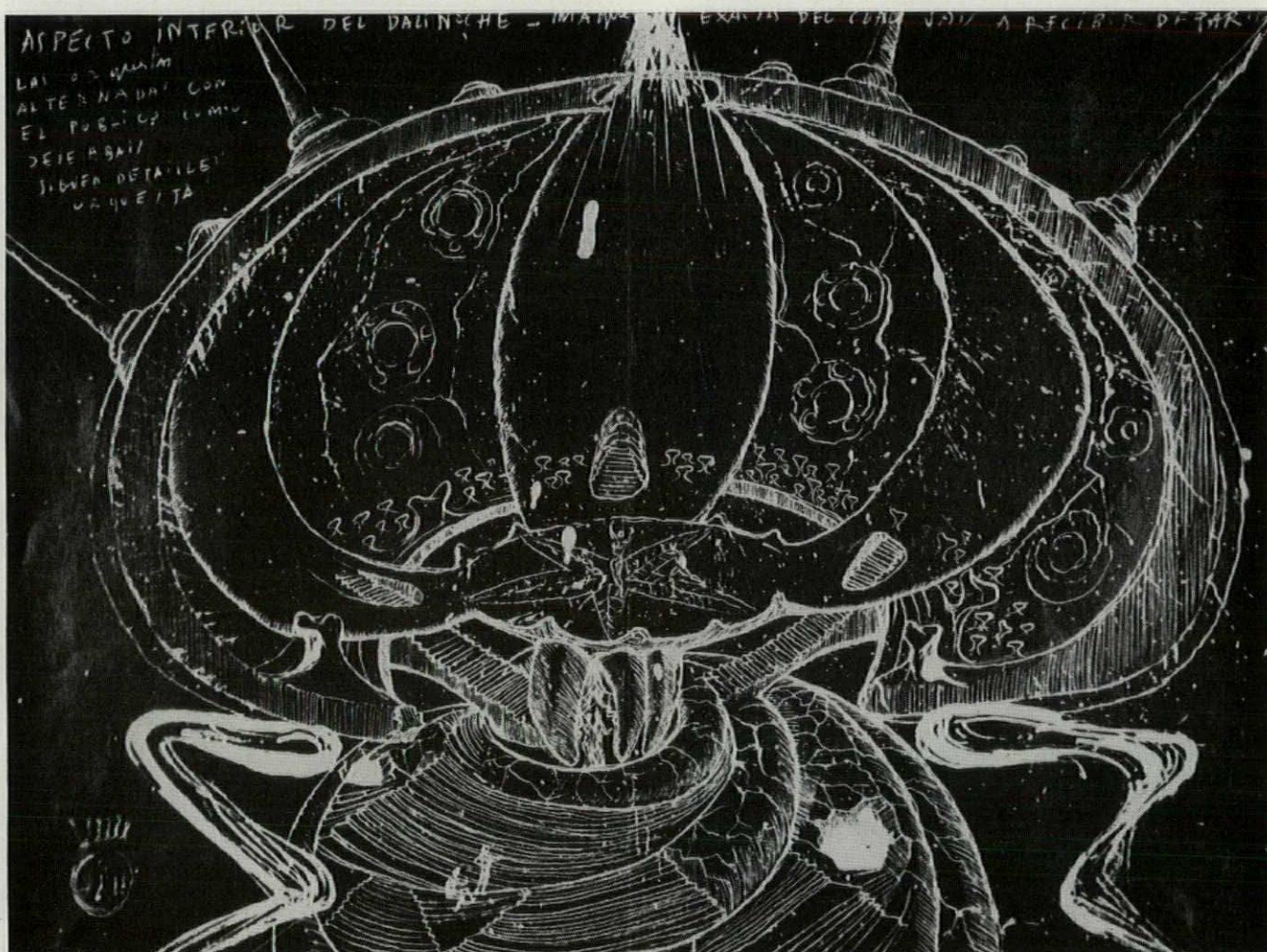
"But remember," continued the professor, musing, "this man Dali is of the theater too, so maybe any building at all looks to him like a great magnified stage set."

"Surely nothing like this has been built before," protested the student.

"But yes it has, yes it has," replied Thruigg, "remember what

PROJECTED NIGHT CLUB for Acapulco, Mexico, by Painter Salvador Dali, is called "Dali Noche" or "Dalinait" by him. A garota or sea urchin supported on four or six fly's legs (of reinforced concrete or covered with bronze) is drawn by "torch giraffes" belching fire and smoke from their nostrils. They are to be made of "local rocks, the roughest and most varied," and are to appear to draw the garota out into the water of the Pacific. Easy steps will be carved in the spiral that leads up the shell under the sea urchin, so spectators not desiring to use the elevators can walk up and into the sea urchin (through its digestive tract), or can sit on the slopes of the shell. Engineer Felix Candela is reported working out the structure.

(continued on next page)



I told you last year about California Roadside Googie? Remember the Old Woman Who Lived in a Shoe—that was a restaurant—or the Brown Derbies or the Alligator bars? This one is for a night club in Acapulco, Mexico, and down there they are still less inhibited."

"I mean," stammered the student, "surely not by anybody serious."

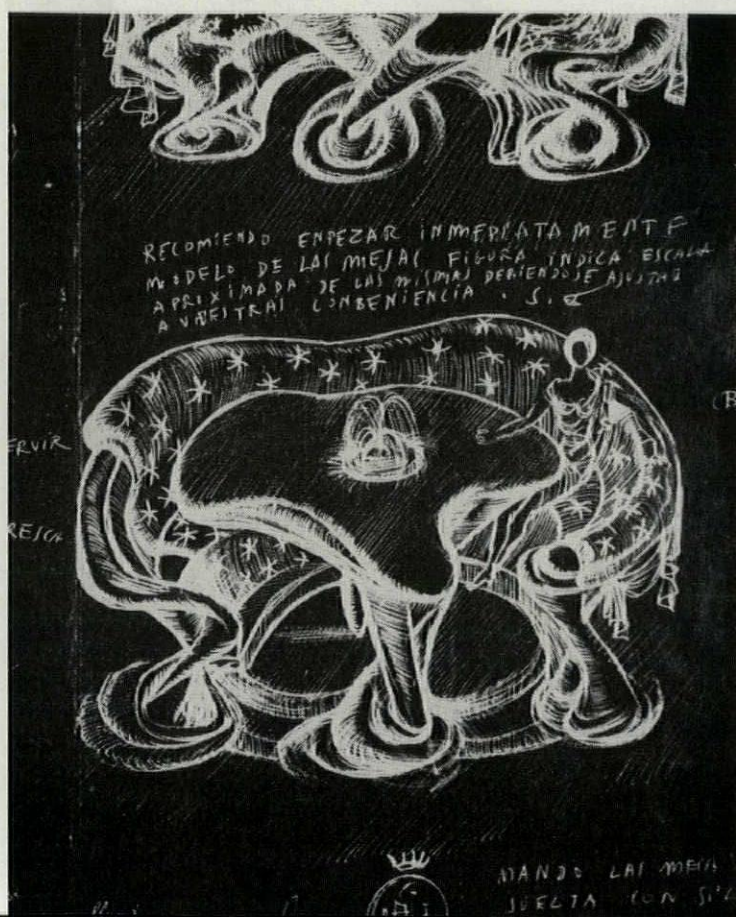
"Well," said Thruigg, "what would you make of a church that was simply sprayed over an armature, like a piece of sculpture—let's say by a famous architect named Le Corbusier. Is the basic idea radically different?"

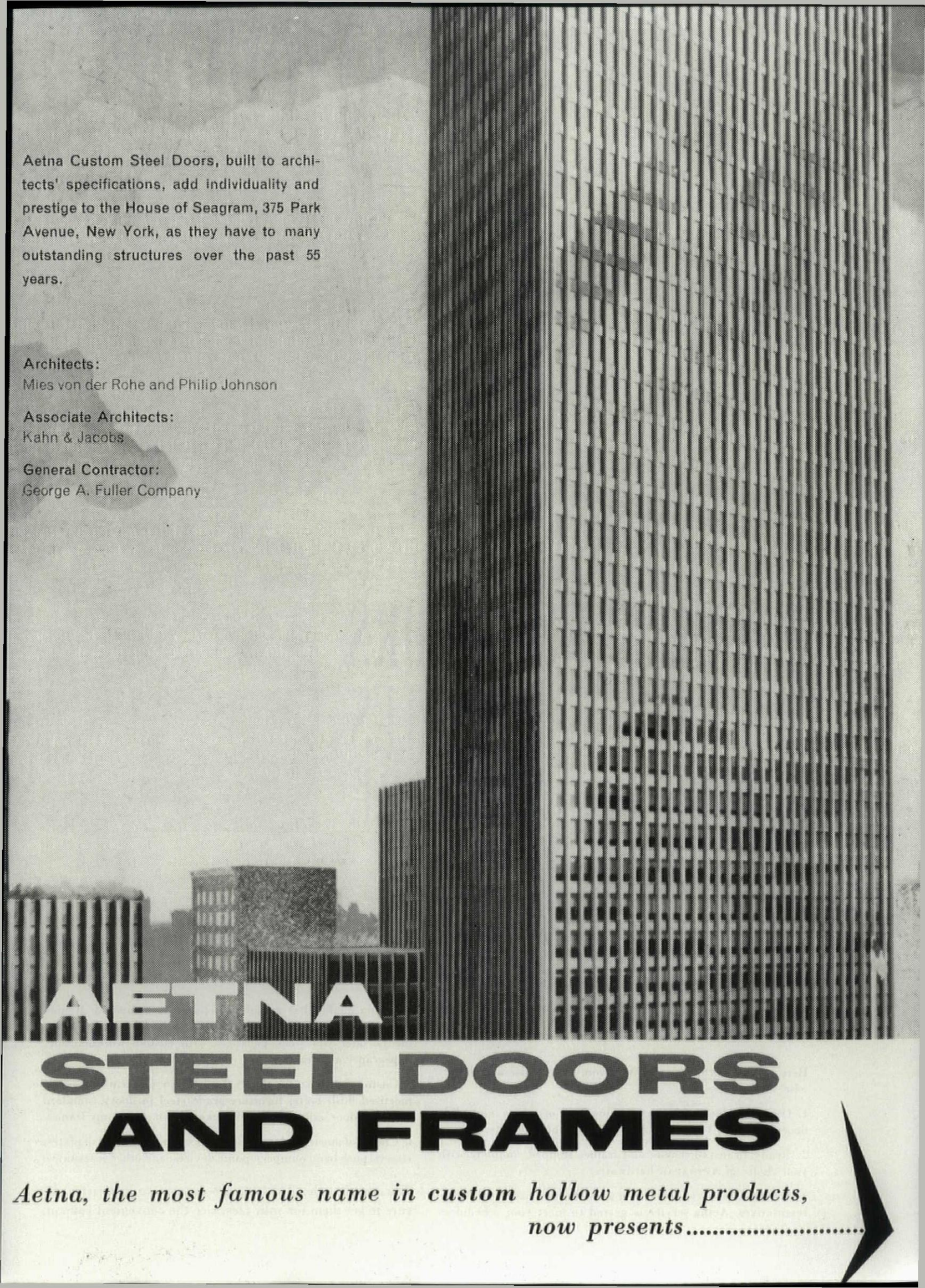
"Oh, but it is," said the student. "At least the form was abstract. This one is just literal animals . . . it's like . . . it's like a dream that had solidified and could turn into a nightmare."

"Yes," quietly replied Thruigg, "there are a lot of those around nowadays. And it's a temptation to play with them by night in order to take some of the scare out of them by day."

TABLE DETAILS show sculpturally shaped outwardly flaring tables, to be cut out of gray marble "by simple stone cutters" and polished "very bright." The capitoné cushions on the seats are to be made in folds of red taffeta, "the same red as the edible part of the sea urchin." The tables are to be covered with "false lapis lazuli in plastic as it is made in Rome." The center of the tables "should be lighted by tiny luminous fountains under the direction of your great makers of night sorcery." Dali's description of the tables makes a play on the word "to serve" which appears in three lines 20 times.

VERTICAL SECTION suggests interior of the night club, in which a performer on a star-shell shape in the center is surrounded by the audience in a circle. (It is left uncertain whether those bumps represent people or coffee tables.)





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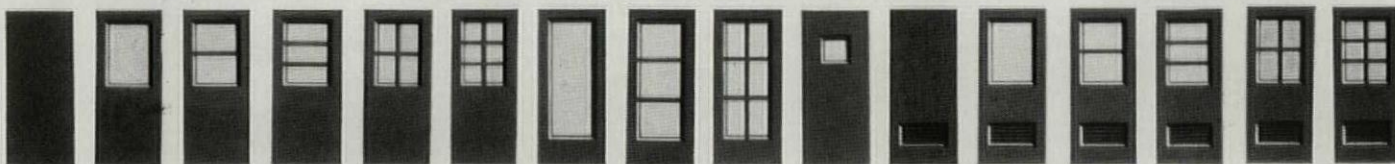
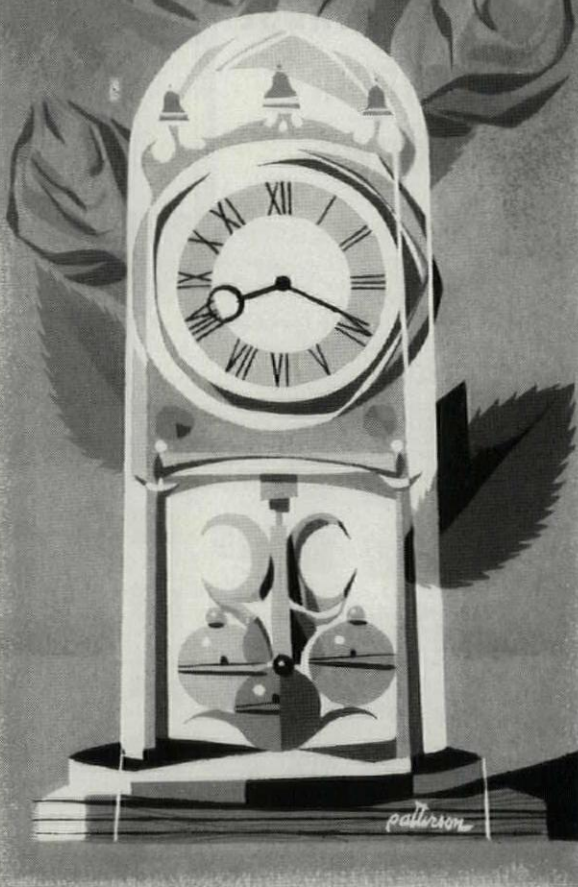
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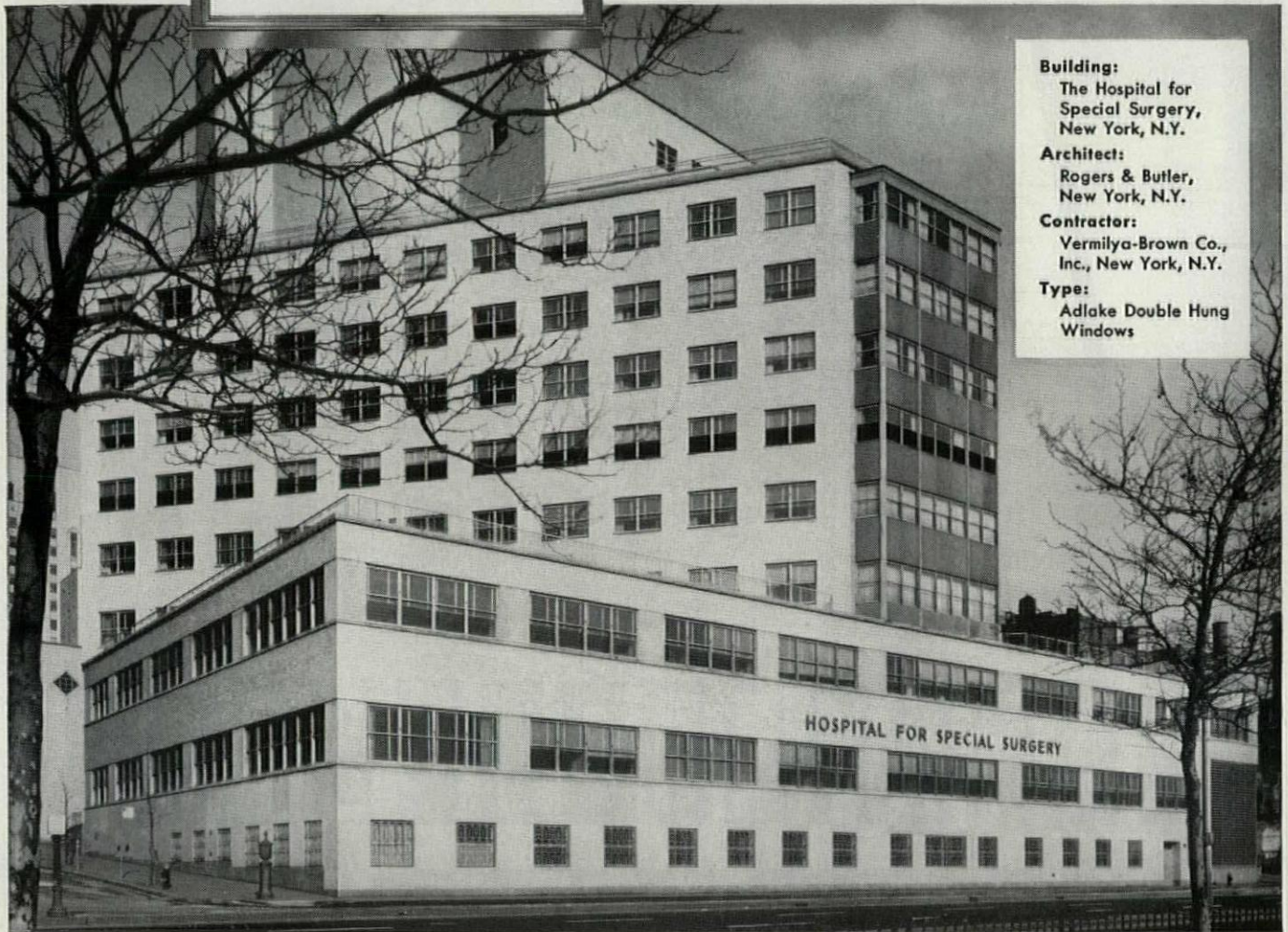
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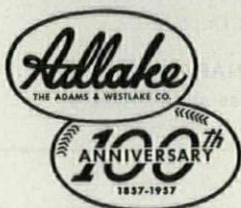
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ASBESTOS SILICA BOARD pares down fireproofing thickness

Nailable and sawable, *Asbestolux* behaves like plywood in many ways—except when under fire. Then the pressure-cooked panel displays an amazing defiance of heat for long stretches. A mix of asbestos fibers, silica and a small amount (less than 5%) of cement bonded under high steam pressure, the inorganic material weighs 14 oz. a sq. ft. in $\frac{1}{4}$ " stock. Two hours of fire protection can be provided in walls and ceilings with a $\frac{1}{2}$ " sheet—thin icing compared to masonry coatings. The steam pressure forming cures the cement, rendering the panels completely incombustible. (Partially cured asbestos-cement board exposed to extremely hot temperatures will generate steam and shatter.) The asbestos for this board is mined from South African deposits for its characteristic long fibers; it gives the board a high degree of resilience and a tensile strength with the "grain" of 900 lb. per sq. in. The stringy

strands become oriented in one direction in the cooking process; cross plies of *Asbestolux* can be laminated into an exceptionally strong building board. The silica base composition bonds well with itself and other materials. Its K factor is 0.75, more than four times as effective as asbestos cement, and its sound insulation value is good.

Although *Asbestolux* is new in US construction, several million square feet already are in use as panel cores and interior finish in structures along the DEW line and in northern Europe. Its easy workability, resistance to rot, mold and chemical action, and good insulating value have given it a fine reputation. The board is not advocated for exposed weather walls, however. Very porous, it will absorb its own weight in water, but will not sag or swell. When saturated it loses about 30% of its strength, but regains it when dry, and constant wetting and drying will not cause deterioration. Most intriguing potential of *Asbestolux* seems to be in back-up fireproofing for glass spandrels where few materials can equal its four-hour rating with just a 2" thickness, and in cores for fire-rated partitions and doors. (The fire ratings quoted are from military and British tests; Underwriters' findings should be available this month.) Price: about 17¢ a sq. ft. for $\frac{1}{4}$ " stock by the carload. Panels come 2' and 4' wide, 8', 9' 10' long, $\frac{3}{16}$ " to $\frac{1}{2}$ " thick.

Manufacturer: North American Asbestos Corp., 141 W. Jackson St., Chicago 3, Ill.

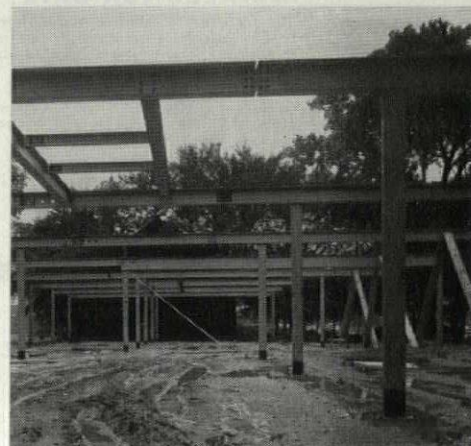
STRUCTURAL STEEL TUBES stocked in long, boxy shapes

Straight 24' lengths of hollow square and rectangular steel columns are now being fabricated by Union Asbestos & Rubber. Twice as long as most welded stock tubing, the unspliced members are brake-formed for a high degree of linear accuracy. Ends

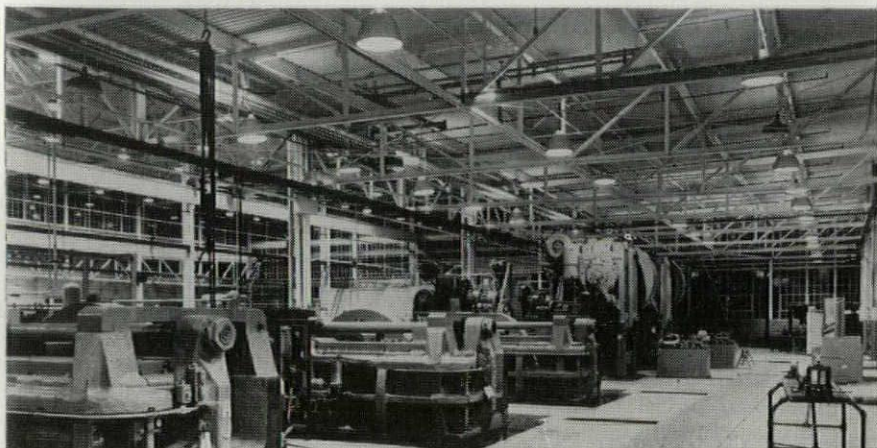
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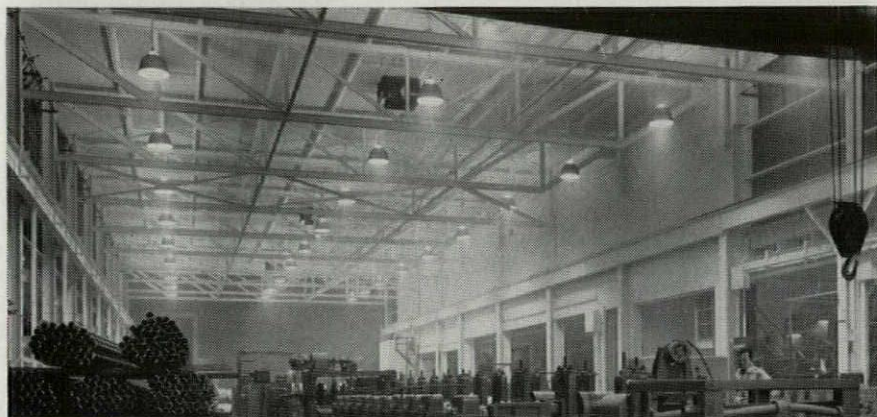
After Marine's flame-thrower blast . . . the panel stands—smudged but in good shape.



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Improve lighting, reduce eye fatigue with Abolite upright fixtures

Only a *small* amount of light (18%) is directed upward through the open top of Abolite upright fixtures, but it makes a *big* difference in both high bay and low bay installations. Dark ceiling shadows are washed away—there's no sharp contrast of bright light against black background. Eye fatigue is reduced—workers are more efficient. Air circulation through the open top fixture sweeps the reflecting surfaces clean, keeps maintenance at a minimum.

There are three Abolite upright units: 18" and 24" diam. Alzak fixtures for use with 400 and 1000 watt mercury lamps; 18" Alzak fixtures for 500 watt incandescent lamps. For full details, write *Abolite Lighting Division, The Jones Metal Products Co., West Lafayette, Ohio.*

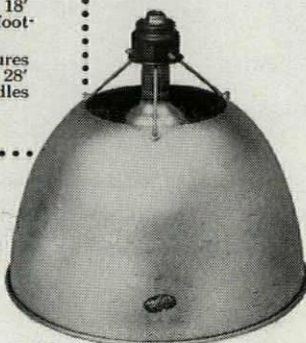
INSTALLATION DATA

Top picture: 24" Abolite Alzak aluminum fixtures with H-400-watt RC1 color-improved mercury lamps. 18' mounting height, spaced 13' 4" by 16' 8". 60 foot-candles average initially.

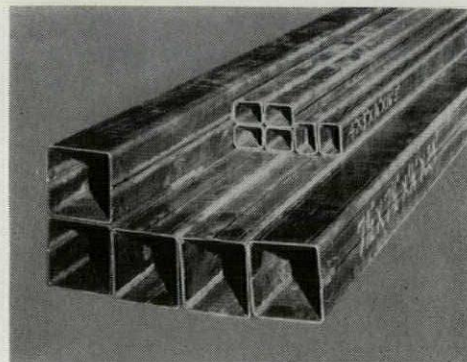
Bottom picture: 24" Abolite Alzak aluminum fixtures with H-400-RC1 color-improved mercury lamps. 28' mounting height, spaced on 20' centers. 35 foot-candles average initially.

ABOLITE

Lighting



of the torsionless tubes can butt precisely. Available in girths of 1' up to 2'-8" and wall thicknesses of $\frac{1}{8}$ " to $\frac{1}{2}$ ", the rectilinear shapes can be used as load-bearing beams and columns in one- and two-story buildings. Smaller sizes will be practical in catwalk, rail and rack structures. The submerged arc-welding technique used for joining leaves no bead; the outer surface of the tubing is smooth on all sides. For

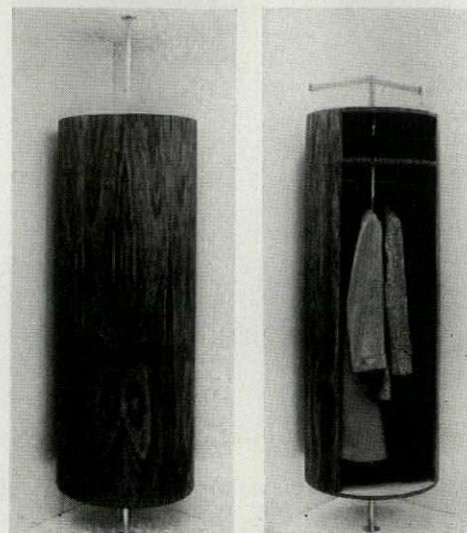


exposed framing, any of the sizes can be furnished with a hot-dip galvanize coat. Prices for 12' or 24' lengths range from \$1.07 a ft. for $\frac{1}{8}$ " thick tubing with 1' girth (weight: 4.85 lb.) up to \$7.78 a ft. for 2'-8" girth member with $\frac{1}{2}$ " wall thickness (weight 48.02 lb.).

Manufacturer: Union Asbestos & Rubber Co., 2900 W. Vermont St., Blue Island, Ill.

REVOLVING CLOSET bracketed to floor and ceiling

Lehigh's suspended closet is charming evidence that coat storage can be an asset rather than an eyesore. Reminiscent of the European freestanding clothes cabinets, the 2'-wide walnut case pivots demurely to face a corner or wall and looks like a gracious barrel—with hand-rubbed



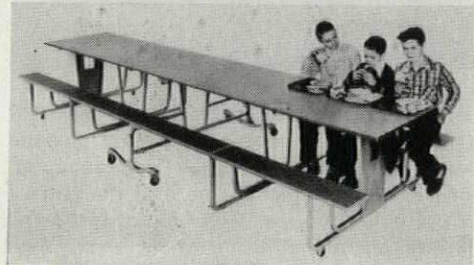
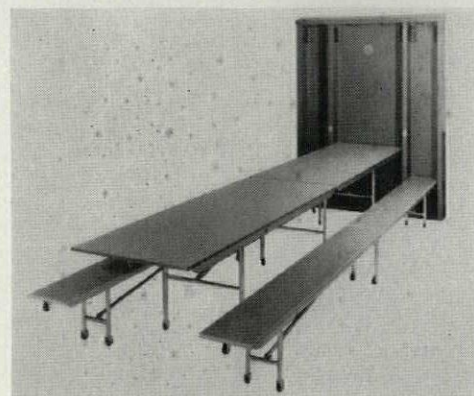
linseed oil finish. Turned frontward, the 5'-6" high cylinder reveals ample room for six overcoats, hats and overshoes. Available with floor pin and ceiling stem at \$297, and with a winged corner bracket for wall mounting at \$317, the unit costs about

the same as one built of studs, plaster, door and hardware.

Manufacturer: Lehigh Furniture Corp., 16 E. 53d St., New York 22, N.Y.

WALL TABLE AND BENCHES unfold hydraulically and quietly

Unbending out of a slim cabinet, an *Erickson* wall table provides comfortable lunching space for two dozen youngsters. Afterward it nests away, out of the way. Released by a key latch, a hydraulic mechanism lets down the melamine-topped table and benches at an easy pace; there is no



clatter or scarring of floors or nerves. Practical for multiuse schoolrooms, the 30"-wide folding table and two 1'-wide seats can be detached from their wall shell and from one another and wheeled around the room separately. The storing cabinet may be mounted on the wall or recessed. A complete unit with 14'-long table sells for around \$400.

Manufacturer: Haldeman-Homme Mfg. Co., 2580 University Ave., St. Paul, Minn.

WOOD CHIP BOARD made in thicknesses up to 2"

Novoply, the veneer-faced panel of resin-treated wood particles, is now being produced in thicknesses of $\frac{3}{8}$ " to 2". Especially adaptable to furniture and partition construction, the new thicker wasteboard weighs about 5 lb. per sq. ft. and is quite an effective sound barrier. The excellent warp resistance and minimal expansion and contraction qualities familiar in 1" *Novoply* are also present in the heavier material. Retail price for 4' x 8' x 2" *Novoply* is about 90¢ a sq. ft.

Manufacturer: US Plywood Corp., Weldwood Building, 55 W. 44th St., New York 36, N.Y.

continued on p. 180



Blistering and peeling paint is one of the most common types of damage caused by the collection of excessive vapor in the side walls.

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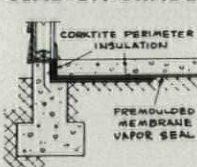
Rotting walls . . . blistering and peeling paint . . . masonry efflorescence (the white powder that forms on the outside of brick buildings) . . . warping and rotting wood floors and termite problems are just a few of the many evils we have learned to live with . . . all of them are directly or indirectly caused by excessive vapor condensation.

Governmental and academic research has proven that more than 80% of the moisture induced into the home is from the ground source. It makes little difference whether gravel is used under the basement, slab floor or crawl-space . . . or whether the site is on high or low ground, whether it's on a sand dune or a cess pool—somewhere below the structure, water exists and vapor will soon rise into the

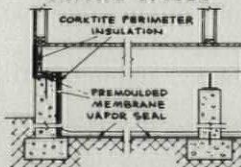
building. The only way to eliminate destructive moisture is in the original construction with the installation of "PREMOULDED MEMBRANE," the industries only TRUE vapor seal. In construction application the 4" x 8" sheets of "PREMOULDED MEMBRANE" are laid directly over the hard tamped grade or fill with a 6" head and side lap that is sealed with Sealtight Catalytic asphalt . . . producing a monolithic vapor seal with mechanically sealed joints, that will expand and contract with the concrete slab above . . . without breaking the bond. "PREMOULDED MEMBRANE" has a permeance rating of only .0066 grains per square foot. We sincerely invite your comparison of "PM" against all other so-called vapor barriers on the market.

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BASEMENT



The above drawings graphically illustrate how the installation of "PM" completely isolates the superstructure from soil moisture.

Write today for complete information and your set of "Tech-Tips."



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Wisconsin State College, Eau Claire, Wisc.
Architects: Eschweiler & Eschweiler, Milwaukee

These windows are mirrors ... on the other side!

People in this semidarkened room, can see *through* windows of *Mirropane*® to observe the children in the adjoining room. But from the children's side—in the brighter room—these windows are mirrors. The children see only their own reflections.

Mirropane has many architectural uses . . . in schools, hospitals, banks, stores . . . anywhere you need to provide a way to observe without being observed.

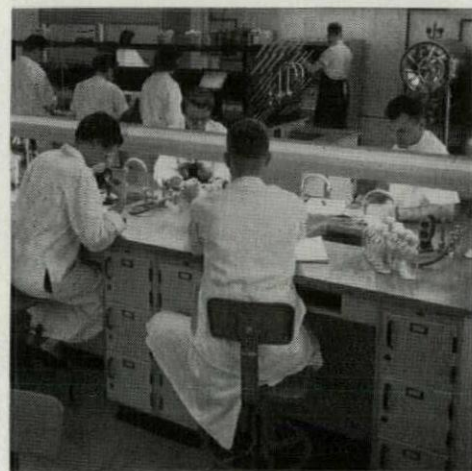
For complete details, call your L·O·F Glass Distributor or Dealer (listed under "Glass" in phone book yellow pages). Or write to Liberty Mirror Division, Department LM-177, Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo 3, O.



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GLASS COMPANY

LABORATORY LIGHT illuminates close work comfortably

In planning the new biological sciences building at Indiana University, the architectural staff was confronted with conflicting light requirements for the laboratory counter. The problem was to create enough illumination at worktop level for close dissection work without causing any bright reflections on microscope mirrors and still keep general light contrasts within reason so that students looking up to the chalkboard would not be temporarily blinded. The solution, worked out collaboratively with Wakefield engineers, is the *Technician*



plan fixture, now available for other school and commercial laboratories. First obvious feature of the 16"-high, table-mounted strip is that it does away with the clutter of individual lamps. More important is the quality and distribution of its light. Two high-output (800 milliamperes) fluorescents are set in each lamp, one above the other, and shielded by a parabolic reflector to cast a 54"-wide band of light. Foot-candle intensity is strongest along the center, about 300, where microscopes would be focused. The foot-candle level grades down to about 200 along both edges of the table. Prices for *Technician* fixtures run \$55 for a 4' model, \$61 for 6' and \$67 for 8', plus lamps and installation.

Manufacturer: Wakefield Co., Vermilion, Ohio

POWER PACKAGE installs in laboratory tables

Set in the apron of each science laboratory table, the *Lab Volt* gives aspiring Openheimers all the voltage they need for school experiments, safely and conveniently. The compact 8¾" x 3¾" deep box provides AC outlets and low-voltage DC current with a precisely calibrated dial. Circuit breakers prevent any damage from overloads, and a reset button re-establishes the connection after the excess load is taken off. Reported to save \$1,000 in wiring costs in a single physics room over central-panel distribution, *Lab Volt* units can be built in wherever needed or may be used as semi-portable units and stored away in a cabi-



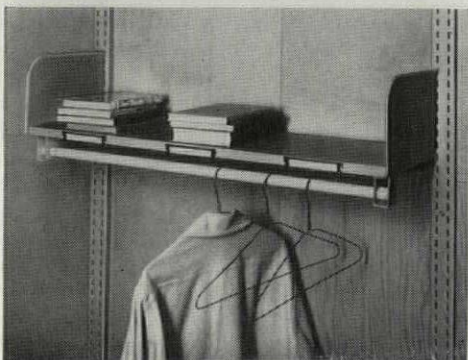
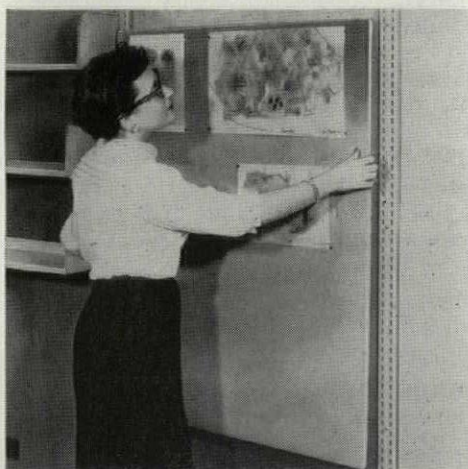
net. Price to schools is \$79 each. Installation, involving only a tie-in to regular 120-v. wiring, should not be expensive.

Manufacturer: Buck Engineering Co., 37-41 Marcy St., Freehold, N.J.

SLOTTED WALL CHANNELS support shelves and chalkboards

The modern classroom requisite, a truly flexible wall system for storage and teaching, can be set up at modest cost with Ames's channels and bracket-on fixtures. Adapted from successful store display equipment for schools, office and library applications, these slotted steel uprights are mounted at 3' intervals along the wall. Shelves, display boards and chalkboards, even lightweight desks, can be hung on the channels at any height and rearranged whenever necessary. Two 7'-6" verticals cost \$8. A set of mounting hardware for a

continued on p. 182



For a modern school...



modern FIRE doors...

Top Photo: Suter, Hedrich-Blessing. Lower Photo: Billy Hope. Courtesy of Howard Andrews, Supt. of Schools, Kellogg, Idaho. Architects & Engineers: Culler, Gale, Martell & Norrie, Spokane, Wash.; Perkins & Will, Chicago, Ill.; White Plains, N. Y.

Kinnear Rolling Doors

This striking new high school at Kellogg, Idaho, presents architectural progress at its best. Right at home in this modern setting are six Kinnear Rolling Fire Doors, like the one at right — with the interlocking steel-slat curtain originated by Kinnear nearly 60 years ago. Like the school itself, these doors owe much of their eye appeal to basic, functional efficiency. In case of fire, they lower *automatically*, blocking the spread of flames. Positive, spring action starts them, yet downward speed is *controlled* for safety. And they can be opened after automatic closure, if

necessary. For extra fire protection plus highest safety for building occupants install Kinnear "AKBAR" Rolling Fire Doors (labeled by Underwriters Laboratories, Inc.)

For all regular (non-fire) needs, standard Kinnear Rolling Doors save space, time, and cut costs. They give added protection against fire, wind, weather, trespass, and vandalism. Built any size; motor or manual control.

Wherever you need doors — for fire protection, for opening and closing efficiency, or for both, there's a Kinnear Rolling Door for best results.

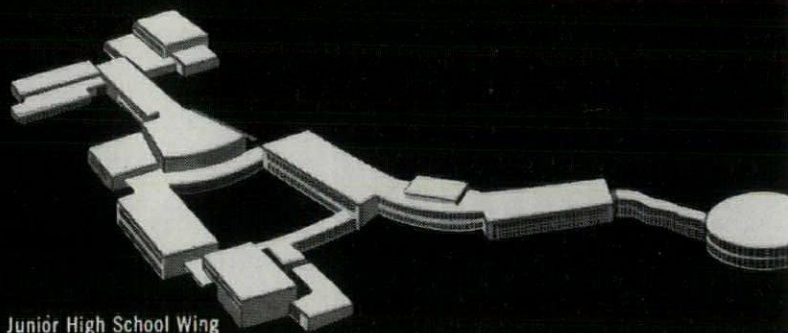
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KINNEAR
ROLLING DOORS
Saving Ways in Doorways

Architect: La Pierre, Litchfield & Partners; Consulting Electrical Engineer: Gustave B. Weiser;
Electrical Contractor: Heckler Electric Co.; Electrical Distributor: Chugg-Carlin, Inc.



Junior High School Wing

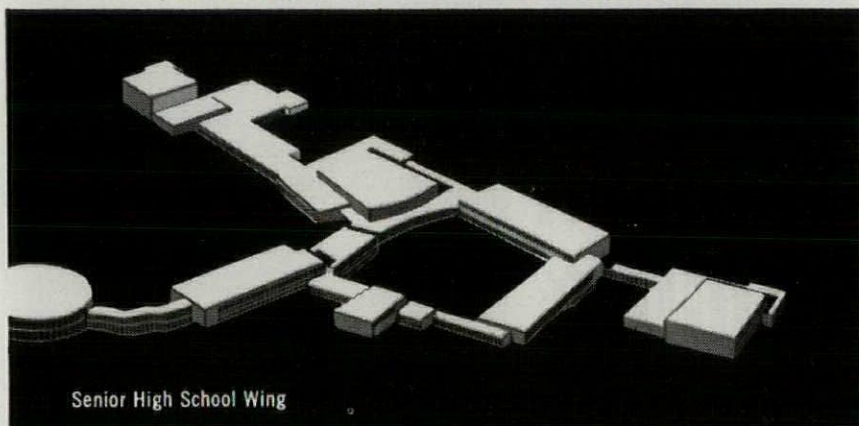
lighting
design by

mc Philben

for the magnificent new
Great Neck High School



... a wholly new concept in school architecture and quality building.



Senior High School Wing

McPhilben 43-24 recessed weather-tight downlights will light the exterior corridors of this superb new school in Great Neck, N. Y. Only 3½ inches deep, the 43-24 housings are sturdily constructed of 16 gauge galvanized steel. The gleaming satin finish of the face plates will resist all corrosive elements, thanks to the anodized cast aluminum construction. And, mcPhilben's exclusive Sealume gasket of neoprene rubber will assure permanent weather-tight maintenance-free operation. Your mcPhilben representative has full details about the 43-24 and other mcPhilben recessed weather-tight downlights, both square and round. Contact him or write to mcPhilben Lighting Co., 1333 Willoughby Avenue, Brooklyn 37, N. Y.

Representatives in major cities • Stocked by electrical wholesalers

tackboard or chalkboard is \$5. Flat and compartmented shelves, 8", 10" and 1' deep are about \$3.15 to \$8 each. Other accessories available include tilted shelves for magazines and cost rack shelf with a hanging rod below. All components are furnished in any of 18 baked enamel colors. *Manufacturer:* W. R. Ames Co., 150 Hooper St., San Francisco 7, Calif.

BLIND CONTROL flips Venetian slats in sections

Conceding that the sun moves up and down as well as sideways, C. B. White has developed the *Versatilt*, a Venetian blind control that can be especially practical in a large-windowed classroom. Two cords at the side of each blind regulate top and bottom sections of slats independently so that direct sun can be blocked off without cutting off useful daylight or ventilation—and without tipping the slats at odd



angles by hand. Slat areas can be proportioned in two, three or more groups, with one spring tension cord providing a full 180° arc for each section. Designed for standard slats, the *Versatilt* hardware is expected to run about \$3 to \$5 more a window, depending on size and number of cord controls called for.

Manufacturer: C. B. White Co., Auburndale 66, Mass.

KNOCKDOWN TROWEL hooks up with drill for power

Putting the finishing touches on 2,000 sq. ft. of concrete an hour, the lightweight 20" *Pony* troweler gets its energy from a slow speed drill. The 18 lb. aluminum alloy tool relies on friction instead of heft for floating and finishing work. It attaches to any drill operating under 500 rpm with a chuck size ½" or larger. Suitable for small maintenance jobs and irregular surfaces, the *Pony* has self-cleaning, telescoping blades that extend outside the guard ring to reach up to curb edges and around other projections on a slab. Price for a *Pony* trowel is \$97.85 with a ½" *Stanley* drill, \$152.78 with a heavy-duty ¾" drill.



The trowel and switch-control handle alone cost \$49.50. Stone and brush attachments are also available for turning the *Pony* into a slab grinder and polisher. All components come apart for storage and travel.

Manufacturer: Goldblatt Tool Co., 1910 Walnut St., Kansas City 8, Mo.

SWIVEL DRILL cuts straight cores in concrete

Designed for high-speed cutting into masonry and reinforced concrete, Truco's 1,000 rpm drill motor plugs into any 110-v. outlet. A built-in water swivel, connected to tap, supply line or portable pressure tank, flushes away cuttings and keeps the diamond drill face cool. The light hand tool will take 1" to 3½" bits. It can be used in

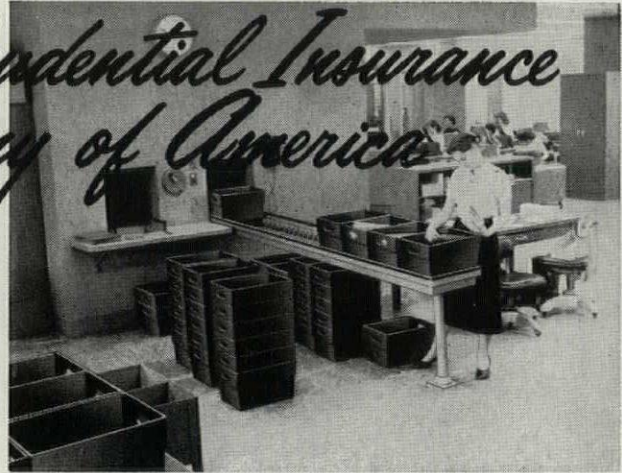


many awkward spots where larger, fixed machines cannot fit. When numerous holes must be drilled in a floor slab, the Truco tool can be used with a portable stand, stabilized by the operator's feet on its base. For rigid anchorage in horizontal position, the stand can be secured against the wall or ceiling with a column screw. The hand swivel drill motor sells for about \$175 plus bits; the stand is \$127.50 extra. Manufacturer: Water Swivel Div., Wheel Trueing Tool Co., 3200-94 W. Davison Ave., Detroit 38, Mich.

continued on p. 184

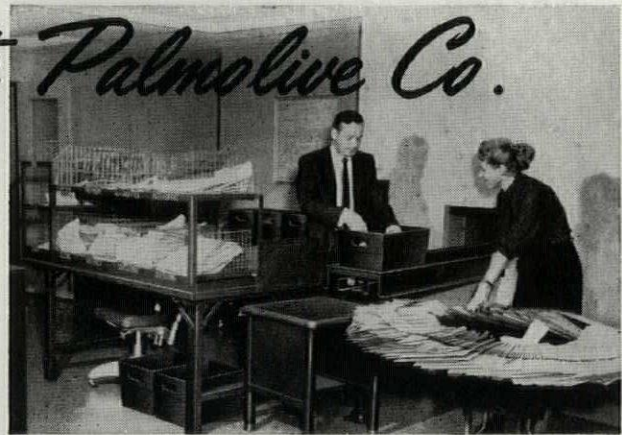
The Prudential Insurance Company of America

... In addition to inter-office mail, an average of 30 bags of mail are received and distributed before noon through 10 floors of its New York office without tying up messengers and elevators.



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For floor-to-floor transfer of mail, modern business uses Lamson Selective Vertical Conveyors. The conveyors carry correspondence and other items in deep, individual trays, serving all floors of a multi-story installation simultaneously, at a rate of ten dispatches per minute.

In performing all operations *automatically*, Lamson Selective Vertical Conveyors assure a uniform and regular flow of paperwork . . . avoiding "batch" deliveries . . . and maintain a level work load within all departments at all times. Elevator service, too, is materially improved since inter-floor messengers no longer "crowd out" passengers.

Why not talk over your vertical-transfer-of-materials-problems with a Lamson engineer? He'll show you ways to increase efficiency and cut costs.



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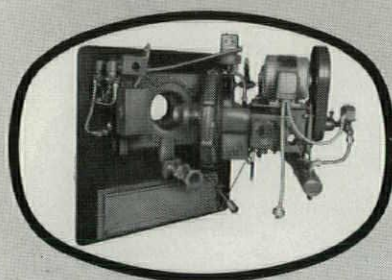
Valuable Information! Clip to Your Letterhead

- ☐ Have an engineer call me for an appointment.
- ☐ Send me the 12-page catalog on Lamson Selective Vertical Conveyors.

96

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cont'd

DRAFTING BOARD SPOOLS keep long drawings taut

Feeding tracing paper from a fresh roll over a drawing board into a receiving tube, the *Rollo-Draft* works much like film spools in a camera. Long drawings can be made on one sheet and kept unsmudged and taut without tacks or tape. Cranks on both sides of the board move the paper to left or right and lock it in place. Stored safely in the receiving tube until finished,



the continuous sheet can be put through a blueprint machine without splicing. A *Rollo-Draft* set of tubes for a 3'-wide board sells for \$89.50; the 3'-6" pair costs \$96.50. *Manufacturer: Aqua Sportsmen, Inc., 2518 Leslie Ave., Norwood, Cincinnati 12, Ohio*

THREE FOUNTAINS set in single plastic shell

Haws 10Y drinking fountain caters realistically to any school's between-class thirsts with three squirtproof bubblers. Molded of polyester and glass fibers, the smooth, contoured wall model can take long and rough treatment from youngsters and weather.



The fountain shell, pigmented throughout in white, blue, coral, yellow, gray, and pistachio, is scar-resistant. Lightweight, it needs no cumbersome mounting brackets. Fountain heads and levers are chromed; pushbutton valves are furnished on special order. Price, with levers, is \$146.66.

Manufacturer: Haws's Drinking Faucet Co., 4th and Page St., Berkeley 10, Calif.

VINYL TACKBOARD

heals its own pin wounds

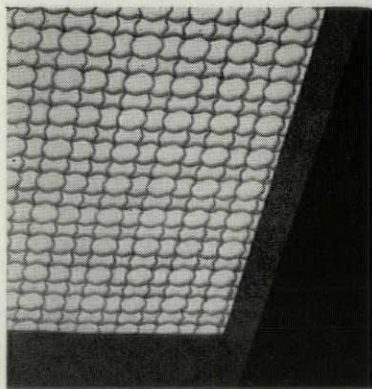
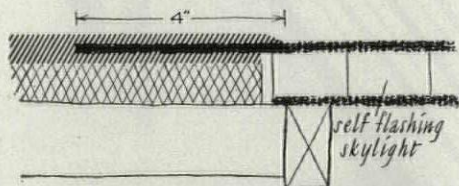
The vinyl *Kalistron* face on *Weldwood Tackboard* has a self-sealing action that grips tacks well and closes the holes after they are withdrawn. Produced as a companion to US Plywood's magnetic porcelainized-steel chalkboard, the plastic-faced fiberboard can be applied directly to studs as a complete interior wall with blind butt joints or metal molding. It has a scuff-resistant, embossed texture resembling burlap, and is furnished in four colors—gray, green and two shades of blue—fused to the underside of the transparent film. Maximum board size is 4' x 12'; over-all thickness is 9/16". It sells for 62¢ to 75¢ a sq. ft.

Manufacturer: US Plywood Corp., 55 W. 44th St., New York 36, N.Y.

TRANSLUCENT SANDWICH

has structural plastic middle

The decorative grid core as well as both skins in Design Industries' new panel are made of glass-fiber reinforced resin. Marketed in sizes up to 4' x 10', the translucent laminate can be framed into a mullion system as a light transmitting curtain wall. It is also engineered to take normal roof loads, with a comfortable safety factor, and so can be mounted as a curved skylight or flashed directly to a built-up



roof. Several core motifs are available including a classic box pattern. Each of the grids is bonded of strips of polyester with unidirectional fibers. Numerous colors can be specified that give the panels light transmission values ranging from 5 to 60%. Thickness ranges from 3/4" to 2 1/2"; 1" is standard. U factor runs from 0.04 to 0.05. Prices start at \$26.45 for a 2' x 2' panel and go up to \$227.13 for a 4' x 10' unit.

Manufacturer: Design Industries, a division of Architectural Plastics Corp., 1355 River Rd., Eugene, Ore.



Stromberg's new Electronic Time System tops the field with...

Here are some
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- Jewelled Master Clock movement with automatically wound 72-hour spring power reserve.
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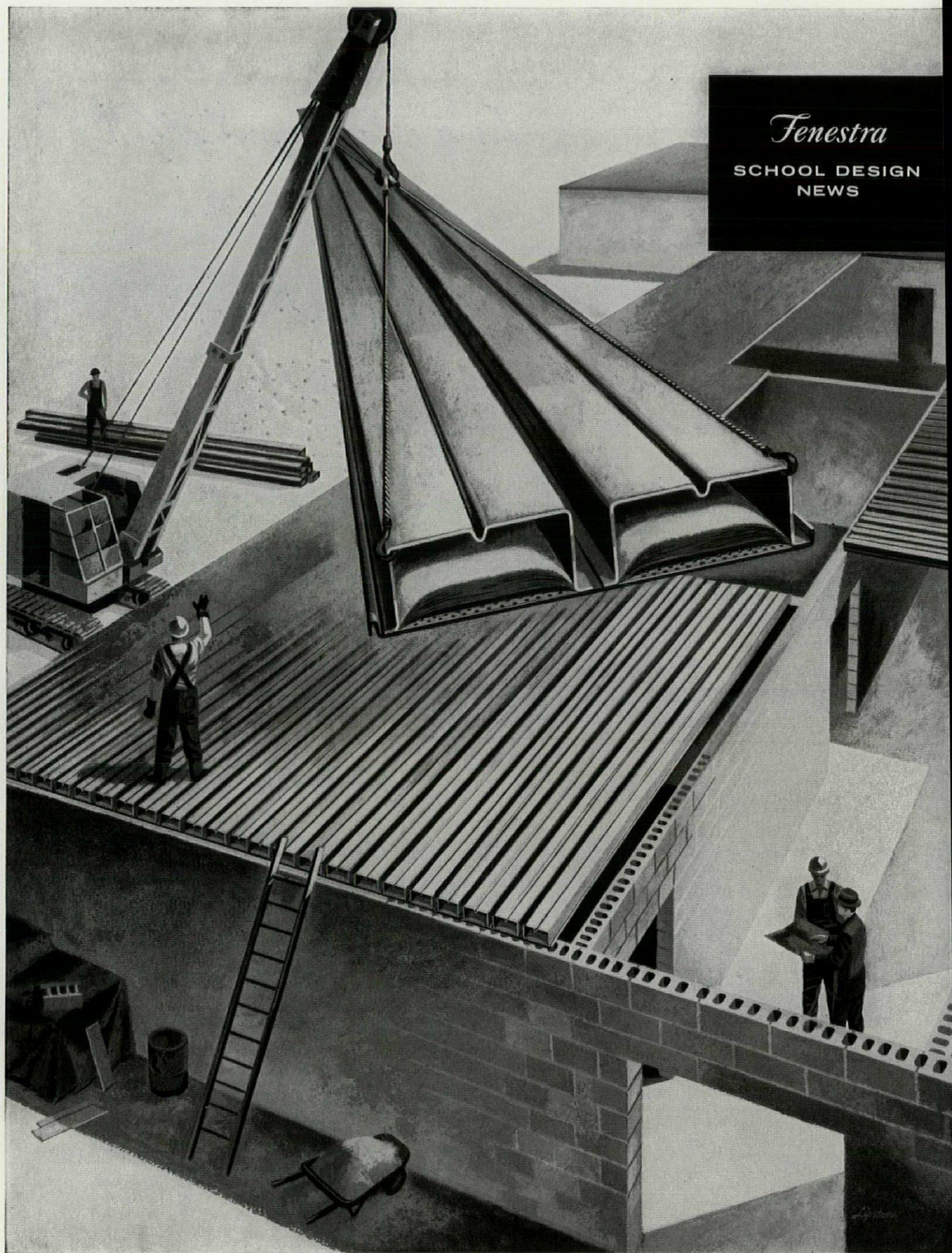


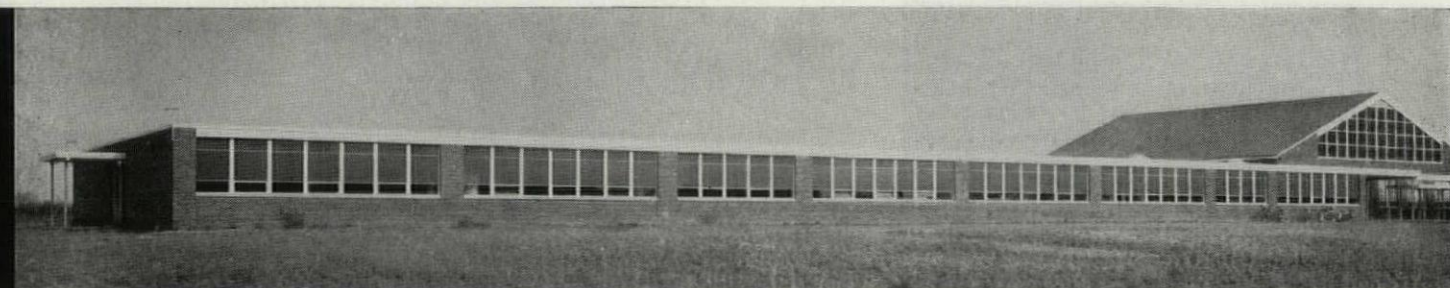
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Thomaston,
Connecticut

Fenestra
SCHOOL DESIGN
NEWS





Fowlerville High School, Fowlerville, Michigan, is designed with interior load-bearing masonry walls and Fenestra Acoustical-Structural "D" Panels to reduce structural steel requirements to a minimum. Total costs for this 41,000 square foot school were approximately \$11.00 per square foot . . . an economical

figure for high school construction in this area.

Architect: Louis C. Kingscott and Associates, Inc., Kalamazoo, Michigan.

Contractor: Vandenburg Construction Co., East Lansing, Michigan.

How Fenestra Acoustical-Structural Building Panels*

SAVE STRUCTURAL STEEL IN SCHOOL CONSTRUCTION

Spanning between interior masonry bearing walls, Fenestra Panels practically eliminate structural steel and reduce foundation and footing requirements. Schools using this basic structural system have been built in many different areas at costs from \$9.00 to \$12.00 per square foot depending on mechanical facilities, interior trim and accessories.

Fenestra Acoustical-Structural Building Panels form the structural roof deck and the finished interior ceiling complete with "built-in" acoustical treatment. They replace *five* different materials—usually requiring extra labor and costs—with *one* building unit, erected in *one* operation by only *one* trade.

The unique cellular design of Fenestra Building Panels makes them strong enough to span up to 31 feet under normal roof loads. They also provide lateral bracing for the bearing walls. Their width—24 inches—fits perfectly with modular design techniques. This speeds up construction and eliminates cutting and fitting of panels and other materials on the job.

To provide the acoustical ceiling, the flat bottom

surface of the panels is perforated. An exclusive Fenestra arched, sound-absorbing batt that produces a noise reduction coefficient of 80% is enclosed *inside the panels*. It cannot be harmed by painting or maintenance cleaning. There is no "stuck on" material to discolor or fall off and require replacement. And, because this plate is a part of the structural panels, it is made of 16-gauge steel—4 times thicker than the usual metal pan ceiling construction. This assures extra resistance to damage by objects thrown against the ceiling or other impacts. Room-to-room noise flow is prevented by sound transmission barriers incorporated into the panel design.

If you are now planning a new school building, you should get complete details on Fenestra Acoustical-Structural Building Panels and the new school design concepts possible with them. The New 1957 Fenestra Building Panel Catalog gives you complete information. Mail the coupon below, today, for your FREE copy or call your Fenestra representative.

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Please send me FREE copy of New 1957 Fenestra Building Panel Catalog including details on Fenestra Acoustical-Structural Building Panels for schools.

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Fenestra
SCHOOL DESIGN
NEWS

"Fenestra Steel Windows' No Painting feature alone saved us \$500 in only two years"

... says Riverside School Staff

Principal*: "We are more than pleased with our Fenestra® Intermediate Steel Windows. No maintenance work on them has been required in the two years we have occupied Riverside, nor have they warped or jammed.

"Keeping Fenestra Windows clean is an inside job all the way. Our maintenance man is able to wash the windowpanes inside and out while standing inside the school building. Windows are washed and polished 35% quicker.

"Lack of corrosion, alone, has saved us approximately \$500.00 because, normally, windows have to be painted every two years. There is no indication that the windows will require painting in the near future.

"It is significant to us that the architect who designed our building has planned 14 others and specified Fenestra Steel Windows for all."

Teacher*: "The windows in my classroom operate as easily now as they did two years ago. Opening and closing them is so easy, even the smallest of our students can handle them."

Librarian*: "We are especially impressed with the excellent ventilation we're getting. Each window remains open at the angle selected—can be readily

adjusted to regulate the amount of air entering the room, and will not slip out of position."

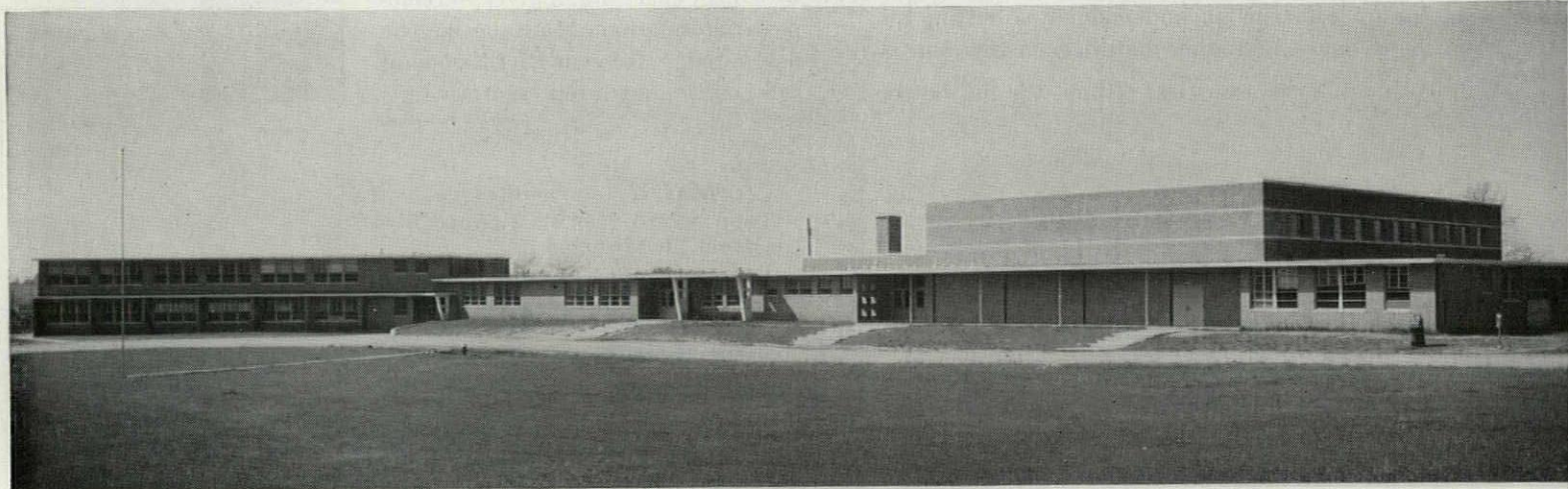
Fenestra Intermediate Steel Windows provide *more and better daylight* for school classrooms. Their slim, but strong, steel sections give you *more glass area* and *clear-vision view* per window opening. Fenestra Windows are engineered and precision built to be rigid and rugged without excess bulk. Sturdy hardware and steel-strong window members assure years of trouble-free service. Cleaning and screening are done safely and economically from the *inside!*

NEW FENESTRA FENLITE FINISH

Fenestra Intermediate Windows are now available with the New FENLITE Finish that gives longer window life *without painting* plus a distinctive window beauty. The FENLITE process is an exclusive Fenestra development based on years of experience and research with corrosion-resistant finishes for steel windows. It saves the cost of maintenance painting year after year.

For modern window beauty, for more daylighting and better ventilation, specify Fenestra Intermediate Steel Windows. Mail coupon, today, for complete information or call your local Fenestra representative—listed in the Yellow Pages.

*Names upon request.





Riverside Elementary & High School, Pendleton, South Carolina, an outstanding example of modern, split-level school design. Contains 38,360 square feet. Capacity: 500 students. 170 Fenestra Intermediate Steel Windows, with their slim, steel members, contribute to the building's architectural beauty, give classrooms better daylighting and ventilation. Architect: John M. Lambert, Jr., A.I.A., Anderson, S. C. Contractor: Triangle Construction Co., Greenville, S. C.

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A dramatic "change of pace". Waylite walls need never be monotonous or dull...there is always an architectural treatment or form that harmonizes with the function of the structure. In addition Waylite provides an insulative structural wall that needs no acoustical treatment—all at one low cost. The Waylite Company, 20 N. Wacker Drive, Chicago, Ill.; P. O. Box 30, Bethlehem, Pa.

WAYLITE
M A S O N R Y U N I T S

**HOW
ACCOMPLISHED:**

Textured 8 x 8 x 8 inch Waylite Units stacked diagonally. Some units set in wall at different level for shadow effect.

CREDITS:

Pub Bar and Restaurant, Philadelphia. Architects: Armand Carroll and Wm. J. Stephenson. Mason contractors: Casper Bros.

...native genius...planning...Japanese designs

NATIVE GENIUS IN ANONYMOUS ARCHITECTURE. By Sibyl Moholy-Nagy. Published by Horizon Press, Inc., 220 W. 42nd St., New York 36, N.Y. 223 pp. 8 1/2" x 10 1/2". Illus. \$7.50

There may be better ways of proving a point than to have a loyal disciple trudge some 15,000 miles collecting photographs to illustrate it. But that's the method that seems to have worked best in this case.

The point: Frank Lloyd Wright's dictum (1910) that "the true basis for any serious study of the art of architecture still lies in those indigenous, more humble buildings everywhere that are to architecture what folklore is to literature or folk song to music... though often slight, their virtue is intimately related to environment and to the heart-life of the people."

The well-traveled disciple: Sibyl Moholy-Nagy, widow of the renowned international designer, and herself a distinguished architectural critic.

This picture collection is the result of her purposeful travels. It is completely convincing.

Drawn largely from the Western Hemisphere, the examples of "anonymous architecture" demonstrate that Americans share

an environmental heritage that is as rich as it is varied. And Mrs. Moholy-Nagy is as delighted to discover this heritage as she is scandalized by modern attempts to pervert it.

Because of the enormous effort and skill that went into her book, it is all the more unfortunate that Mrs. Moholy-Nagy's publishers could not stretch the budget enough to give the photographs and entire layout better paper and more imagination.

REAL ESTATE AND CITY PLANNING.

By Richard L. Nelson and Frederick T. Aschman. Published by Pentice-Hall, Inc., 70 Fifth Ave., New York 11, N.Y. 507 pp. 6" x 9 1/2". \$10

The world's problems are rarely so simple that they can be solved by discussion alone. But hope continues that if we can agree to agree on certain matters, the remaining controversies will be diminished.

It was this philosophy that must have given Messrs. Nelson and Aschman courage to make a survey of the cold war between real estate people and planners. Otherwise, with their respective experience in the fields, they would surely have despaired long before this lengthy, thoughtful and thorough study was ready for the printer.

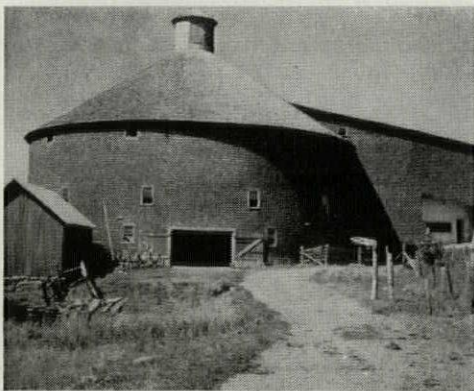
We can agree on certain definitions: what real estate is, what planning is. We can agree on the history of the city. We can agree on the need for transportation. And then we can scratch around for a few more acceptable generalities. But apparently we cannot honestly face up to the precise issues of mistrust and fear that, city by city, are making this real estate-planning relationship so deadly.

Until such a plain-spoken job of reporting is done, it is doubtful that the truth will be fully served. And, until then, we should doubtless only expect volumes that read like the findings of the World Court.

JAPAN'S NEW ARCHITECTURE. Edited by Professor Shinji Koike in collaboration with Architect Ryuichi Hamaguchi. **WORLD'S CONTEMPORARY HOUSES:** Vol. 1, NORTHERN EUROPE; Vol. 2, CENTRAL EUROPE; Vol. 3, SOUTHERN EUROPE; Vol. 4, U.S.A.; Vol. 5, LATIN AMERICA; Vol. 6, JAPAN. Edited by Shinji Koike, Ryuichi Hamaguchi, Kimimasa Abe. Published by Shokoku-sha Publishing Co., Tokyo, but available at various prices through Charles E. Tuttle Co., Rutland, Vt. In Japanese and English. All illus.

Impressive as Japanese architecture old and new may be, the volume of material written about it is even more overpower-

continued on p. 192



A heritage of environment: from a circular barn in Clinton, Pa. . .



. . . to a well-ventilated peasant house in a Haitian jungle valley.

AN OPEN LETTER TO FOOD SERVICE ARCHITECTS AND CONSULTANTS

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ing. Professor Koike and his coworkers are irrepressible. And fortunately the photographs available to them, their sense of layout and the quality of paper and binding are generally excellent.

One could only wish that the level of architectural criticism were as high. Perhaps the professor's translators were excessively polite, and perhaps his text was more incisive in the original. But American readers will be disappointed by his disinclination to be candid.

TECHNICAL PUBLICATIONS

A selection of new handbooks, textbooks, technical reports, brochures and commercial leaflets, noteworthy for their information content or pictorial format or both

CALCIUM CHLORIDE IN CONCRETE. Published by the Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D.C. 40 pp. Illus.

One of the recommended practices above

is the use of 1% of calcium chloride by weight for air-entrained concrete in cold weather. This booklet contains full quantitative and technical information, plus specifications.

PLUMBING PLANS AND SPECIFICATIONS.

Published by the Joint Plumbing Industry Board of New York, 101 Fifth Ave., New York 3, N.Y. 10 pp.

Checklist for architects, engineers, builders and awarding agencies, specifically in the New York area, for preparing more exact plans and specifications to reduce costs, insure good work.

PLEXIGLAS REPLACEMENT GLAZING (PL-251).

Published by Rohm & Haas Co., Plastics Dept., Washington Sq., Philadelphia 5, Pa. 12 pp. Illus.

Detailed installation instructions and data for architects, plant and school administrators on the use of clear acrylic plastic sheets as substitute for window glass, skylights, etc., in situations where frequent breakage is a problem.

METAL CURTAIN WALL CWA-2.

Published by Michaels Art Bronze Co., Inc., P. O. Box 668, Covington, Ky. Folder file. Illus.

Detail and data sheet on a new, clean, anodized aluminum curtain wall system whose main feature is snap-in stops instead of screws to allow different profiles in framing by variation of the stops.

ALUMINUM IN ARCHITECTURE.

Published by Kaiser Aluminum & Chemical Sales, Inc., Palmolive Bldg., 919 N. Michigan Ave., Chicago 11, Ill. 15 pp. Illus.

Full data, properties, details and specifications on this company's line of architectural alloys, finishes, embossed patterns, sections and general building products.

DATA FILE: SEALERS.

Published by the Adhesives and Coatings Div., Minnesota Mining & Mfg. Co., 423 Piquette Ave., Detroit 2, Mich. Six brochures and data sheets. Illus.

An informative file on 3M "Weatherban" sealers for curtain walls, panels, expansion joints, other building applications, giving properties, performance, compounding and application data, detail drawings and methods, case histories. Sent only on business letterhead request.

UNIVAC II DATA AUTOMATION SYSTEM

MANUAL: U 23. Published by Remington Rand Univac Div., Sperry Rand Corp., 315 4th Ave., New York 10, N.Y. 79 pp. Illus.

Complete and highly informative guide to the new Univac electronic computer data processing system for business and engineering use, written and illustrated for the layman as well as computer specialists.



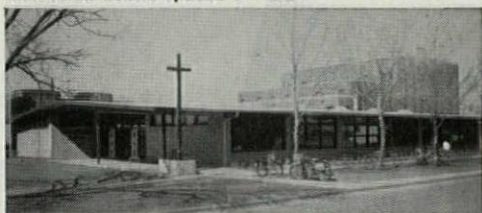
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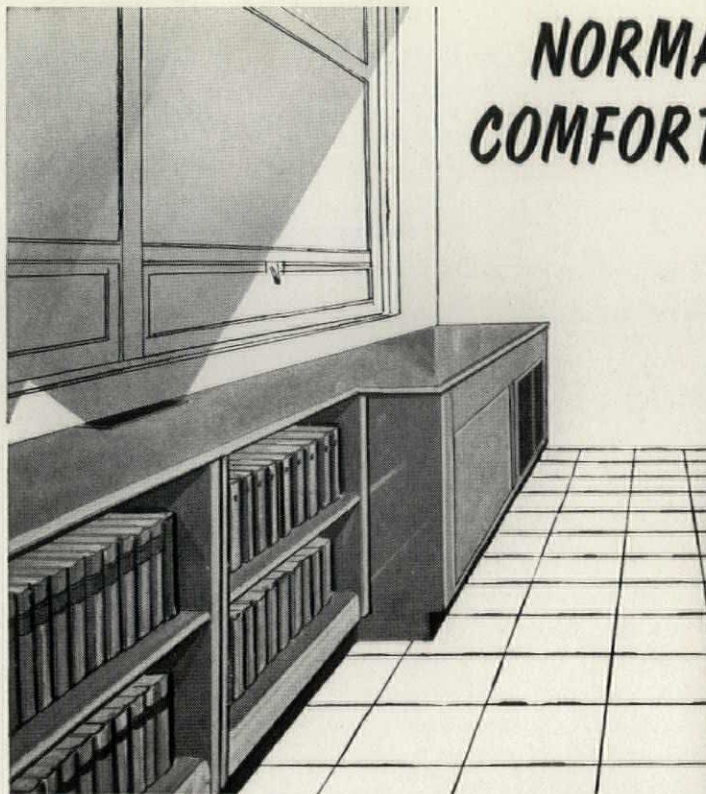
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Saint Joseph School, McPherson, Kansas; Architect: Robert Marr, McPherson, Kansas; Contractor: Frank Jackson, McPherson, Kansas. Rilco Wood Roof Deck of Western Red Cedar spans the 5 1/4" x 17 7/8" x 40' laminated beams spaced 14' o.c.

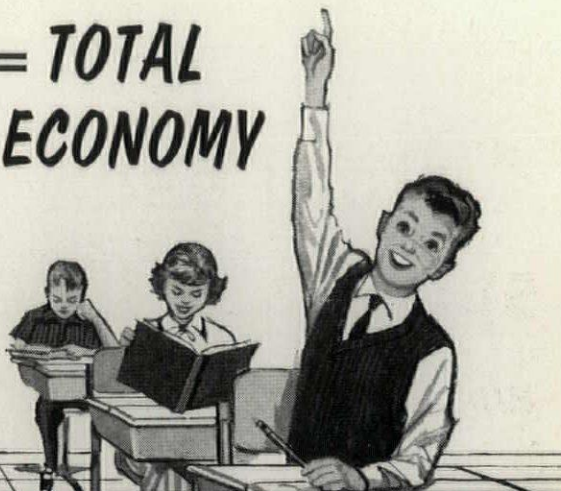


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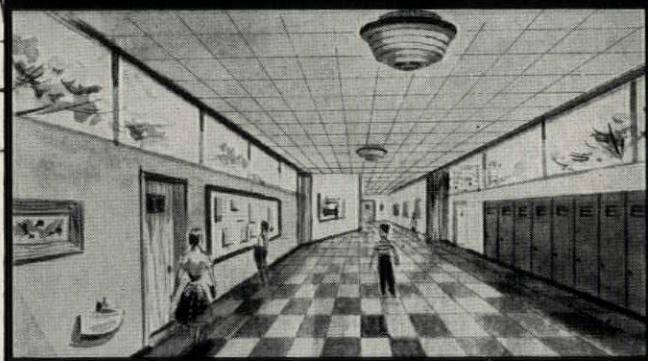


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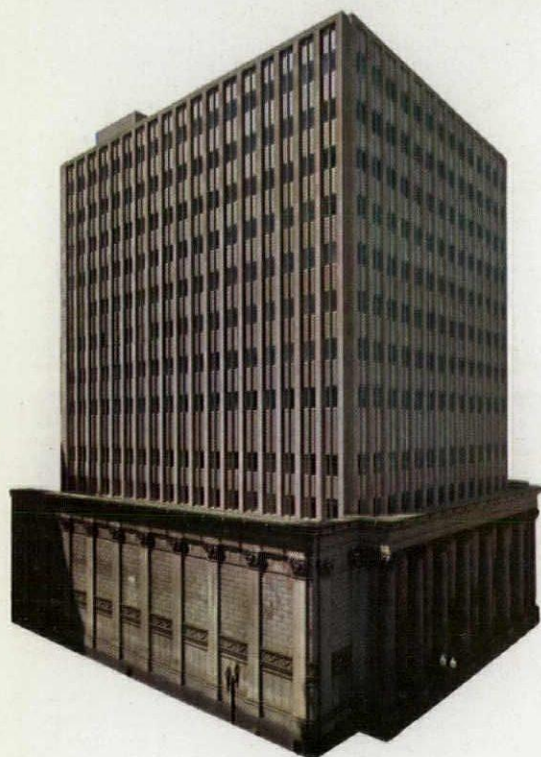
The Federal Reserve Bank of Minneapolis serves the Ninth Federal Reserve District. It moved into its own building in 1925 and, naturally, outgrew its quarters as

the economy of the district expanded. The check collection department, for example, now clears more than 108 *million* items a year.

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General Contractors: Naugle-Leck, Inc., Minneapolis

Panel Fabricator: Benson Mfg. Co., Kansas City

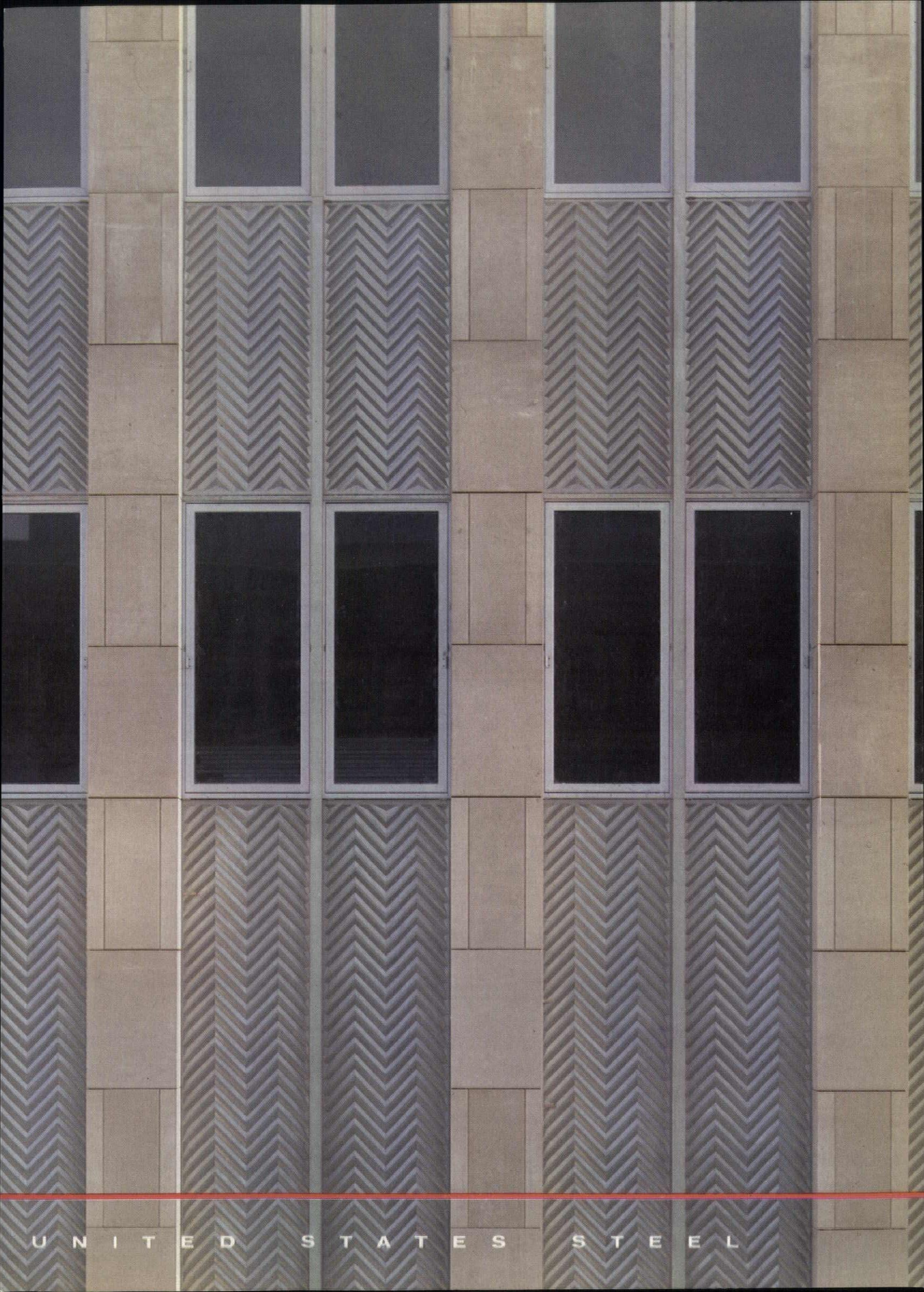
Consulting Architects: Holabird & Root & Burgee, Chicago

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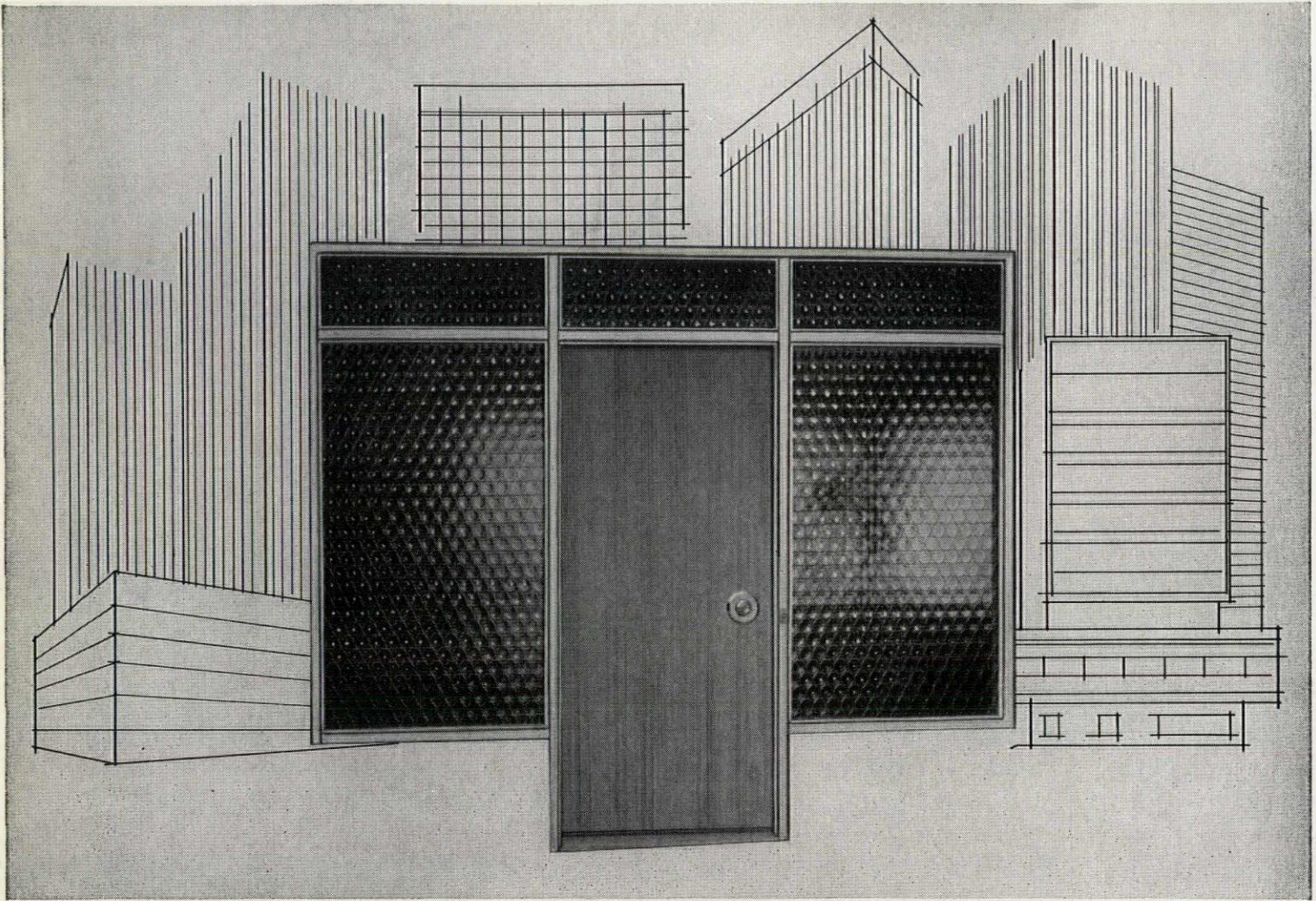


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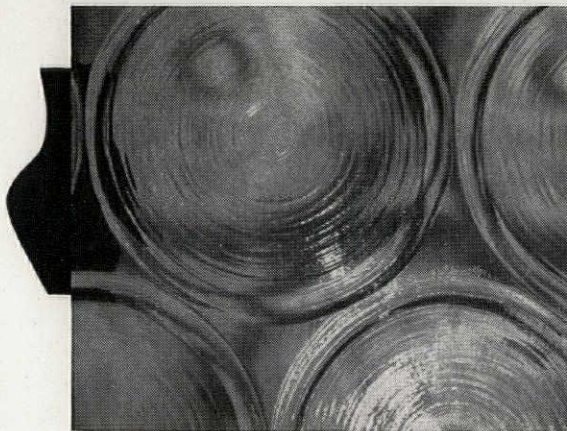
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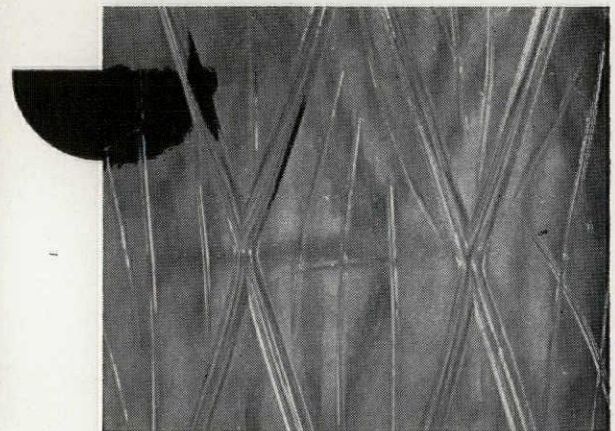
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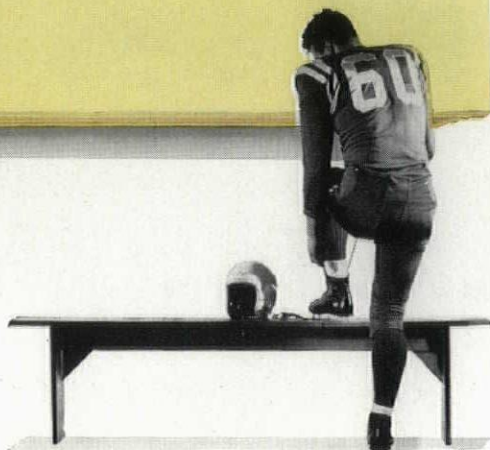


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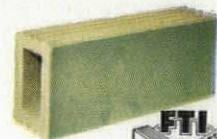
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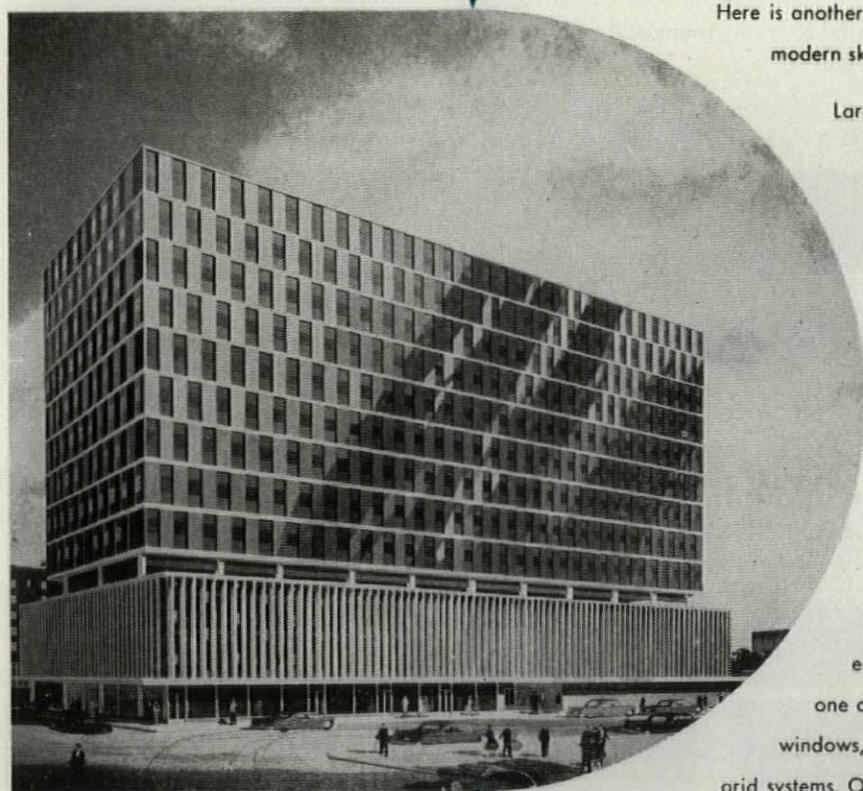
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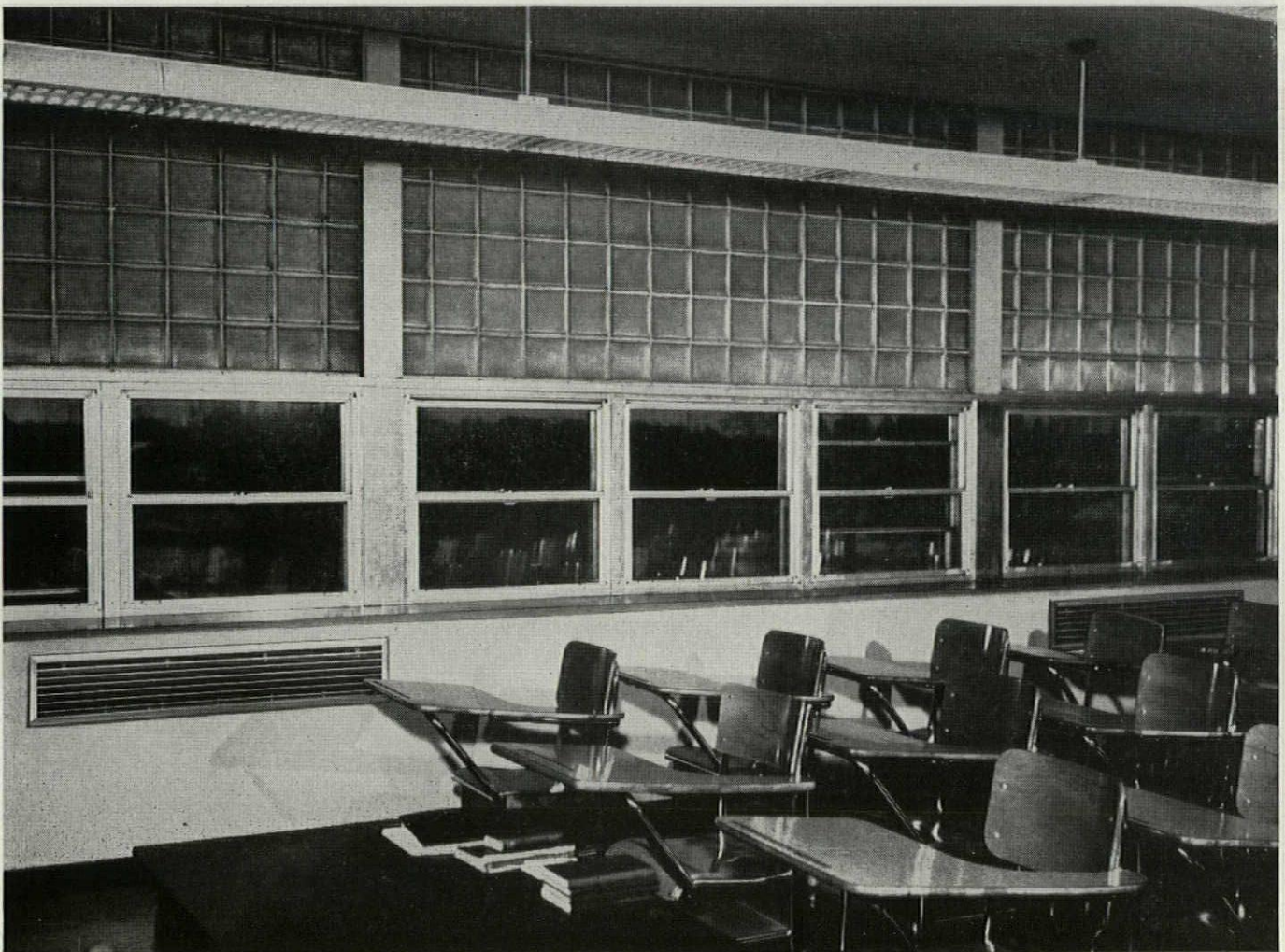
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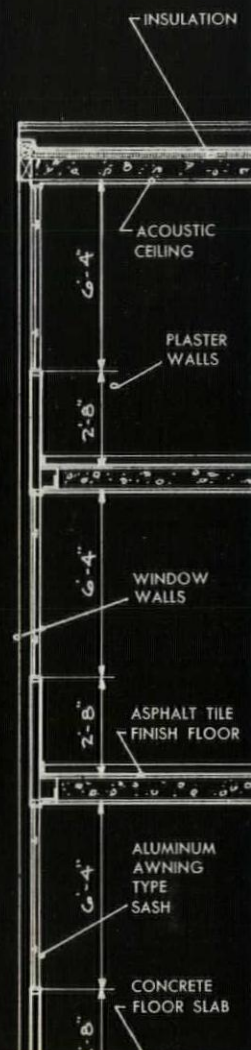
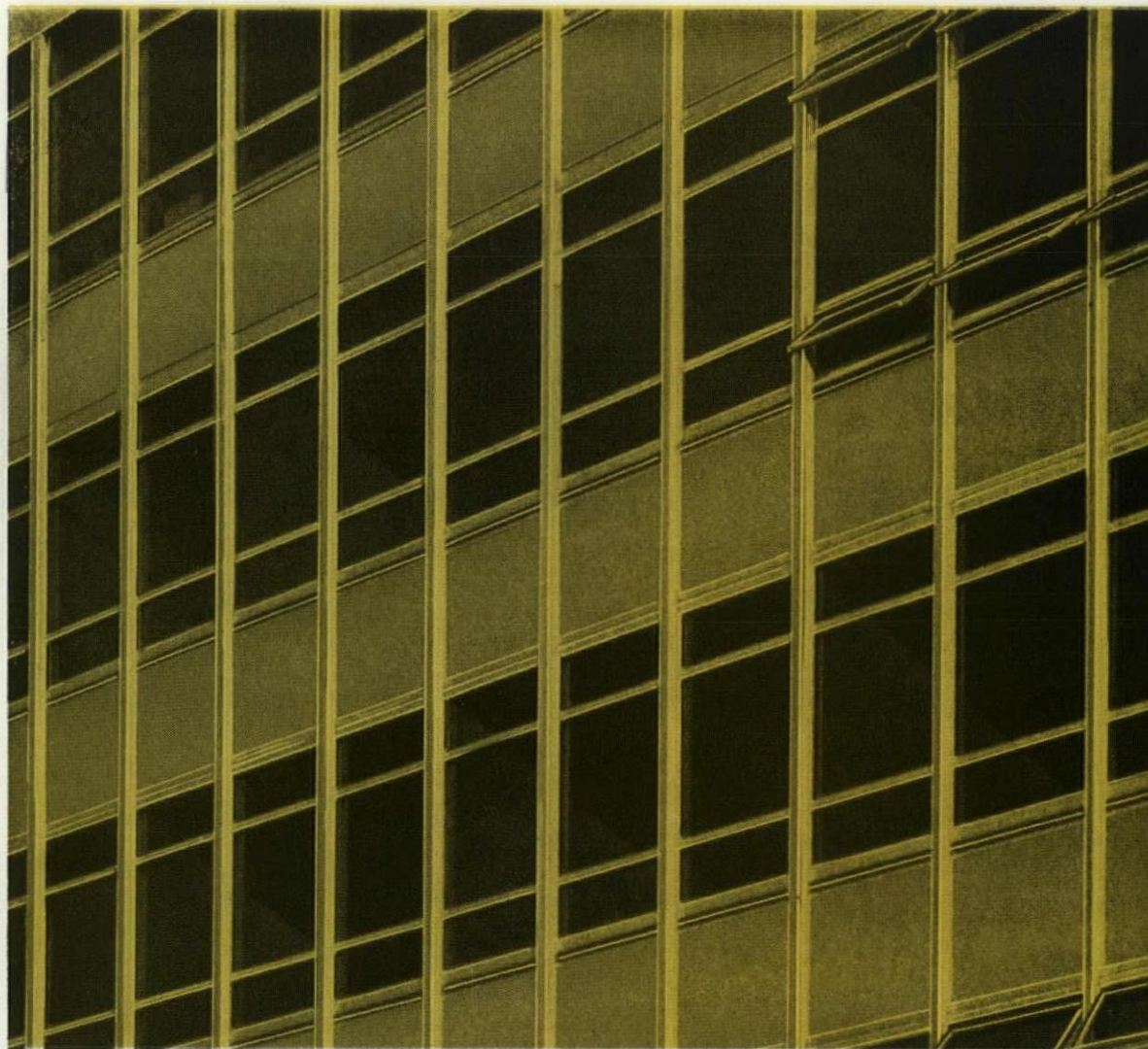
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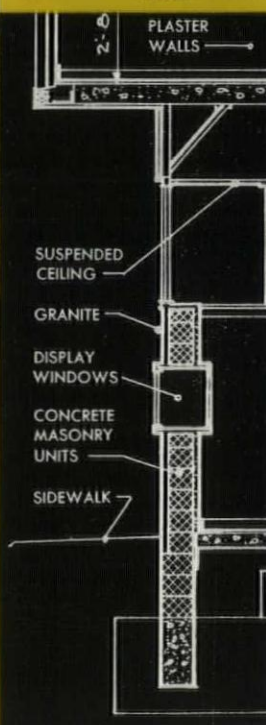
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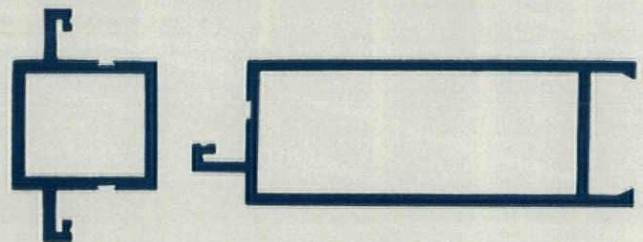
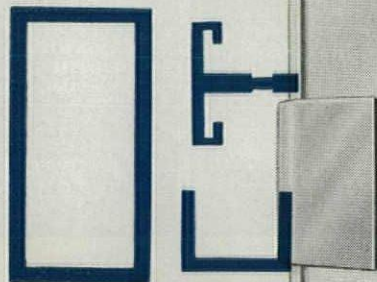
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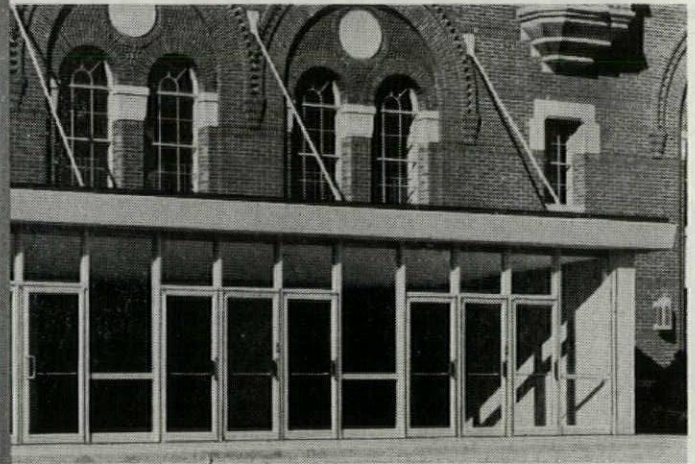
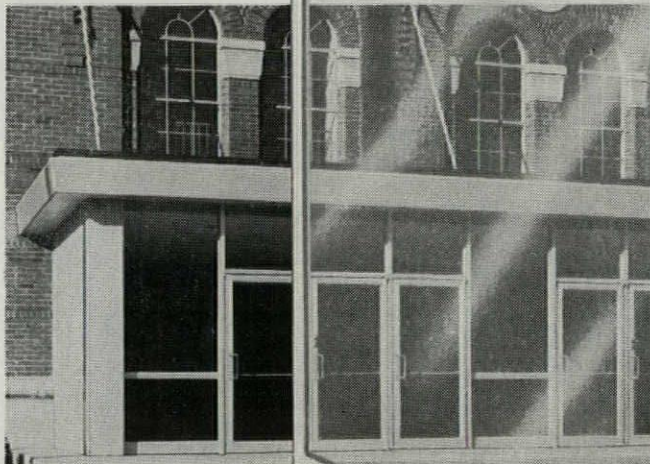


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What people said at Connecticut General's symposium on highways

"The New Highways: Challenge to the Metropolitan Region" was the name of the September conference sponsored by the Connecticut General Life Insurance Co. in its brand-new Hartford headquarters. Well run and well focused, the highway symposium brought forth much common sense, some genuine wisdom, and even some humor. The general theme was stated in Wilfred Owen's introductory paper; it was recapitulated (with fireworks) in Lewis Mumford's concluding speech. Excerpts from their remarks and other speeches follow.

Wilfred Owen, author of *The Metropolitan Transportation Problem* and staff member of the Brookings Institute:

Modern transportation has enabled large numbers of people to concentrate in cities. It has supplied the food and materials necessary to maintain the urban population and has afforded mobility necessary to enjoy the economic, social and cultural advantages of the metropolis. But metropolitan cities have grown to the point where they threaten to strangle the transportation that helped to make them possible.

The escape to the fringes has been less than a complete success. Suburban blight is spreading into once pleasant neighborhoods from the cluttered and unsightly roadsides that have proved bad for traffic, bad for business and bad for the community. It is the automobile that is transporting this blight to the suburbs. The natural beauty of the countryside is being jeopardized by the bulldozers. Soon the attempt to flee to the unspoiled country may be thwarted as one unplanned metropolis runs into another.

Unless America acts quickly to achieve comprehensive solutions, problems that seem bad today are bound to become worse in the years ahead. Some cities are starting to show the way. But their efforts hardly begin to match the problem. By 1975 we can expect another 50 million people to be living in metropolitan areas. Twenty million more workers may be added to the rush hour jam. More people and higher incomes will mean more transportation of all kinds. More jobs and more leisure will mean constantly increasing traffic. Over 100 million motor vehicles will be on the road.

If these trends are superimposed on the

metropolitan hodgepodge that planless growth makes inevitable, America will be faced with an absurd paradox. In spite of the world's highest income, the majority of our people may be faced not only with poorer standards of transportation, but with deteriorating standards of living. Contrary to the comforting projections of a steady rise in national product, tomorrow's utopias may be more statistical than real.

In the face of this worsening situation, the Congress of the US has recently enacted the most spectacular aid program ever made available for urban areas. Under the Federal Aid Highway Act of 1956, provision has been made for the greatest roadbuilding program in history. Altogether, the expenditure of some \$100 billion of federal, state and local funds is probable over the next decade and a half. The most spectacular part of this program will be the construction of a 41,000-mi. National System of Interstate Highways to cost some \$25 billion. Approximately 6,000 mi. of these expressways will be located in urban areas, absorbing half the total Interstate Highway outlay. The new program adds up to the most promising opportunity yet presented to attack the growing transportation crisis in metropolitan areas.

But will the new highway program automatically solve the critical problems of traffic congestion that threaten the metropolis? And, more important, will it help to resolve the basic problems that underlie the plight of our cities?

Victor Gruen, architect and planner:

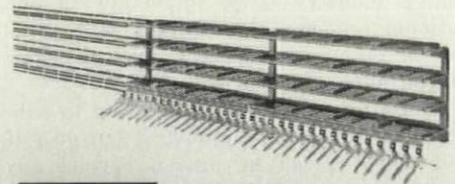
The automobile has long ceased to be just a tool for mobility. It has become a mental disease: "autorosis." To many, it is a way of ego satisfaction; to some, a way of sublimation for inferiority complexes. How far we have gone in this respect is illustrated by the following item from the *Los Angeles Times* of Aug. 6, 1957. The headline reads: "Wife Ambushes Ex-Husband with '49 Caliber Buick." And here is the report, in abbreviated form: "Ramming his '57 Chevy with her '49 Buick at least half a dozen times, she screamed, 'Turn around and fight like a man! My car can beat your fancy dan heap any day of the week and twice on Sunday!'"

We can only hope that once the novelty of the horseless carriage as a new toy wears off, cases of autorosis will somehow decline.

However, one argument favoring more and more public subsidies to the automobile industry (in the form of the con-

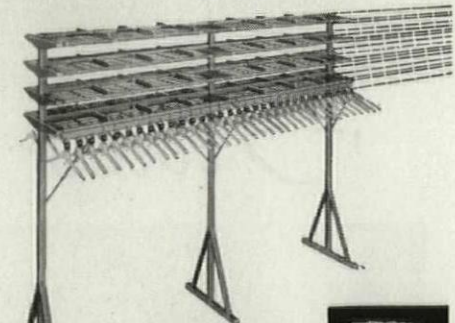
continued on p. 198

Checker® COAT and HAT RACKS



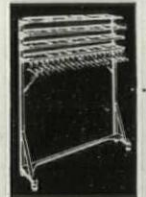
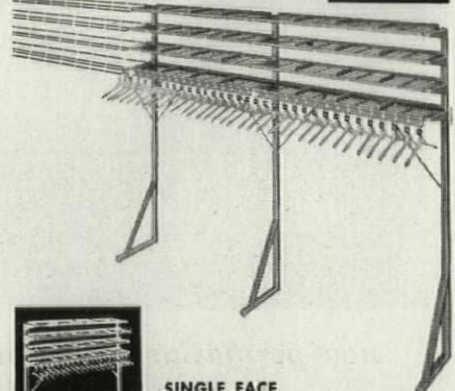
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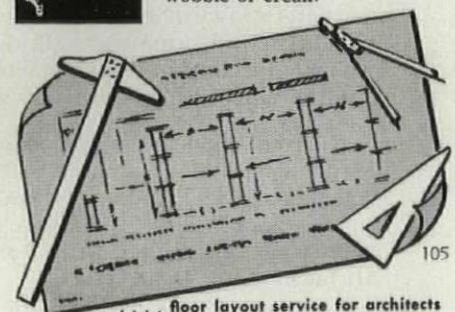
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struction of billions of square feet of concrete pavement on which to move and store the products of Detroit) will be raised with increasing emphasis: that the automotive industry is so important to our national economy that anything—regardless of other consequences—must be done to guarantee its flourishing.

Of course, we should be willing to subsidize the automobile industry, but only if and when it can be proven beyond any doubt that its products will achieve the benefits of efficient mobility without in-

flicting disproportionately grave damages. As long as the danger of an ever growing death rate on our highways is not banned—as long as the automobile threatens to destroy our urban way of life and to block out landscape and countryside in the process—all public expenditures in its behalf must be regarded as immoral.

The absurd paradox that, in spite of growing wealth, we are receiving diminishing returns from our effort-investment in enjoyment already exists. In many ways, today's urbanites are poorer in enjoyment

potential than their forefathers or than citizens of countries with much lower general living standards.

To many citizens of European cities, for example, life experiences are enjoyed on three levels. There is the dimension of work, the dimension of the home, and the dimension of the city, the community. Their cities are the cause of pride, of social, cultural and spiritual experiences gained in intimate contact with the urban environment. We in America have, in most cases, completely lost the third dimension of urban experience. Our man-made environment causes us, instead, tensions resulting from damages, time loss, and the blunting of our sensibilities. We have lost most of the direct sensual reactions from social, cultural and spiritual experiences which are possible only in common with many others. In many ways we have turned to vicarious, nonparticipating experiences, typified by television in the protected area of our homes. Europeans, on festive occasions, leave their homes to join with others in the enjoyment of their cities. We, on the other hand, flee the jungles of our cities at the stroke of the time clock to seek the comparative security of our four walls.

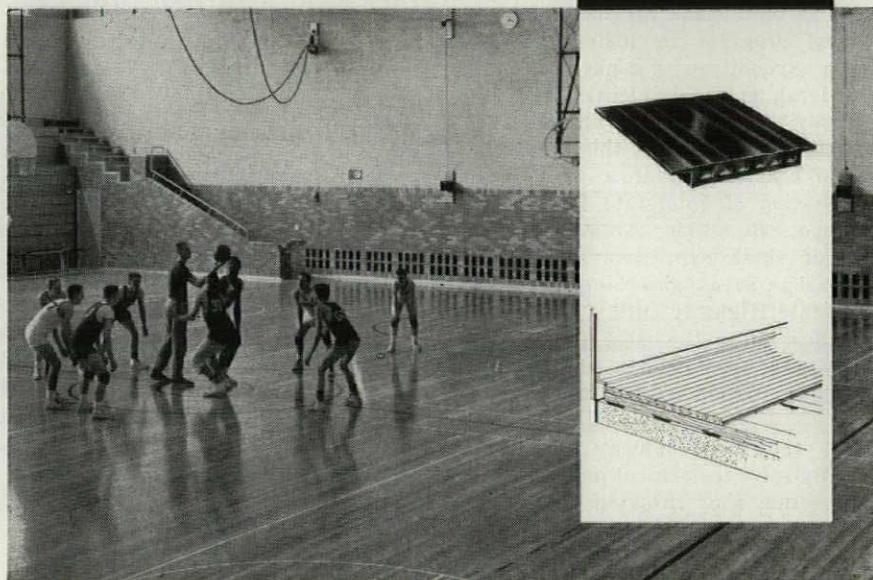
If we don't want this insanity to continue, we will have to change the pattern and functioning of our urban scene drastically. We must develop a new planning philosophy of boldness and clarity, one which properly considers our possibilities and abilities and thus sets goals which are attainable. Such a basic planning philosophy must be available and agreed upon before you can begin to talk about legal tools, because they must be designed for the purpose they are to serve; before we can begin to talk about engineering methods, because they must be calculated for a specific aim; before we can begin to talk about financing methods and economic tools, because they can only be developed if and when their end-aim can be stated.

Luther Gulick, *president of the Institute of Public Administration:*

The new highway program will greatly step up the dynamic forces which have produced our modern urbanism. It has been said that the new program will double the amount of major highway construction going forward. Does this mean that the pressure for metropolitan spread will be doubled? This is too low an estimate. I think there is a multiplier in this equation. Each of these new limited access thoroughways will end in a metropolitan area. Many will be entirely new rights-of-way. Each will be a new artery making possible new factory, home and store developments adjacent but not within the existing settlements. Every interchange will invite the developer and investor. And what is more, highways and developments like this generate more automobile ownership, more dispersal,

continued on p. 200

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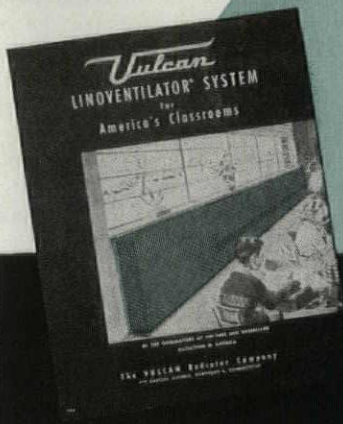
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which in turn, make the new patterns of settlement more attractive. Around the cities, the new highways magnetize the open country.

But little will be accomplished in the metropolitan areas merely by talking enthusiastically about "cooperation." Everybody believes in working together, until they get down to cases. I propose therefore to list a few things which are involved:

► First, we need a good solid recognition

that there are metropolitan problems which cannot now be solved individually and severally, but must be approached on a comprehensive basis: water supply, river and harbor pollution, wastes, air pollution, recreation, civil defense, various minimum civilized standards and protections, and above all, transportation and traffic in relation to land-use control.

► Second, we need specific new administrative machinery, both at the state capitals and in Washington, designed to bring

about better coordination of all state and federal activities and programs which have an impact on the metropolitan regions. No state or federal program dealing with highways, rail and air commerce, ports, parks, water, pollution control, general drainage, civil defense, urban renewal, housing, health, education, or crime should go forward without the consideration of the interrelation of the program with other governmental activities as they hit the metropolitan regions. This is a big order, but it is high time that central government took as much interest in the big cities and their surroundings as it now takes in Indian reservations and agricultural regions. From now on, don't forget, we have the votes!

► Third, in each major metropolitan region we shall now need to develop official machinery for local coordinated governmental action. This machinery must be: wide enough to cover the general common sense geographic boundaries of the metropolitan area; democratic, that is, made up of locally elected representatives of the entire area and of its several parts; empowered to deal with the genuinely "metropolitan problems" on a comprehensive basis without getting into or destroying the strictly local or community activities of the constituent parts of the region; and finally, it must be an action agency with built-in planning, with powers of decision and action, not an impotent structure for wishful thinking only.

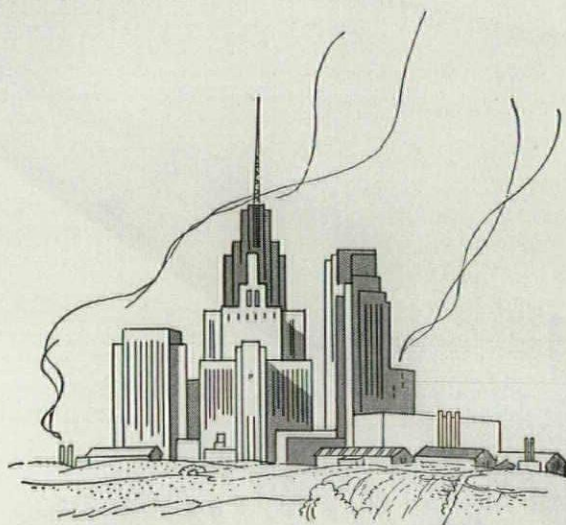
Most metropolitan areas need a new governmental layer, a sort of regional "Metropolitan Council."

James Scheuer, developer and chairman of the New York Housing Advisory Council, Inc.:

It is a significant and disturbing commentary on the state of the nationwide movement to replan our metropolitan areas today that the \$100 billion interstate highway program, perhaps the most potent urban planning tool of the twentieth century, has been placed in the hands of highway engineers. These are the men whose job it is to move traffic as economically and rapidly as possible, using as their rules-of-thumb origin and destination charts and the cost of right-of-way.

Perhaps in days gone by, when highways were essentially a rural matter, it was quite proper for urban communities to be given little or no share in the planning process. But today, when new highways have within them the seeds to make or break the future of our burgeoning cities, their planning can no longer be the exclusive concern of traffic engineers. Highways have become a matter of human engineering involving the destinies of millions of people who will be living in our metropolitan areas for many years, and requiring the uprooting of hundreds of thousands of our citizens who live or work in the path of the up-coming highways. Al-

continued on p. 202



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though the highway engineers obviously are the ones to make the final plans, the federal law should make mandatory the observance of certain standards relating to the impact of the highways upon our metropolitan areas.

Take the matter of housing dislocation. In Washington, D.C., the expressway program, which is scheduled to proceed simultaneously with the nation's largest urban redevelopment program, will displace 4,500 families: about as many as will be dis-

placed by the entire 550-acre residential redevelopment project.

In Chicago, during the last eight years, where slum clearance for Title One and public housing has dislocated a total of 15,000 families, the expressway program has demolished the homes of an additional 7,000, increasing the relocation burden by 50%. In 1956 the Illinois Highway Dept. led all other city and state agencies in the number of households relocated for just one project—the Northwest Expressway.

In Cincinnati, 3,750 families will be dislocated by the Millcreek Expressway—more than the city's first two redevelopment areas combined.

These statistics could be repeated in city after city across the country. According to the FORUM, about 90,000 families a year will be displaced by the new roads which will cross the nation. It is therefore obvious that the acute shortage of low middle-income housing which has been aggravated by the slum clearance program will soon reach crisis proportions. No program in our history has undertaken the displacement of so many people at so rapid and inexorable a pace.

Thus, ironically, the urban renewal housing program which could benefit in many ways by the road program is instead being placed in serious jeopardy by it. Does this mean that we should urge the highway engineers to detour our blighted areas in order to avoid the housing relocation headache which such mass displacement produces? Or should we postpone urban renewal for a decade or more until the new highways are completed?

James Rouse, realtor, developer and member of the President's Advisory Committee on Housing Policies and Programs:

We will never make our cities what they ought to be simply by clearing slums and eliminating blight. There is a lot more wrong with our cities than the physical condition of the buildings, the streets and the alleys. A gigantic and fully effective physical clean-up program would simply restore the physical condition of our cities to the beginning point of the deterioration pipeline, but it would have little effect upon the forces for deterioration which dragged them down in the first place.

The problem of the city is to create neighborhoods out of sprawling blocks. A highway is the most important single force in this neighborhood creation. A huge unplanned highway program will rip through and around the cities with little attention to neighborhood destruction or neighborhood creation. But a highway program that recognizes its enormous potential in partnership with urban renewal will relate every highway to its neighborhood impact.

There are two important expressions of this impact:

► First, it is vital to neighborhood creation and protection that main traffic streams be removed from the residential communities and transferred to planned interneighborhood and intercity traffic streams. The future highway, therefore, becomes important in channeling objectionable traffic, dirt and noise out of the neighborhoods.

► Second, the highway is important in that its width and function automatically create an effective boundary defining and protecting a neighborhood on either side if it is planned, located and constructed with this purpose in mind.

continued on p. 204

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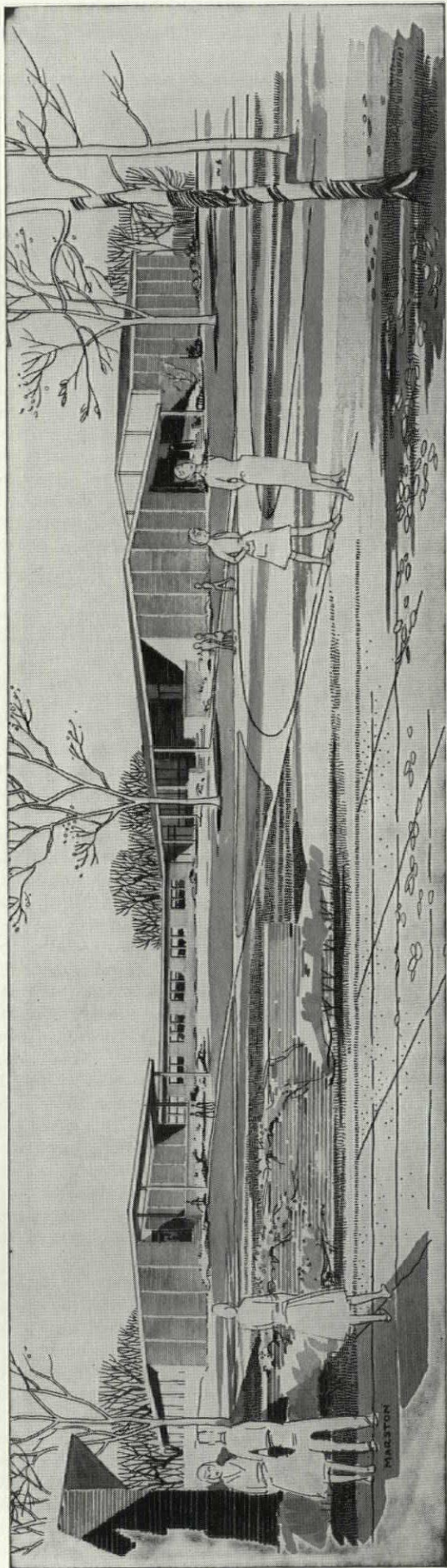
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View looking toward the Chestnut Hill Elementary School. Architects: Sargent, Webster, Crenshaw and Folley, Syracuse, New York

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Also designed for 600 students. There are 20 regular classrooms, a cafeteria-assembly room, a library, a home-making suite of two classrooms, two industrial arts shops, one art room and a large separate double gymnasium. It also has administrative and teacher facilities similar to the elementary school, two service rooms and a complete kitchen. Total: 55,835 square feet.

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This business of neighborhood creation and protection is not new. Most of the development of our cities has been by accident to date, and the accident of growth has created in almost every city some examples of "natural" neighborhoods. In almost every instance of strong neighborhood revival there have been natural protective forces at work which have given shape and meaning to the particular area as a neighborhood.

The highway is our great new "topo-

graphic" opportunity to give neighborhoods definition. The city's entire public works program must be thought of in terms of its potential for neighborhood destruction or creation. Schools, playgrounds, hospitals, public buildings of all kinds, each has the opportunity to provide a neighborhood core or a neighborhood boundary, or if illogically and haphazardly located, each has the opportunity to split up and break apart areas which might have been made into wholesome neighborhoods.

Foster Winter, vice president of Detroit's leading department store, *J. L. Hudson Co.*:

In Detroit we are turning our attention back to the metropolitan center, the central business district, and are now studying ways of applying experience in our regional centers to the downtown area.

The first question which Detroit had to face several years ago when we started building the Lodge expressway was how to bring the expressway traffic into the central business district; how close we should bring the expressway to the central commercial area; how we could bypass the through traffic not destined for the central business district; and at how many points we could bring ramps from the expressway into the central area.

This first series of problems Detroit resolved by a decision to encircle the central business district by an expressway loop about one mile in diameter. From this loop there will be nine ramps leading into the central business district and 14 bridges for thoroughfares leading into the center.

City officials in Detroit are now engaged in studies of the heart of the central business district: whether we may convert three blocks along Woodward Ave. into a pedestrian mall, where we may provide parking between the central shopping area, and ramps leading to thoroughfares; how we can bring transit passenger terminals close to the heart of the area; how we may improve the walkways for pedestrians from parking lots or transit terminals to the final shopping area; and whether we should construct a circumferential boulevard to facilitate traffic within the expressway loop.

Of one thing we are certain: the construction of the expressway at a distance of one-half mile from the central shopping area has so completely disrupted the old street pattern that we must clear and rebuild the whole belt of land along the inside margin of the expressway. Detroit has filed applications for three urban renewal projects within this marginal area.

We may also include a circumferential boulevard if we find that this type of road proves to be the best facility to handle the local vehicular traffic of automobiles, buses and delivery trucks within the central business district.

I have pointed out that Detroit is studying the possibility of converting our principal downtown street to a pedestrian mall for four blocks in the heart of the shopping district. We are quite serious in this study. We have seen the tremendous impact on shopping habits of the kind of center where pedestrian traffic is freed from the hazards of vehicles, and time pressures of traffic lights. We can see a possibility of bringing into the downtown area some of the qualities of leisure, beauty and excitement which are so attractive to shoppers in regional centers.

continued on p. 206

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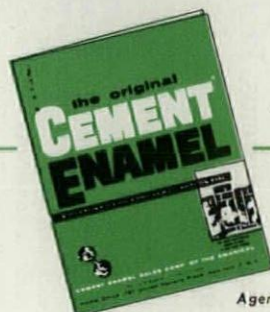
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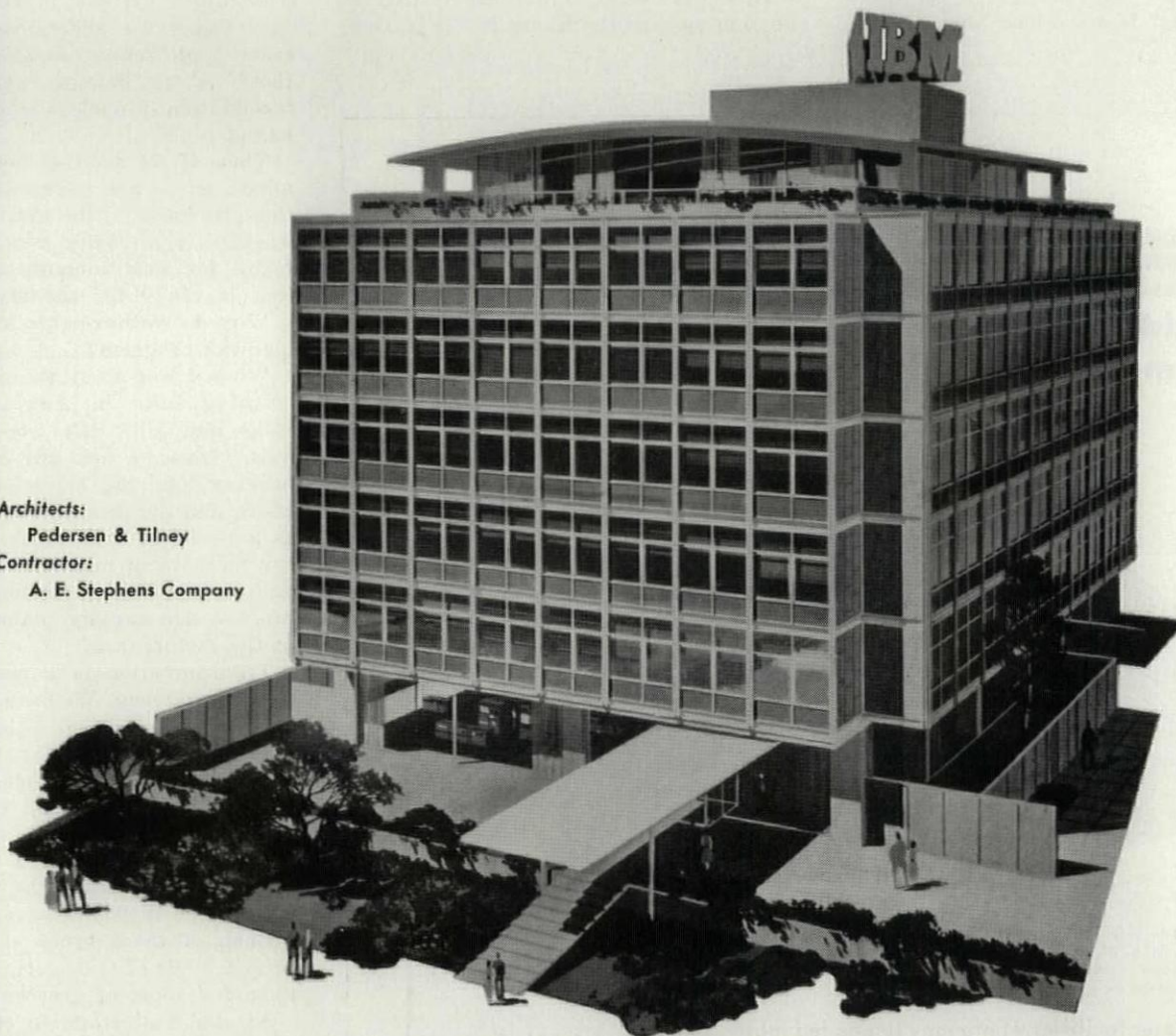
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Lewis Mumford, writer and critic:

We have good reason to be anxious. The first day of the conference a rumor floated around that the Federal Highway Administrator and the Federal Housing Administrator—the two people most concerned in a public program for highways—were meeting under this roof for the first time.

It seems obvious, if you will let me speak very rudely, that neither of these administrators have the slightest notion of what they are doing. If they had, they would

have gotten together a long time ago as the first step in their planning operations.

But the real blame for their behavior lies with the kind of commission they got from Congress. The legislation that brought the highway program into existence was based on a very insufficient study that got its approval from Congress on a dubious pretext. That study was a study of highways, not a study of real problems, the study of transportation in our country. And the reason it was jammed

through Congress so blithely and lightly was partly because we Americans have an almost automatic inclination to favor anything that seems to give added attraction to the second mistress that exists in every household right alongside the wife—the motor car.

The real reason advanced for a national highways program was that this was a necessary part of our defense program. That was a pretext; it was nonsense. It is about time we understood the fact that every high school student knows today: there is no defense against total extermination in nuclear warfare, no defense except peace.

Then, if we get that settled in our own minds, let us ask the question—let us look this gift horse in the mouth—let us decide whether it is really a young race horse, ready for new conquests or an old nag that is ready for the slaughterhouse.

Why do we have this \$26 or \$28 billion highway program?

When I was a boy we used to sing those touching lines in *America*—"I love thy rocks and rills, thy woods and templed hills." Now we love our expressways and parking lots, big cloverleaves and traffic knots, and the face of America is changing as a result of this inordinate passion for our mechanical mistress. Instead of planning motorcars and motorways to fit our life, we are rapidly planning our life to fit the motorcar.

Transportation is a main condition of city development. We have had river cities, canal cities, railroad cities, and now we have motorcar cities. None of these cities was capable of being what the modern city may yet become because it had tended to rely on an overemphasis on single modes of transportation and in doing so lacked the flexibility, lacked the variety and the choice that it should have had.

Each of these types of cities achieved certain goals of transportation and each of them fell short of greater possibilities.

As the final stage in city development today, we have the task, a great task and a challenging task, of replanning our entire transportation network from the airplane to the pedestrian to make possible the new type of city in which all our technological advances in the conquest of space and time will be put to the service of human life.

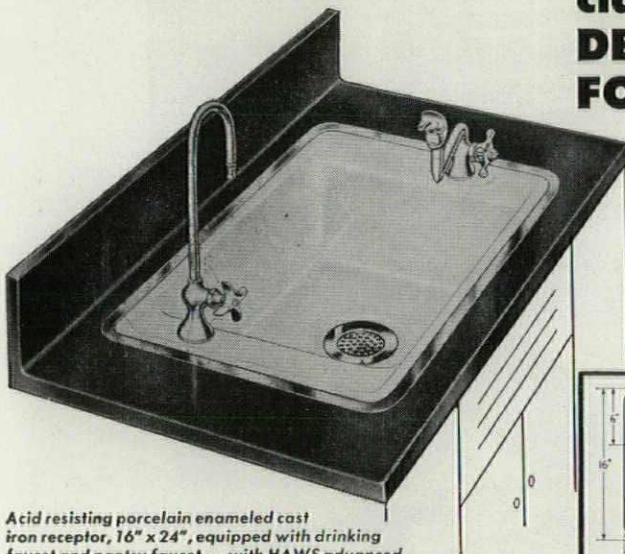
This does not merely mean planning better roadways. This means planning and rejuvenating our railroad systems. It means redistributing our population. It means eventually replanning our entire system of local government.

I don't know whether I am representing the consensus of this meeting but I am left with the distinct impression that we had better slow down our unilateral highway program before we write in more obsolescence into the highway system. We want more flexibility, a greater diversification of means, we want to get ready to establish the new pattern for a unified kind of regional city. As it is now, nobody is planning for the sake of the human community.

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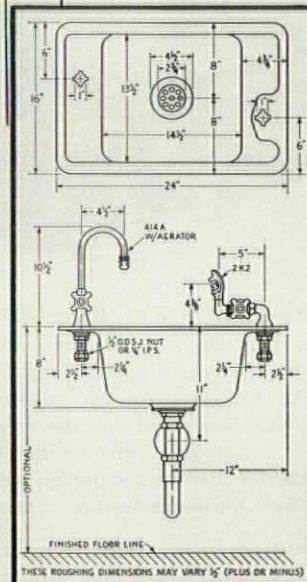
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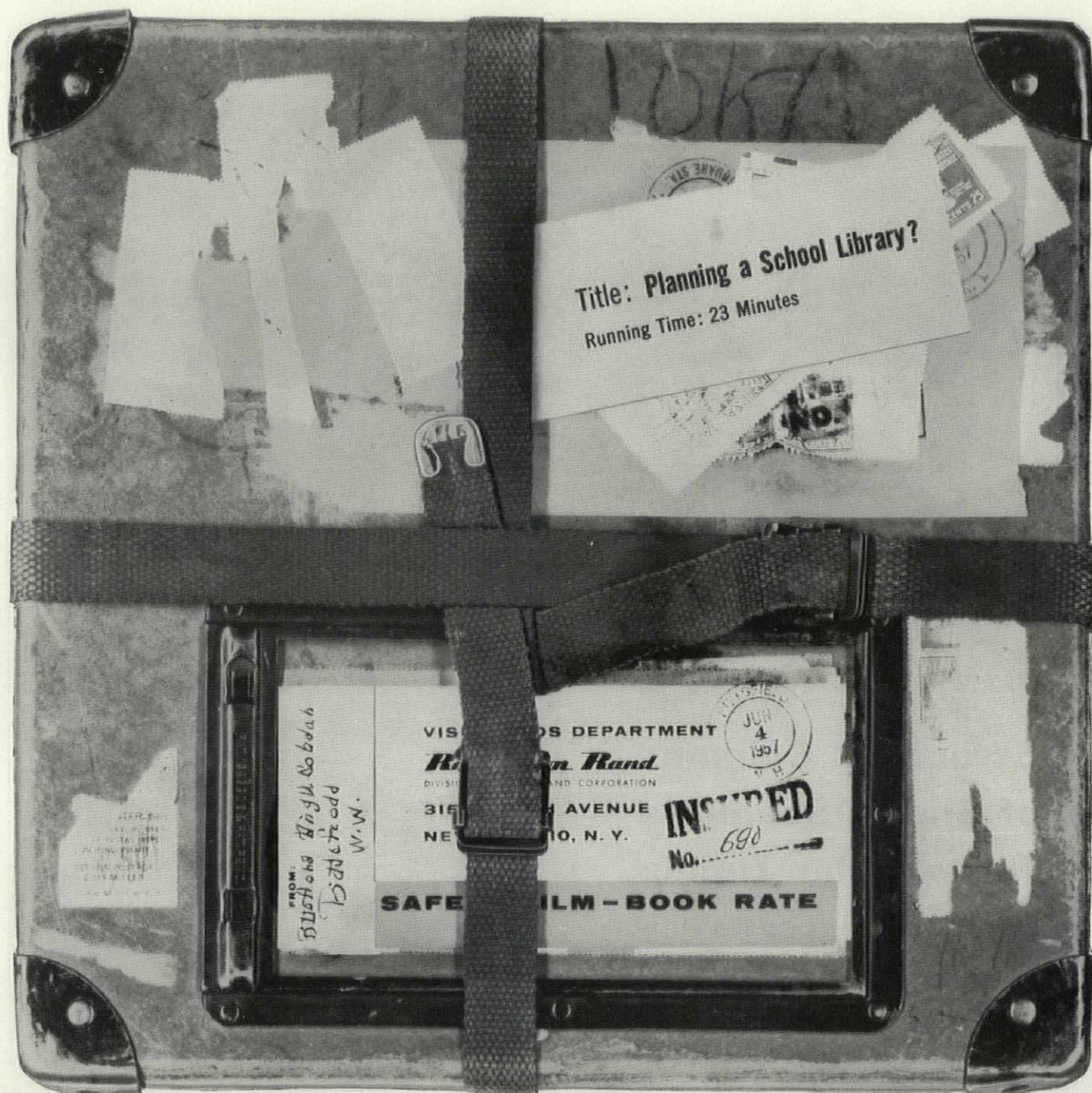
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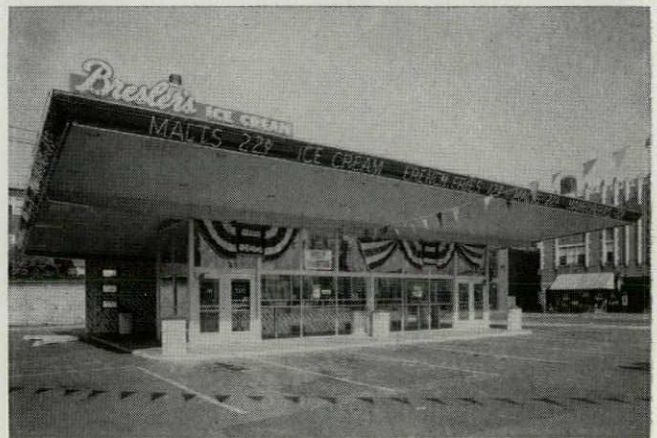
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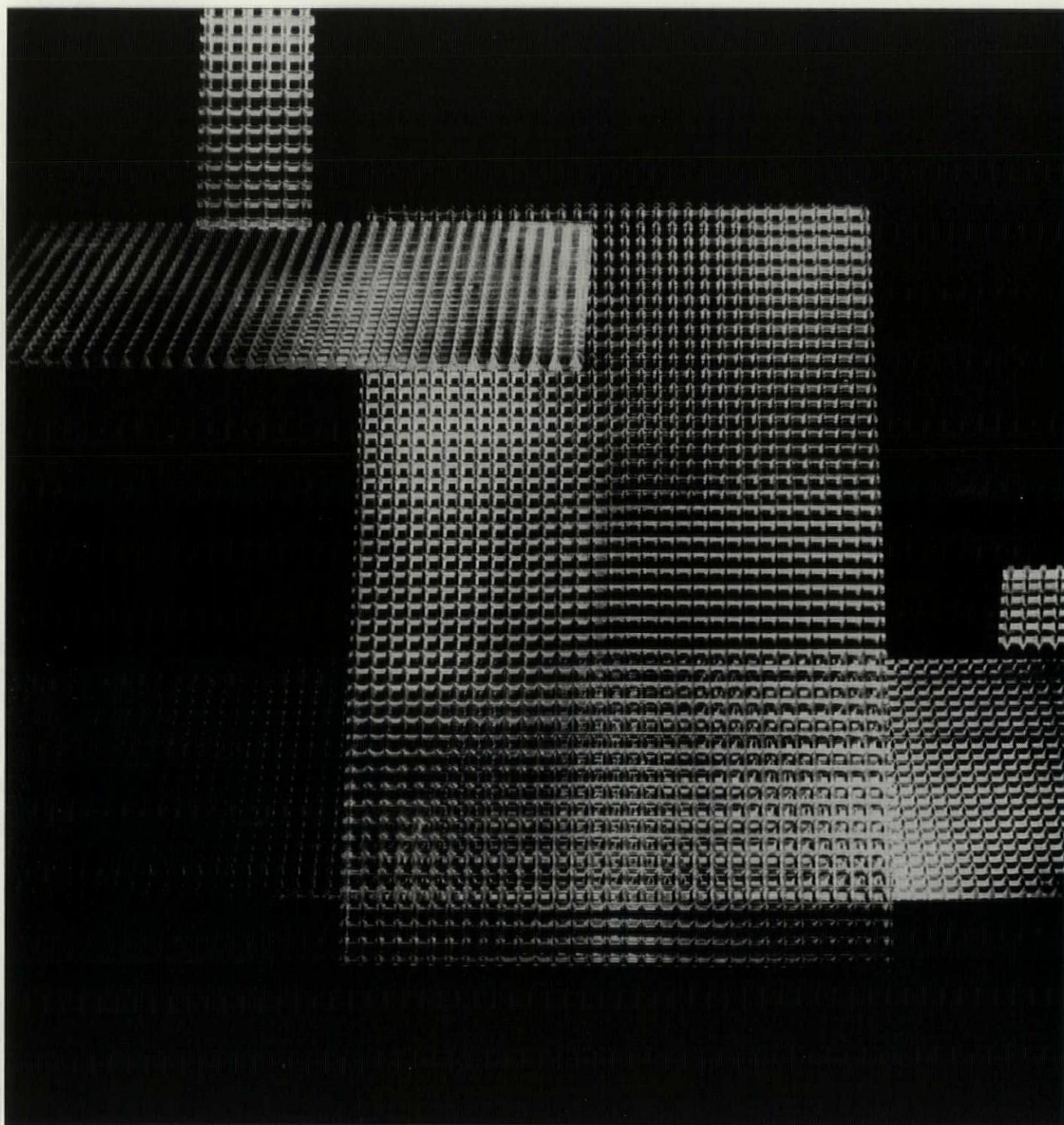


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Vision-Vent® Window Walls of the type shown here are the key to Truscon's low-cost school design. Vision-Vent goes up like other curtain-wall systems—fast and easily. And, it offers this important plus—it's a complete wall with window already in place, completely contained within the depth of the window-framing members. Insulated panel can be in color. Choice of double-hung or projected steel windows. The Truscon design system is based upon a 9-foot module consisting of twin Vision-Vent units with mullion.

In the Truscon design concept, roof of the single-story building is supported by Truscon Clerespan® Steel Joists integrated into the 9-foot module. Clerespan steel joists reduce construction time because they are light, long, easy to handle. They are designed to meet all types of loading conditions. Open web allows passage for ducts, pipes, electrical conduit, as needed. Joists can be left exposed and painted, or an acoustical ceiling can be suspended.

TRUSCON STEEL



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REPUBLIC STEEL

YOUNGSTOWN 1

TRUSCON offers a new way to build low-cost schools

Go-together Truscon Standard Steel Building Products give you a system for designing low-cost schools that go up fast. Truscon Vision-Vent® Window Walls, Joists, Ferrobord® Roofdeck, and Steel Doors and Frames all readily adapt themselves to efficient modular design.

Get needed classrooms now. Using this Truscon system as a guide, you can help your community more readily solve the pressing problem of classroom shortages. You can design classrooms around local needs, both current and future. You can provide for expansion.

Speed and Economy. This application of multiple Truscon products takes advantage of the speed and economy of off-site construction. Standard steel building products are most economical, and are readily available.

Class A, fire-safe construction. Simplified con-

struction methods and modular design can provide a permanent, high quality school that will be an asset to any community. This is Class A construction. Materials are fire-safe. And, because all these Truscon products are *steel*, they are strong, long-lasting, safe. Original building dollars go farther, serving your community for years.

Expand as needed. This type of construction has been planned with insulated end walls which can be removed. This means that additional space can be added, and the end-wall re-used. Additions can be made rapidly, easily, and in perfect architectural harmony. Your best protection against early obsolescence is provision for easy expansion.

Get the facts now. Send coupon for booklet describing this vital use of Truscon go-together products.



Truscon Ferrobord® Steeldeck is welded to the top of Clerspan joists to produce a fire-resistant roof. Ferrobord is light, easy to handle, easy to place. Long lengths span three or more purlins. It roofs large areas quickly. Top surface is ideal for the application of insulation, and built-up waterproofing.

Truscon Steel Doors and Frames are easy to hang, easy to finish. They can't warp or stick, are fire-resistant. They offer low initial cost, low maintenance cost, safety and durability.



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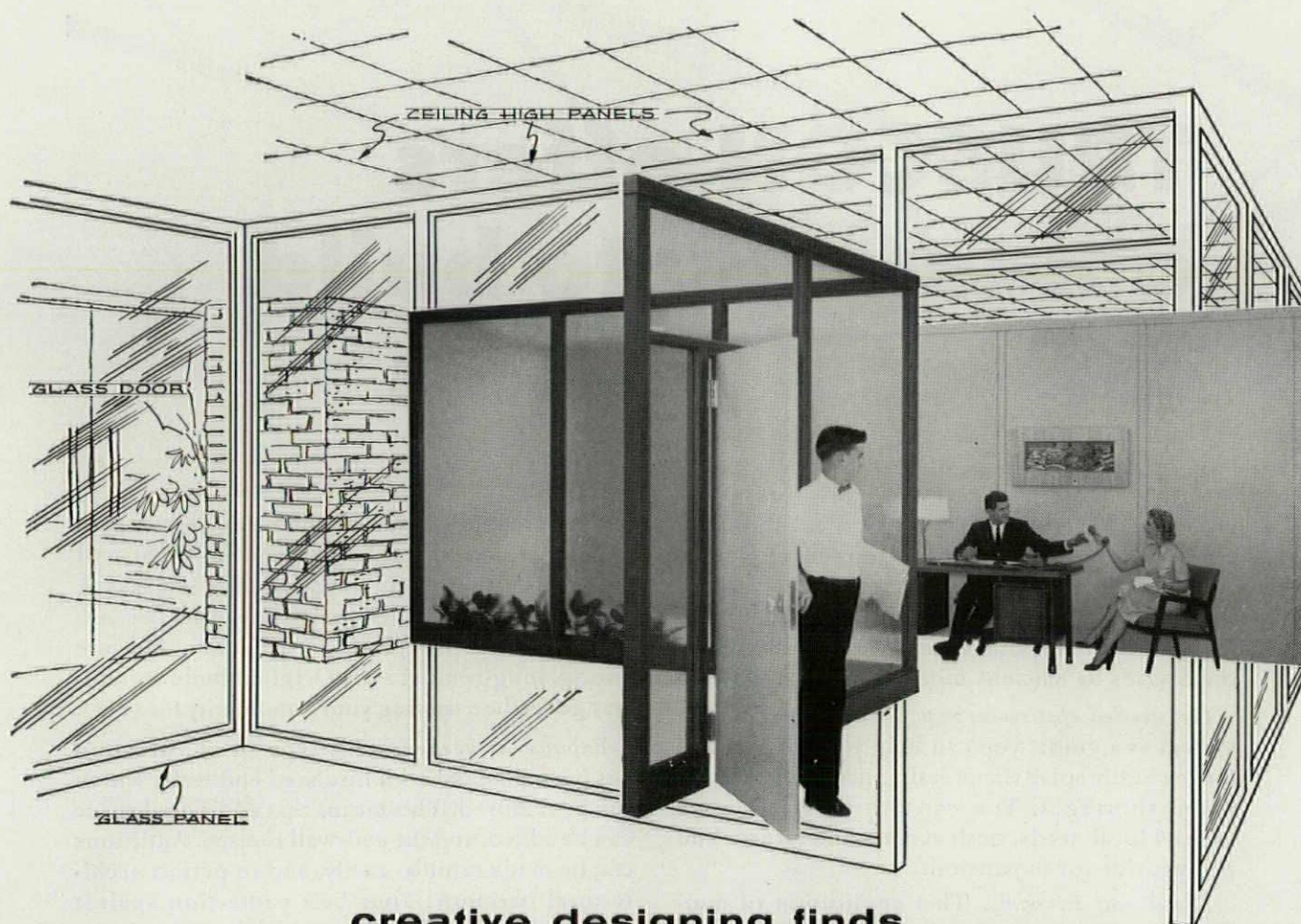
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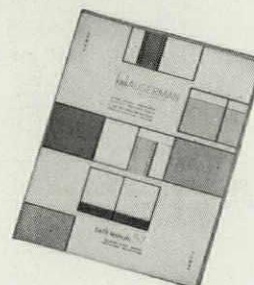
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PITTSBURGH GLASS is basic to the Ford Central Office Building

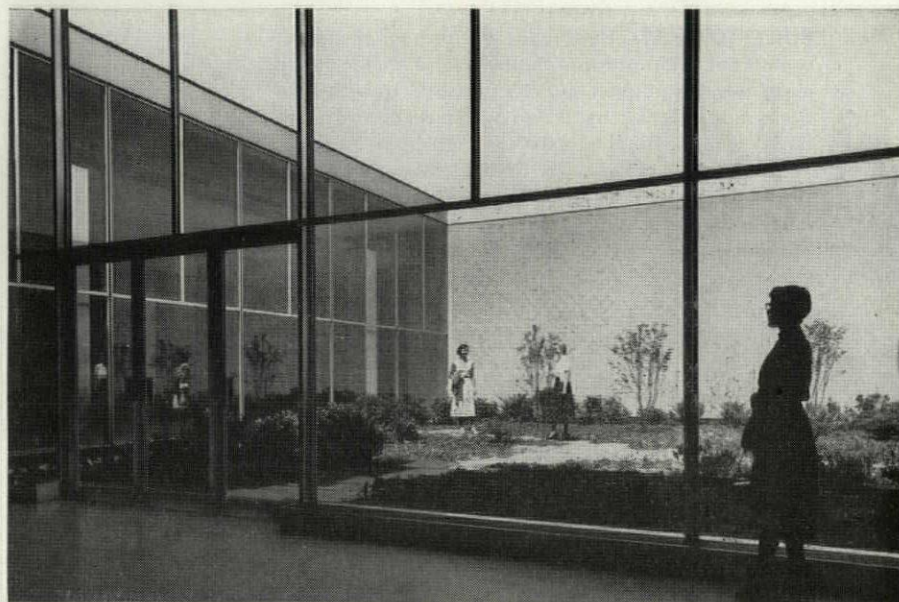


THE NEW ADMINISTRATIVE OFFICES of Ford Motor Company are housed in this 12-story glass and steel building in Dearborn, Michigan. The creation of Skidmore, Owings & Merrill, Architects & Engineers of New York City, this structure utilizes *Pittsburgh's* SOLEX® Green-Tint, Heat-Absorbing, Glare-Reducing

Glass in the large glass areas which form a prominent part of the curtain wall exterior. In addition, this modern eye-catching building includes such Pittsburgh Glass products as TWINDOW® . . . the twin-glass insulating windowpane . . . Polished Plate Glass, Rough Plate Glass, and Pittsburgh Copper-Backed Mirrors.

Design it better with **PITTSBURGH GLASS**

Distinctive architecture of the new in Dearborn, Michigan



THE EXCEPTIONAL insulating properties of *Pittsburgh's* TWINDOW provide a clear view of this court off the main concourse of Ford's new Central Office Building, both winter and summer.



A FEATURE of this new Ford building is the use of Pittsburgh Polished Plate Glass to separate the secretarial areas from the hallway, with Pittsburgh Rough Plate Glass dividing private offices.

Your Sweet's Architectural File contains detailed information on all Pittsburgh Plate Glass Company products... Sections 7a, 13e, 16d, 21.

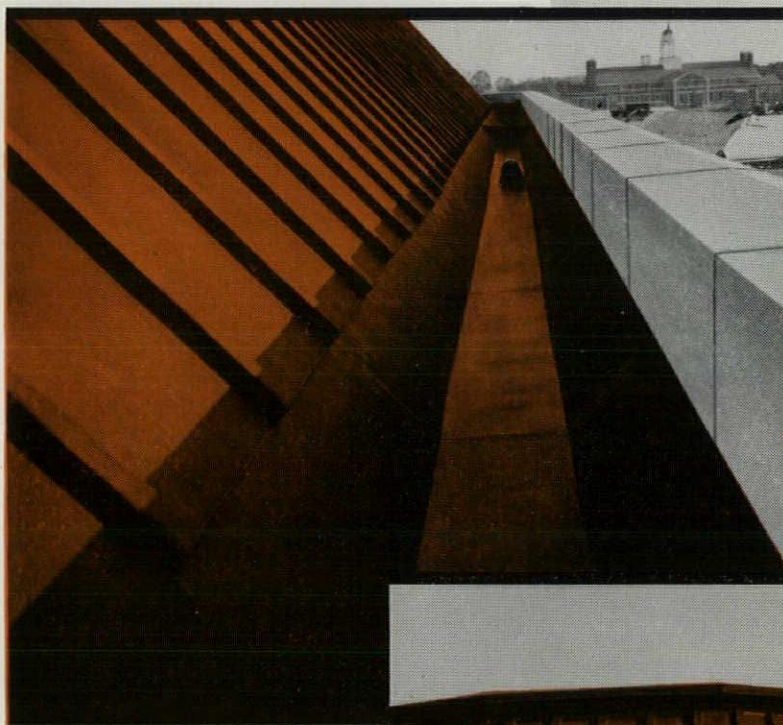


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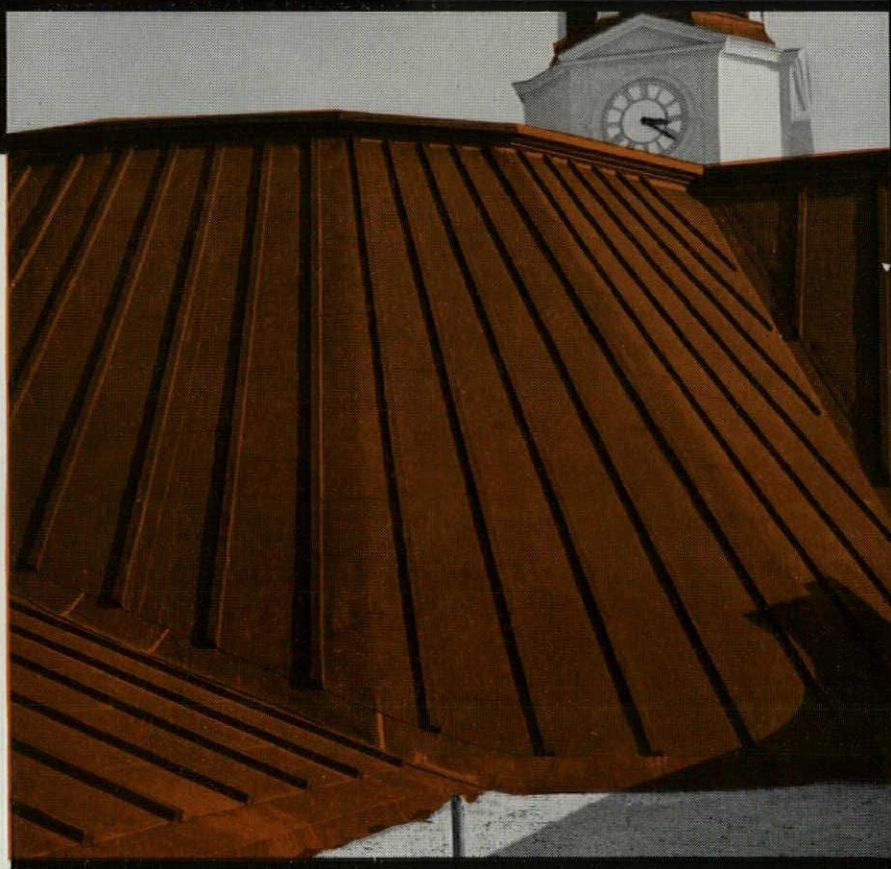
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

BUILT TO LAST—Here you see section of batten seam roof with parapet flashing and gutter. Note neat, clean installation that can be made when Revere Copper is installed by skilled workmen according to recommendations made in Revere's 110-page Brochure, "COPPER AND COMMON SENSE." Shown in background is one of the expansion joints which is used to insure gutter against buckling and cracking when copper expands and contracts with temperature changes.



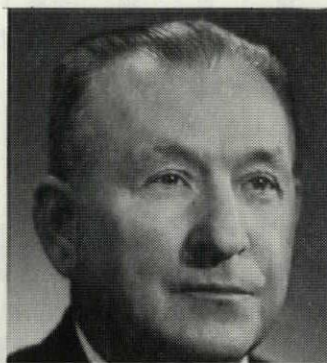
CLOSE-UP OF SECTION of batten seam roof on Chapel Building which was installed according to recommendations made in Revere's Brochure, "COPPER AND COMMON SENSE," as specified by the architectural firm of LARSON AND LARSON, Winston-Salem, N. C.

J. FREDRICK LARSON who has earned a splendid reputation for the fine work he also has done at Colby, Bucknell, Lehigh and other colleges says that, to his way of thinking, the "COPPER AND COMMON SENSE" Brochure is a "must" for every architect and contractor.



"The 400,000 lbs. of sheet copper used on the buildings of Wake Forest College emphasize the matchless characteristics of this ageless metal in building construction."

*Says FRANK COX, President
Cox Roofing Company, Winston-Salem, North Carolina*



One of the beauties of copper," continued Mr. Cox, is that it is equally at home in the traditional or the most modern designed building.

"Of course, the things about copper which are most appreciated by sheet metal contractors like myself are its workability, the ease with which it is soldered and formed, the fact that its enduring qualities have been proved for so many centuries that its wearability is never questioned. It's the kind of material on which you can safely stake your reputation, which is the kind of material I like to work with."

Leading architects, too, are partial to this centuries-tested metal because of its extreme flexibility in design and its ready acceptance among those who pass on specifications. In writing specifications they have found there is no "or equal" for copper.

An added service to architects and sheet metal men is

the marking of all Revere Sheet and Strip Copper with the correct gauge and temper in water-soluble ink.

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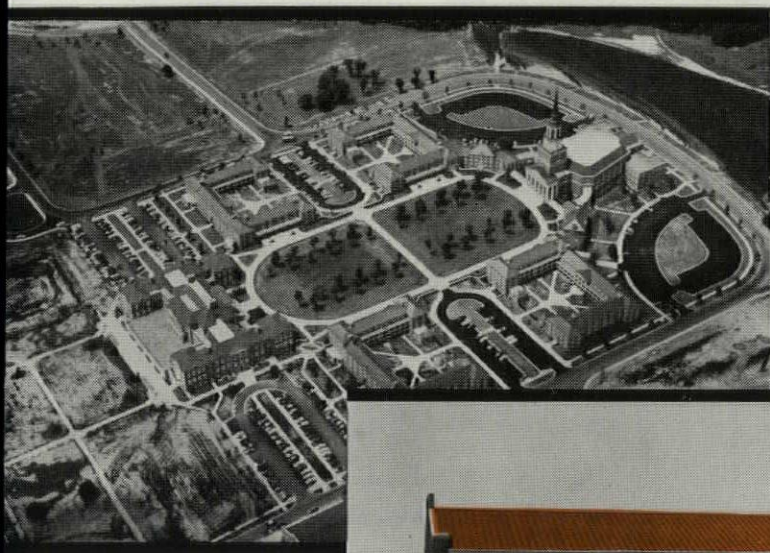
*Patented. No. 2,641,203 Other Pats. Pend.

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CHAPEL AND GYMNASIUM BUILDINGS at Wake Forest College alone took 125,000 lbs. of Revere Sheet Copper for roof, gutter and flashing work. Copper used on all buildings amounted to some 400,000 lbs., most of which was supplied by Revere.



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THE news in building construction is more than dollar volume—it's new materials and new products.

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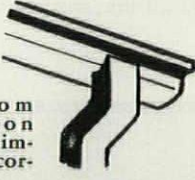

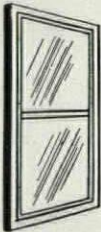
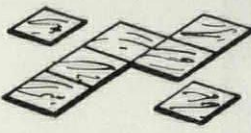

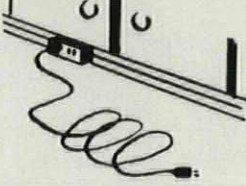
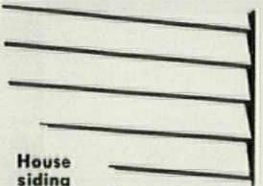
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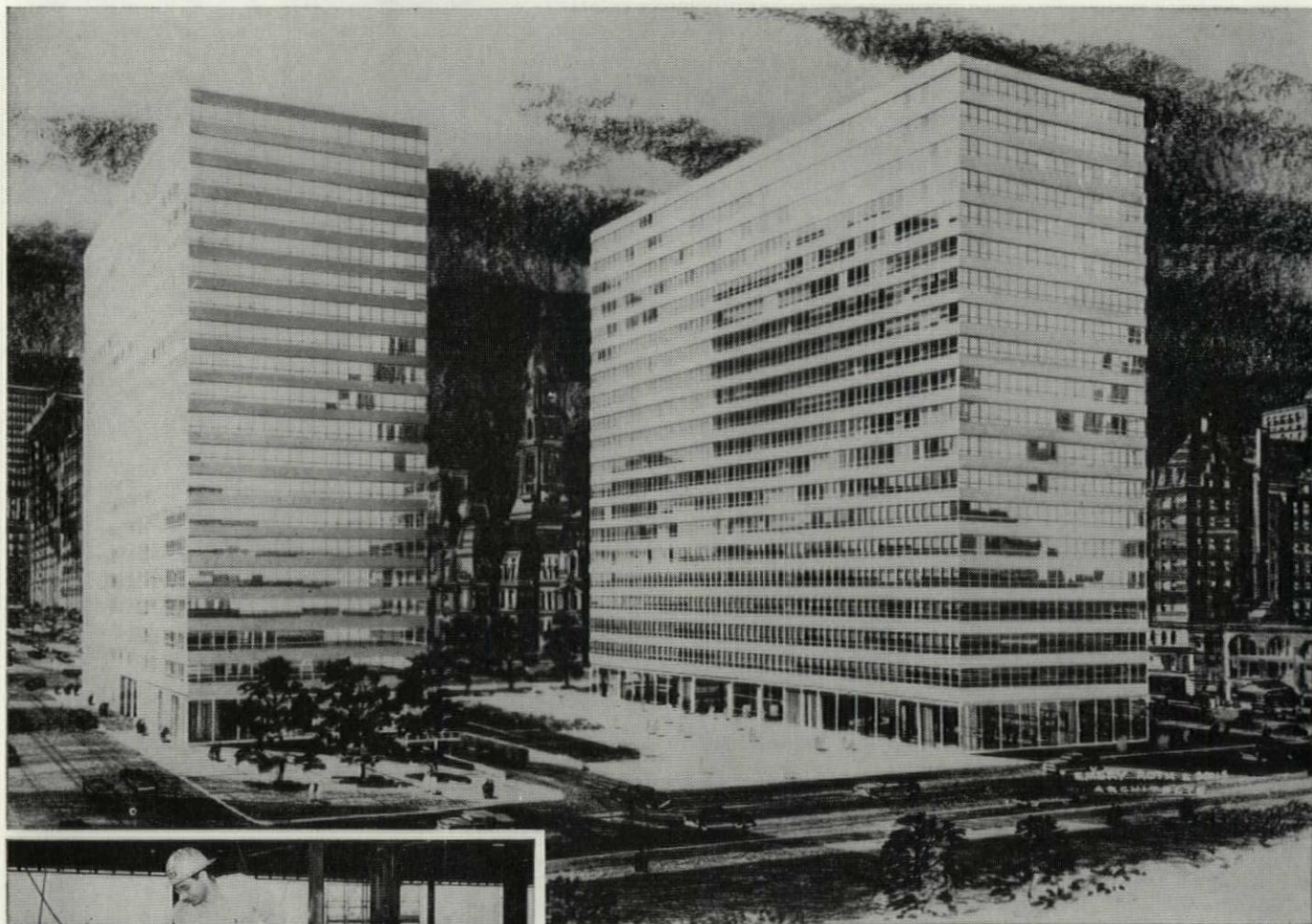
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<p>Floor tile of vinyl provide a tough, durable, wear-resistant surface.</p> 	<p>Wall coverings of vinyl coated fabric offer practicality with beauty.</p> 	<p>Electric outlet strip of rigid Geon plastic provides multiple outlets.</p> 	<p>House siding offers unlimited color possibilities, low maintenance.</p> 



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Installing steel conduit on the 18th floor of the first Penn Center Plaza Building.

Philadelphia's "new look" also had a "safe look" during the construction for and occupancy of the Penn Center Plaza buildings. For each had to be wired for a 6000 K.W. load and only *steel conduit* could so safely handle the electric power requirements imposed by complete air conditioning, fluorescent lighting, automatic elevators and countless electrically operated business machines.

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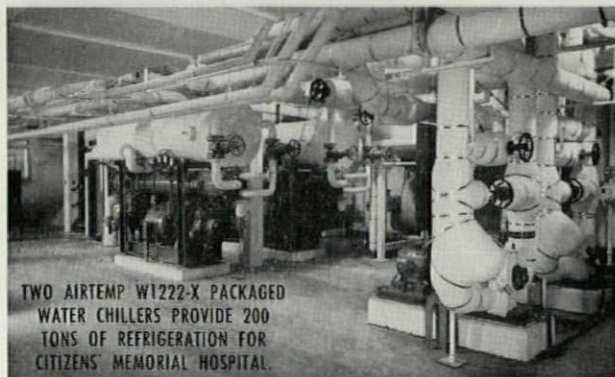
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Outside weather conditions, or inside requirements may make it necessary to heat some sections of a building at the same time that other sections require cooling. Where these conditions exist, the McQuay "MC" MULTI-ZONE air conditioning unit will furnish balanced comfort *simultaneously* to different determined areas with either filtered, *cooled* and dehumidified air, or filtered, *heated* and humidified air . . . or a mixture of these in any desired proportions . . . at your command.

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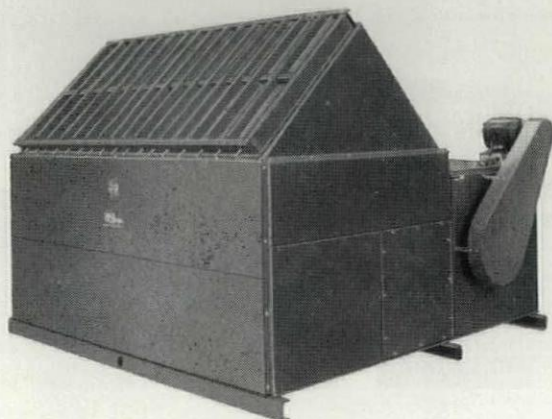
"MC"

MULTI-ZONE
AIR CONDITIONERS

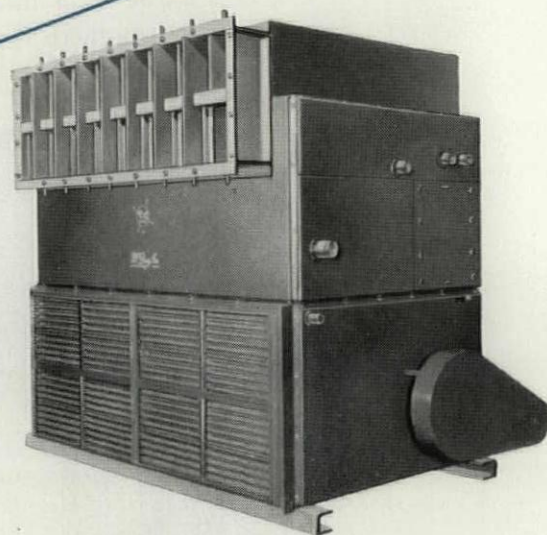


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McQuay HORIZONTAL Multi-Zone unit

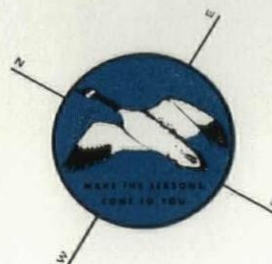


The McQuay "MC" Multi-Zone air conditioning units are available in 8 sizes from 1370 c.f.m. to 21,000 c.f.m. Each unit has a standard number of zones available from 6 on the smallest to 22 on the largest. All zones are interconnected by a single external connecting rod. A full line of accessories is available . . . preheat steam coils, filter sections, mixing boxes, humidifiers.

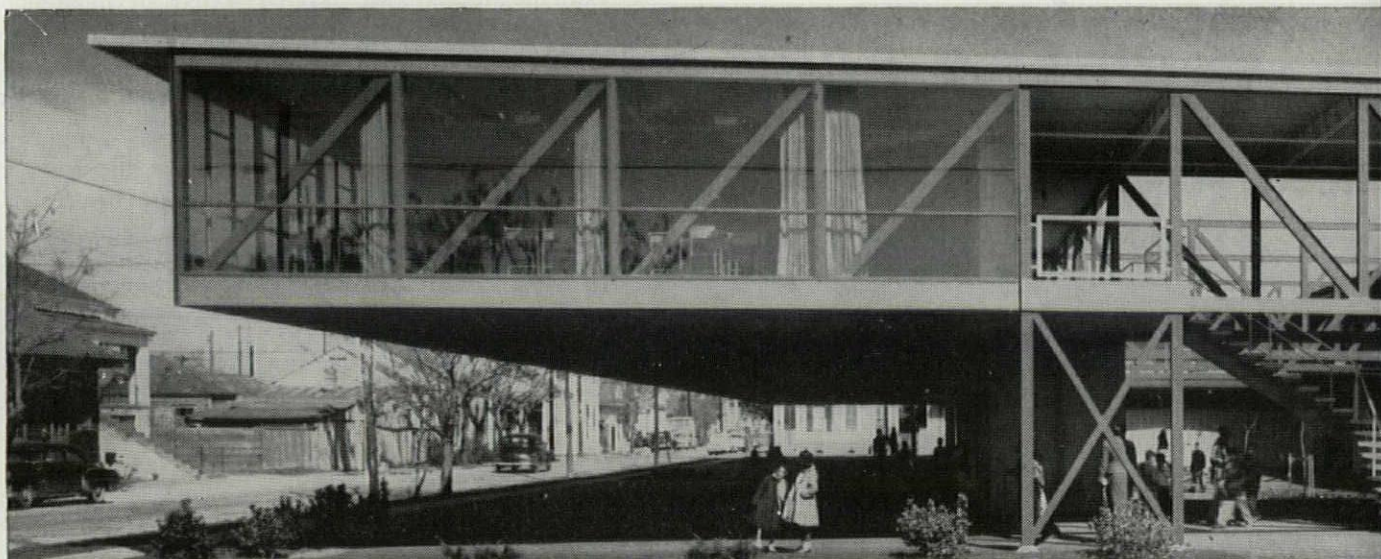


McQuay VERTICAL Multi-Zone unit

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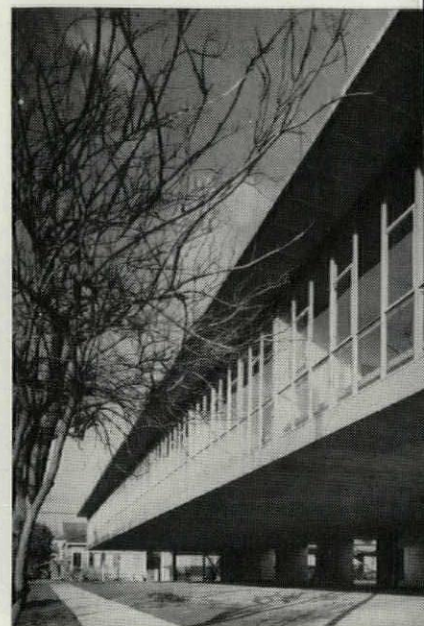
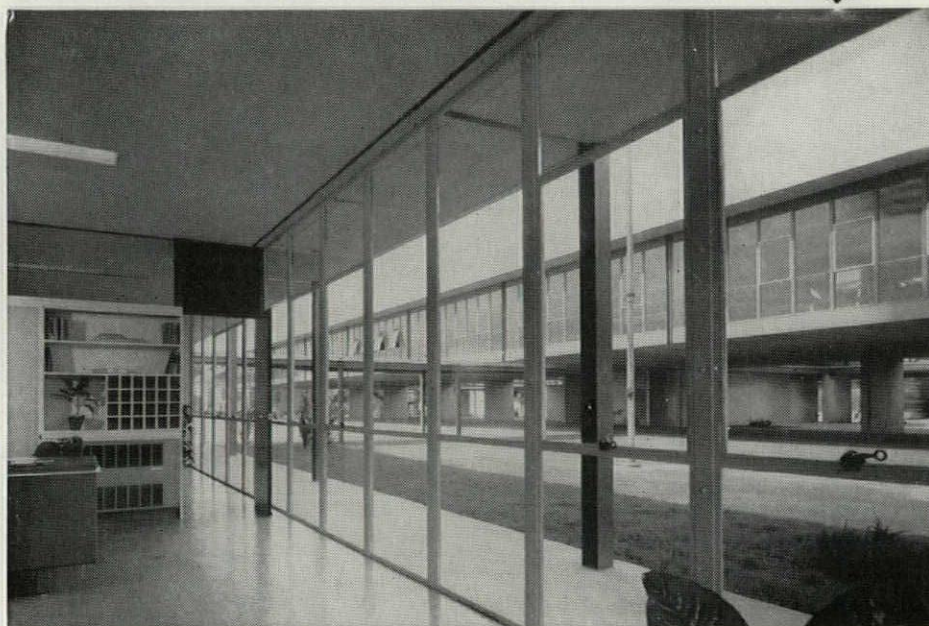
Hardly anyone can pass this school building without a stop and a stare. People call it the "treehouse school," because it is literally suspended in mid-air on 12 cantilevered trusses. By doing this, they could use the space *underneath* the school for a playground. The space was badly needed, because only two acres were available for a 770-pupil school . . . the Phyllis Wheatley School in New Orleans.

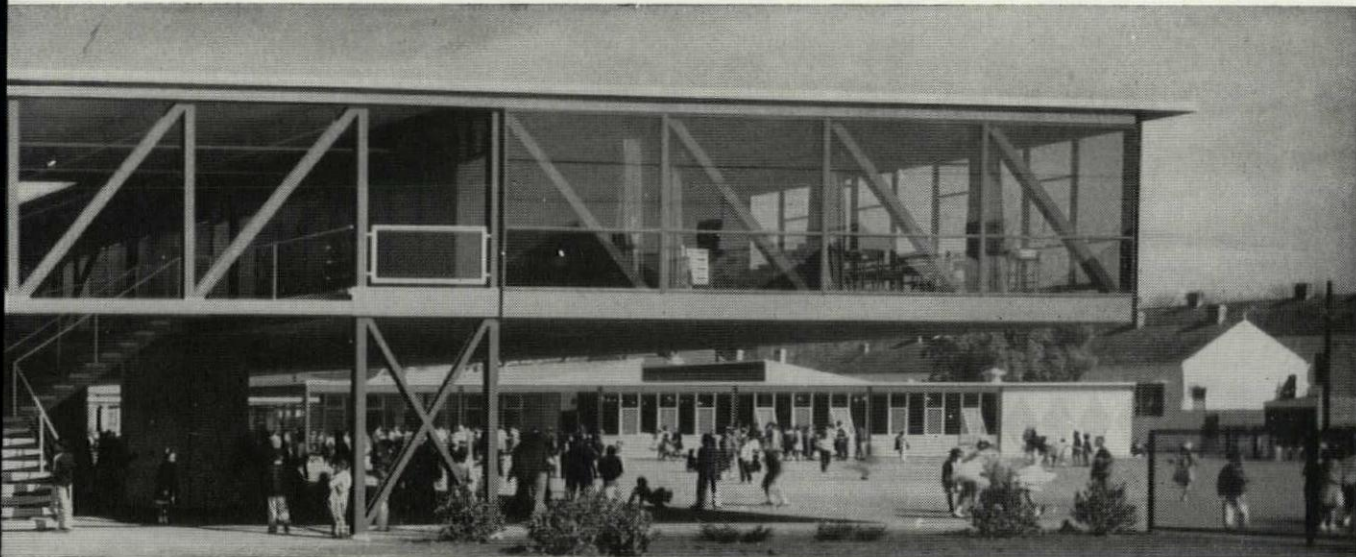
Each of the 22 classrooms is glazed with SOLEX heat-absorbing, glare-reducing glass. On southern exposures, where the sun beats

in fiercely, the floor-to-ceiling openings are *double-glazed* with PPG's SOLEX TWINDOW[®] units. By using fixed instead of operating sash, the architects saved enough money to install—in every room—exhaust fans which draw cool air over the students.

The ground-level administration building (which is protected from the sun) is glazed with huge panels of clear PENNVERNON[®] window glass. All in all, the school is a show place for Pittsburgh Glass, and one of the outstanding schools to be built anywhere in this country.

C





A

Main entrance. Classrooms are grouped around this "court."

B

Typical classroom. Children are thrilled by the "treehouse" effect.

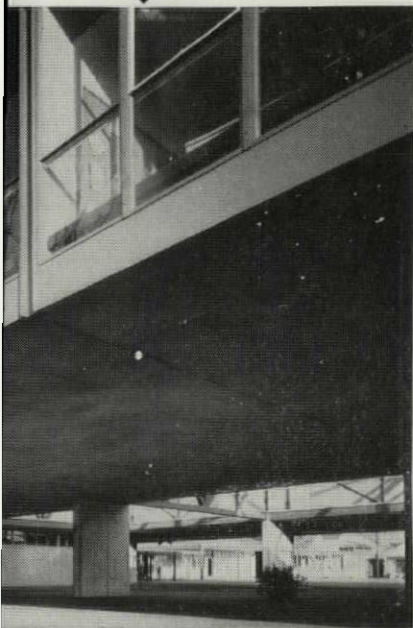
Administration building. The daylighting is excellent.

The cantilevered truss system. Note absence of pillar "forest."



D

Architect:
CHARLES R. COLBERT, NEW ORLEANS, LA.



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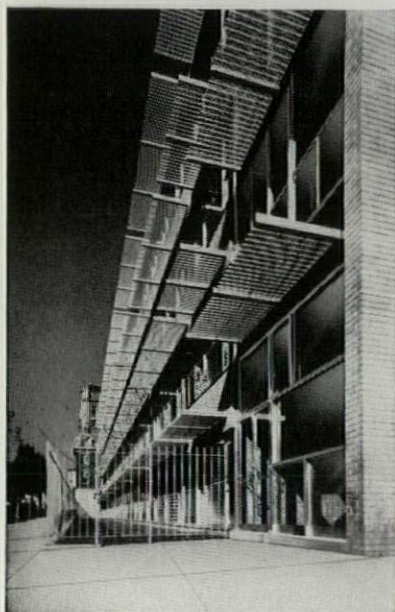
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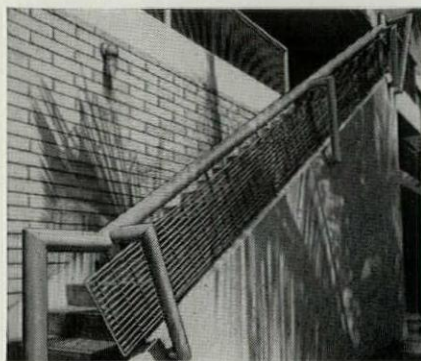
Curtis Hall, Temple University, Philadelphia
Nolen & Swinburne, Architects

At, unusually light and transparent appearance is achieved in this new 4-story classroom building by the extensive use of IRVICO type CC pressure-locked aluminum grating as sunshades. These help reduce air-conditioning costs and help control sky glare. They also serve as window cleaning walkways.

Angell Hall, University of Michigan
Kahn Associated Architects and Engineers, Inc.

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Capital Building, Waikiki, Oahu, Hawaii
Wimberley and Cook, Architects

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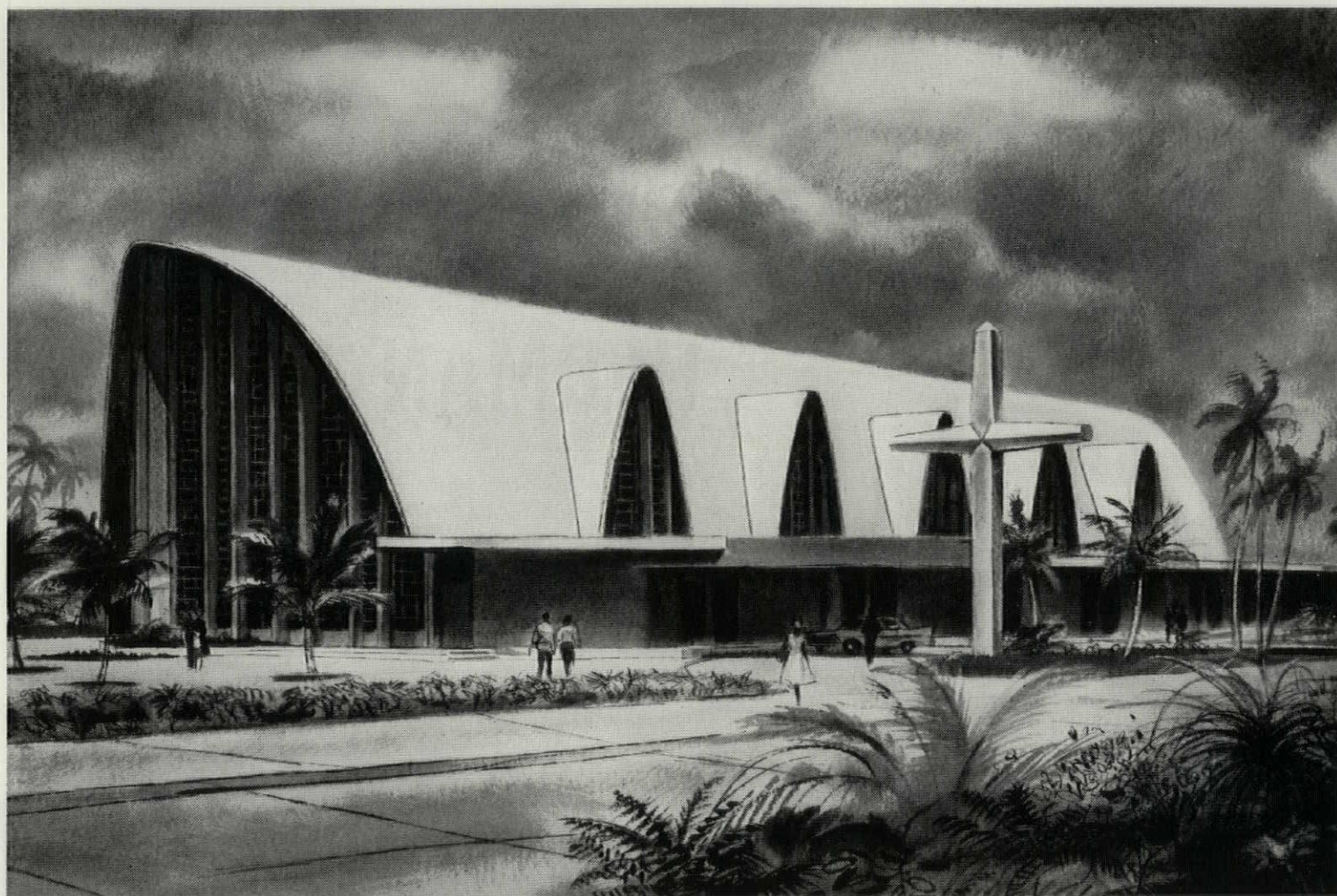
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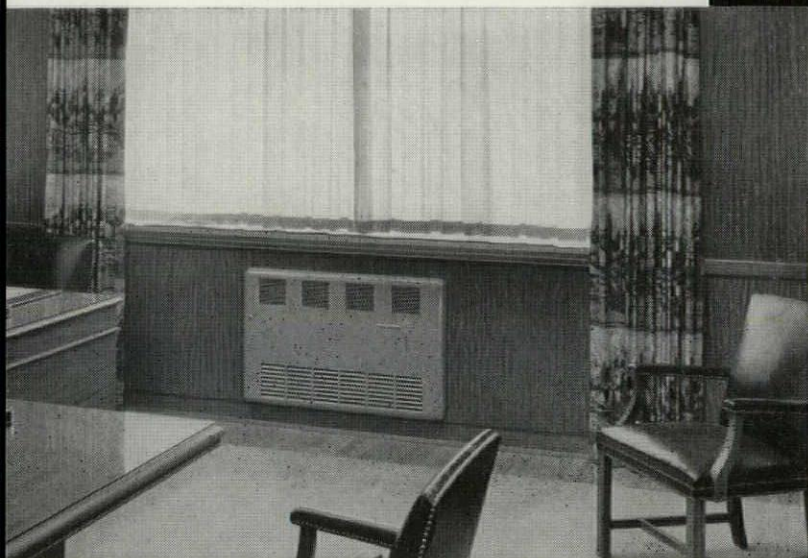


Church of Santa Maria Reina at Ponce, Puerto Rico

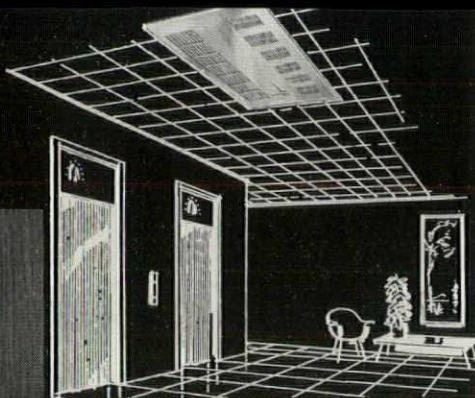
This beautiful church with its unique concrete arch roof was designed by O'Kelly & Mendez, Architects and Carl B. Brunner, Jr., Designer. The Contractor was Santoni & Vivoni. For over 60 years, we have provided foundations for the finest structures in America, and for almost as long, offered complete construction services abroad. Investigate the advantages of using

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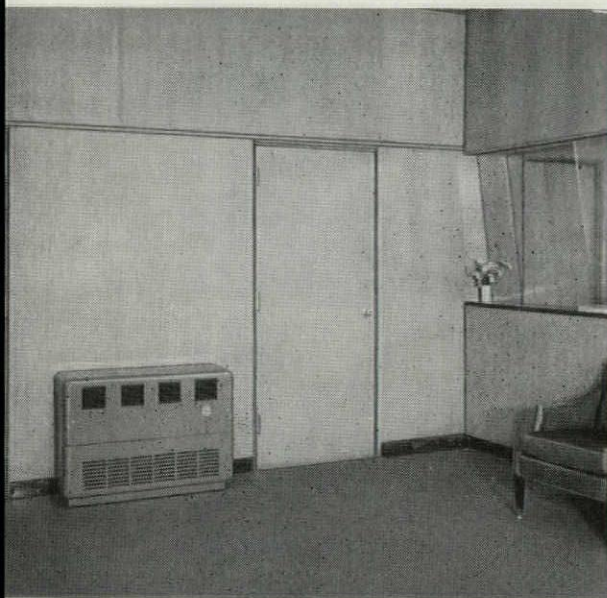


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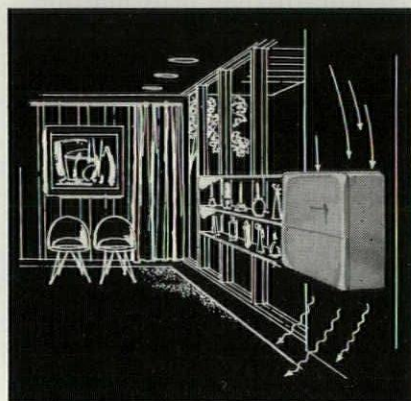
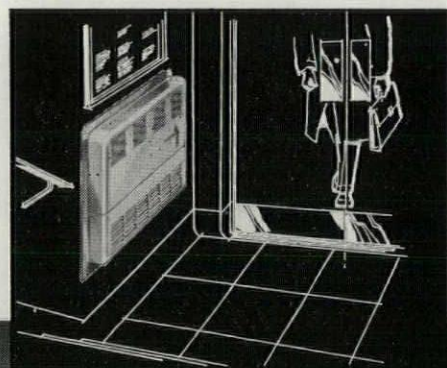
HERMAN NELSON..



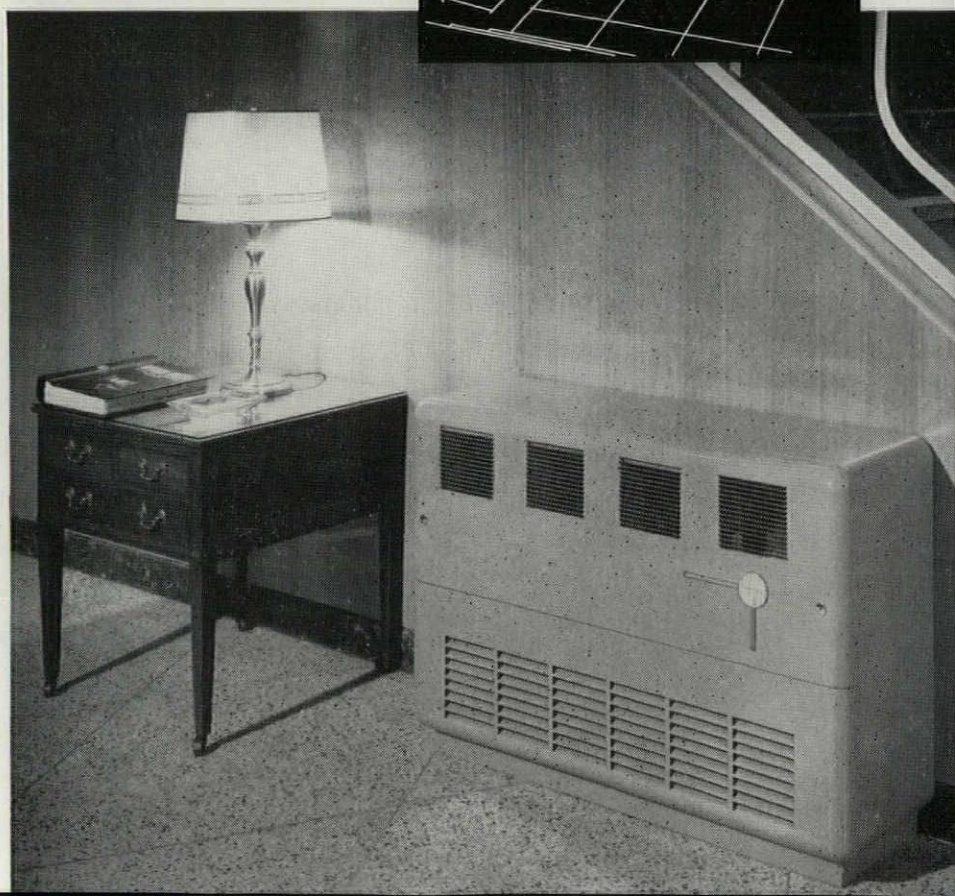
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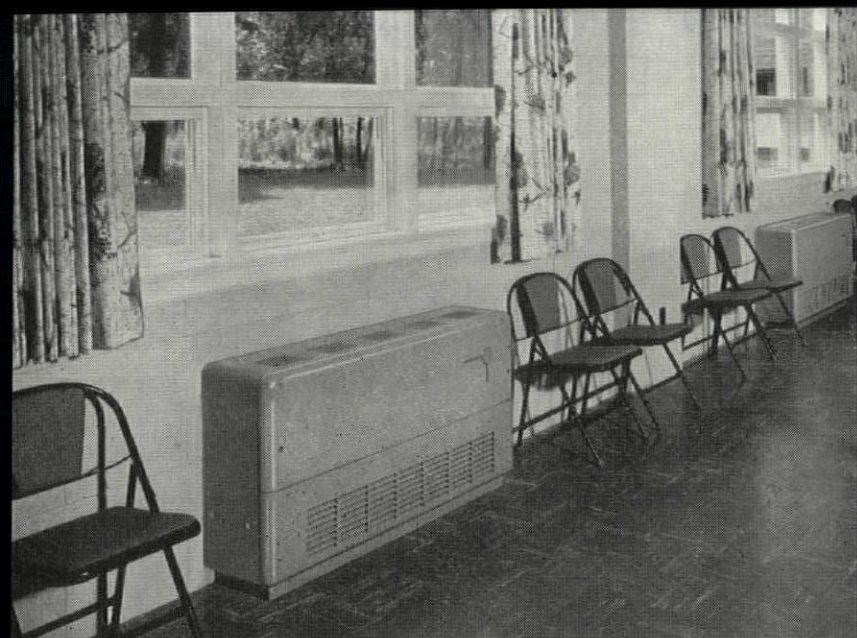
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semi-recessed in the wall.*

*Stairway space utilized in office
building.*



*Cold floors? Not with this inverted
Console Heater installation.*





Warm air where you want it—especially in churches and assembly rooms.

.CONSOLE HEATERS

**beauty, performance and variety of arrangements
offered by no other cabinet style heater**

Just look at a few of the smart new arrangements possible when you plan with the Herman Nelson Console Heater in mind. Place these attractive units free-standing, semi-recessed or fully recessed on the floor. Use them as room dividers. Hang them from the wall. Suspend them from the ceiling. There is no limit on your design ideas!

Here, in a compact, single source of heated air for both commercial and institutional applications, you offer graceful beauty combined with quiet, dependable performance. Proved efficient heating "package" consists of hot water or steam coils, fan assembly and filters. A choice of colors, too! Get ALL the facts now on the beautiful Herman Nelson Console Heater. Write for Bulletin 727A.

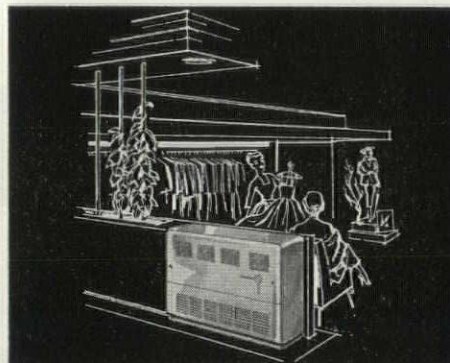
Better Air is our Business



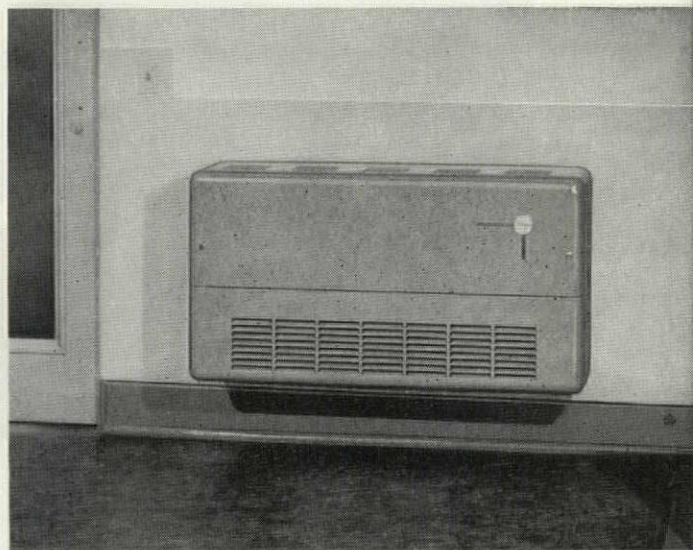
American Air Filter

COMPANY, INC

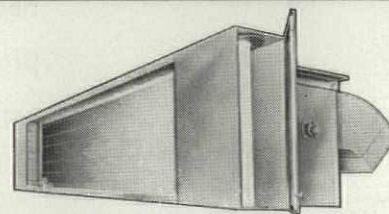
LOUISVILLE 8, KY.



Adds smart beauty as an attractive room divider.

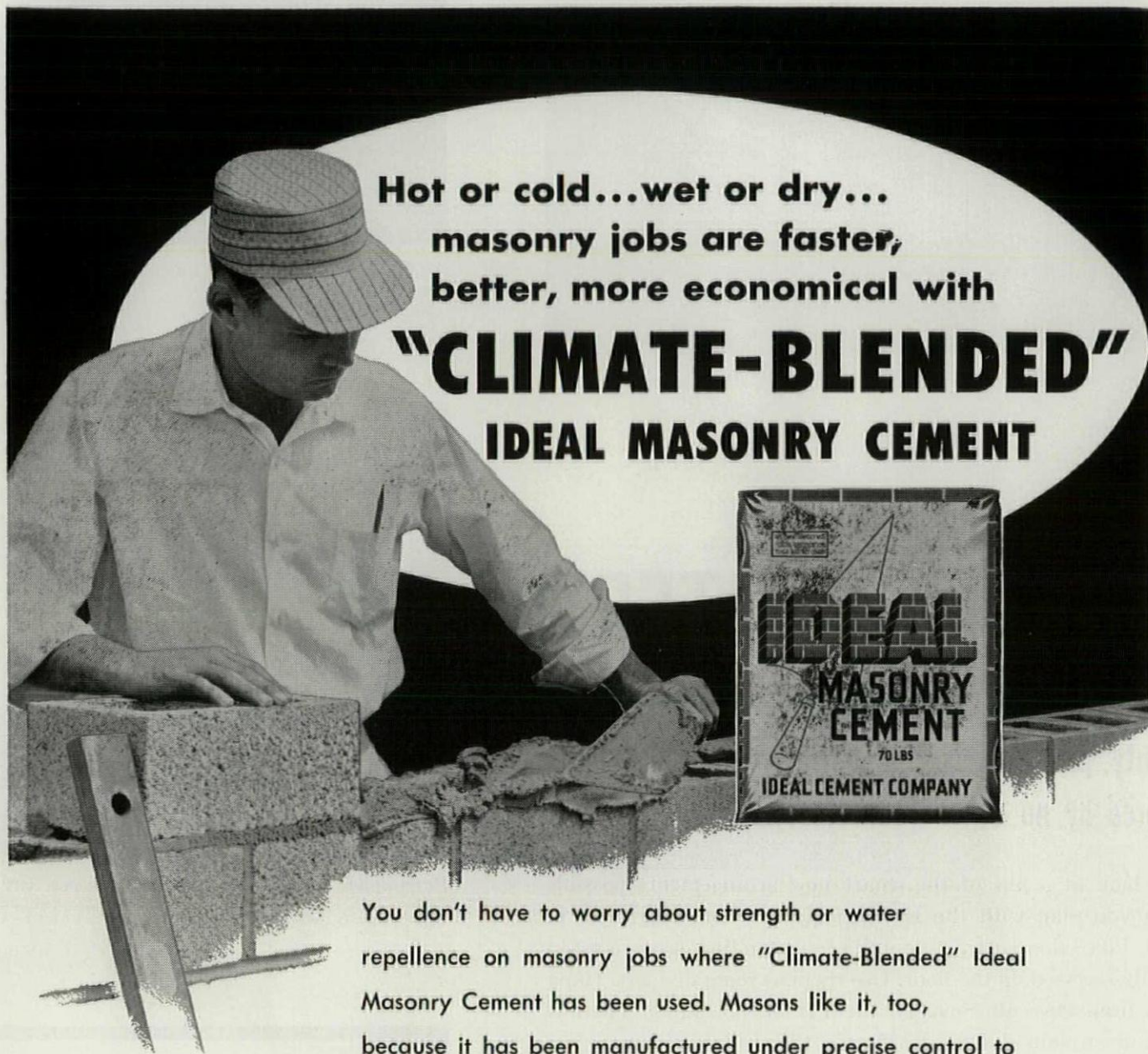


Remodeled corridor—no room for recess, yet off floor



**ANOTHER ADVANCED-DESIGN
PRODUCT FROM HERMAN NELSON**

Now . . . Roll-O-Vent air handling units that change their own filters *automatically*! They're new from Herman Nelson. A 65-ft. roll of filtering media loads like a camera, lasts up to a year, provides *constant*, high-level performance because clean media rolls into position *without attention*. Write for details. Ask for Bulletin 780A.



Hot or cold...wet or dry...
masonry jobs are faster,
better, more economical with
"CLIMATE-BLENDED"
IDEAL MASONRY CEMENT

You don't have to worry about strength or water repellence on masonry jobs where "Climate-Blended" Ideal Masonry Cement has been used. Masons like it, too, because it has been manufactured under precise control to provide excellent plasticity, strength, yield, and water repellence, regardless of the climate, weather, or area of the country where it is used.

Masonry jobs where "Climate-Blended" Ideal Masonry Cement has been specified get done faster, at lower cost, and provide maximum durability for the finished work.

First Choice with Masonry Contractors and Owners



IDEAL CEMENT COMPANY
DENVER, COLORADO

14 PLANTS AND 3 TERMINALS SERVING SOME OF THE MOST RAPIDLY GROWING AREAS OF THE NATION



WEIRKOTE'S[®] skin-tight zinc coating never gives rust a break

No wonder the steady shift is to Weirkote zinc-coated steel! No wonder more and more spec sheets insist on Weirkote—like this:

SHEET METAL WORK—Materials—Galvanized steel. Unless otherwise specified, this shall be of 26-gauge galvanized sheet steel, of "Weirkote" with make and gauge stamped on each sheet.

Weirkote's continuous-process zinc coating is uniformly skin tight, flawless. It's made that way to stay that way through the toughest fabrication

and roughest job-site handling. No flaking, no peeling.

It brings first-class corrosion resistance and long life to roof ventilators, heating and ventilating ductwork, ducts for dust and fume removal, rain drainage systems, water type air coolers, other sheet metal uses. Low first cost, low maintenance cost.

Free Weirkote Booklet

Send for the new Weirkote booklet today. Write Weirton Steel Company, Dept. P-17, Weirton, West Virginia.



**WEIRTON STEEL
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



MULTICOLOR LACQUER CUTS COSTS ON 28 TEXAS SCHOOLS

For 18 new schools already completed and 10 more soon to be started in the Houston, Texas area, multicolor* lacquer was specified to cut costs while adding an interior touch of modern beauty.

Architects and builders everywhere have found that multicolor lacquer helps cut costs because it can be applied directly over irregular surfaces. One coat of multicolor will cover imperfections or rough surfaces, yet produce a finish that is attractive and serviceable—one that is most pleasing and intriguing to the designer.

A unique coating, multicolor utilizes lacquer to simultaneously spray two or more colors on a primed surface as a single finishing coat. Application involves only the use of normal techniques and equipment. Over suitable primers it offers complete and attractive coverage to a variety of surfaces including concrete, plaster, canvas, wood, wallboard and various plastics and metals.

Bellaire Senior High School, pictured here, was designed by Golemon & Rolfe, and was awarded the Medal of Honor for design by the Houston Chapter, A.I.A. It was the only school in this area to be so honored.

Hercules Powder Company does not make finished lacquers or coatings of any kind. If, however, you have difficulty securing adequate information on multicolor lacquers, write us and we will be glad to assist you.

This advertisement is one of a series prepared to explain the suitability of multicolor lacquer finishes for a wide variety of architectural applications.



Cellulose Products Department

HERCULES POWDER COMPANY

INCORPORATED

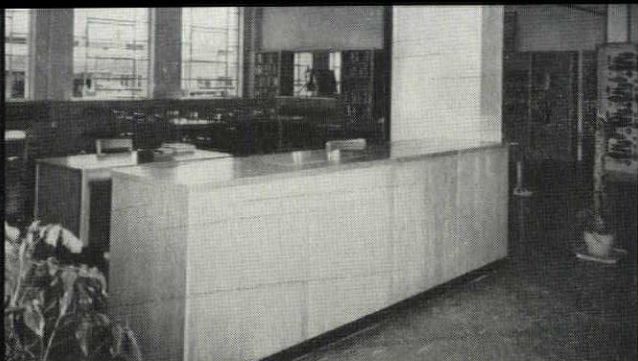
900 Market St., Wilmington 99, Del.

CHEMICAL MATERIALS FOR INDUSTRY

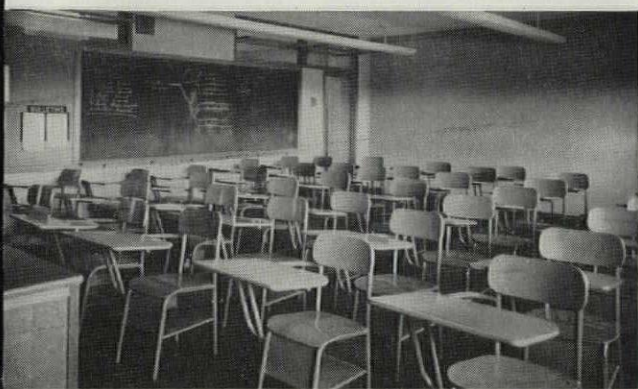
**Multicolor lacquer used in the Bellaire Senior High is "Plextone®," supplied by Plextone Corporation of America, New-ark, N. J., Chicago, Ill., Los Angeles, Calif.*



CL57-1

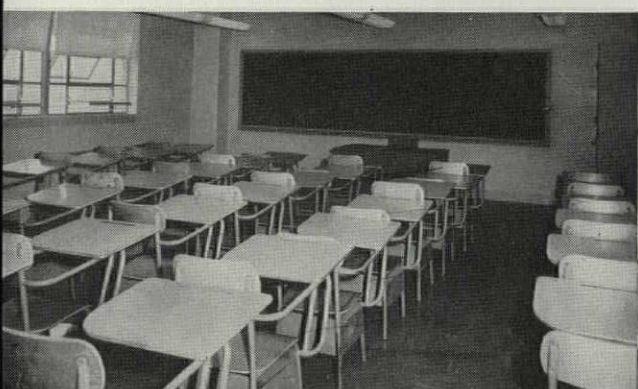


EASY TO APPLY—Multicolor is easy and fast to apply. Commercially available spray equipment is used and it's sprayed much like any conventional architectural finish.



COLORFULLY DIFFERENT

—Two or a multitude of colors can be combined—but all are sprayed at once—giving the designer possibilities galore with which to work.



VARIETY OF TEXTURES—

Different effects are easily achieved—from large particles giving a granite-like appearance to small ones the size of pin-points.



STURDY AND PRACTICAL

—Multicolor is really tough. It withstands scrubbing and scuffing—any normal abuse—and it won't come off when properly applied.

metlwal

helps classrooms "grow" as they're needed . . .



Corridor, Charles Orr School, Cleveland, O.



Low Maintenance. Floor to ceiling **metlwal** have a baked on finish that resists marring and scratching. Easy to keep clean with soap and water.



Classroom, Charles Orr School, Cleveland, O.

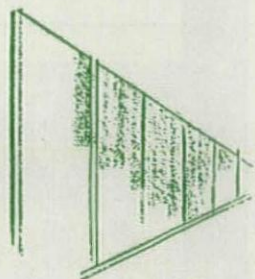


Adaptability. Chalkboards, doors, windows, electrical outlets are easily installed wherever you want them using standard components.



Some of the schools using metlwal:

Welsh School and Worthington Hooker School, New Haven, Conn. Roger Bacon High School, Cincinnati, Ohio. Schenley High School, Pittsburgh, Pa. Sanford Junior High School, Minneapolis, Minn. Board of Education (three vocational schools), Philadelphia, Pa. Depew Junior-Senior High School, Buffalo, N. Y.



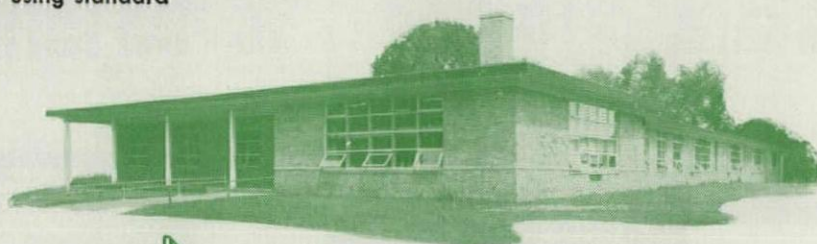
Planning your school with **metlwal** partitions is an excellent way to prepare now for the future. As the need arises, **metlwals** can be quickly and easily rearranged to increase room or corridor sizes, to change the floor layout, or to increase the number of rooms.

metlwal's versatility was recently demonstrated in Port Huron, Michigan's Chippawa Junior High School when the Board of Education decided to turn two classrooms into one library room.

The superintendent and his own employees made the change without outside help. No alterations in the walls or ceilings were necessary; no noticeable marks or defects were left in the floor to show where the partition had formerly been located.

metlwal's low maintenance cost is also pointed up in this school. During the last four years there has been no maintenance cost for **metlwal** partitions, but the other walls have cost 1.1 cents per square foot per year.

Flexibility, low first cost, functional design and modern beauty combine to make **metlwal** a prime choice for new schools designed to grow with the community's needs,



metlwal *by* **PROSPERITY**
DIVISION OF WARD INDUSTRIES CORPORATION
SYRACUSE, NEW YORK

been dropped, however) estimates its saving at \$35,000 a year.

Though this evidence is intriguing, it is far from conclusive, and the dangers of generalizing from it are great. For one thing, differences in residential patterns from community to community can upset any assumptions about what desegregation will, or won't, do to existing physical facilities. Dr. W. D. McClurkin, director of field surveys for Nashville's George Peabody College for Teachers, points out that what may hold for one town, where the Negro population is concentrated and its colored schools placed at or near the center of that population, won't be true at all for a town with an interwoven Negro population and a pattern of white and colored schools in fringe locations. "The truth is we just don't know, generally, what will happen," McClurkin says. "And until there is a range of case-study material from which we can make valid comparisons between like communities, we won't know."

In the absence of more exact data, many educators are forced to rely on the 1954 findings of the so-called Ashmore project. This was a study of the structure of biracial education in the US directed by Harry Ashmore, the executive editor of the *Arkansas Gazette*, and financed by the Fund for the Advancement of Education. In all, it produced four books of which the over-all summary volume is *The Negro and the Schools*, written by Ashmore himself.

Despite the popular notion, Ashmore was forced to conclude that "segregation has not been an important separate factor in school costs until now and is not likely to be in the immediate future." His reasoning was that the South until now has had to contend with two gaps in its educational structure, the inequality between urban and rural schools as well as the differences between Negro and white facilities. Only now did Ashmore find the South reaching the point where it had enough classrooms and enough teachers to meet the minimum demands of its children for education. "There has been a general

discrimination against Negroes, it is true," he said. "But it could have been corrected only by pouring additional money into the total system or by lowering the standards of the white schools. If at any point in the past discrimination had been wiped out by total integration the effect would have been that some Negroes would have gone to better schools and some whites to worse—but no appreciable economies would have resulted to make additional funds available for improvement of the total system."

On the whole, though Ashmore found instances of waste caused by segregation, he felt that they did not add up to anything like a determinant in school finance in the region. Nor did he see any substantial savings in the immediate future from desegregation. "If Negroes and whites were immediately reshuffled through the whole of the school system, the same general deficiencies in physical facilities, teacher training and the like would exist." Justice might be achieved, in that the deficit would then fall evenly upon members of both races, but the over-all standards of public education would not be materially improved.

Tomorrow may be different

Whether this will be true in the long-range future is the provocative question. The South today is a land of transition. Industrial growth, particularly in the Southeast, has been drastically changing its traditional agricultural economy and, in terms of population, its people have been becoming city dwellers, rather than farmers. In the decade 1940 to 1950, the South was becoming urbanized more rapidly than any other region. On top of this, southern Negroes were not only leaving the farm, but leaving the South altogether. Whereas 72% of all US Negroes were in the 13 states traditionally classed as the South in 1940, only 62%—a little more than 9 million people—were there in 1950. (Put another way, the South which was more than one-third Negro in 1900, was less than one-fourth Negro

in 1950, and if the trend continues, will be only one-fifth colored at the time of the next census.)

This urbanization and outmigration has already had tremendous consequences, and it is bound to have more. Most important, it has meant the beginnings of a breakdown in the old plantation system of mutual obligations between Negroes and whites and, in its place, the emergence of a new society, characterized by less personal contact and less intimate dependence of Negroes on whites. Such an urban, industrialized society has its drawbacks, notably a more detached relationship between the races and harder lines of spatial segregation. But its very nature and its exposure to outside forces makes it increasingly difficult for the white southerner to regard the Negro as his former slave, or as a dependent child, and in fact demands that he begin to look upon him for what he is, an individual with equal rights and equal responsibilities. That such a demand should bring racial tension and, in some cases, violence (of which the school flare-ups are only one aspect) is not surprising. For a tremendous change is involved, and change rarely if ever occurs without friction.

In the light of this gigantic transition, the day is unquestionably coming when the maintenance of a dual school system in the South will become an increasingly significant item of expense. This will be especially true in rural areas, hit hardest by the population exodus, and where there has been wholesale building and, perhaps, overbuilding of Negro facilities. But it will also hold for the city, where shifting population patterns will produce the same result in fringe areas of overlapping white and Negro populations. In this sense, the siting of new schools for greatest economic utilization is likely to become a paramount consideration in the years ahead as it already has, to some extent, in the North.

Thus a true economic pressure for integration may emerge. When it does, it will be an important addition to the formidable array of legal, social and religious forces that are working for equality today.

MERCHANDISING APPEAL EXEMPLIFIED BY



Lighting that often increases retail departmental sales as much as 300% is provided by Mainliner Luminaires, and featured throughout all departments of the great new Montgomery Ward store located at Portsmouth, Ohio.

New "must" for Store Lighting—

MAINLINER LUMINAIRES

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Lowest Installation and Maintenance Costs Fulfill Today's
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Most leading retailers now *know* that proper store-illumination can attract as much as $2\frac{1}{2}$ times more traffic!—can increase the sale of displayed items 30% to 50%—can improve impulse-buying fully 5% overall! That store lighting *alone* can speed all selling-operations 20%—and eliminate returned-goods transactions 90%!

These facts are frequently cited in accounting for the spectacular "swing" to Mainliner Luminaires, for modern store lighting or re-lighting—along with the three major reasons for "specifying Mainliners"!

Mainliner Widest Variety! 4 mounting types, 6 basic sizes and 13 shielding styles fulfill *any* large-area lighting requirement!—permit more than 1000 *all different* combinations! Modular proportions and *dimensionally correct* construction, of Mainliner Luminaires, "mate" with any type of "squared" ceiling material!

Highest Quality Appearance! Mainliner door-frames have *mitered* corners. Latches are flush, almost indiscernible. The extremely "shallow" design of Mainliner units gives a "patterned" rather than a "boxy" appearance, when they are surface-mounted. And, a black stripe applied to the light-trap seat—*eliminates* the escape of light from around the door-frames of Mainliner Luminaires!

Save Installation Costs 3 Ways! Rugged and reinforced Mainliner construction eliminates "crimping" and "wobbling"—for *much* easier handling! Mainliners come *completely pre-assembled!* Doors are packed separately. Cartons simply "rip" open. Mainliners cut *all* job-planning—job-layout—and luminaire-handling time!

Mainliners are only $4\frac{7}{8}$ " deep! Easiest ever to position and mount! Recessed models include Flange-type, Grid-type and Snap-in Tee-Bar units. Surface-mounted units permit a semi-recessed appearance.

Mainliner doors, too, come pre-assembled—hinge and latch from either side. And, the *complete pre-wiring* of Mainliner Luminaires is *consistently* reported to cut wiring-time in half!

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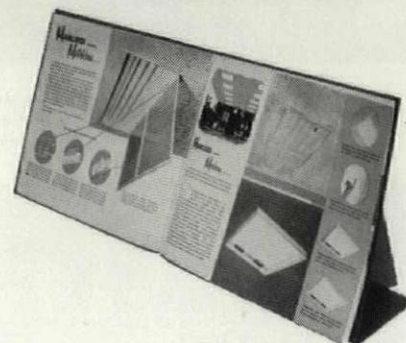
Get all three superior advantages of Mainliner Luminaires—through your nearby Westinghouse Representative—through your own, local Westinghouse Distributor or write directly to Westinghouse Electric Corporation, Lighting Division, Cleveland, O.

See how easily various models from the wide variety of Mainliner Luminaires are applied for both functional and decorative lighting, as well as for "Merchandising" lighting.

Request a Mainliner presentation today!



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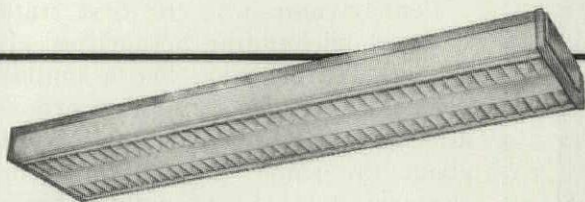
the men from

Smithcraft

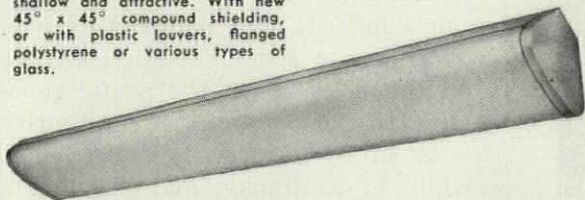


Charles Kleinschmidt and Harry Bailey, Louisiana representatives, members of Smithcraft's nation-wide sales-engineer organization, demonstrating the New Smithcraft TWOSOME.

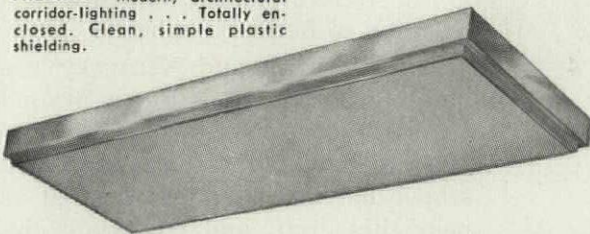
Always ready to explain in detail the benefits of new lighting developments, the men from Smithcraft know the importance of teamwork in planning good lighting. When they team up with you and your associates to select a lighting fixture that fits both the budget and the blueprints, they can find the answer in Smithcraft's complete line of lighting units. Make it a point to consult with the Men from Smithcraft on any lighting planning.



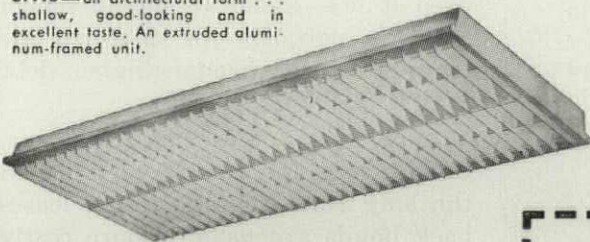
TWOSOME — Top value, low cost, shallow and attractive. With new 45° x 45° compound shielding, or with plastic louvers, flanged polystyrene or various types of glass.



FREEWAY — Modern, architectural corridor-lighting . . . Totally enclosed. Clean, simple plastic shielding.



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- ☐ Please send me the monthly publication, "Light Side of the News", so that I can keep in touch with the latest trends in lighting.
- ☐ Please send me folders and catalog sheets on the "4 Good New Ideas in Lighting".
- ☐ Please send me the complete SMITHCRAFT CATALOG, containing data on America's Finest Fluorescent Equipment.

AF-11



Ramset speeds erection of two-story "piggy-back"

Thanks to curtain-wall construction and RAMSET® fastening, there was no need to reinforce the understructure of this new Denver office building. Using RAMSET, two new floors went up in three weeks *without disturbing the tenants in the lower eight floors!*

The speed, quietness and portability of RAMSET helped to make this "piggy-back" operation a success.

RAMSET operators are able to move

fast because they have no power lines or bulky equipment to slow them down. One-hand operation makes for faster, safer work. Fasteners and charges are conveniently carried in a pocket. There is no time wasted drilling. Holding power exceeds old-style fastening methods.

Call your RAMSET dealer (listed under "Tools" in your phone book). He's an expert on fastening to steel and concrete.

T. J. Moore, architect; K. C. Construction Supply Co., curtain wall contractor; Neal Electric Co., electrical contractor; Bell Plumbing & Heating Co., plumbing contractor.

Ramset Fastening System

WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION

12157-K BEREA ROAD

CLEVELAND 11, OHIO

MONEY FOR SCHOOLS

continued from p. 167

districts are pinched by statutory interest rate limits, of course, in which cases the only recourse is to try to get short-term money or push a higher limit through the legislature.

Leasebacks: expensive alternative

In cases where school districts are pinched by interest rate or debt limitations, some states have established school building authorities. These authorities operate through some variation of the leaseback mechanism so popular in commercial building.

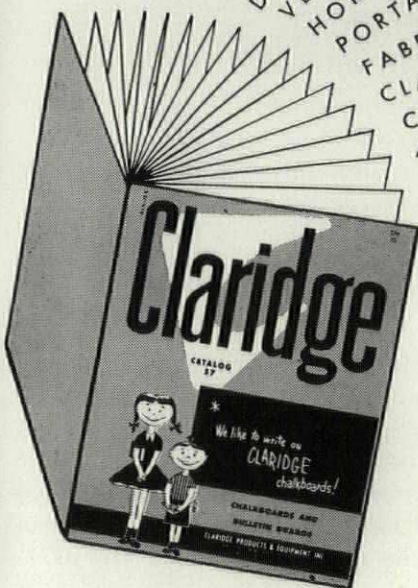
Pennsylvania was the first state with school building authorities, although Kentucky has had a similar device, called school building corporations, for over 30 years. Both work about the same: the authority or corporation buys land, builds schools with proceeds from limited obligation bonds. It then leases the school back to the school district, paying off the bonds with the rental revenues. In Pennsylvania, the authority is set up by the school district itself, while in Kentucky, and Indiana, a group of local citizens form a corporation to build the schools.

Both Indiana and Kentucky use building corporations to get around their unrealistic state bonding limits (2% of assessed valuations). Most school districts have long been at or near this limit, and politicians figured it was easier to set up school building corporations than to attempt to push through higher debt limits.

It is easier, politically, to do this, but it costs the taxpayers more in the long run. For one thing, leaseback bonds are usually more costly than regular school district bonds because they are limited obligation bonds. In other words, the full taxing power of the locality is not behind those bonds as it is behind a general obligation bond. (Investment bankers estimate limited obligation bonds must carry $\frac{1}{4}$ of 1% or more in higher interest rates than general obligation bonds.) In the case of Pennsylvania, school authority bonds always cost more, both

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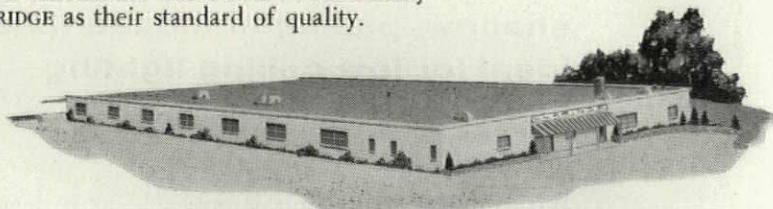
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HORIZONTAL SLIDING CHALKBOARDS
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ALUMINUM DISPLAY and TROPHY CASES
DUAL PURPOSE REVERSIBLE CHALKBOARDS



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STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of Architectural Forum published monthly at New York, N. Y., for October 1, 1957.

1. The names and addresses of the publisher, editor-in-chief, editor, managing editor, and business managers are: Publisher: Ralph D. Palne Jr., 9 Rockefeller Plaza, New York 20, N. Y. Editor-in-Chief: Henry R. Luce, 9 Rockefeller Plaza, New York 20, N. Y. Editor: Douglas Haskell, 9 Rockefeller Plaza, New York 20, N. Y. Managing Editor: Joseph C. Hazen, Jr., 9 Rockefeller Plaza, New York 20, N. Y. Business Manager: John J. Frey, 9 Rockefeller Plaza, New York 20, N. Y.

2. That the owner is: Time Incorporated, Time and Life Building, New York 20, New York; that the names and addresses of stockholders owning or holding one per cent or more of total amount of stock are: Henry P. Davison, c/o J. P. Morgan & Company, P. O. Box 1266, New York, N. Y.; William V. Griffin, 20 Exchange Place, New York 5, N. Y.; Irving Trust Company, New York City, successor trustee under the will of Briton Hadden for the benefit of Elizabeth Busch Pool, c/o Irving Trust Company, Custodians Department, 1 Wall Street, New York 15, N. Y.; Margaret Zerbe Larsen, c/o Time Inc., Time & Life Building, Rockefeller Center, New York 20, N. Y.; Roy E. Larsen, c/o Time Inc., Time & Life Building, Rockefeller Center, New York 20, N. Y.; Henry R. Luce, c/o Time Inc., Time & Life Building, Rockefeller Center, New York 20, N. Y.; The Henry Luce Foundation Inc., 9 Rockefeller Plaza, New York 20, N. Y.; Samuel W. Meek, c/o Greenwich Trust Company, Greenwich, Conn.

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3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

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JOHN J. FREY,
Business Manager.

Sworn to and subscribed before me this 18th day of September, 1957.

DOROTHY BUCK
Notary Public, State of New York
No. 24-0477675
Qualified in Kings County
Certificate filed in New York County
(My commission expires March 30, 1959)

[SEAL.]

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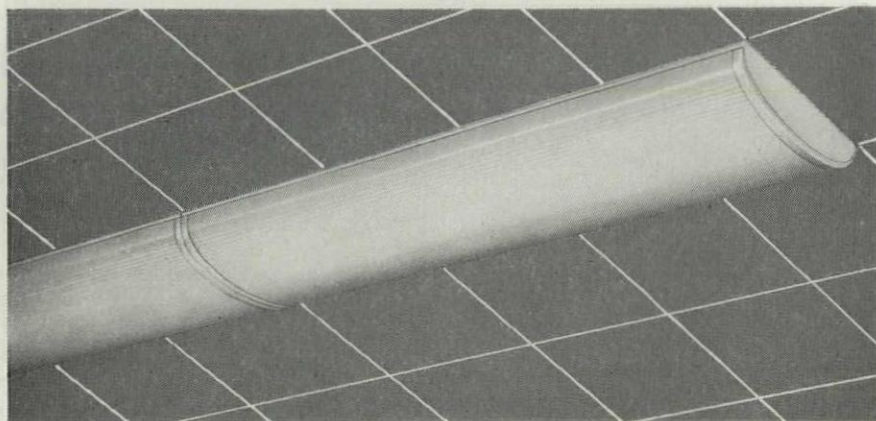
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**Minimum depth consistent with good light
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With curved shield, unit is only 3 1/4" at it deepest point ... yet surface brightness is virtually uniform at all viewing angles and well within acceptable limits for glare-free comfort.

**Improved light-stable extruded plastic
guaranteed not to warp or discolor**

Shield is of Koppers improved EVENGLO*, a premium-grade polystyrene with built-in resistance to discoloration caused by ultra-violet radiation of fluorescent lamps.

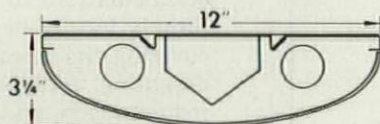
*EVENGLO is a registered trade mark of Koppers Company, Inc.

**Easy to install ...
only two basic parts**

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**Easily cleaned ... no need
to remove shield from fixture**

Curved shield is invisibly framed and hinged ... lets down at a touch, wipes clean in seconds.



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MONEY FOR SCHOOLS *continued*

because of the limited obligation feature and because in case of default, bondholders cannot attach or sell any property. About all they could do should an authority default—and even though it is unlikely, it is just such a remote possibility that bond attorneys make much of—would be to run the school authority themselves.

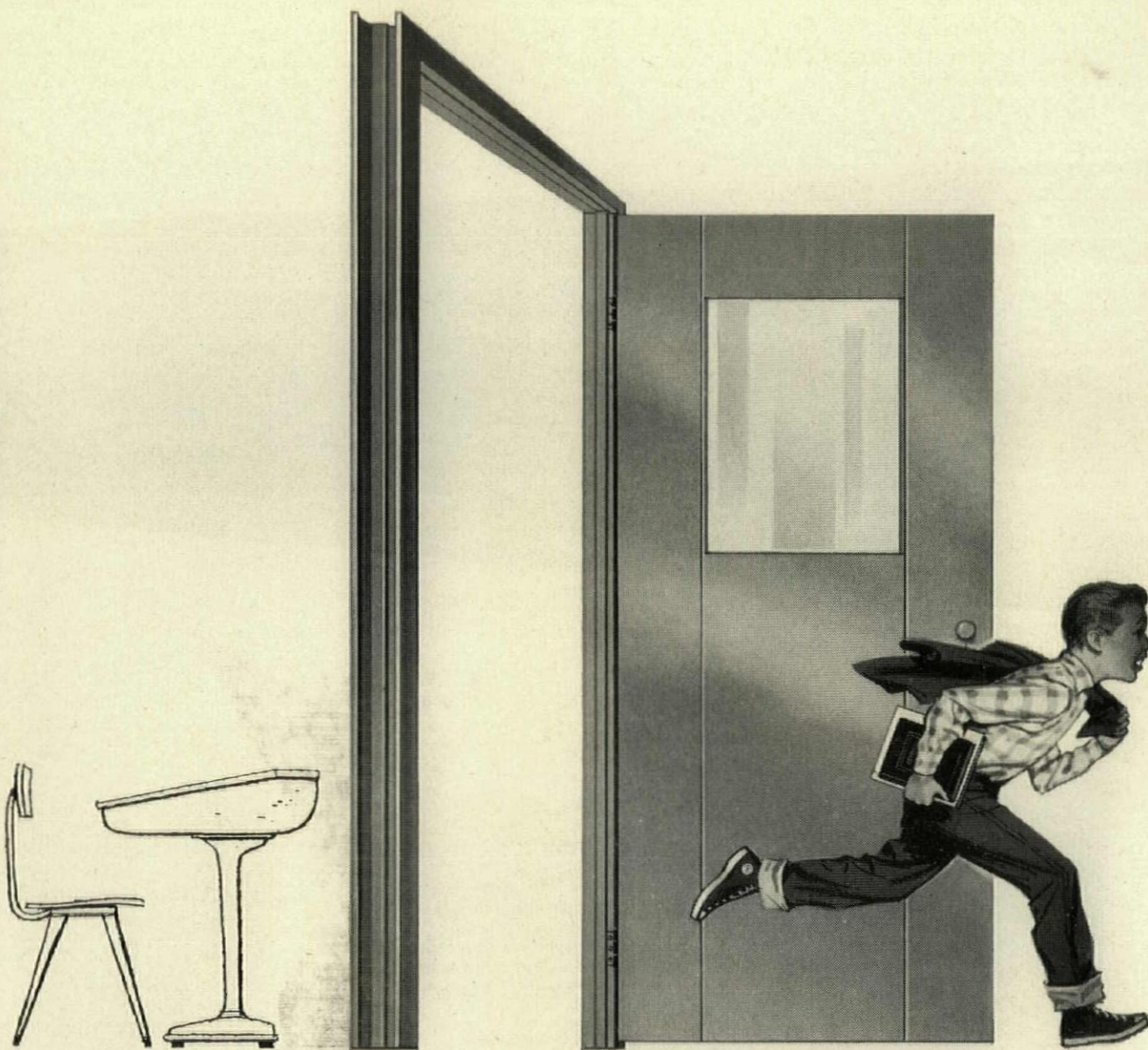
What it will cost

Realizing that it is usually better to borrow long term doesn't make today's high interest rates look any more attractive, however. For example, a difference of 1/2 of 1% more on the interest rate of a hypothetical \$500,000 serial bond issue can mean that total costs are raised 6 1/2%. If the interest rate should rise, say to 4 from 3%, the total cost would go up 13%. In one actual recent school bond issue of \$2 million, a full point difference in the rate would have meant nearly 10% higher total costs over the life of the bonds (p. 167).

Most school issues are planned on the basis of the probable rate that will result from the lowest bid for the bonds. From a financial consultant, usually a recognized investment banking house, a school district can get a fair idea of what it will have to pay for its money. But should the market change drastically, and the best bid be quite a bit lower than expected, it could mean a big change in the sort of building that might result. In the \$2 million issue cited above, for instance, a difference of 1/2 of 1%—not unlikely in the current market—could cost nearly \$90,000 more in net interest over the full life of the bonds. This could mean two or three less classrooms than had been originally planned for.

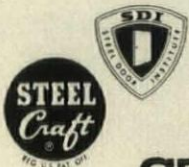
As big a factor as interest can be, however, it is not so important as some educators and economists make it seem. C. Canby Balderston, vice chairman of the Federal Reserve Board of Governors, recently pointed out: "The higher costs of borrowing may have received a disproportionate share of public atten-

continued on p. 242



the best way out of a classroom problem...

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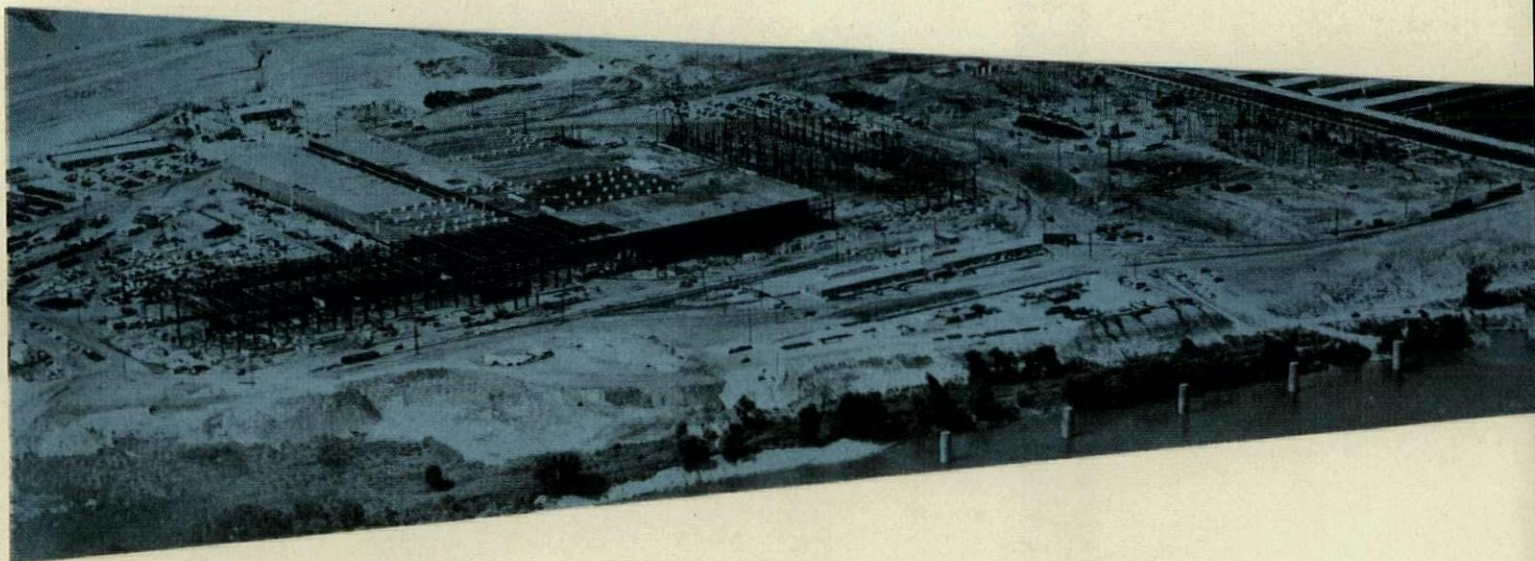
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☐ Heavy-duty, Series 16 doors

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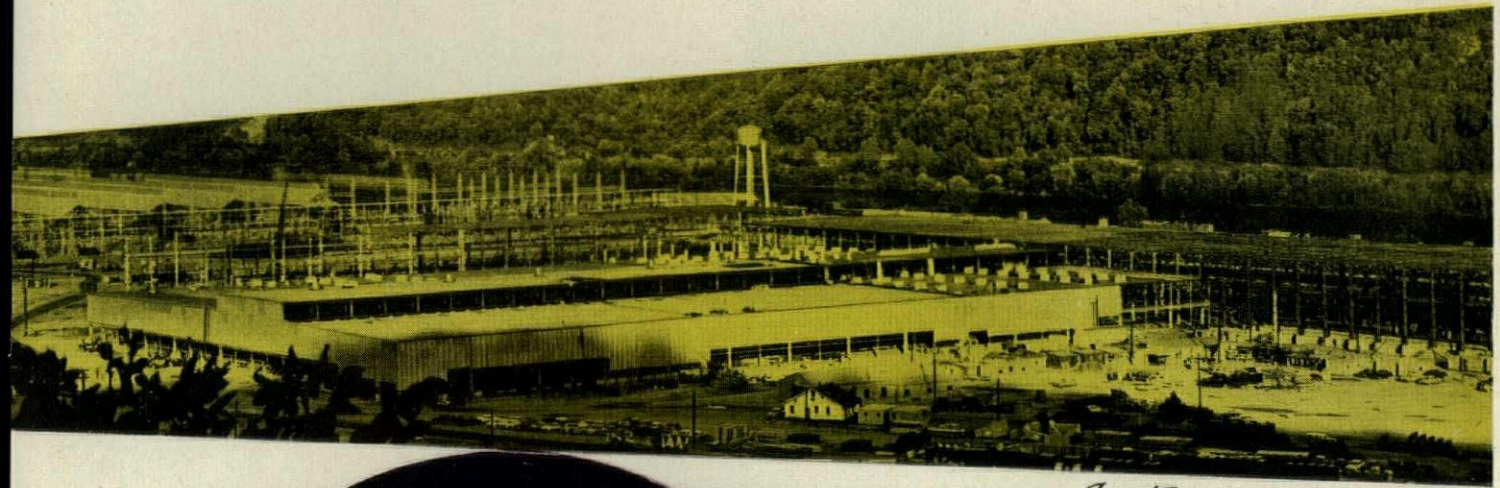
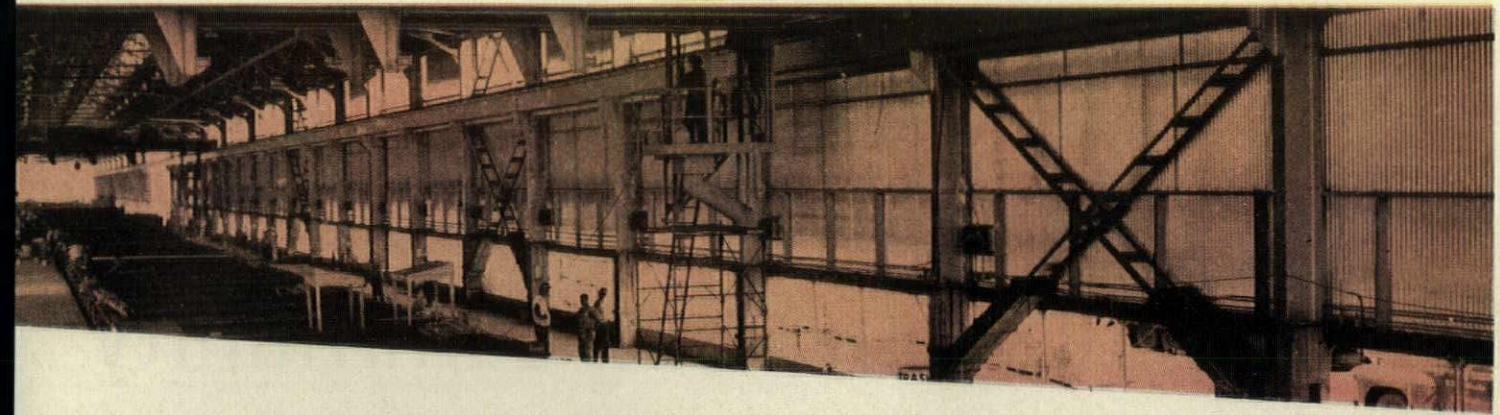
Flag-raising day at this giant new mill will mark an important new chapter in the exciting 22-month growth of Olin Aluminum. New ore ships, rolling mills, extrusion plants and wire and cable mills are already in operation or under construction. With these modern, fully-integrated facilities, Olin Aluminum is right now on the way to an initial annual volume of 340 million pounds of quality Aluminum. And that is only the beginning.

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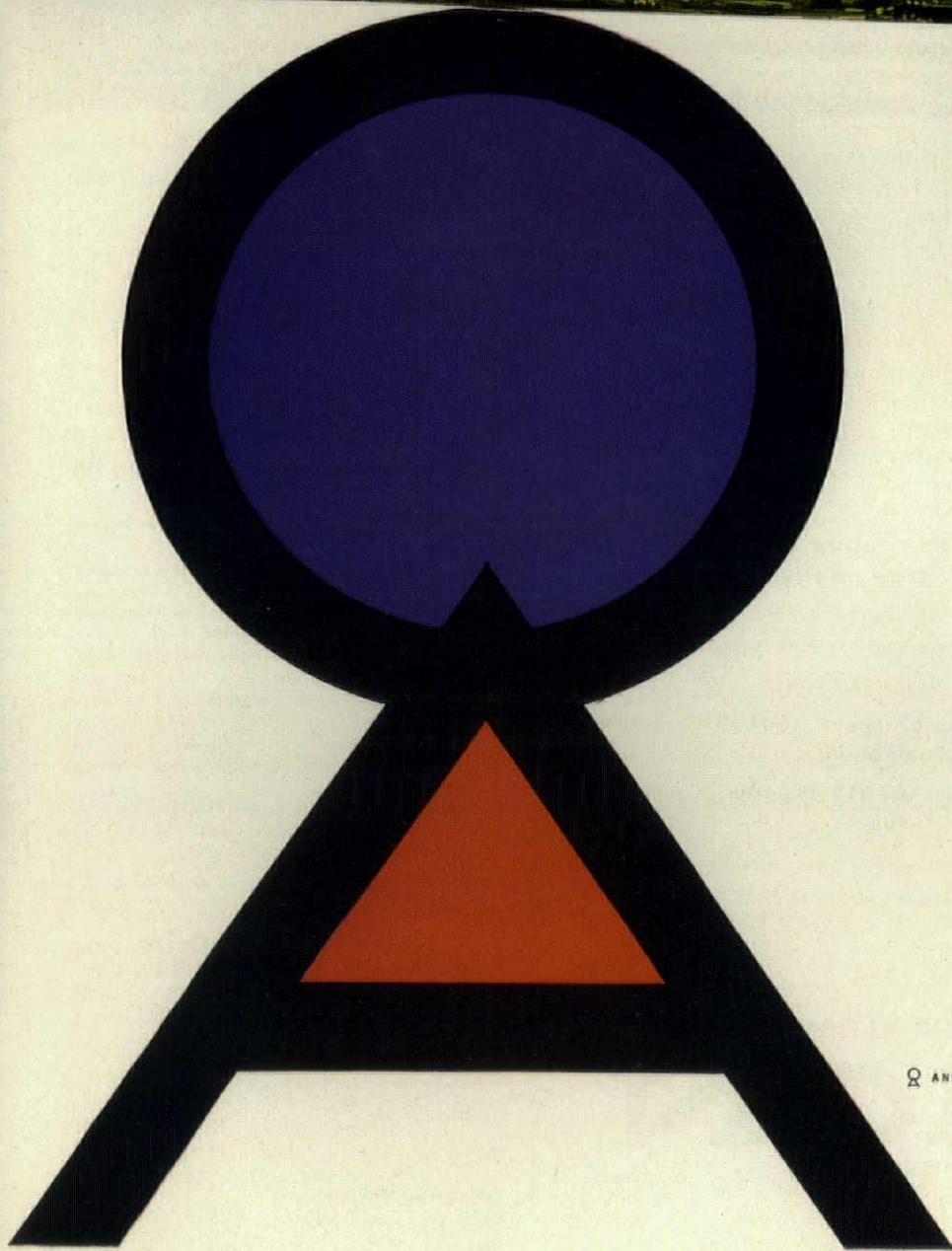
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Housing deteriorating?

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You will find that *everyone* is interested in bettering his way of life. You will find it easier to gain better living conditions when neighbors join forces. By forming, or joining, a local community improvement group you gain many personal benefits yourself.

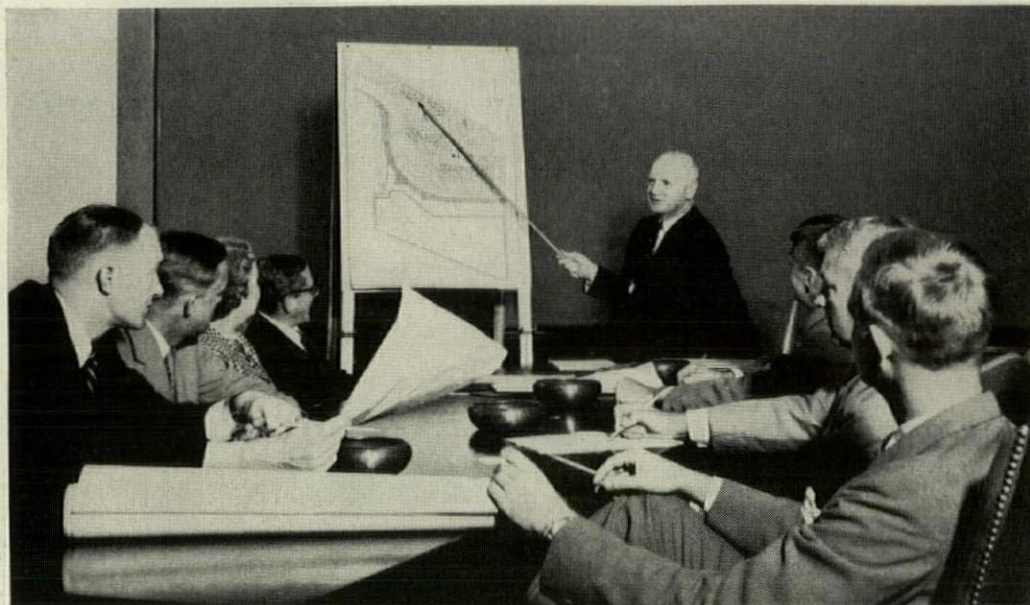
Keep up your home— work with your neighbors

Keep up your own home. Then talk with your friends, local business leaders, neighbors. Discuss this message with them. If conditions in your community need correction, *get together to get things done*. Get the facts, set practical goals and act.

Your group might begin by undertaking special neighborhood projects: clean-up campaigns, street or sidewalk repairs, gaining and upholding better housing and zoning laws. Today you might want improved garbage collections. Tomorrow your group could spearhead a combined community conservation, rehabilitation and slum-clearance program.

ACTION and many local agencies can assist you

Cooperation is the key to success. Work with the many private groups which already exist. Talk to your city, county or state officials. They can help *you*—your group can help *them*.



Use the points at right as a basic organization and operating guide. For further information, write ACTION—the American Council To Improve Our Neighborhoods.

It is a national citizen organization dedicated to home and neighborhood improvement. It can help you by sending suggestions, ideas and success stories on how other community improvement groups began, what they have done, and how they did it.

Use coupon to send for free publications

Fill in the coupon below to receive the following booklets and reports:

1. Time for ACTION
2. The Complete ACTION Catalogue of Publications.
3. The ACTION Reporter, a monthly newsletter.

For information on a specific home-improvement or group project, write a letter explaining the exact situation to ACTION.

How to conduct a successful group

1. Organize systematic methods for getting the facts... household surveys, meetings with key officials, employment of expert counsel.
2. Present the facts to the people, your civic leaders, the local authorities.
3. Work with other local groups and official agencies.
4. Plan long and short-range objectives... each with a concrete beginning, middle and end.
5. Maintain a continuing program. Vary it. Make membership easy, keep it representative.

Some things your group can do

1. Keep up your own homes, encourage others by sharing your experiences in housing improvement with them.
2. Organize neighborhood and block groups to handle their own problems.
3. Undertake special neighborhood projects: clean-up campaigns, planting trees, converting vacant lots into pleasant playgrounds.
4. Be the "watchdog" on city services and facilities, guard against violations of housing or zoning codes.
5. Publicize community improvement projects and maintain contact with national groups such as ACTION.
6. Hold periodic Community Conferences, invite civic officials to explain local laws and answer neighborhood questions.

ACTION:

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advanced design guarantees maximum glare-free lighting of all working surfaces . . . and provides a true 'welcome' appearance for our visitors.

"Our architects, Firestone & Cassidy, and our general electrical contractor, The J. P. Novatny Company, both of Akron, have assured us of valuable savings in installation because of the construction of these Sylvania fixtures."

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tion in view of the relatively small part that interest plays in total municipal and state expenditures. . . . Actually, interest has increased less in the past decade than have other types of expenditures. . . . The potential plight of municipal finance arises not out of increased costs of borrowing, but out of growing costs of current operations and of enlarged capital expenditures." The average interest on the nearly \$10 billion local long-term school debt is still less than 2.5%. (In 1931, interest totaled 4.8% of school debt and in 1946 it was 4.1%.)

The Fed points out that there are worse things than tight money, that inflation can prove more costly over the next eight years than high interest rates (page 167). Up to 1965, building via long-term borrowing would be \$2.6 billion cheaper with long-term interest rates at 5% and prices steady, than it would be if interest rates stayed around 3½% but prices rose an average of 2½% per year (something less than they have been rising for the past few years).

Critical yardsticks

The best way to battle higher interest rates, say the experts, is for a school district to improve its credit rating. It should have competent legal and financial advice, they say, and, above all, watch what they call "the critical yardsticks." These are: the ratio of total debt to assessed valuation of property; total debt to full market value; per capita debt; the debt calendar itself, that is, how the debt is spaced over the future; how much state aid a locality gets; the tax collection record. Conservatively, investment bankers, as well as those who rate municipal bonds and thereby play a major role in establishing interest rates, say that total community debt should not exceed 15% of assessed valuations. School district debt alone should not exceed three and one-half times a locality's total annual expenditure. The debt calendar should be evenly spaced, without large chunks of debt coming due in any short period. Too much reli-

ance on state aid sometimes looks scary to an investment banker, because state legislators can trim such aid at any time. And if a locality needs a lot of state aid, it indicates its own inability to handle local problems. Finally, a community's tax collection record should be good, in all kinds of economic weather.

Taxes, regressive and progressive

Taxes are, in the minds of many, the nubbin of the whole school finance problem. Traditionally, school debt and school operating expenses are paid for by property taxes. Now this tradition shows serious signs of breaking down. These taxes have already shown that they are not adequate, in most cases, to do the whole job of providing the funds for school building. They are referred to as "regressive taxes" contrasted to "progressive taxes" such as the graduated income tax.

Property taxes are regressive in that they are inflexible, slow to respond to changes in the business cycle due to the fact that real estate values generally are slow to move and local assessors even slower. Thus, in a period of prosperity such as the past eight years, while federal individual income taxes have gone up 108%, and state income taxes more than 130%, local property taxes have gone up only 72%. Since 1940, the gap shows even wider. Property taxes have nearly tripled since then, but state income taxes bring in seven times as much revenue as in 1940, and federal income taxes nearly 40 times as much.

The balkiness of property taxes to respond to prosperity doesn't mean that they have no advantages or that localities have reached the end of their capacity to tax. The big advantage to the property tax is its stability—while it is sluggish in a time of fast-moving prosperity, it is likewise more dependable when the business cycle moves the other way. And there is still plenty of room to expand property taxes. Most localities currently value their property at only 30 to 40% of true value, on the average. And debt lim-

its for most localities are around 6 to 7%. Thus, they could still stay within a safe debt limit range of 10% by simply raising the percentage of debt that can be outstanding. Or, they can value their property on more realistic terms.

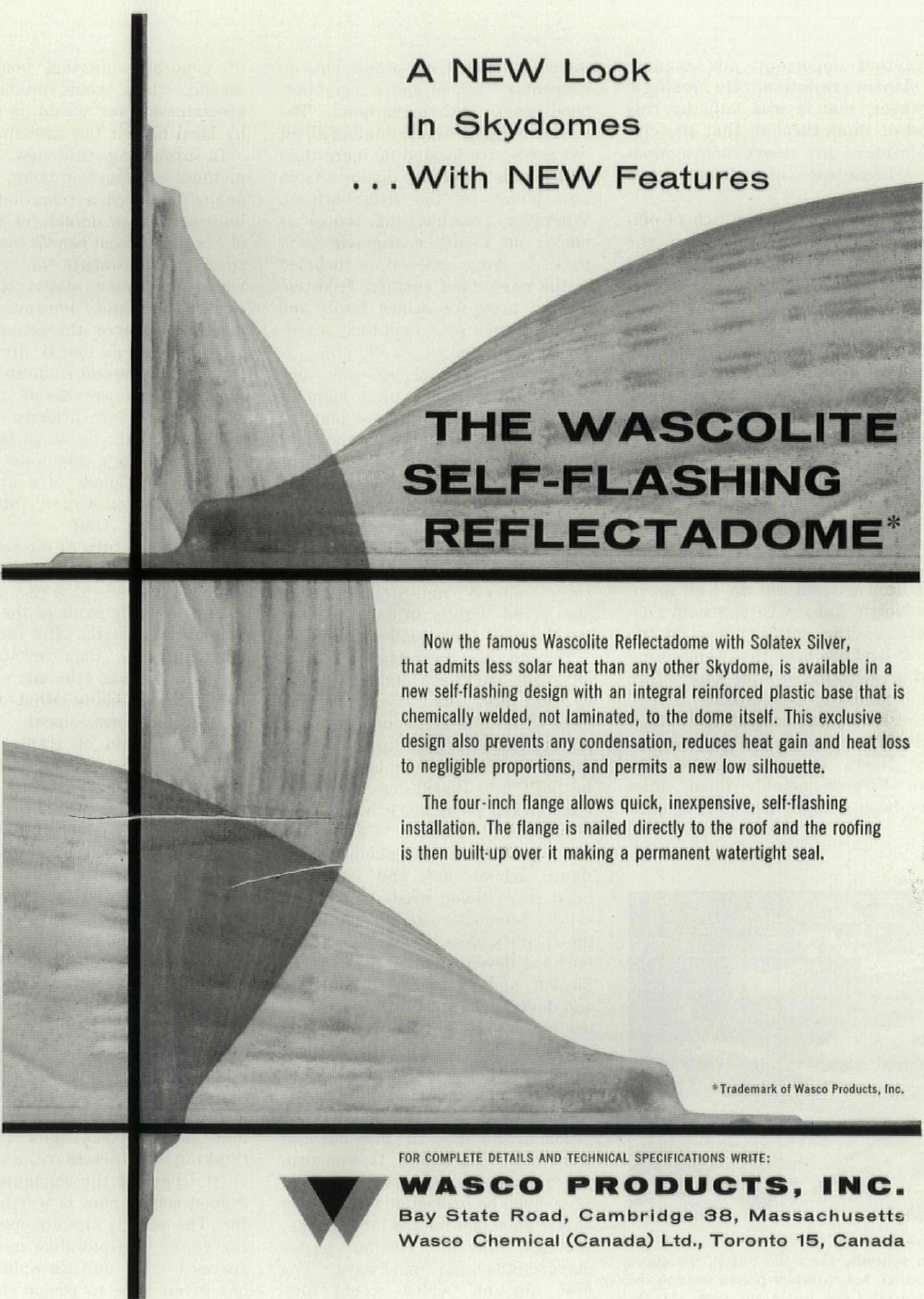
But for nearly half the states in the Union, debt limits can be changed only by constitutional amendment, indicating how jealously legislators guard the sensitivities of taxpayers. And, on the local level, there is no surer way to start a heated wrangle than to suggest a boost in property valuations.

The fact is that evidently people are willing to pay more for schools through income, sales and other such taxes at state and federal levels than they are through local property taxes. The US Office of Education has observed that "the shift from local taxes is partially due to difficulties with the general property tax and to the ease with which new state taxes are enacted, collected and distributed."

Difficulties attending the property tax as a revenue source have been largely responsible for the growing role of the states in school financing. State aid of all sorts accounts for nearly 50% of all revenues for public schools. Ten years ago, state aid accounted for only 39%.

Evolution to Revolution

When the furor over high interest rates has finally died away, the fundamental problems of the willingness and the capacity of taxpayers to pay for schools at the local level will come into clearer focus. If the federal and state governments are going to provide the bulk of the funds for school capital expenditures, new financing tools will be evolved, some of them stemming directly from the experiments and experiences of the past two years. If, as present trends indicate, fiscal responsibility for school building slips away from local government, some measure of political responsibility will inevitably shift also. The evolution of the economics of public schools could cause a revolution in the politics of public schools.



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were that important, and chanced a blanket rejection. He realized, however, that it was only by this kind of think-through that the city could make any impression against the pressures of characterless growth.

Fortunately, city and school officials were fearful enough of the population increase statistics to feel kindly toward visions. The school board was willing to work with the park commission—or any one else, for that matter, who could make sense out of the boom.

By winter of the next year, when the city signed on Engelhardt, Engelhardt, Leggett & Cornell as educational consultants, school-park cooperation had become a reality in Kansas City North. Stanton Leggett could say without fear of contradiction: "There are relatively few places where a cooperative program has been carried out so well as in the North Kansas City School District. . . . The critical aspect of the whole deal has been the preplanning and preselection of sites long before the community developed."

Geissal's plan, backed up by Leggett's annual surveys, put Kansas City North in an enviable position. Fifteen neighborhood units have been mapped out so that each

includes about 4,000 people plus an elementary school and a neighborhood park and playground. The school and play areas, totaling about ten acres, are located no more than half a mile's walking distance from any home in the neighborhood. Wherever possible, the school is placed on a site contiguous to a park; in some cases it is included in the park. Cost savings, from decreased need for school buses and special school play facilities, are already being felt.

By the original scheme, five neighborhoods made up a community. Each community was planned to contain a secondary school and community recreation space of at least 25 acres. It was conceived that three community units would be sufficient for Kansas City North's population, which will go up to 75,000 in the foreseeable future. (A recent survey indicates that the plan erred slightly in underestimating the need for secondary schools.)

Beyond this, the report called for city-wide parkways and play areas to total more than 700 acres. Yet, even with these generous allotments of free space, Geissal knew that additional safeguards would have to be built into the system. One that has worked particularly well is the "Community Council Forum," a group of citizens and planners who figure school play and neighborhood recreational needs before real estate becomes scarce. Thanks to the forum's close scrutiny of neighborhood developments, sites can be platted and purchased in advance and dovetailed into the over-all land-use pattern. With costs in developed sections more than five times those in undeveloped sections, this kind of foresight makes a considerable difference in the community budget.

The financing of the plan has also worked out as hoped. It was proposed that the necessary total of \$1,100,000 be broken down into two parts: \$500,000 for the large parks; \$600,000 for the smaller parks, playgrounds and parkways. The first amount, which would ultimately benefit the city as a whole, would be acquired through the sale

of general obligation bonds. The second, which would produce more specialized good, would be acquired by local benefit tax assessments.

In proposing this new, unusual method of fund raising, Geissal again displayed a remarkable willingness to risk defeat for the sake of his plan. Local benefit taxes force special assessments on residents whose properties border on a particular community improvement. In most sections of the country they are regarded as illegal, discriminatory and the surest route to political suicide. They are barely tolerated when used for priority repairs, would normally be cause for revolt if diverted to a planning project. But here the shade of a highly respected Kansas Citian intervened, one Delbert J. Haff.

Back at the turn of the century, it was Haff who had succeeded in laying out the pleasant system of parks that is now the pride of the old-line residential district. His method of financing: the then revolutionary, but unavoidable (the city's bonded indebtedness being what it was) idea of local assessment.

With the aid of Haff's memory and his own realistic arguments ("no one likes taxes, but . . ."), Geissal won the point and the financial part of the plan is now being implemented. All of Kansas City North is being treated as a huge, single benefit district. Some 9,000 to 10,000 tracts, involving that many individual owners, are coming under the program. And the owners, who appear willing to go along, can either pay the total at one time or divide the assessment into nine yearly installments.

The fact that the plan has survived these many tests is a kind of miracle of local awareness: awareness on Geissal's part that big thinking was necessary, awareness on the part of the community that a good school plan is worth paying for. The plan is already opening up for young and old alike new green spaces for life and learning. And it has given hope to people elsewhere that the school in the park may be a clue to salvation for the entire town.



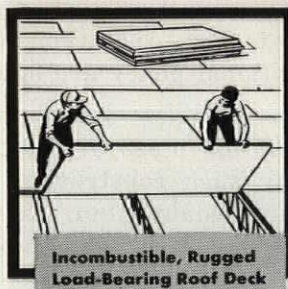
Two schools, the lower public, the upper parochial, are carefully placed next to the Windwood Lake recreation area. At the top is the growing neighborhood which they serve.



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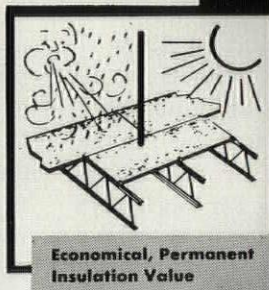
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guidance on how to compare school costs, see p. 134.) Some of the schools lauded in the *Digest* appear to be good values, and some typical. To help readers judge for themselves, they are shown or discussed on p. 120.

General economies recommended by the *Digest*, far from being the exception, as the article implies, are almost universal in schools today. A number, in fact, are used at Heathcote. Several that are highly touted, such as the building of a school "core" to which additional classrooms can be added later or the use of exposed masonry indoors, were in fact first used by the architects of Heathcote in a famous prewar school, Crow Island, in Winnetka, Ill. But in the *Digest* they are credited—with the air of big news being imparted—to an architect who has sensibly adopted them, as hundreds of other architects have today.

Nonetheless, the fact does remain that school taxes are high—as the *Digest* says, at their highest level in American history. (Every expenditure is at its highest level in American history.)

The *Digest's* thesis is that this sorry circumstance of high taxes is owing to one culprit—those "lavish" schools. "To build their lavish schools, towns are being plunged into debt for a generation to come. In many places, school costs take up more of the community's total income than all other services combined."

Wait a minute. Aside from the fact that school building costs average amazingly low, lots of things come out of those taxes other than school construction. Last year total school costs amounted to \$11.7 billion. Of this sum, roughly \$2.8 billion or 23.8% was for capital outlay. (Even this figure includes much in addition to construction—the purchase of land, its development, the purchase of furnishings and transportation equipment.)

Nor must we forget, as the *Digest* did, the cost of borrowing money for school construction. A difference of 1% in bond interest is equivalent to an increase of as much as 15% in construction costs, so far as the

taxpayer is concerned. Interest rates are going up. The best rate for the first issue of State of California School Bonds in 1950, for instance, was 1¾%. The best rate the state could get on its most recent issue was 3½%.

In real life, the wonder indeed is not that school taxes are so high—but that they are not higher. Capital outlay for schools in 1925-26 was 20% of total school expenditures. Last year it had risen by only 3.8% in spite of the fact that, unlike the taxpayers of the twenties or thirties, we are contending with an abnormal construction backlog (80,000 classrooms in arrears) and obsolescence (79,000 more classrooms needed for that alone, a heritage of the depression and war years. In addition we are attempting to meet shifts in population and growth of new suburbs unparalleled in American history. Incidentally, in 1925-26, only 26% of pupils stayed in school through the 12th grade, compared with an estimated 65% today. How can school costs help but rise? There is nothing sinister or mysterious about the reasons.

The \$2.8 billion spent in 1956-57 for capital outlay on schools is, in reality, less than the amount spent last year by the American people for liquor (\$9.3 billion), or for cigarettes (\$5.6 billion) or for highways (\$5 billion). Burdensome as school taxes are, the money going into school building seems hardly an exorbitant allocation of resources for a nation dependent not only on cars and cigarettes, but also on an informed electorate and an educated working force.

Minor confusions

Aside from flaws in its fundamental thesis that unreasonably high taxes are fritted away in building frills, the *Digest* article is larded with many minor confusions. Two will serve as examples:

▶ "Available in most localities are prefabricated schools, or schools consisting of prefabricated parts in many materials . . . and including portable classrooms to meet emergency school enrollments. Any

economy minded school board may make a choice of one of these when hard pressed by urgent classroom shortage."

That statement confuses two totally different matters: 1) prefabricated building components, and 2) prefabricated rooms or buildings. Virtually every architect-designed, custom-built school today uses many prefabricated parts. As for prefabricated rooms or buildings, FORUM knows of no single instance in which these have cost less than a custom-built school or classrooms of comparable quality. In some instances, the prefabricated school has cost more. (For detailed information on school prefabrication, see p. 139.) There is no magic, cost-lowering factor in prefabrication of whole schoolrooms and school buildings. Sometimes it sounds as if there were—before foundation work, additional equipment normally figured into construction cost, and adaptations to legal requirements or state educational policy are figured in.

▶ "Many lavish schools today are costing up to \$25 or \$30 per sq. ft."

Any such construction costs are neither "many" nor are to accomplish "lavish" aims. They are rare exceptions, and then almost always the result of either difficult site circumstances or really phenomenal ineptness. Heathcote (bid in 1952), used by the *Digest* as the prime example of a "palace," had a construction cost of \$18.95 per sq. ft. Aviation Trades High School in New York, now under construction for 2,500 day and 4,000 night students, is that rare example of a conscientious school job which does exceed \$25 per sq. ft., but consider why: it has to conform to the most expensive city multistory building and fire codes, it had bad site conditions requiring piling, it includes a quarter-million dollar group of cells for testing jet engines, much unusual mechanical equipment including escalators and elevators to handle mass traffic in its seven stories, and among its many remarkable facilities are 37 special shops, a plane apron and hangar. Its cost is \$25.84 per sq. ft. Taking Indiana as

continued on p. 248



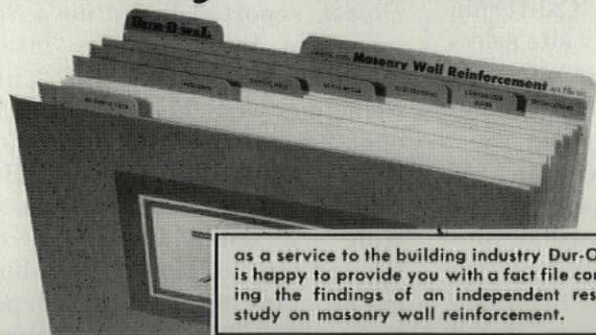
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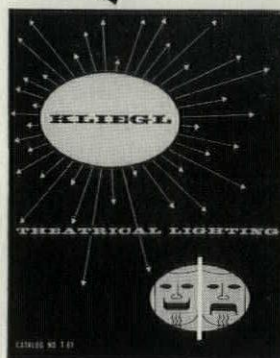
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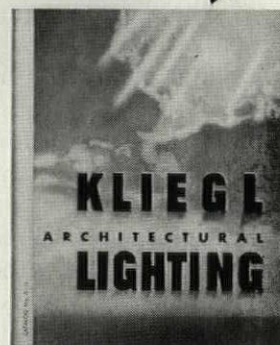


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an example of a state whose requirements rule out many design advances in economy used elsewhere, we find that even so most schools are in the \$12 to \$15 per sq. ft. range, a very few reach \$22, none reach \$25. Now, if the *Digest* has switched its basis of comparison at this point, without any hint it is doing so, and is suddenly including furnishings, cost of land, and site developments such as roads, it could produce examples. Otherwise, the statement cannot possibly be justified. Its only usefulness is for giving taxpayers the synthetic jitters.

Finally, there is the "authoritative" air of the *Digest* article, which gives so strong a ring of substance to the whole. Indeed, the article includes an explicit statement of first-hand and authoritative research: "To find out why, after billions are spent on our schools, we still have underpaid teachers and overcrowded classrooms, this writer has crisscrossed the US and consulted outstanding authorities in government, education and architecture."

The *Digest's* information on several of the "extravagant" schools could only be based on inaccurate hearsay and rumor, or misinterpretation, or it has been knowingly manipulated. It is kinder (and FORUM has reason to think, truer) to believe the writer was satisfied with hearsay. In three cases of the "economical" schools, the information is evidently derived from a pamphlet published by a building materials association. Its use is hardly an example of first-hand research. On none of these three schools, nor on two other specific references to economical schools, did the author even communicate with the architects.

Six authorities

Of the other four references to specific economical schools, one is generalized and anonymous, and the other three all involve Architect Robert A. Green of Tarrytown, N.Y., who was architect of two of the schools and associate architect of the other. Green was consulted. He seems to be the *Digest's* main, if not only, authority from the profession of architecture. He is delighted

with the *Digest* article and goes along completely with what it says.

Let us see what other authorities cited by name in the *Digest* say about the article:

► Dr. Walter D. Cocking, editor of *The School Executive* magazine, rightly characterized by the *Digest* as a "distinguished authority," reports: "I did not talk to Harvey [the *Digest's* writer]; he took the quote attributed to me out of an article and used it absolutely out of context. I would give many of these schools he calls 'good' and 'bad' a completely reverse appraisal."

► Dr. James D. MacConnell, director of the School Planning Laboratory, Stanford University, reports: "The *Reader's Digest* article appears to be out to attack everybody in the school business — architects, superintendents, board members and planners. My advice to the author was that he emphasize the need for school boards to give architects time to do their work, to plan ahead. The *Digest* distorted the point of view of every source of information I know. The arguments for the use of cheap materials are a fallacy. The place where money can be saved in school construction is in proper financing, proper planning, and proper site selection. I told the author that San Mateo school district in California saved a great deal by early site selection. But he ignored an example that did not tie into his generally critical thesis."

► The American Association of School Administrators reports the quote attributed to it regarding dining halls "used only an hour or two a day" was taken from a five-year-old publication in which it was used as an extreme, hypothetical example to emphasize a point. The *Digest* added the words "or two" on its own, and put the words in a context to make it appear the AASA was deploring a common practice. The AASA is dismayed by the way the *Digest* made usual economies sound exceptional, and exceptional extravagance sound usual, as well as by the article's whole "slant."

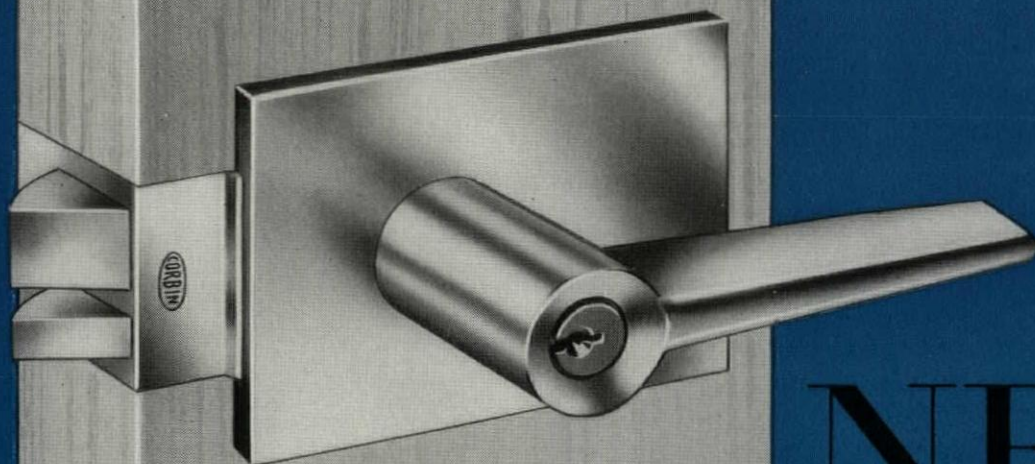
► Professor William R. Flesher, of Ohio State University, made these points: "The article may have done a

service by awaking interest of the public in school construction, but this may be outweighed by its disservices. It may make it tough for some communities to get good buildings. Some waste is occurring, but in spite of what people are doing for better schools, rather than because of what people are doing. My discussion with Harvey was for the most part in general terms. For instance I did not mean to imply, as it sounds in the article, that any large number of schools is being built with wasteful basements. I do not recall seeing any nonuseful school basement excavations in new construction in the past two years. The point I tried to make about auditoriums is that the trend is toward small ones or little theaters, along with multi-use of certain large spaces, as a better solution for many districts than the single large auditorium. The question is not just putting less money into schools, but how to get safe schools, educationally functional schools, attractive schools, schools which are not wasteful—good buildings for the money that is spent."

► Dr. William McClurkin, secretary of the National Council on Schoolhouse Construction, Nashville, whose "scholarly studies of schoolhouse extravagance" were extolled by the *Digest*, reported to *Nation's Schools* magazine that what is meant is "the Council's booklet of 'Thirteen Principles of School Building Economy.' One of the goals of the Council has been to combat waste. Harvey could have emphasized these principles. I don't think his editor wanted him to. How we can build to get economy was not the purpose of the article. There are 13 principles, but he doesn't mention those at all. They were pretty good and still are."

That completes the list of the *Digest's* own cited authorities, and that is what these authorities think of the way the *Digest* employed their names and positions to buttress its curious thesis.

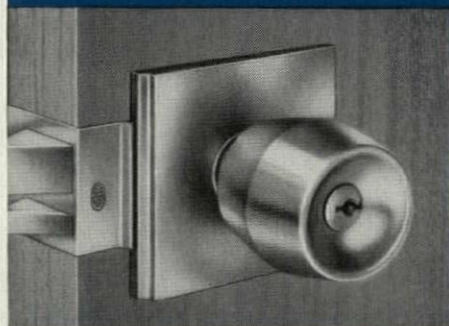
Public schooling is an integral part of the American way of life; and school costs, as a matter of public responsibility, are going to be with us a long time. They must be faced rationally and honestly.



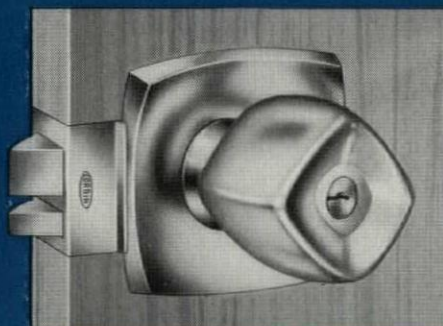
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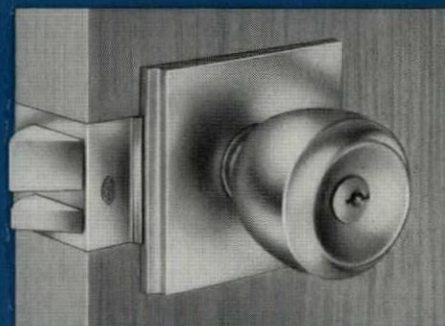
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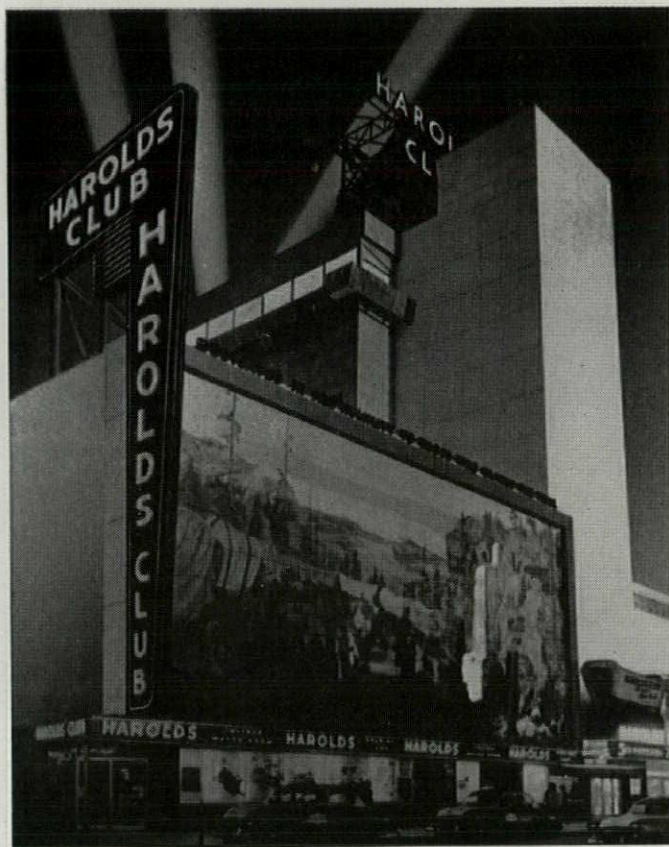
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*Harold's Club, Reno, Nevada, Ferris & Erskine, architects, Reno; Clyde E. Bentley, mechanical engineer, San Francisco; Earl O. Stice Co., mechanical contractor, Glendale, California.

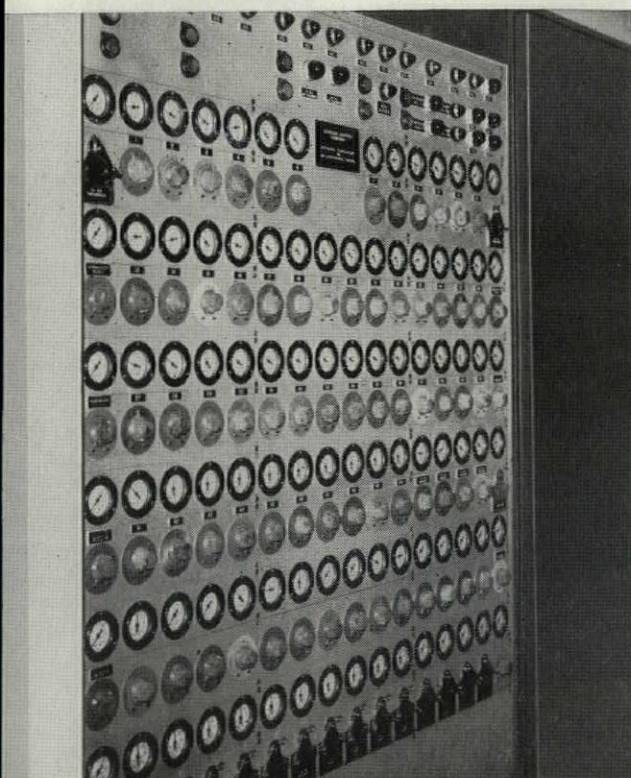
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0 Zones of Comfort. What appear to be section number markers over each gaming area are actually pendant-mounted Johnson *Comfostats*. There are four individually controlled comfort zones in the view above. Harold's Club offers a choice of 750 slot machines, plus roulette, black-jack, craps, and cards.



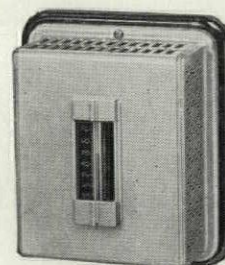
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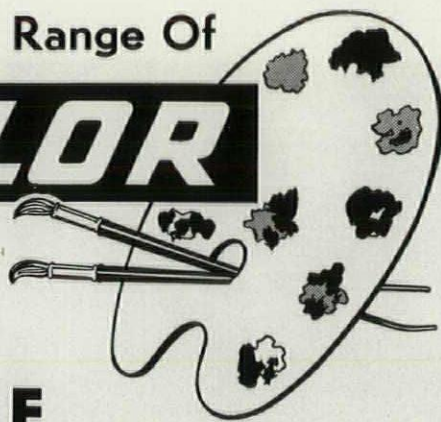
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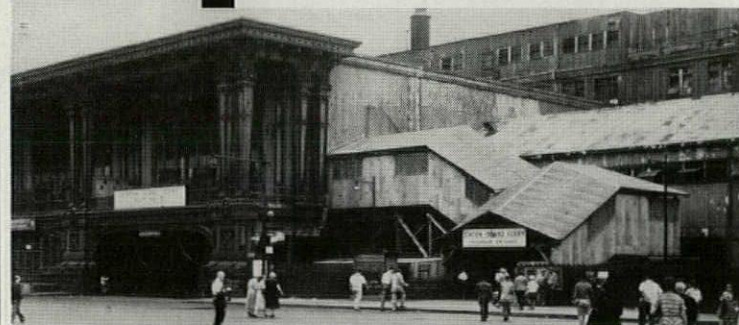
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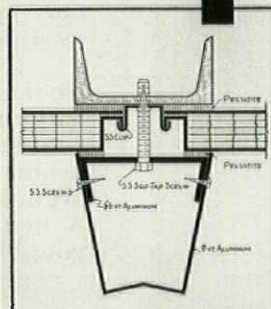
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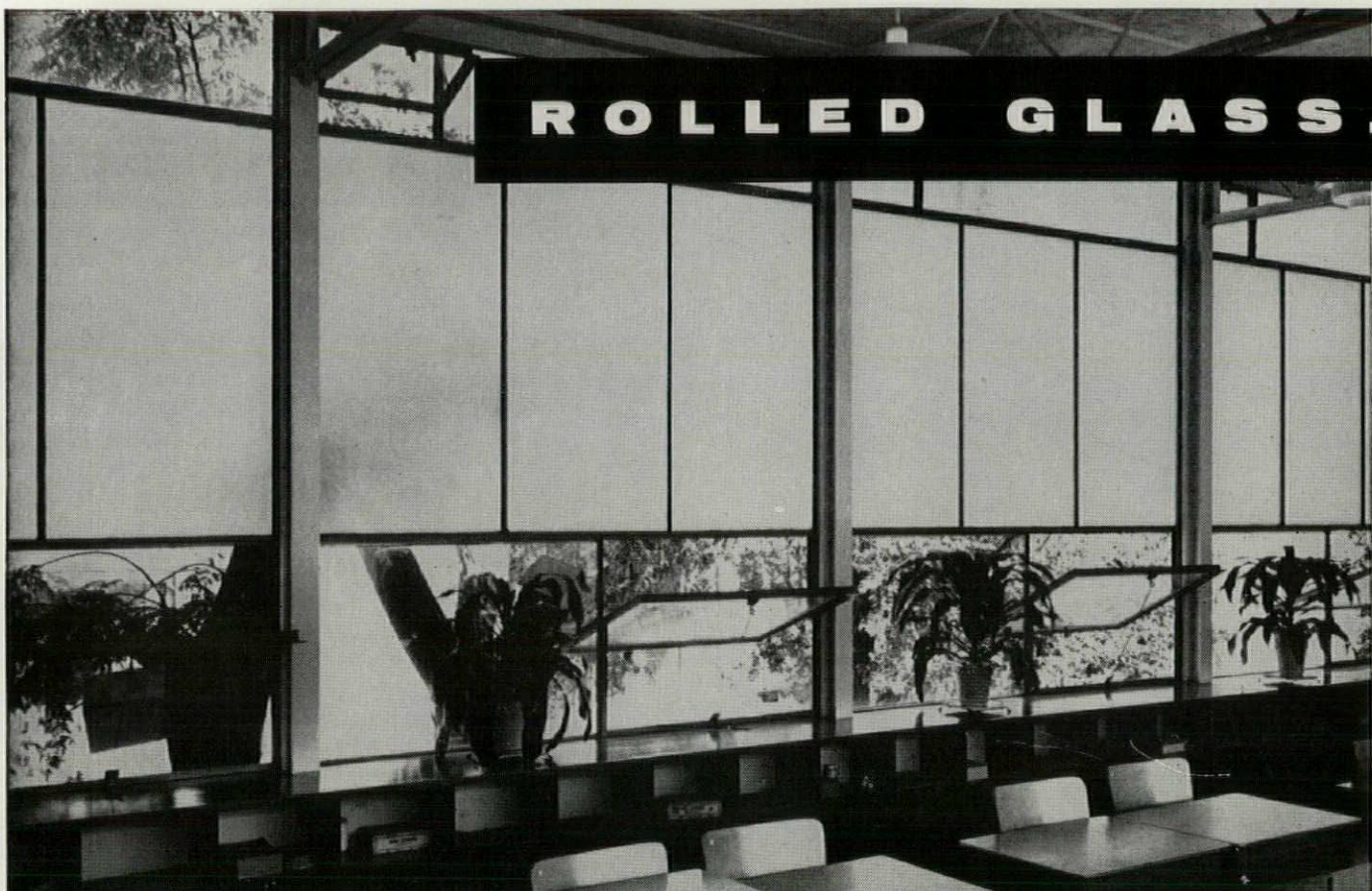
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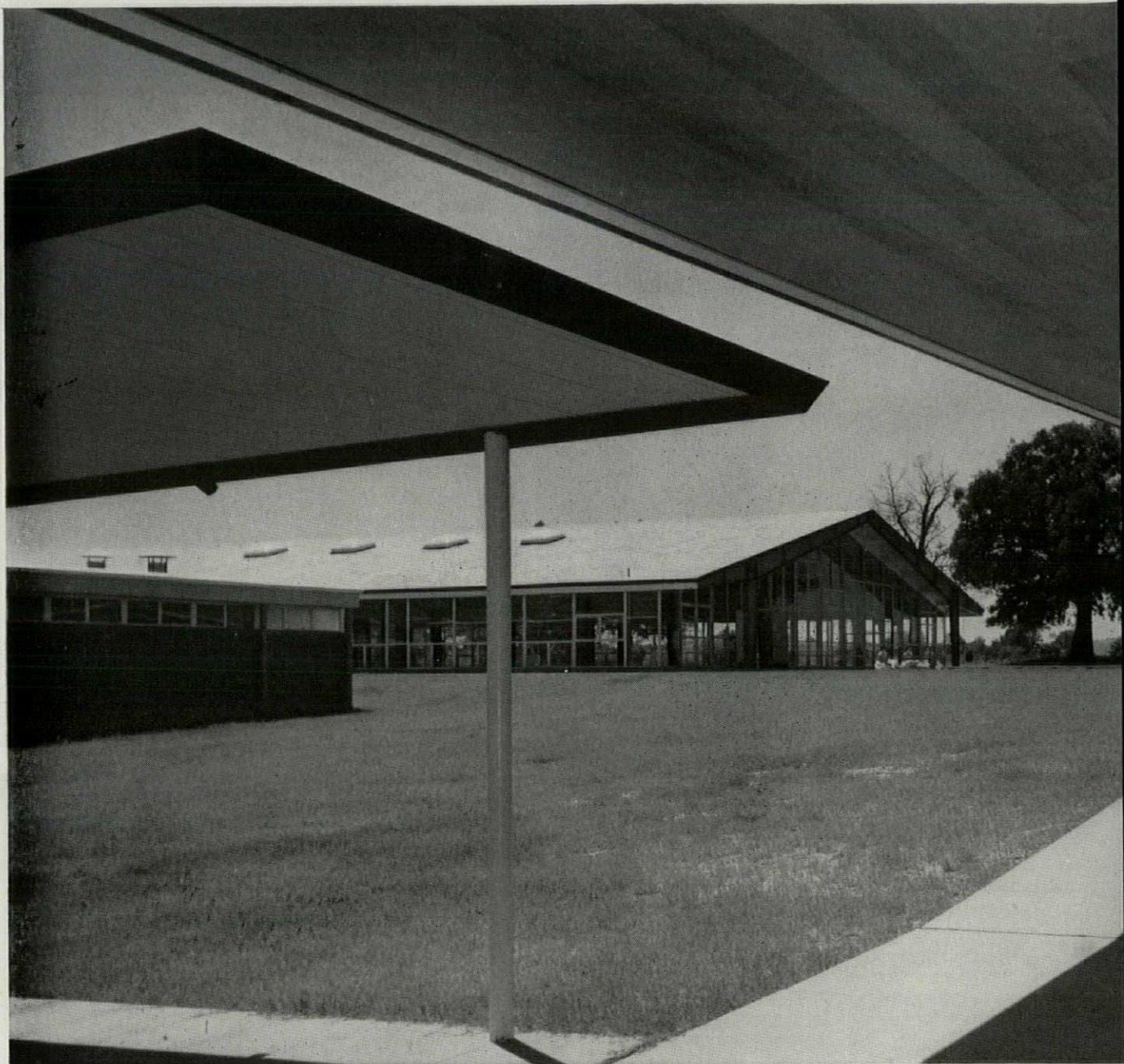


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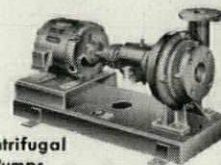
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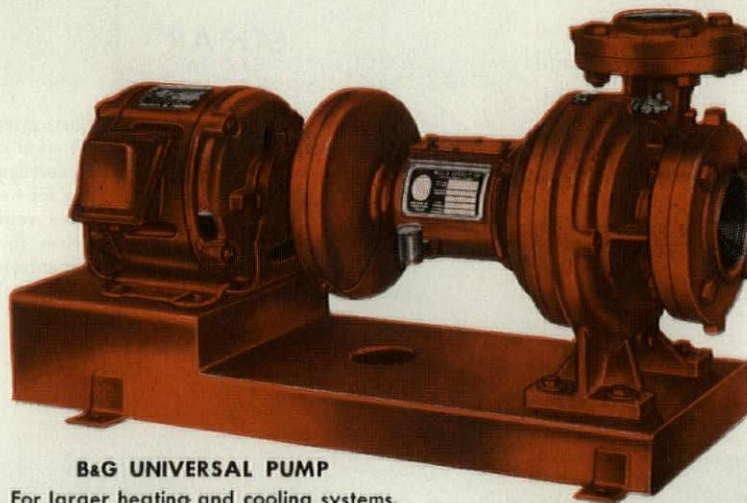
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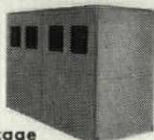
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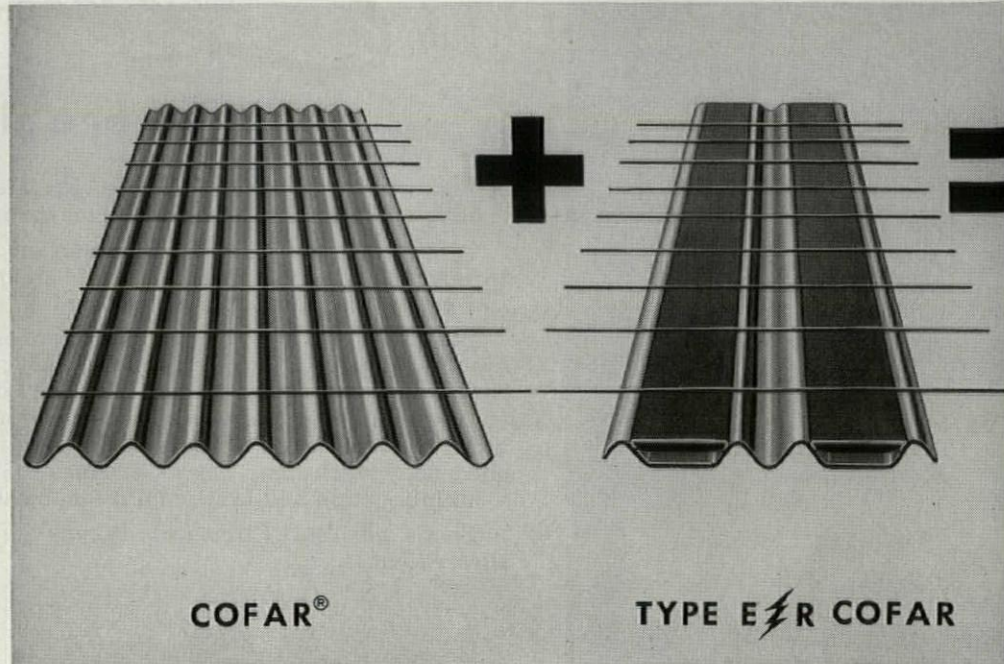
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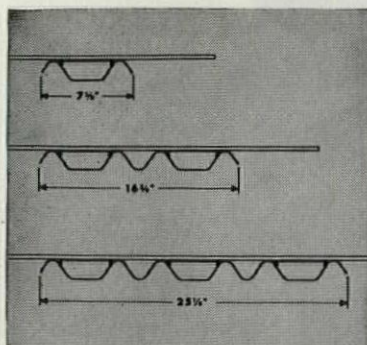
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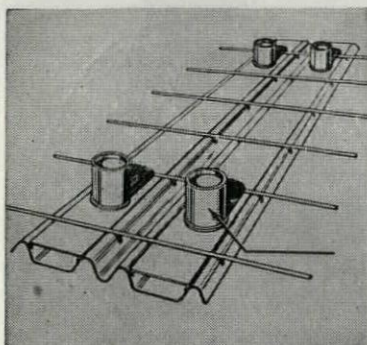
E-R Cofar cells are used between conventional Cofar units. These cells are wide troughs capped to form spacious 5.2 square inch raceways for wiring. NOTE: E-R Cofar units also have T-wires welded across corrugations to maintain Cofar composite slab action. Type E-R Cofar is equally suited to steel or concrete frame construction.

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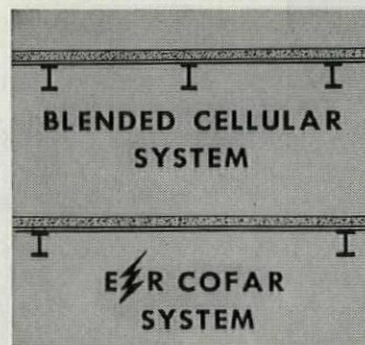
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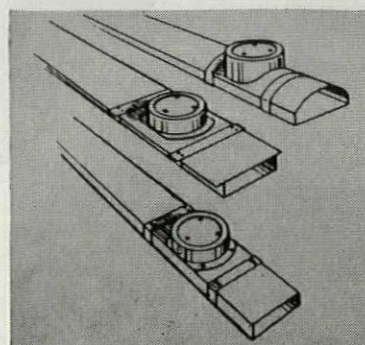
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Available with either pre-set or with blank cap plate for after-set inserts, E-R Cofar provides complete electrical accessibility. Pre-set inserts eliminate noisy and costly concrete drilling operation. If desks are rearranged, floor service outlets can be located in *minutes*.



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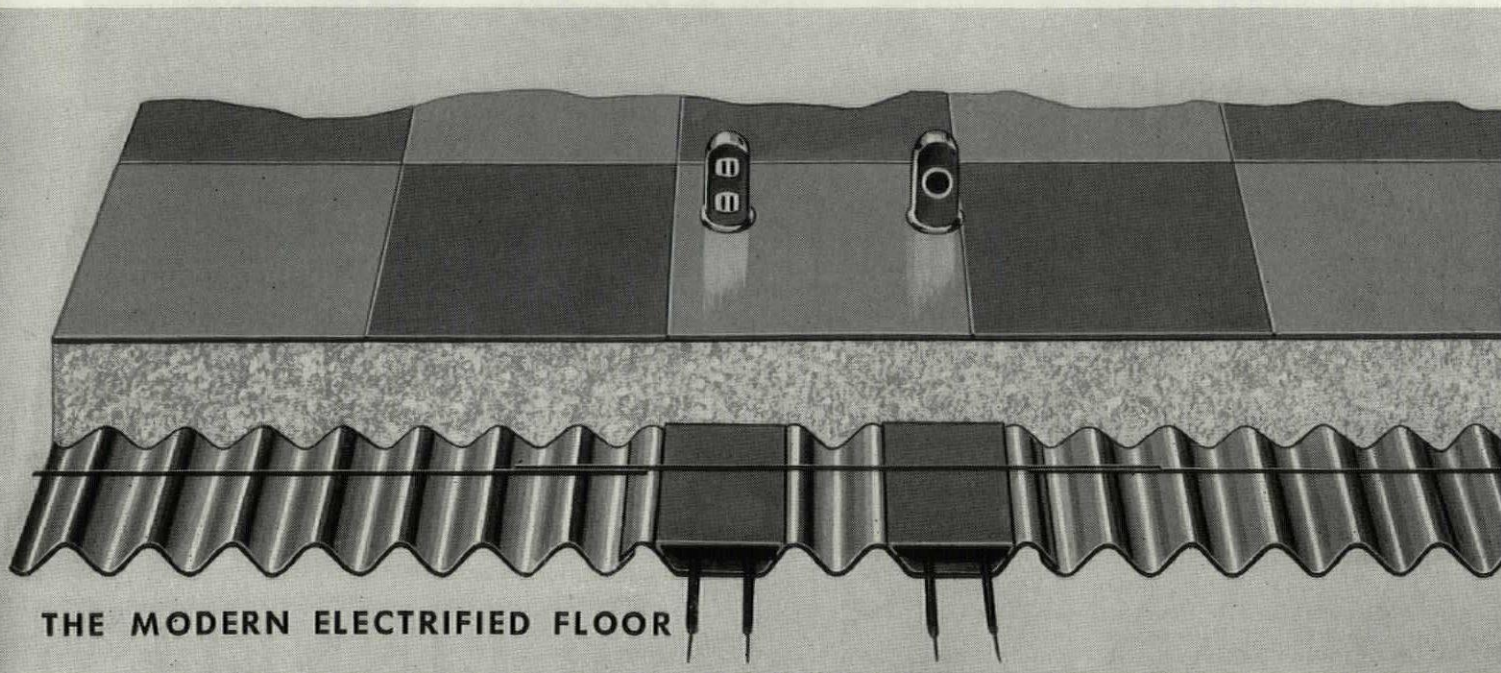
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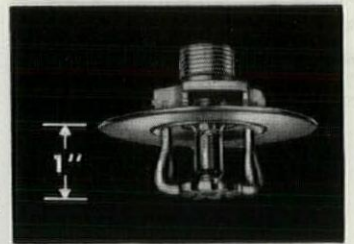
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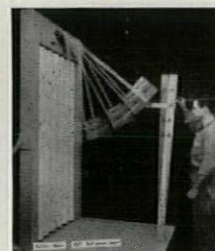
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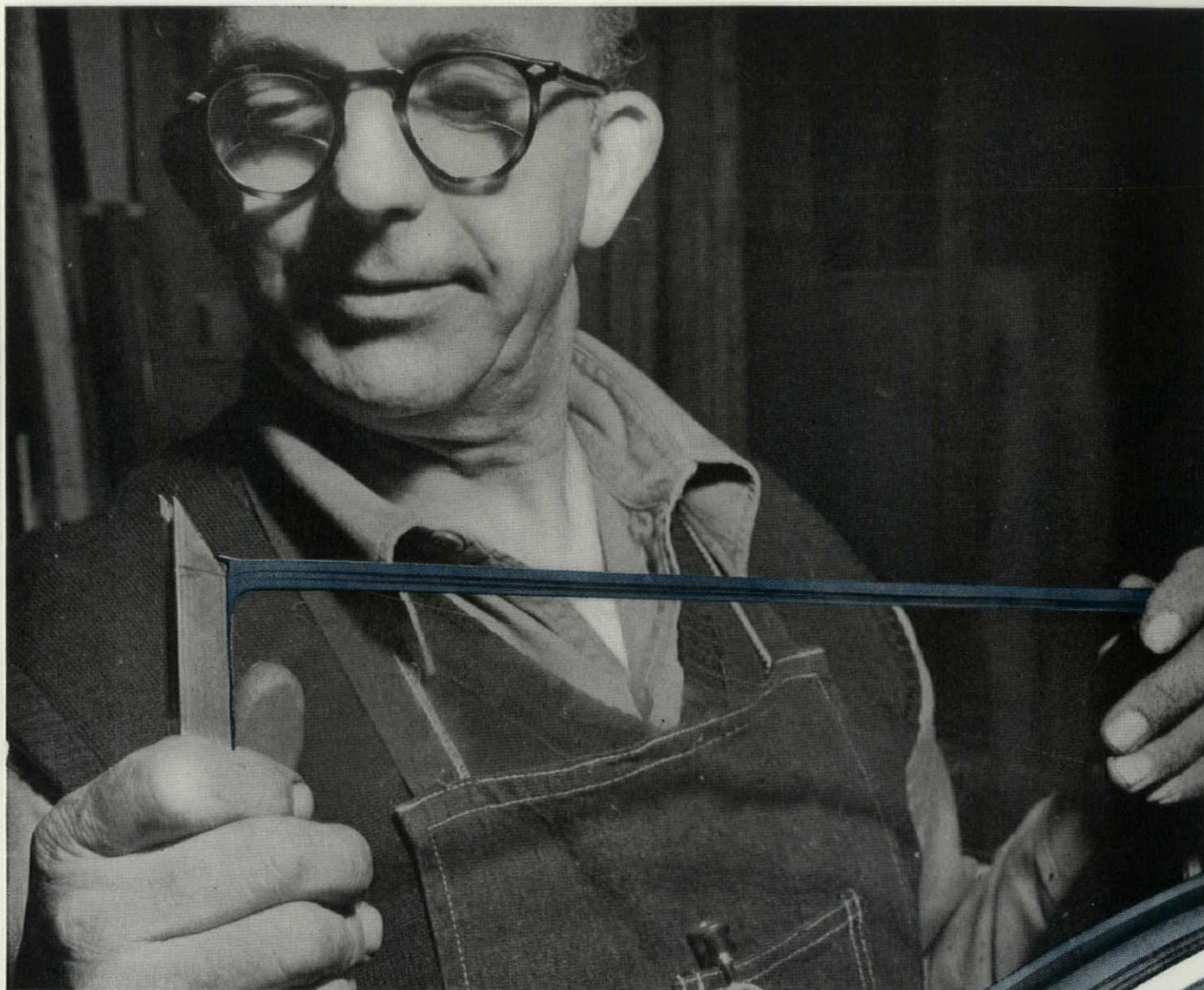
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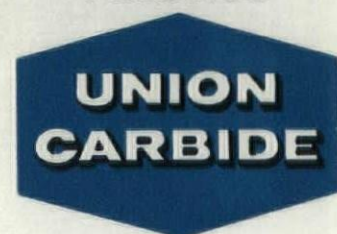
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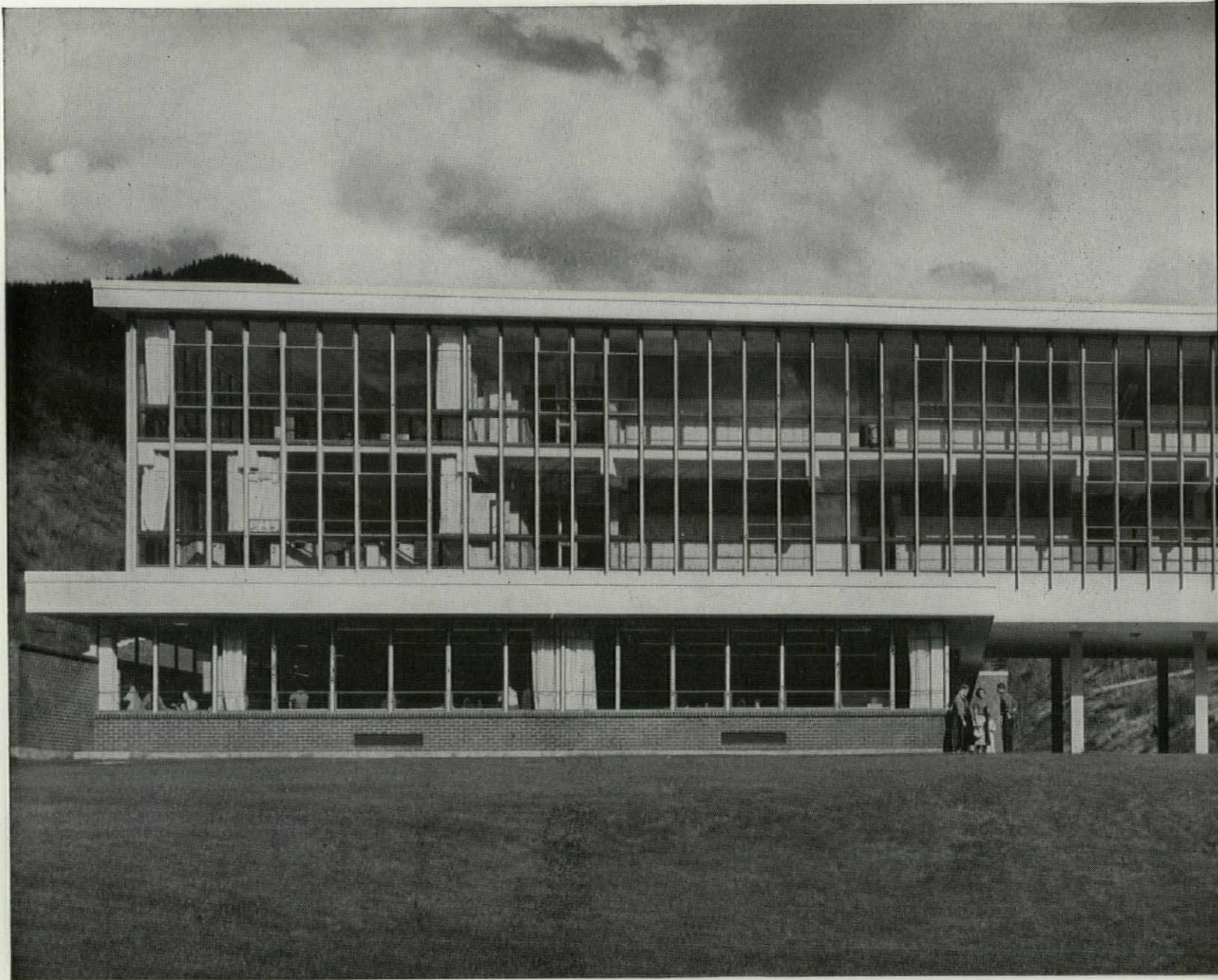


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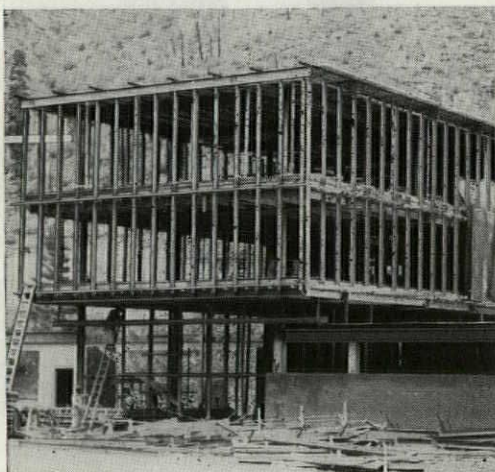


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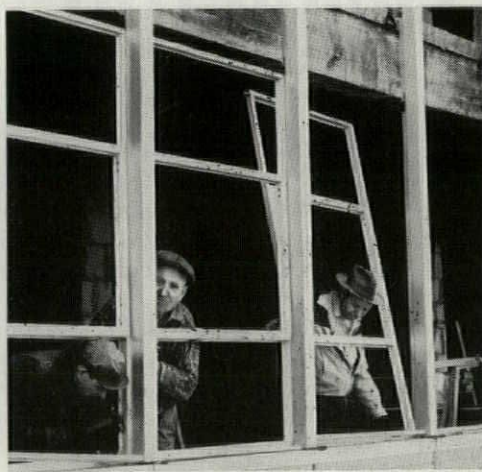
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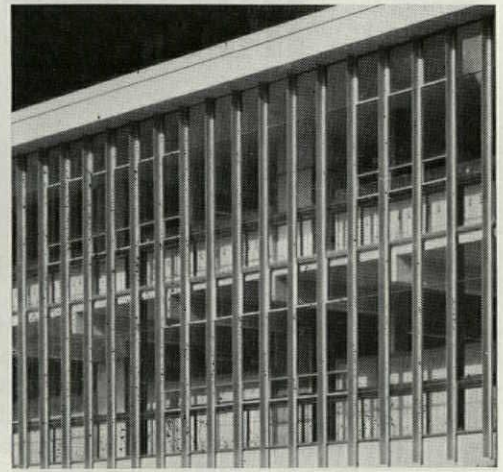
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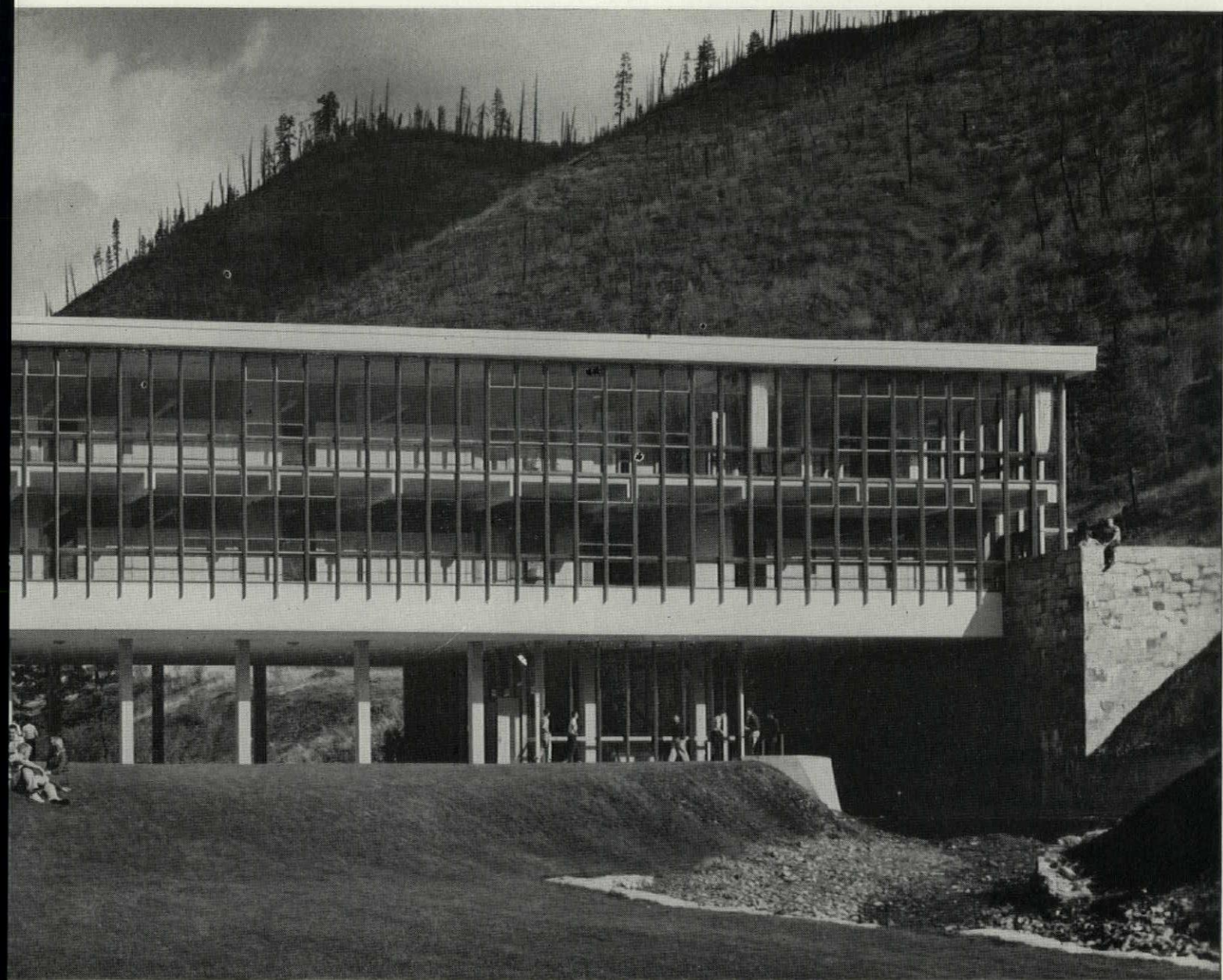
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KELLOGG HIGH SCHOOL, Kellogg, Idaho. Architects: Culler, Gale, Martell & Nerrie, Spokane, Wash.; Perkins & Will, Chicago, Ill. Contractor: Johnson-Busboom-Rash, Spokane, Wash. Photograph by Hedrick-Blessing.

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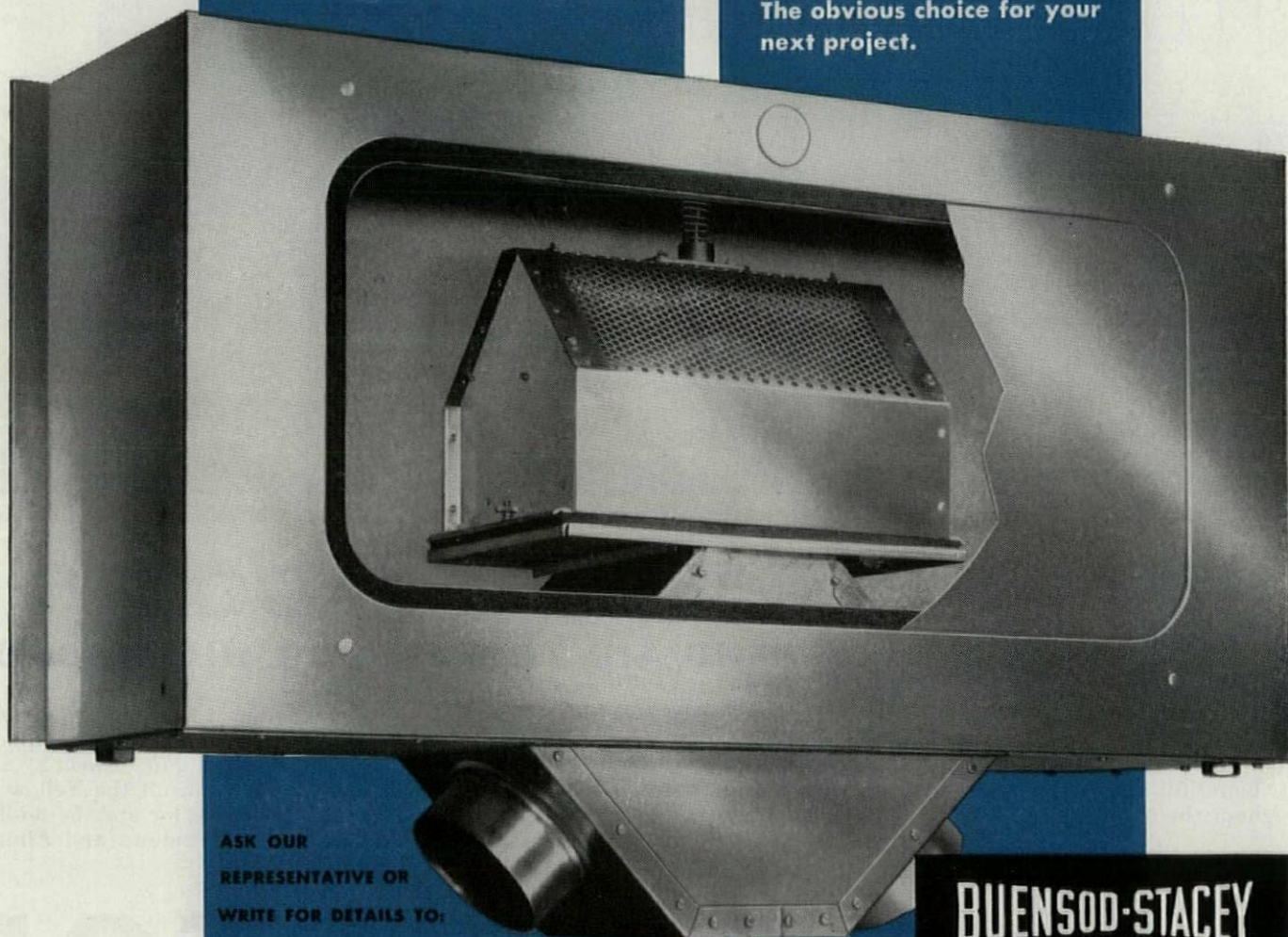
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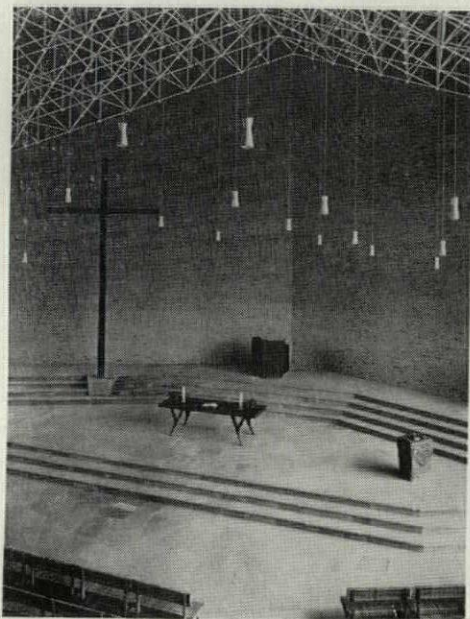
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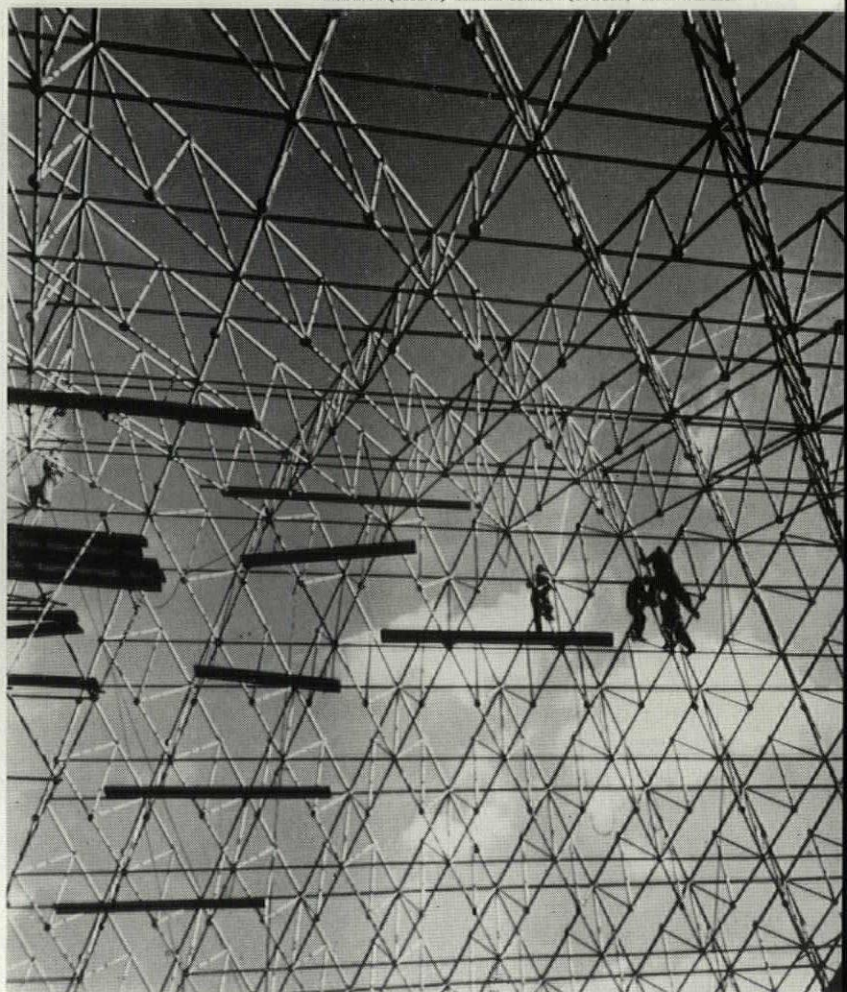
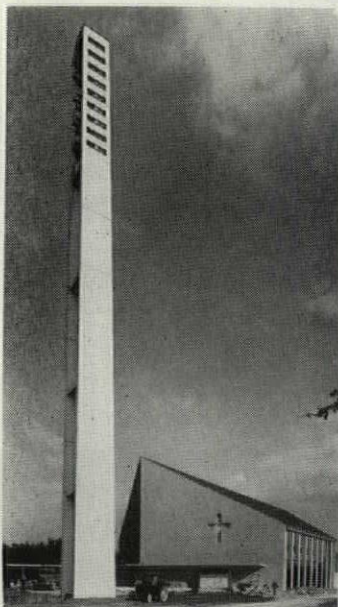
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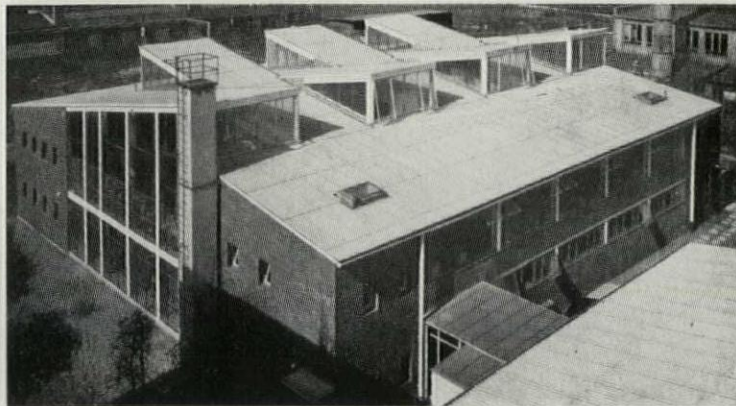
An enormous space frame forms the roof of a new church in Unterrath, near Duesseldorf. Putting it up was a revealing experience both for workmen (below) and for Architects Helmut Hentrich and Hubert Petschnigg, who had sought to apply the theories of Chicago's Konrad Wachsmann (AF, Sept., '54) to German construction problems. A less successful part of the "Petrus-Kirche" is the 123' bell tower (below, left).

PHOTOS: (BELOW) RUDOLF EIMKE: (OTHERS) ARNO WRUBEL

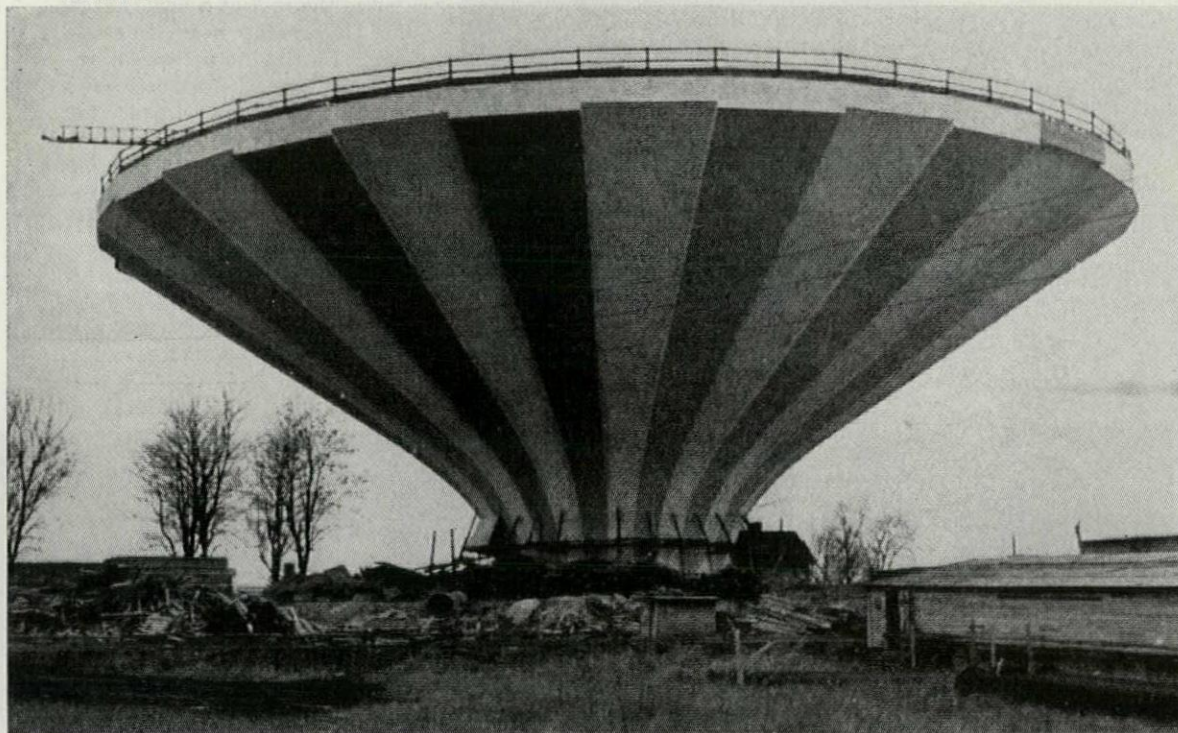


BERLIN ZIGZAG

Visitors to West Berlin's current International Building Exhibition may overlook a more modest but equally admirable example of German architecture in an industrial corner of the city. Designed by Architects Konrad Sage and Karl Hebecker for one of Berlin's vital precision electrical firms, the small plant fights a zigzag battle for all-important light.



COURTESY BOUW



SWEDISH TOADSTOOL

The oddly shaped water tower still had a long way to go when the picture at left was taken. To push the preassembled, 320-ton reservoir up on its 112' stem, 32 hydraulic jacks were brought into play. This incredibly arduous job (some of the jacks were hand-operated) took place in Örebro, Sweden last winter, is still the talk of the town.

TORONTO SCREEN

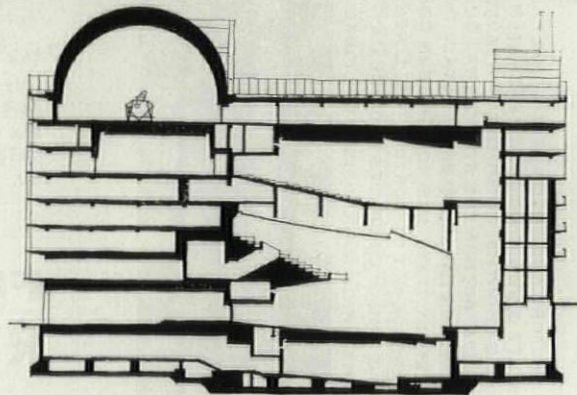
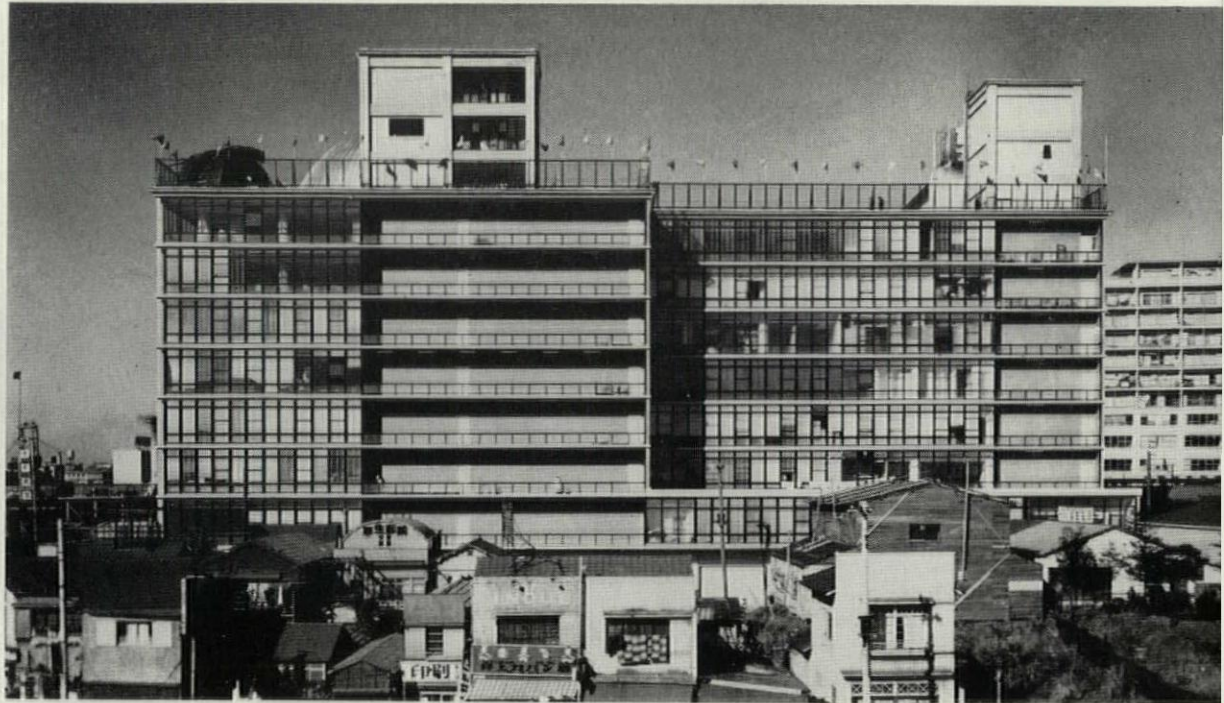
Architect Forsey Page's new home for Toronto's Juvenile and Family Court has all the room and equipment to sort out the problems of modern sociology—a three-floor, H-shaped plan, soundproofed rooms, "think" machines, steam-heated play courts. It also has the sequestered look of an up-to-date speakeasy. Through the pierced limestone façade the daylight comes brokenly; above the entrance a portcullis-like canopy is poised.



PANDA

TOKYO BEEHIVE

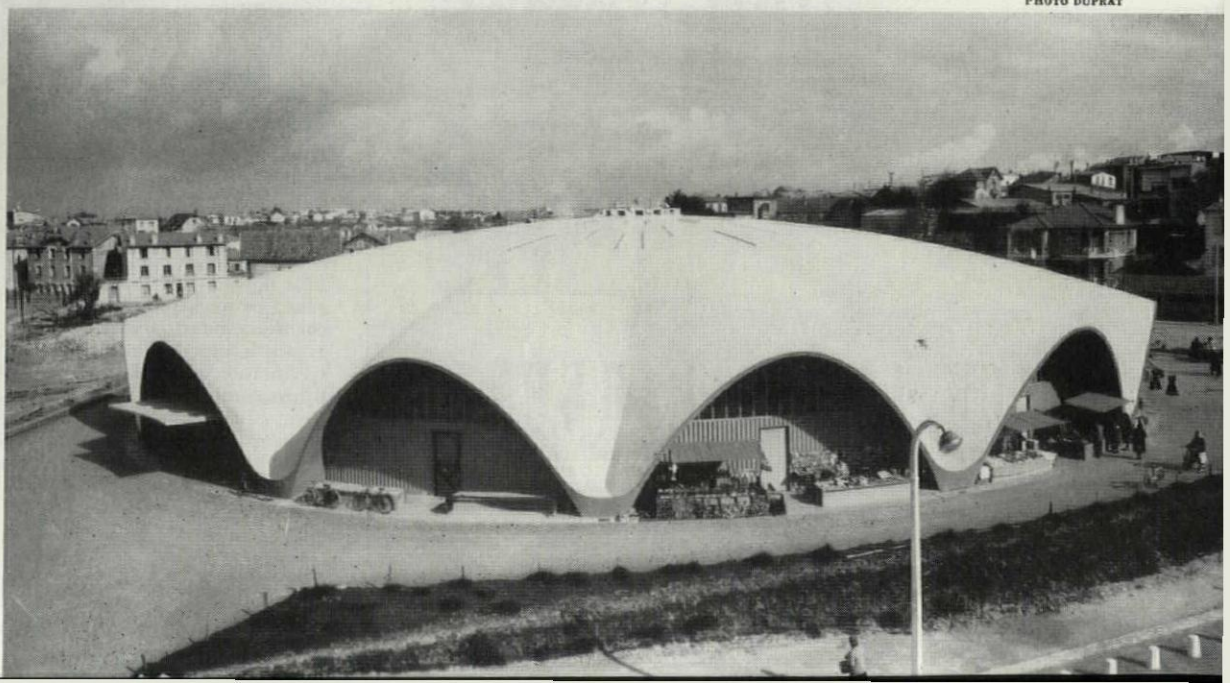
The railroad station newsreel theater is now regarded as rather commonplace in this country and abroad. Not so common is the facility at Tokyo's Shibuya Station. For connected to that station's extensive shopping areas and terminals is a monster theater-museum-planetarium that would satisfy the cultural demands of several US cities. Architect Junzo Sakakura is to be commended for somehow shoehorning into one well-integrated form four theaters, five restaurants, a fashion school, a planetarium, shops, and an astronomical museum.



FRENCH SHELL

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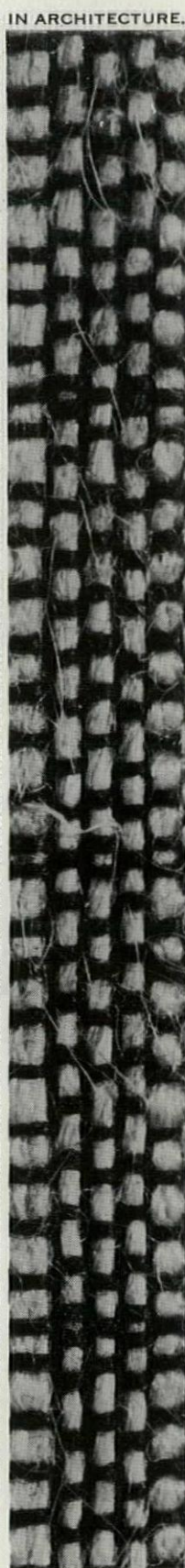


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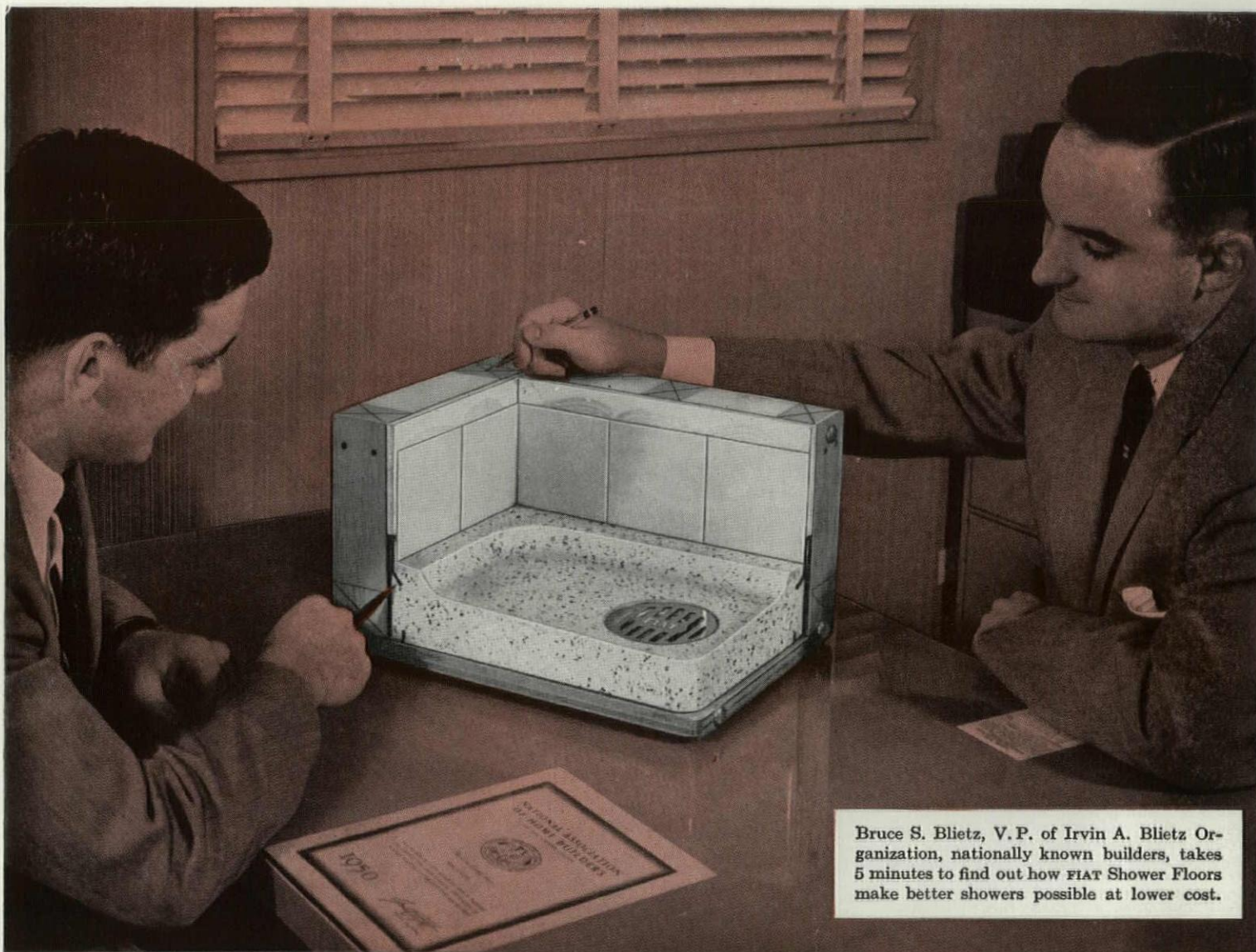
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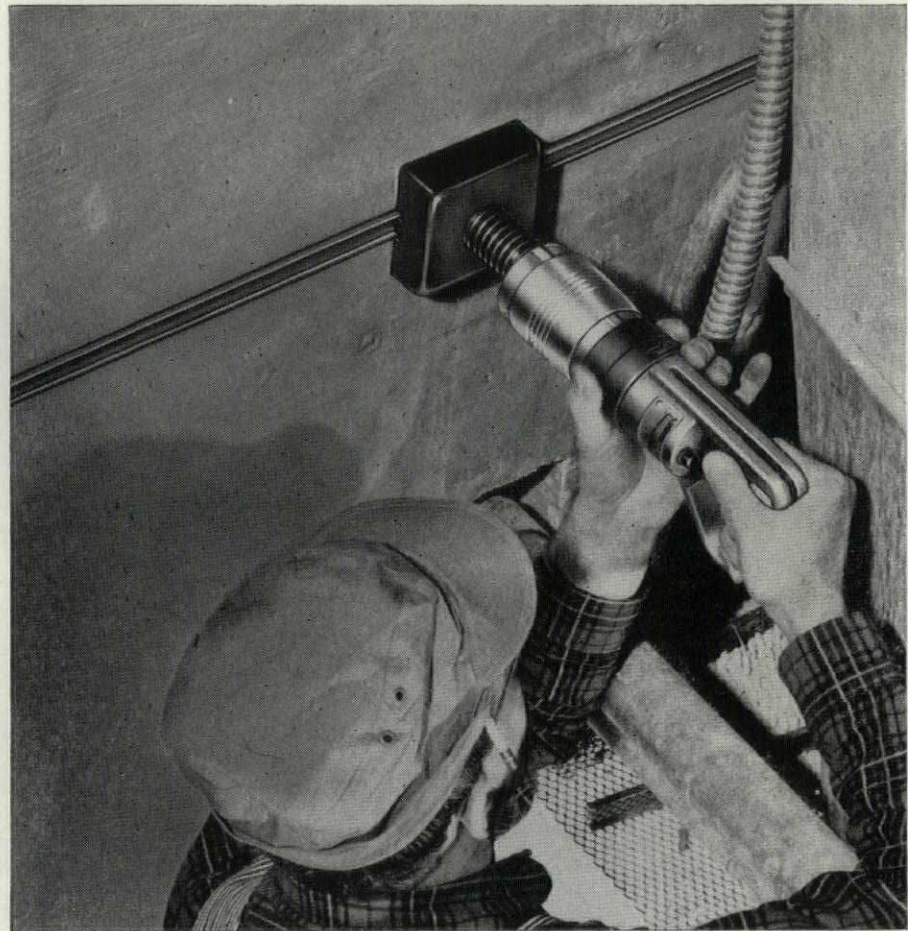
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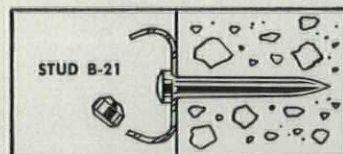
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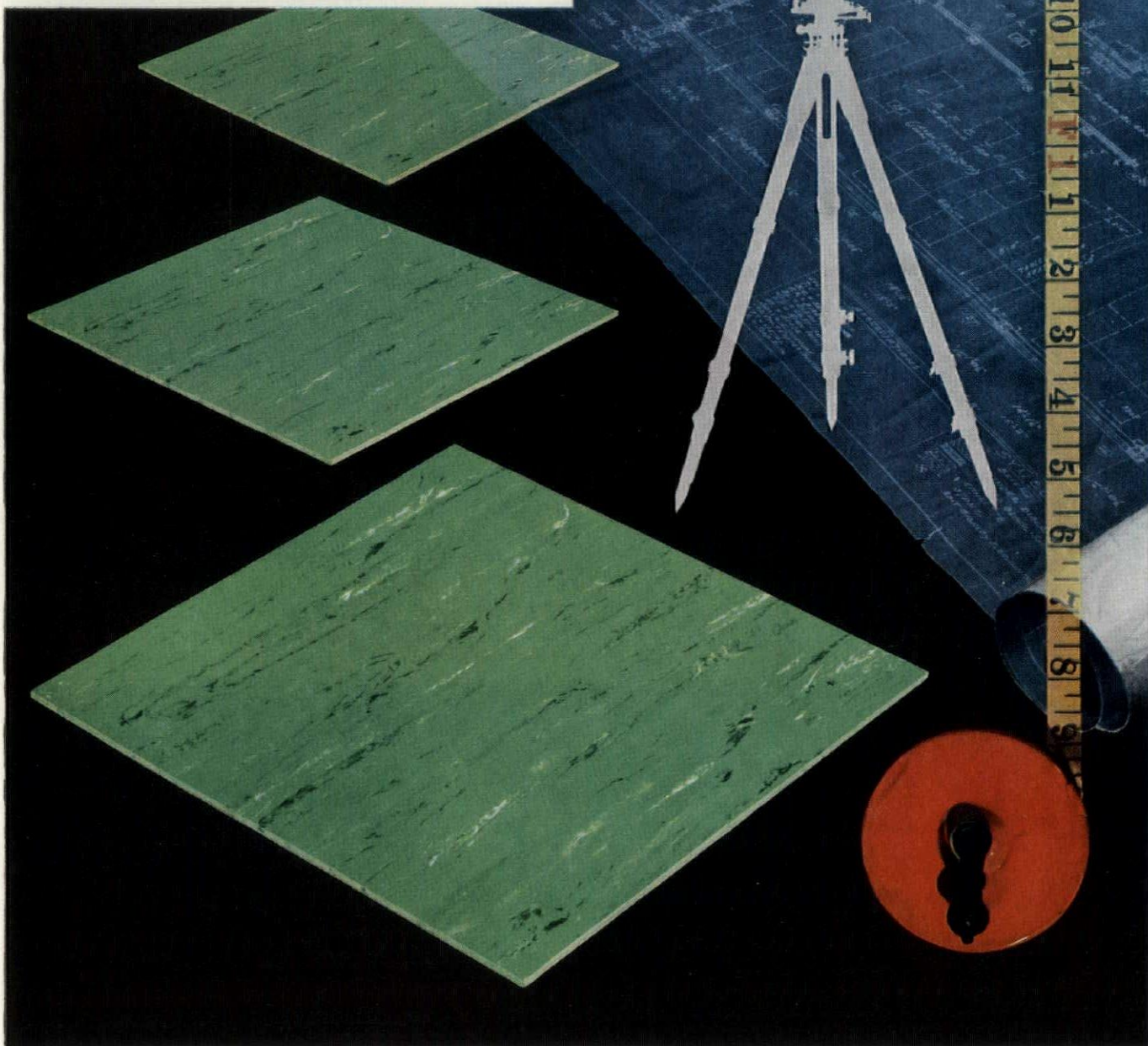
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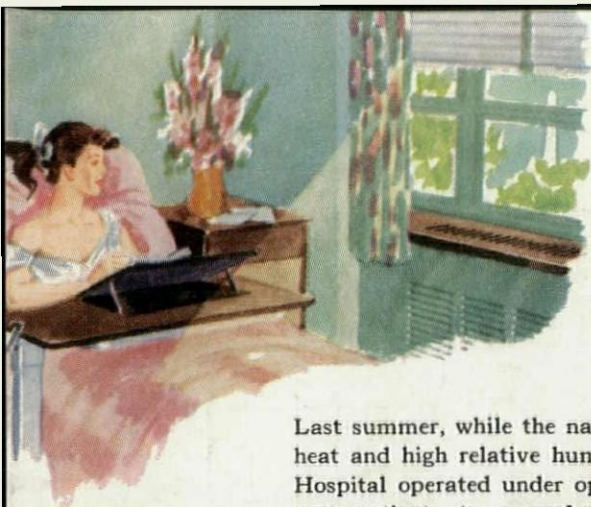
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