SCHOOLS FOR TEENAGERS
Sixteen beautiful, modern and efficient restaurants are in operation along the length of the Ohio Turnpike. Involved in their construction and furnishing were three different leasing operators, three contractors, two decorators and one architect.

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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.

116 That Reader’s Digest article
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.

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

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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.

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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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To work well, secondary schools must appeal to a highly volatile and special group of young people. Ten case studies show various combinations of workability and appeal.

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A typical school system in Maryland tries out a host of learning aids, including general education laboratories, showcase classrooms and the first full-scale teaching by closed-circuit television.

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Tight money has not yet hurt school building, but high interest rates and a shaky local tax structure raise the question: how will we pay for our schools?

168 Designed for air conditioning
Only a handful of schools are air conditioned, but more are coming—and with important changes in window design and the use of interior space.

170 Good nait Dali
Painter Dali’s latest joke: a “nait” club for Acapulco, Mexico, shaped like a sea urchin and drawn by “torch” giraffes, strikes Professor Thrugg as maybe a bad dream.
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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 excelling 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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Write for completely descriptive folder
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.

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 Leon 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 64% above FHA's tentative appraisal.

The New Haven auction also had raised a serious question for all rede­velopers and redevelopment officials over the FHA practice of making tentative appraisals on redevelopment sites that sometimes have the effect of having FHA set the price for the land. This has occurred when prospective re­developers have attempted to negotiate redevelopment land purchases from local agencies on the basis of whatever value FHA would finally allow on the land for its mortgage insurance purposes. To the extent that the FHA now seems willing to recognize current market prices for resold redevelopment land, if such prices exceed initial FHA appraisal, local agencies can now hope for more competition for their redevelopment sites and less need to negotiate deals with lone sponsors.

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

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

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 re-claimed, 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
Trinity is the *whitest* white cement judged by any standard. It is whitest in the bag . . . whitest in the mix . . . whitest in the finished job! You can see the extra whiteness with the naked eye! Trinity White is a true portland cement. It meets all Federal and ASTM specifications. Use it for architectural concrete units; stucco, terrazzo; cement paint; light-reflecting surfaces; mass or contrast; or wherever the purity of white and the purity of color tints is desirable in concrete or masonry. Trinity Division, General Portland Cement Co.

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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 $15 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 interest ceiling. The program had received a comprehensive study urging reforms, and for special elections about to draft the necessary laws for such reforms covering both jurisdictions. 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 bond 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.

**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 back yard, 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.

**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 mass...continued on p. 12
IT'S GOOD BUSINESS TO SPECIFY GARAGE DOORS MADE WITH

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No matter how heavy the service...no matter how severe the weather...the Dorlux panels in overhead-type garage doors are guaranteed for a lifetime of service without splitting, splintering, delaminating or cracking.

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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?

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

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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. Balking 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."

Van equipped cafeteria for 1845 Cathedral's restoration

Van . . . founded only two years after the 112-year old St. Peter in Chains Cathedral was first built . . . is proud to have fabricated and installed the new food service departments in the restoration of this landmark . . . headquarters of the Archbishop of the Diocese. As many as 500 members of the parish can be served at one time.

- Use Van's century of experience for your food service equipment needs . . . whether new, expansion or modernization.

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- Use Van's century of experience for your food service equipment needs . . . whether new, expansion or modernization.
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.]
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.
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 stud work, 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 stud work.

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% 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 lb. metal lath cornerite; 2" x 2"—18 ga. welded wire cornerite; 2½" x 2½" meshes—21 ga. galvanized wire.

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.

<table>
<thead>
<tr>
<th>Load Test Data</th>
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<tr>
<td><strong>Load (Lb.)</strong></td>
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<tr>
<td><strong>Average</strong></td>
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<tr>
<td><strong>2½&quot; x 2½&quot;—19 ga. Keycorner</strong></td>
</tr>
<tr>
<td><strong>1st</strong></td>
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<tr>
<td><strong>2nd</strong></td>
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<tr>
<td><strong>Average</strong></td>
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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.

---

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Wire gauge</th>
<th>2' x 2' - 4' lengths</th>
<th>Shipping wt. per package</th>
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<tr>
<td>19</td>
<td>1000</td>
<td>65.5 lbs.</td>
</tr>
<tr>
<td></td>
<td>4' wide x 500' rolls</td>
<td>65 lbs.</td>
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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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Keystone Nails • Keystone Tie Wire
Keystone Furring Nails • Concrete Nails
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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.

Should you need any data on curtain walls or other applications of Alcoa Aluminum, just contact your nearest Alcoa sales office. Or write Aluminum Company of America, 1887-L Alcoa Building, Pittsburgh 19, Pennsylvania.

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Since function and beauty played such an
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<tr>
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<td>General Offices and Manufacturing Division</td>
<td>Dept. AF-11, Michigan City, Indiana</td>
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<tr>
<td>MICHIGAN CITY, INDIANA</td>
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it's genuine

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Address ____________________________
City ____________________________ Zone ______ State ______

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by LIGHTOLIER

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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.

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

You have a complete choice of steel underfloor wiring systems from General Electric: The G-E cellular-steel floor system...the G-E two-level steel system...

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.

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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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"This construction system was evolved to create large areas of uninterrupted space for automated production lines. The huge roof canopies are made of precast concrete members supported on steel cables, which are hung from precast, prestressed concrete girders. The result is a fireproof, maintenance-free roof. There is great flexibility in this system. Tall pieces of equipment can be accommodated by lifting out concrete members. Walls can be moved at will, since they do not function as supports. This construction system also results in very long spans with low ceilings for efficient air conditioning. Because the concrete units are identical, they can be precast separately, with a minimum number of master forms. This saves construction costs and meets any need for new plant space resulting from production-line changes."

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.

UNIVERSAL ATLAS CEMENT COMPANY—MEMBER OF THE INDUSTRIAL FAMILY THAT SERVES THE NATION—UNITED STATES STEEL

ATLAS PORTLAND CEMENT • UNIVERSAL PORTLAND CEMENT • ATLAS DURALESTIC PORTLAND CEMENT • UNIVERSAL PORTLAND SLAG CEMENTS • ATLAS MORTAR CEMENT • ATLAS WHITE PORTLAND CEMENTS • ATLAS LIMESTONE CEMENT • UNIFLUX-OIL-WELL CEMENT
This reception room at National Van Lines, Inc., Chicago, greets every visitor with the classic beauty of "Venetian"—exclusive pattern in Gold Seal Nairon Custom, full-thick vinyl tile.

Smartest heavy-duty vinyl floor money can buy

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, alkalis, 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.

So before you write your next flooring specs, see Gold Seal Nairon Custom "Venetian." Your discriminating clients will still be thanking you years from now.

Specifications: Gold Seal Nairon Custom tile: 9" x 9", 12" x 12", 18" x 18" tiles in 5/16" 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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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.

It would be difficult to conceive of more pleasant, more practical, more efficient lighting at any price. The installation conforms to the foot-candles standards shown in the “Manual of Certified Lighting” as set up by the National Lighting Bureau. To get quality lighting at sensible cost for your next school, library, office or store installation, get LITECONTROL.

INSTALLATION:

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ENGINEER:

LIGHTING SPECIALIST:
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ELECTRICAL CONTRACTOR:

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.

INTENSITY:
Average 85 foot-candles in service.
Average 38 foot-candles, vertical reading on bookshelves, 4 feet from floor.

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LATEX PAINT FACTS FOR ARCHITECTS

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

Now in one easy-to-use booklet you can get answers to your questions on latex paints—their uses, benefits and limitations. "Why and Where To Specify Latex Paints" was written to serve as a helpful guide for architects, specification writers and contractors.

This booklet answers such questions as: On what interior and exterior surfaces can I specify latex paints? Where should they not be specified? Why can they be applied over freshly dried plaster? Why don't surfaces need to be primed before latex paints are applied? Can coats of latex paints and oil paints be applied alternately in successive coats? What controls chalking in latex paints?

Get the answers now to these and the other questions you have about latex paints. For your copy of this booklet write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1836R.
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Projects

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.

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 Villaneuva.

MODERN TROTTING TRACK IN ITALY

A new trotting track near Rome, designed by Architect Aleardo 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. Designed 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.

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 3 1/2-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.
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 Architects 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.

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.

A loan of $3.5 million from the Community Facilities Administration of HHFA will help to finance the University of Michigan's largest dormitory for women. Designed for 1,190 students, Mary Markley Hall will cost $6 million. Architects: Harley, Ellington & Day, Detroit.

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

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

ROCKAWAY TOWNSHIP SCHOOL—Rockaway, N. J.
Architect: Alfredo 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.
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<tr>
<th>DOUBLE-HUNG WINDOWS</th>
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</tr>
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</table>

FABRICATION IN ALUMINUM — STAINLESS STEEL and COATED STEEL
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 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%.

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
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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 307... or write to MARMET for Catalog 58c.
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 16:100 to 28:100. 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.

**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:

### 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 structural, 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 structural 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 structural steel 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 wide flange beams over the $106.50 rate of other big producers.

A major factor helping to break the scarcity of fabricated structural 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. Hansen 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 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.
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“STANDARD CATALOG UNIT”
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“SATISFABRICATED”
AIR CONDITIONING UNITS
BY GOVERNAIR
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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.
Gold Bond Insulation Roof Board was used at the new Minot Air Force Base, Minot, N. D. for pitched roofs on hangars and for flat administrative and service building roofs. Here’s why:

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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.

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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 im-
ports) totaled 18 billion bd. ft. in the
first half of 1957, or a 12% decrease
from 1956. Hardwood flooring produc-
tion was down 19% for the first half of
the year, and shipments off 5%.

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can be attractive as well as safe with
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New plant costs detailed;
resales bring profits

If its suitability for the first occupant
ends, a well-constructed modern indus-
trial 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 develop-
ment of new industrial tracts. Sale-
leasebacks of relatively new structures
can often be made today by many cor-
porations 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

continued on p. 54
In current commercial and industrial construction...

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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%).

<table>
<thead>
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<th>Item</th>
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<td>Land</td>
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<td>0.127</td>
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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%. 

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%).

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<tr>
<td>Foundations</td>
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<tr>
<td>Structural steel</td>
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<tr>
<td>Fireproofing columns</td>
<td>0.076</td>
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<tr>
<td>Roof deck</td>
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<tr>
<td>Concrete floor: 5&quot;</td>
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Curtain-wall Construction for SCHOOLS with Mo-Sai

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:

**MO-SAI ASSOCIATES, INC.**
Members, The Producers' Council

BADGER CONCRETE CO., Oakfield, N.Y.
CAMBRIDGE CEMENT STONE CO., Attica 24, Mich.
ECONOMY CAST STONE CO., Richmond 7, Va.
GEORGE RACKLE & SONS CO., Cleveland 5, Ohio—Houston 20, Texas
GOODSTONE MFG. CO., INC., Rochester 21, N. Y.
HARTER MARBLECRETE STONE CO., Oklahoma City, Okla.
OLYMPIAN STONE CO., INC., Seattle 7, Wash.

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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.

CECO CURTAINWALL & MODULAR DESIGN

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.
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.

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, enamlers use more of this special metal than any other base for architectural porcelain enamel.

For more information on porcelain enamel curtain walls, write us at the address below. Ask for a copy of our new booklet, "Architectural Design With Porcelain Enamel on Armco Enameling Iron."

ARMCO STEEL CORPORATION
2207 Curtis Street, Middletown, Ohio

Sheffield Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation
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 \( \frac{1}{4} \)" 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.
Why Don't You Let V-LOK Sell YOUR Next School Job?

Acres Of Steel Framing Up and Being Roofed In
And Not a Brick Has Been Laid

That's why V-LOK Steel Framing cuts construction time in half... 7 or 8 months instead of 12 or 14 months.

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.

It only takes one V-LOK job and the savings in erection time to make a School Board and the tax payers in that district your friends for life. The V-LOK Design Manual will be a welcome addition to your files. Send for it.
There’s no limit when you design with Panelyte

NO LIMIT TO CONCEPT—Versatile Panelyte is the decorative laminated plastic that enhances the beauty of all installation and furniture surfaces.

NO LIMIT TO COLOR—Available in 66 different, authentic woodgrain finishes, marble effects, patterns and decorator solids, Panelyte will blend with any design for any décor.

NO LIMIT TO WEAR—Practically indestructible, Panelyte resists heat, stains, scuffs and impact—provides a lifetime of dependable service.

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No matter which **FINISH** you like—you can buy it in

**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**

Producers of Stainless Sheet and Strip Exclusively

WOODLAND AVENUE, WASHINGTON, PA.
The Dunham-Bush 'CR' line of year 'round room air conditioners is available in cabinet or recessed models; vertical or horizontal models; combination water cooling and heating coils; combination direct expansion and steam coils; three control kits.

Mark of Dependability...

IN AIR CONDITIONING • REFRIGERATION • HEATING

Members of the Dunham-Bush family have been serving the air conditioning, refrigeration and heating industries for an amazing total of 167 years.

This more than a century and a half of heat transfer experience is your assurance of dependable products.

And you can depend on the man behind the product... the Dunham-Bush sales engineer. He's ever available... near your town... to assist you. His technical skills aid you in three great industries.

May we send him your way to talk about the "CR" line and other great dependable products by Dunham-Bush!

For One Source—One Responsibility, look to...

Dunham-Bush, Inc.
Underwriters' Rated FIRE WALLS

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, Fiberglas 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 Trafier 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.
There is no other

The Burgess-Manning Radiant Acoustical Ceiling

The Only Completely Integrated Radiant Heating, Cooling and Acoustical Ceiling

The Burgess-Manning Radiant Acoustical Ceiling has been thoroughly 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.

(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 Delia, Chicago — architects

Providence Hospital, Washington, D.C.
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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 FRICITION
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. ravenswood 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 STEELLOX 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 STEELLOX 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.

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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...

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 proportioned back support and extra-large seat make a child more responsive, less restless...actually help correct poor posture. Superstrong 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

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."
New easy-operating

Barcol WARDROBE door only $240*
Free -- Complete Manual now ready; send for yours!

[Left above] Compact, easy-operating WARDROBE door 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 WARDROBE doors 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 counterbalanced action gives fingertip control. Teacher or pupil raises and lowers new WARDROBE door with complete ease.

Double utility. Upper section of WARDROBE door offers unbroken mounting surface for chalkboard, chalkrail, and tackboard. Firm, sturdy construction completely eliminates rattle when chalkboard is in use. WARDROBE doors save on building costs, add to room efficiency.

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

Neat appearance. Teachers emphasize importance of eliminating cloakroom clutter. WARDROBE doors 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.

Barber-Colman Company
Dept. U711, Rockford, Illinois, U.S.A.
The Nassau Astronomical Station. The viewing opening is comprised of two shutters, which slide to the right and left. Fully open, the port is 7 1/2 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, 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.
Cleveland, Ohio

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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
Address
City
State

The Structural Steel dome, prefabricated and assembled in the plant of The Paterson-Leitch Company, Cleveland, O.

General Contractor:
The Austin Company
Cleveland, Ohio
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 Toplite Panel which brings daylight in through the roof. Continuous strips of these panels permit excellent light distribution without solar heat gain or glare.

Toplite 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 Toplite 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 PRODUCT
OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO
New!

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.

Name.
Address
City
State

LIGHTING PRODUCTS INC., Highland Park, Illinois
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'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".

American Can Company Coil Cutting Plant, Tampa, Fla.

Jobber-Erector: Florida Steel Buildings, Inc.

American Can Company Again Specifies

Reyconowall

REYNOLDS ALUMINUM
FIELD ASSEMBLED
CURTAIN WALL SYSTEM

American Can Company Coil Cutting Plant, Tampa, Fla.
it's RIXSON throughout AT LASALLE HIGH SCHOOL

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. COMPANY
9100 west belmont avenue • franklin park, ill.
CANADIAN PLANT: 43 racine rd. • rexdale, ontario
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.
QUALITY PORCELAIN CONSTRUCTION

VISORY ASSISTANCE — To carry out bold ideas or to meet any special requirements, consult your local Davidson distributor. Experienced engineers, with imagination, are available to discuss and to work with you in determining the most effective and economical way to apply porcelain panels on new or existing structures. Continuing research at Davidson, in the field and laboratory, continually 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.

PERFECT ERECTION BY TRAINED, LOCAL CREWS — Each Davidson panel is accurately placed and lined up, plumb, plumb, 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.

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. Examples: 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 enclose 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.

Panel separation is not less than 1/4” nor more than 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.

EXPERT ERECTION — 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.

EMPLOYMENT — Davidson offers a number of employment opportunities to qualified individuals, from field mechanics to engineering and managerial positions.

WRITTEN 12-YEAR GUARANTEE — Davidson Architectural Porcelain 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.

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 or write us for 56-page hard-bound catalog with traceable drawings.

THE
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, weatherlight—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. Price-Winning Design—Middlesex Mutual Trust Building at Wellesley, 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.
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

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 Marked by Good Housekeeping

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

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**Publication**

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

Name ____________________________

Affiliation ________________________

Address __________________________

City __________________ State ______

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*published in Architectural Forum, November 1957*
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!
It takes connections to do business...

and the best connections are made through Milcor Celluflor

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

Specify Milcor Celluflor 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.
POWERS Type-IC
Pneumatic
Thermostat

Since the Gaslight Era...

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

in 1901

The old DRAKE SCHOOL, built
at the turn of the century, was one of Chi­
cago’s best. It is located in the famed Prairie
Avenue district and was completed in Janu­
ary 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 Chi­
cago’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.

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 record­
ing 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 main­
tenance 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.

86
Chicago Taxpayers benefited from the Economy of

POWERS quality systems of Pneumatic
TEMPERATURE CONTROL

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
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.
Classroom in Maple Dale Elementary School, Milwaukee, Wisconsin, showing ceiling installation of new Acousti-Celotex Steelacoustic® Panels.
Acousti-Celotex Contractor: Edward T. Ver Halen, Inc.
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. Reused 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 form in various types meet virtually all requirement in concrete floor slab construction over structural steel frames.
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
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

THANKS TO WESTINGHOUSE TRAFFIC SENTINEL®

NO “JITTERY” DOORS HERE

In cosmopolitan New York, Westinghouse operatorless elevators equipped with 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 Architects specification only.
Pittsburgh Corning 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
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.

Your design initiative is given free rein. By manipulating the structural members . . . by specifying double pitch or butterfly shapes, complete rigid frames or cantilevered construction, canopies or lean-tos . . . by combining various sizes and roof pitches, building lengthwise or laterally—you can dictate the structural form of the building.

But more than that, with the Butler modular system of construction, you also dictate the finished appearance. Since walls are non-load bearing, you have unrestricted freedom in your choice of wall material. Emphasis can be on design and protective characteristics.

No other modular system opens so wide the door to creative imagination. In no other modular system is the end product so clearly your trademark . . . so decidedly a tribute to your individuality.

Why don't you get the whole story from your Butler Builder? He's listed in the Yellow Pages of your phone book under "Buildings" or "Steel Buildings." Ask to see the color film, "Architectural Opportunities with the Butler Building System."
Here, at the University of Michigan, is an outstanding example of forward thinking in competitive pool planning. Nothing has been overlooked in making this installation the country's finest. Its unique design—with the diving area adjoining, but outside the main tank—makes possible its uniform five-foot depth throughout the entire six-lane course. Both beauty and permanence were achieved through the use of Romany-Spartan small unit tile for runway and tank lining.

From natatorium to auditorium, classroom to kitchen... Romany-Spartan's wide range of colors, sizes and shapes, glazed and unglazed, offers tile for every purpose. For design help or information, call your nearby Romany-Spartan representative. United States Ceramic Tile Company, Dept. A-15, Canton 2, Ohio.
You can brighten up school interiors with colorful and decorative floor patterns achieved with Johns-Manville Terraflex Vinyl Asbestos Tile. At the same time, you can radically reduce maintenance costs.

Actual on-the-job figures show Terraflex Tile cuts floor maintenance as much as 50%, when compared with the next-best resilient type flooring.

No expensive treatments are necessary to preserve its original beauty. An occasional sweeping or mopping is virtually the only attention this remarkable flooring requires throughout its long, trouble-free life.

Terraflex Tile flooring resists muddy tracks, chalk dust, greases, oils and alkaline moisture. It possesses a toughness and resistance to wear which assures service year after year. Terraflex Tile will outwear other types of resilient floorings of the same thickness two to one.

Made of plastics, reinforced and strengthened with indestructible asbestos, it is fire- and wear-resistant. It has a mineral composition which does not dry out or undergo chemical change. J-M Terraflex Tile is extensively used in school buildings both new and old.

For complete information and color charts, write to: Johns-Manville, Box 158, New York 16, N. Y.
... profits... architects... metropolises

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. TUBLER
Mages, Tyler & 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
Pereda & Luckman
Los Angeles, Calif.

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

W. G. LYLES
Lyles, Huesel, Carlisle & Wolfe,
architects and engineers
Charleston, 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
Great 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 "metropolis"? 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

The Altec Lansing sound system which serves this magnificent new Mormon Temple is similar to the systems found in more and more of the country's finest buildings. Architects have come to rely on Altec Lansing sound equipment not only for quality but for long term operating economy. Superior craftsmanship and stringent production testing guard this reputation for leadership in all phases of sound engineering.

Listed in the Blue Book of Satisfied Altec Customers are the newest and finest public buildings, hotels, department stores and schools. Designed by skilled Altec Lansing engineers and installed by a qualified sound engineering contractor, Altec Lansing equipment insures highest quality performance through years of trouble-free service. See our catalog in the Architectural File (32a/AL) and in the Industrial Construction File (12k/AL) of Sweet's Catalog or write Dept. 6F.
the hinge that oils itself...

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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.

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G. N. H. REYNOLDS, Director of Planning
City of Milwaukee, Wis.

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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.

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continued on p. 100

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Letters

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 redistricting 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 Whittaker, 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

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

To his own considerable "surprise," retired Cleveland Architect Alexander O. 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

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 1956 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.

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 G. 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
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premier 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. Oreal, former owner of the Paramount Furniture Co., Warren, Pa., since 1952 vice president of Panader Furniture Co., elected 1957-58 president of the National Assn. of Furniture Manufacturers.

NAMED: Karl S. Brown, market analyst, writer and former assistant to HHF-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. Ovsresat, 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 Island Architect; New York Architect William Lescas, 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. 72nd 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 $1,980 at the free rate). No São Paulo first award for architecture was made this year, but Brazil's Salvador Candida won 50,000 cruzeiros for his plans for a 16-story São Paulo apartment building, and Italian Architects Gian Antonio Bernasconi, Annibale Fiocchi and Marcelllo Nizzoli received a similar award for the Olivetti Headquarters building in Milan (AP, Oct. '56).

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, Neil Boldrick, vice president, Acme Brick Co., Fort Worth; for construction procedures, Builder Andrew Place of South Bend, Ind.; and for promotion, P. L. Prentice, editor and publisher, House & Home.

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- South High School
  Bakersfield, California
- Morrillton Elementary School
  Morrillton, Arkansas
- Sierra Joint Union High School
  Auberry, California
- St. Paul's Lutheran Church
  Clyde, Ohio
- Catholic Student Center
  Louisiana State University
  Baton Rouge, Louisiana
- Immaculate Heart of Mary Parish
  Chicago, Illinois
- New Science Building
  Northeastern State College
  Tahlequah, Oklahoma
- South Union Junior High School
  Fresno, California
- Mockingbird Road Elementary School
  Vero Beach, Florida
- Administration & Educational Building
  Buena Vista College
  Storm Lake, Iowa
- St. Monica Parish Church
  Willows, California
- Purdue University
  W. Lafayette, Indiana
- Wm. S. Speed Building
  University of Louisville
  Louisville, Kentucky
- Elementary School
  Phoenix, Arizona
- Lodi High School
  Lodi, California
- McKinley School
  Bakersfield, California
- St. John the Baptist School
  Chico, California
- St. Monica's Church & School
  Dallas, Texas
- Southeastern College
  Hammond, Louisiana
- Trinity Episcopal Church
  Lawrence, Kansas
- Our Lady of Fatima Shrine
  South Bend, Indiana
- Sardis Presbyterian Church
  Charlotte, North Carolina
- Theodore Roosevelt School
  Indio, California
- St. Peter & Paul Parish
  Turkey Creek, Indiana
- Belle Isle Elementary School
  Oklahoma City, Oklahoma
- Eunice Smith School
  Alton, Illinois
- Holy Name Elementary School
  Cook, Indiana
- University of Pennsylvania
  Philadelphia, Pennsylvania
- Swarthmore College
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* After a serious fire started by debris during the construction of a new supermarket, architect Doak Martin of Worcester, Mass. stated, "I am pleased with the performance of wood as it is obvious had the members been made of unprotected steel-they would have deformed under the extreme heat." The Unit laminated arches in this supermarket were merely resanded to remove the char formed during the fire and construction continued without costly delay.

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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...
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Editorial cont'd.

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.

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 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.
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%. Mean time 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:

1. How do we plan and design for teen-agers?
2. 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 160,000-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 makeshift 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 convincing—$80,000 per classroom or $7.24 per sq. ft. or the like—the article reads fast and plausibly. So

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 case for “lavishness” and “costly the autonomy, which is the foundation architectural FORUM / November 1957 school building and rising popula­

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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, $12.83 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. 146

Case studies on pp. 119-121

architectural FORUM / November 1957
These are the schools the Digest accused of waste

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 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 $4,200 extra abnormal expenditure for fill and foundation, included in the general contract. Also the kitchen had to be sized and the "cafeterium" adapted for use in conjunction with a future junior high school.
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; 5% of 1% of the total construction cost.

Many architects still do build nostalgi c towers and columned entrances, and this is, of course, misguided. But instead of being put on the taxpay er's bill, they parade Grecian pillars at entrances; build flights of en trance steps and pile on ornamental stone 'trim.'

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.

The school referred to is a recently completed grade school for 350 children near White Plains, N.Y., I saw an immense two-story gymnasium large enough to accommodate 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.

"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.

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.

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 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

Walt Whitman elementary school, Woodbury, L.I.; Robert A. Green, architect. Bid in 1984; 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.

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.

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

*“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.”

*“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.”

*“The Walt Whitman elementary school at Woodbury, L.I., another prize-winning school by Architect Green, cost only around $18.50 per sq. ft. in a high-cost area, largely due to its ‘modular construction.’”

*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, 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 top lighting; 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 abut cen­ tral 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 lavatory, 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.”

*“Sikeshton, Mo., saved money by building classrooms back to back with one wall dividing two classrooms.”

*All cost figures are as reported by architects, excluding fees, site work, and furnishings. They cannot be vouched for by FORUM; nor have they been tested against the cost measurement formula given on pp. 184-187.
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.).

"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).

"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 middles, aluminum sash. Roof is steel bar joists, gypsum board, poured gypsum, rigid glass fiber and tar and gravel; double-paned plastic top lights 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."

"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 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, 1½" 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."

"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, 2½" 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.
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.
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 airport 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.
One all-white district stated voluntarily that it would accept any Negro who wanted to enroll.

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

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, had the idea that the region'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
DESEGREGATION

$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 biciphal 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 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

* 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 up 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.
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 1 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 1/4 to 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 southern 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 Rohrbaugh: “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
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 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.

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
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, Nicholas 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.

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
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**

<table>
<thead>
<tr>
<th>Spaces</th>
<th>School “A”</th>
<th></th>
<th>School “B”</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Sq. ft.</td>
<td>No.</td>
<td>Sq. ft.</td>
</tr>
<tr>
<td>Classrooms</td>
<td>18</td>
<td>12,600</td>
<td>25</td>
<td>21,000</td>
</tr>
<tr>
<td>Auxiliary areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science laboratories</td>
<td>4</td>
<td>4,200</td>
<td>7</td>
<td>6,050</td>
</tr>
<tr>
<td>Auxiliary areas</td>
<td></td>
<td></td>
<td>6</td>
<td>1,050</td>
</tr>
<tr>
<td>Business education rooms</td>
<td>4</td>
<td>3,360</td>
<td>2</td>
<td>1,600</td>
</tr>
<tr>
<td>General education laboratories</td>
<td>2</td>
<td>2,400</td>
<td>2</td>
<td>1,800</td>
</tr>
<tr>
<td>Homemaking</td>
<td>1</td>
<td>1,200</td>
<td>3</td>
<td>2,550</td>
</tr>
<tr>
<td>Art</td>
<td>1</td>
<td>1,000</td>
<td>1</td>
<td>1,200</td>
</tr>
<tr>
<td>Mechanical drawing</td>
<td></td>
<td></td>
<td>1</td>
<td>900</td>
</tr>
<tr>
<td>Shops</td>
<td>1</td>
<td>1,800</td>
<td>3</td>
<td>4,500</td>
</tr>
<tr>
<td>Auditorium for 1,000 (assembly in cafeteria)</td>
<td>1</td>
<td>9,100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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          | 3,000    | 8          | 8,400    |
| Game rooms        |            |          | 2          | 3,500    |

**Cafeteria**

| Seating area      | 3          | 3,000    | 4          | 4,400    |
| Kitchen, etc.     | 1          | 1,000    | 1          | 1,800    |
| Stage and chair storage | 800 |         |            |          |
| Administration (excluding library work) | 1,610 |         | 3,800 |

**Total educational area**

| 48,162            |          |

**Approximate gross area**

| 66,000            |          |

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 designed 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 | $—— |

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 | 0.83 |
Southeast | 0.66 |
Great Lakes | 1.15 |
North Central | 1.00 |
South Central | 0.86 |
West | 0.83 |
Pacific | 1.22 |

2. COST PER PUPIL

| PUPIL CAPACITY |
| No. of Units | Unit Capacity |
| Classroom | ——— | ——— |
| Kindergarten | ——— | ——— |
| (on double sessions) | ——— | ——— |
| Science laboratory | ——— | ——— |
| Commercial education | ——— | ——— |
| Home economics | ——— | ——— |
| Art | ——— | ——— |
| Shop | ——— | ——— |
| Band or chorus room | ——— | ——— |
| Gymnasium or playroom | ——— | ——— |
| with partition | ——— | ——— |
| Swimming pool | ——— | ——— |
| General education laboratory or study hall | ——— | ——— |
| 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.
judged 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.

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

Note: for comparison of educational programs divide each area by total pupil capacity (col. 2). This will indicate the differences between schools in availability of educational facilities.

<table>
<thead>
<tr>
<th>DESIGN EFFICIENCY RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET EDUCATIONAL AREA</td>
</tr>
<tr>
<td>GROSS AREA</td>
</tr>
</tbody>
</table>

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%.
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 multivariate 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 Chevrolts. 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, prefab 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...
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. 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 somewhere 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, etc., 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 Fenestra, 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 columns, 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 harried 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 principle 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
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."
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.
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 least, 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 teenagers, 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: teenagers 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 teenager 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 teenagers’ 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 — reduction of vandalism. This is without doubt the most heartening type of economy — reduction of vandalism. This is without doubt the most heartening type of economy — reduction of vandalism.
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
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.

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.)

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.

DESIGN FOR TEEN-AGERS

A main corridor becomes a cohesive Main Street

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.

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.

Site irregularities are natural places for outdoor congregation

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 pro-
dered 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 ad-
ject 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 back-drop 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.

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' multipurpose rooms instead of being doled out in a central cafeteria. Students push the carts, dispense the food, act as cashiers, return debris. Meanwhile 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 “landings” 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
the school day a contributing part of the educational process.


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, assemblies 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.


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Much dignity and charm in little scope

For this 1,000-student junior high on a steep 8¼-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.

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, newsman, 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-
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 metamorphisis 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

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.
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."
"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 Hoopersboro 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 instead 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.
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).
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

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 ingenuity 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.
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.\* 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 3\% or higher than similar bonds from integrated districts outside the South.

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\% 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*
Designed for air conditioning

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.
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 horizontal shapes of the window groups...both are pleasing rectangles repeated within the rectangle of the elevation itself.

And, speaking of sizes and proportions, it’s PELLA alone that offers wood casements in glass sizes as large as 24" wide x 60" high. How? Butt plates of the sash hinges are riveted to the inner rigid steel jacket that reinforces the sturdy wood lining. And extra long hinge wings give additional bracing to sash.

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Weldwood Chalkboard doubles as a magnet-holding bulletin board. Versatile, shatterproof, it never needs resurfacing, permits glare-free reading from any part of the room... and it's guaranteed for life. Chalkboard colors: gray (2 shades), green (2 shades), and Projection White.

"Recess is called," said Professor Thrugg, "and we are through for the day with serious subjects."

"What is that?" asked a student, pointing to the drawing on Thrugg's desk.

"Architecture by a painter," said Professor Thrugg.

"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 Thrugg, "the more foolish the more challenging."

"But not from a drawing like that!" exclaimed the student.

"Oh, yes," said Thrugg, "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 Thrugg, "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 Thrugg, "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 Thrugg, "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 capitond 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." Dalí'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.)
Aetna Custom Steel Doors, built to architects' specifications, add individuality and prestige to the House of Seagram, 375 Park Avenue, New York, as they have to many outstanding structures over the past 55 years.

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Fireproof board . . . structural tubes . . .
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ASBESTOS SILICA BOARD
pare 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 ¼" stock. Two hours of fire protection can be provided in walls and ceilings with a ¼" 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 ½ sq. ft. for ¼" stock by the carload. Panels come 2' and 4' wide, 8', 9' 10' long, 3/16" to ½" 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 continued on p. 178
Low bay...

or high bay...

Improve lighting, reduce eye fatigue with Abolite uplight fixtures

Only a small amount of light (18%) is directed upward through the open top of Abolite uplight 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 uplight 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 RCI color-improved mercury lamps. 18' mounting height; spaced 13' 4" by 10' 8". 60 foot-candles average initially.
Bottom picture: 24" Abolite Alzak aluminum fixtures with H-400-RCI color-improved mercury lamps. 20' mounting height, spaced on 20' centers. 36 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 ⅛" to ½", the rectilinear shapes can be used as load-bearing beams and columns in one- and two-story buildings. Smaller sizes will be practical in catwalks, 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 ¼" thick tubing with 1' girth (weight: 4.85 lb.) up to $7.78 a ft. for 2'-8" girth member with ½" 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 clutter or scarring of floors or naves. 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.


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 ½" 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., Weldon Building, 55 W. 44th St., New York 36, N.Y.

continued on p. 180
These windows are mirrors ... on the other side!

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**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

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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.)

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For a modern school...

modern FIRE doors...

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 Manufacturers: Buck Engineering Co.,
37-41 Marcy St., Freehold, N.J.

Manufacturer: KINNEAR Manufacturing Co.

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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.

Manufacturers: 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 $8 to $5 more a window, depending on size and number of cord controls called for.


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 1/4" 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 1/4" Stanley drill, $152.78 with a heavy-duty 3/4" 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.


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DRAFTING BOARD SPOOLs
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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., 2818 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 78¢ a sq. ft.

Manufacturer: US Plywood Corp., 58 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 million 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 % to 21/2"; 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.


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architectural FORUM / November 1957
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.


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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... says Riverside School Staff

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"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.

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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!

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*Names upon request.
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CREDITS:
...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. 8½" x 10½". 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 9½". $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.


Impressive as Japanese architecture old and new may be, the volume of material written about it is even more overpowered...

continued on p. 102
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.


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 studs instead of screws to allow different profiles in framing by variation of the stops.


Full data, properties, details and specifications on this company's line of architectural alloys, finishes, embossed patterns, sections and general building products.


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.


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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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Architects: Smith, Hinchman and Grylls, Detroit, Mich.

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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 suburbs will seem bad today are bound to become worse.

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.

Victor Gruen, architect and planner:

The automobile has long ceased to be just a toy 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: "Raming 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 continued on p. 198
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 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 throughways 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,
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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.

continued on p. 202

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For a typical Plextone application, we refer you to the Hercules Powder advertisement on the Bellaire Senior High School on pages 230, 231 in this issue.

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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 displaced 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 displaced 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 displaced by the Mill Creek 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 an effective boundary defining and protecting a neighborhood on either side if it is planned, located and constructed with this purpose in mind.

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By using lightweight Stran-Steel framing for construction of the new Chestnut Hill elementary and junior high schools, the school board of Liverpool, N. Y., saved $286,361 over median cost figures for the state of New York. Savings were achieved through these basic design and construction innovations, combined with material and labor saving economies:

- One-floor design using Stran-Steel framework, site-fabricated. Complete steel framework was assembled from standard lengths of joists, channels and studs.
- The nailable feature of Stran-Steel framing for low-cost finishing. Collateral materials were nailed directly to framework by carpenters.

These schools are in a northern climatic area requiring fully insulated buildings and complete heating systems. Proportional savings can be obtained with Stran-Steel in less costly schools in milder climates as well.

CHESTNUT HILL ELEMENTARY SCHOOL
Designed for 600 students. There are 21 regular classrooms, a cafeteria seating 200 also used as an assembly room, a library, a music room, two guidance rooms, a two-station gym-playroom with changing rooms and showers. Also, an administrative suite, a conference room and lounge for the teaching staff, a service area and a complete kitchen. Total: 50,028 square feet.

CHESTNUT HILL JUNIOR HIGH SCHOOL
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.
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 "topographic" 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.

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**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.
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is more than just a phrase. Like the hallmark you find on fine silverware, it has become a mark of quality recognized throughout the entire construction industry. More than that, it is a sure indication that the architect, the contractor and the owner recognize that the quality of their completed building can be no better than its component parts. And that's why so many of America's finest new buildings feature "Curtain Walls by General Bronze."

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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 motocars 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 motocar 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 relocating 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.
This film was made with one purpose in mind — to assist architects, school administrators and librarians in planning better libraries.

You'll see the importance of teamwork, among these groups, that is so necessary to effectively create the successful operation of today's school libraries.

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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.

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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.

If you have this problem, contact the nearest McQuay representative for consultation, complete engineering data and costs ... When it's McQuay, you can be sure that engineering research and know-how have produced the finest, most efficient and dependable equipment available ... and, only McQuay makes the famous Ripple-Fin coils. McQuay, Inc., 1609 Broadway St. N.E., Minneapolis 13, Minn. Representatives in all principal cities.

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.
Stilts hold it up—
Solex® glass keeps the heat out

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 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 PENNYVERNON® 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.
Main entrance. Classrooms are grouped around this "court."

Typical classroom. Children are thrilled by the "treehouse" effect.

Administration building. The daylighting is excellent.

The cantilevered truss system. Note absence of pillar "forest."

Architect:
CHARLES R. COLBERT, NEW ORLEANS, LA.

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for information about the use of these famous
Pittsburgh Glasses in school construction:

SOLEX® . . . . . . . . . . . . . . heat-absorbing and glare-reducing plate glass
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Vestibule mats of Irving grating prevent excessive grit, mud and wetness from being tracked into corridors of public structures, office buildings, schools and the like. Grit, rain, snow and slush drop through the open-mesh grating to receptacles below which can then be flushed into sewers. Thus a clean entrance is always assured, and the cleanliness of the interior is in turn preserved.

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**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.

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Send for the new Weirkote booklet today. Write Weirton Steel Company, Dept. P-17, Weirton, West Virginia.
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.

*Multicolor lacquer used in the Bellaire Senior High is "Plextone®," supplied by Plextone Corporation of America, Newark, N.J., Chicago, Ill., Los Angeles, Calif.
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.

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Different effects are easily achieved—from large particles giving a granite-like appearance to small ones the size of pin-points.

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—Multicolor is really tough. It withstands scrubbing and scuffing—any normal abuse—and it won't come off when properly applied.
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helps classrooms "grow" as they're needed . . .

Planning your school with **metlwal** partitions is an excellent way to prepare now for the future. As the need arises, **metlwal**s 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.

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**Low Maintenance.** Floor to ceiling **metlwal** have a baked on finish that resists marring and scratching. Easy to keep clean with soap and water.

**Adaptability.** Chalkboards, doors, windows, electrical outlets are easily installed wherever you want them using standard components.

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Some of the schools using **metlwal**:
- Welsh School and Worthington Hooker School, New Haven, Conn.
- Roger Bacon High School, Cincinnati, Ohio.
- Schooley 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.
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—

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More and more—retailers are now demanding that their store lighting shall
give them every possible merchandising advantage!

Most leading retailers now know that proper store-illumination can attract
as much as 2½ times more traffic!—can increase the sale of displayed items
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These facts are frequently cited in accounting for the spectacular “swing”
to Mainliner Luminaires, for modern store lighting or re-lighting—along with
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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 con-
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ceiling material!

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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 scat
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 4¾” 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!

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.
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.

**CIVIC** — an architectural form . . . shallow, good-looking and in excellent taste. An extruded aluminum-formed unit.

**EXECUTIVE** — an all-steel louvered unit, shallow with illuminated, tapered sides. Provides 30° x 45° shielding.

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... include Smithcraft's 4 GOOD NEW IDEAS IN LIGHTING because they are good looking and good lighting . . . and because they fill very definite needs in the lighting of today's interiors.

Wherever good lighting is important, you'll find . . .

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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.
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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.

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 1½ of 1% or more in higher interest rates than general obligation bonds.) In the case of Pennsylvania, school authority bonds always cost more, both

continued on p. 240
Claridge has made great strides in modernizing and improving chalkboards and bulletin boards to keep pace with the demands of present day education. Over 35 years experience enables us to approach the problem on a know how basis. Our one ultimate purpose: the finest chalkboards and bulletin boards with greatest educational value. Thousands of schools the world over...and many leading architects use Claridge as their standard of quality.
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 $\frac{1}{2}$ of 1% more on the interest rate of a hypothetical $500,000 serial bond issue can mean that total costs are raised 6$\frac{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 $\frac{1}{2}$ 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-
If you're facing a tight budget on school or other institutional construction, Steelcraft standard steel doors and frames can meet your requirements most economically. A wide variety of types and sizes, solid or prepared for glass, is factory-stocked for immediate shipment. Door "packages" are shipped complete with hardware, fully machined and mortised... ready for fast installation. Both standard duty (20 gauge) and heavy duty (16 gauge) are available. Specify Steelcraft standard steel doors to save money and specification time. See Sweets' Catalog or write for details.
Flag-raising day at
another great new
Olin Aluminum plant

Cradled in the heart of the Ohio River Valley, this expansive industrial giant is about to spring to life. Ultra-modern from the ground up, this huge new Olin Aluminum Sheet Mill within a few short months will add its production to the vigorous mainstream of quality Aluminum flowing to the nation from four Olin Aluminum plants. 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.

This new Aluminum will be custom-tailored to your specifications. And the unique standards of quality and service by which it will be produced and delivered to you will help you simplify your manufacturing procedures and achieve maximum efficient production from each pound you use.

If this is the kind of quality and service you have long been looking for, write now for product availabilities to our new permanent sales headquarters: Aluminum Division—Sales, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York.
How to work with your neighbors to protect your home and community

Community crowded?
Neighborhoods decaying?
Housing deteriorating?

In neighborhoods throughout the nation today, citizen groups by the score are tackling, and licking, the manifold problems of modern community growth.

They are people just like you. They have found strength and success in numbers ... by keeping up their own homes ... by joining with their neighbors in community improvement projects and thereby gaining better living conditions for all.

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 slim-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
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:
American Council To Improve Our Neighborhoods
Box 462, Radio City Station, New York 20, N.Y.

Please send me special ACTION material that will help me organize, join or conduct a Community Improvement Group.

Name
Address
City State
Organization (if any)
Sylvania's new Mohawk Fixtures in the main office impart even, soft brilliance to the Travertone ceiling, composition (plastic vinyl) walls in green and tan shades, and the beige terrazzo floors," reports Sales Engineer R. E. Hofacker.

SYLVANIA

MOHAWK FIXTURES

efficient lighting with the clean and classic look

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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 3 1/2% but prices rose an average of 2 1/2% 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 30% of assessed valuation. 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 reliance 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 180%, 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 limits 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.
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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 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 classroom 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-saving 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 multi-story 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.

THAT READER'S DIGEST ARTICLE continued from p. 117

continued on p. 248
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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 Digest 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.

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*Harold's Club, Reno, Nevada, Ferris & Erskine, architects, Reno; Claude E. Bentley, mechanical engineer, San Francisco; Earl O. Sibert Co., mechanical contractor, Glendale, California.
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When you have a client who says, "I want a room that goes with the furniture we already have," you'll be wise to recommend Simpson Toasted “V” Groove redwood plywood paneling. This versatile wood goes with any decorating scheme. It consists of clear, all heart rift grain redwood plywood, with a rich sheen to it, and with deep grooves literally "toasted" in every 5, 11, 7, 9, 10 and 6 inches for a relaxed, friendly random-planked effect.

This distinguished paneling by Simpson offers architects rare opportunities for warm yet dramatic effects in new homes, offices and public buildings. It is also ideal for remodeling, since it can be put up right over old wall surfaces.

So if you want to give your client's project inherently warm and welcoming overtones, specify interiors of Simpson Toasted “V” Groove redwood plywood paneling. Simpson Toasted “V” Groove plywood paneling is also available in fir, Philippine mahogany and knotty pine.
MODERN DESIGN CALLS FOR COOLITE

Extensive use of Coolite glass in sidwall sash in the Thomy Lafon Elementary School, New Orleans, fits the aims of architects, Curtis & Davis, to obtain "the ultimate in scientific achievement for natural lighting... a truly functional architecture adapted to human values and physical needs." Coolite, glare reduced, floods classrooms with softened, glare-free light... absorbs up to 50% of solar heat... makes rooms appear larger, friendlier.

GLASS MAKES A GRACEFUL ENTRANCE

In a distinctively different doorway, made possible by the handsome Broadlite pattern, the reception hall is flooded with flattering, diffused daylighting. A rhythmic pattern, translucent Broadlite glass offers a new, dramatic decorating texture that creates a feeling of leisurely living and gracious hospitality, in either modern or traditional settings.

Architect: Kogley, Westholl & Arbogast
Combining beauty and utility in an exciting variety of residential, commercial and industrial applications, rolled glass by Mississippi offers an extensive selection of patterns with surface finishes and light transmission characteristics that fulfill the requirements of any design or specification.

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MODERN VISTAS ARE CREATED WITH GLASS

As advanced in design as the sleek California Zephyr seen through it, Polished Misco (Approved Fire Retardant No. 32) is used extensively in Chicago's Union Station to help protect its thousands of travelers. This rugged glass offers effective but inconspicuous protection at minimum cost in windows, doors, transoms, skylights, partitions . . . wherever fire and breakage protection is required.

COOLITE GLASS IS RIGHT VARIETY FOR HEINZ

Executed in a shimmering sweep of Coolite, Heat Absorbing, Glare Reducing glass, the Heinz Vinegar Plant, Pittsburgh, has been acclaimed "a brilliantly incisive piece of architecture." Here, employees see better, feel better, work better— for Coolite filters out unwanted factors in "raw" daylight . . . helps keep interiors cooler, more comfortable.

Architects and Engineers: Skidmore, Owings & Merrill
Photos: Ezra Stoller

GLASS COMPANY
38 Angelica St. • St. Louis 7, Mo.
ROLLED, FIGURED AND WIRED GLASS
The J. R. Moore Junior High School, Tyler, Texas, is equipped with B&G Boosters where low heads and small motors are adequate and B&G Universal Pumps where high heads and capacities are required. B&G Airtrol Fittings and Compression Tanks are also installed for effective control of air in the system.

ARCHITECTS-ENGINEERS: Caudill-Rowlett-Scott, Bruce and Russell, Associated, Bryan and Tyler, Texas
MECHANICAL ENGINEER: J. W. Hall, Jr., Bryan, Texas
MECHANICAL CONTRACTOR: Leon Southall Plumbing Co., Longview, Texas

A COMPLETE LINE OF EQUIPMENT FOR HEATING AND
The satisfactory performance of a circulated water system for heating or cooling is essentially dependent upon the pumping equipment.

Quiet pump operation is all-important. Transmission of pump noise through the piping system can create an annoying condition which penalizes careful designing and installation.

B&G Booster and Universal Pumps are engineered and built to meet the exacting demands of water heating and cooling systems. These are not run-of-mine centrifugal pumps...they are distinguished by numerous features which assure silent, vibrationless operation. Among these are specially built, more costly motors, tested for quietness—oversized shafts of hardened alloy steel—long sleeve bearings—noise dampening spring couplers—oil lubrication and leak-proof mechanical seals.

That’s why B&G Circulating Pumps are preferred...they’re quiet where silence counts!

**B&G UNIVERSAL PUMP**
For larger heating and cooling systems.
Capacities to 12,000,000 BTU.

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New reinforced concrete floor

Why didn’t someone think of this before! One simple, cost-cutting operation, yet it combines 3 major steps in the construction of office building floor slabs—

1. Forming
2. Reinforcing
3. Electrification.

Heart of the system is Type E-R (for “Electrically Ready”) Cofar, new cellular units designed to carry wiring. When these cells are combined with Cofar—a unit that forms and reinforces concrete—all 3 slab requirements above are met before concrete is placed! Chief advantages: A low-cost, high-strength floor with electrical flexibility that meets the present and future demands of any office building. No wasted fill. No wasted ducts or wiring. Fewer construction steps. Here’s how it works . . .

CHECK THESE MONEY-SAVING ADVANTAGES OF THE E-R COFAR SYSTEM

1, 2 or 3-Cell Units
With E-R Cofar, you choose the amount of electrification you want. One, two and three-cell units are available and spacing between units may be varied as necessary. Units are available in lengths to 16 feet and are manufactured from heavy gage galvanized steel.

Pre-Set Inserts
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.

Reduces Framing
Cofar slabs are more economical than any other type of floor forming and deck system on 10' to 14' beam spacings. Wide spacing eliminates need for intermediate beams, saves on fire-proofing materials. Lighter dead loads also save on footings and foundations.

Header Adaptability
Any Underwriters’ Laboratories-approved header duct system (such as Nepco or Walker) can be used to activate Type E-R Cofar cells. When two or three-cell units are used, service fittings can be placed as closely as 8 inches apart on the finished floor (see above).
In the finished system, E-R and conventional Cofar units work together to provide a superior reinforced concrete floor with complete electrification. A network of E-R cells—placed where you want them—assure electrical flexibility for the life of the building. Wires are pulled through the raceways and brought to desks and machines no matter where they are located. At the same time, Type E-R Cofar floor slabs retain all the advantages of reinforced concrete. Concentrated loads are distributed by the 2-way slab action of high-strength Cofar floors. Structural tests verify the ultimate strength to be 7 to 10 times design load. Use of 1.5 oz. hot-dip galvanized coating guarantees building life permanence. Type E-R Cofar floor slabs offer a low-cost, high-strength floor which is always "electrically ready."

UNDER CONSTRUCTION . . .

E-R Cofar has been specified for the Fidelity National Bank Building in Baton Rouge, La.

Architects: Wilson & Coleman
Contractor: L. W. Eaton Co., Inc.
Structural Engineer: Mettraeir & Ingram
Electrical Engineer: Chesson, Forrest & Holland
Electrical Sub-Contractor: Sachse Electric Company
(All firms located in Baton Rouge, La.)
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The inexpensive Bogen
single-channel console, with
built-in radio tuner and slide-out
record player, distributes radio
programs, recordings and speech
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By the addition of a "top hat"
of classroom selector switches,
facilities can be provided for
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Intercom is readily incorporated
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This provides 2-way conversation
with any teacher in the school.

multiple channels
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into a 2- or 3-channel
system, permitting
distribution of 2 or 3
programs simultaneously to
different groups of rooms.

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planning — and at the lowest possible cost — request our 16-page bro-
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wood ram is set to
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rigid trunnion for
accurate measurement
of impact.

Hufcor "takes" the
impact. No cover
penetration or parts
damage.

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dividers. By actual test the
special laminated cover con-
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twice as much impact as
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flame, moisture, dryness, rust
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HOUGH
A million vinyl splines...

not one complaint

Here comes another storm window set to give a lifetime of trouble-free service. It's being fitted with a spline extruded from BAKELITE Brand Vinyl Plastic.

Over the past four years Monarch Products Corp., Chicago, Ill., has produced and sold a million storm windows and doors so fitted. There has never been a complaint.

The extruder, Jarrow Products Company, also of Chicago, gave the splines an accelerated sun, weather, and dirt test that equalled ten years' exposure. Examination showed that the BAKELITE Vinyl Plastic kept its flexibility and underwent almost no color change. This material is resistant to ice, snow, heat, cold, water, and chemicals.

Do you have a similar use for gasketing, welting, or splines in your plans? Write for information on this and other building applications of BAKELITE Vinyl Resins. Address Dept. YW-2.
WALLS OF WEATHERTIGHT

Ready for the Lupton Windows. Completed installation of outer mullions before erection of Lupton Windows. Notice outstanding simplicity—the windows themselves become the walls in this all-Lupton installation.

Fast, clean installation. Lupton Metal Windows are delivered ready for immediate placement. With mullions in place, workmen put up Lupton window sections from within building—fast, inexpensively.

Adjustable ventilation. Projected in at bottom or out at top, these Lupton Windows provide immediate controlled ventilation with maximum light, are tight-fitting and rattle-free.
LUPTON METAL WINDOWS
BRING MAXIMUM LIGHT AND AIR TO KELLOGG HIGH SCHOOL

With this ultra-modern consolidation school the community of Kellogg, Idaho, voices its pride and civic-mindedness. Thanks to these walls of LUPTON engineered metal windows, bountiful ventilation and light are made available throughout the building.

Working together with school authorities to typify community solidarity, the architects conceived this building design which embodies a continuous wall of windows. Bright yellow-painted steel mullions and red muntins provide a joyful frame to the impressive view through the 513 LUPTON Steel Architectural Projected Windows.

Certain extreme climatic conditions (wind and dust storms; smoke from nearby Bunker Hill smelter; a wide variance in atmospheric temperatures) made the selection of materials unusually important. Ruggedness and simplicity characterize the construction, and are epitomized in the modern, precisely-engineered walls of tight-fitting LUPTON windows.

The Kellogg High School project reflects a growing movement towards the use of entire walls comprised of LUPTON windows in schools, hospitals, and other modern buildings.

LUPTON'S 75 years' experience in metal-window and curtain-wall manufacture merits your complete investigation—look first in the Architectural File (Sweet's) for the Michael Flynn Catalog, and then consult the Yellow Pages under "Windows—Metal." Or write for specific additional information on LUPTON Metal Windows and Aluminum Curtain-Wall Systems.

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METAL WINDOWS AND CURTAIN WALLS
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CONGRATULATIONS, AIA! Michael Flynn Manufacturing Company joins the other members of the Producers' Council in extending best wishes on the occasion of your 100th-anniversary celebration May 14-17.
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NOW AVAILABLE IN ALUMINUM!

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Milwaukee, Air Equipment Distributors of Wisconsin
Minneapolis, E. J. Baker Co.
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Washington, D. C., Lancaster May & Co.
A continuing review of international building

BETWEEN HEAVEN AND EARTH

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 Wachsman (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 WURZEL
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.

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.
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

Paris Architects Simon & Morisseau wanted to put a festive roof over the market at the new town of Royan. Yet there was also the problem of giving focus to the town's life. After consulting with Engineer R. Sarger, they decided to risk a new form that would accomplish both purposes. The form: a circular shell, 185' in diameter but only 3' thick. The shell soars 35' above the middle of the busy market, giving townspeople a free floor for strolling and shopping. It also pulls the town together visually, a function traditionally assigned to somber monuments.
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Everyone who buys, sells or specifies industrial lighting equipment is invited to send for a free copy of the new RLM Specifications Book. Write: RLM Standards Institute, 326 W. Madison Street, Suite 830, Chicago 6, Illinois.
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The cross section sample being shown in the photograph above clearly and simply demonstrates why the FIAT PreCast method of shower floor construction is the answer to an age old building design problem. It takes but a few minutes to see how this one-piece floor has many, many advantages over old fashioned, built-on-the-job shower floor construction. It is immediately evident that this solid, monolithic unit does away forever with any problems of leakage. The cut-away view shows how the integral flange forms a watertight seal between the floor and shower wall material (whether tile, plaster, wallboard or structural glass). You can examine how the drain is cast permanently into the floor material and how the inclined floor and raised shoulders deflect water downwards toward the drain. You will appreciate the substantial savings of on-the-job labor and understand why the low installed cost of a PreCast FIAT Floor makes all other shower floor methods obsolete.

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Asphalt, Cork and Rubber tile... over 150 decorator colors!

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<th>Specifications</th>
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<tr>
<td><strong>SIZE:</strong> 9” x 9”</td>
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<tr>
<td><strong>THICKNESSES:</strong></td>
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<td>5/64”, 1/8”</td>
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<tr>
<td><strong>COLORS:</strong></td>
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<tr>
<td>MARBLEIZED</td>
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<tr>
<td>Standard -- 12</td>
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<td>Decorator -- 8</td>
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<td>(including solid black, white)</td>
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<td>De Luxe -- 7</td>
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<td>Decorator -- 7</td>
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<tr>
<td>WOODGRAIN -- 3</td>
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Last summer, while the nation's Capital sweltered in 101° heat and high relative humidities, surgeons at Providence Hospital operated under optimum thermal conditions and sent patients to a perfectly conditioned post-operative recovery room. Cardiac patients and other seriously ill persons were spared the dangerous strain of adjusting to such weather extremes.

In fact, any patient in any room in the building could have the benefit of the exact "climate" needed for his health and comfort.

In every respect, Providence Hospital justifies its "Modern Hospital of the Year" award. The impressive 350-bed institution includes all departments, research facilities, special treatment rooms, a complete diagnostic outpatient clinic, nurses' home, lecture halls and classrooms. It is shaped and oriented to afford a panoramic view of Washington from each bedroom and from the solarium on each floor. Every patient's room receives some direct sunlight.

Of special importance is the fact that Providence is equipped to use the full potential of its air conditioning. A Johnson Pneumatic System of individual room temperature control provides the necessary flexibility to meet each one of the building's varied temperature and humidity requirements.

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