December 1952

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

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

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

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

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

$7,700-a-bed hospital
A case history in cost cutting (p. 129)
Here's a cost-saving idea for every office - including yours!

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DECEMBER 1952

NEWS

LETTERS

CHURCHES
First Unitarian Church, Madison, Wis. Frank Lloyd Wright, architect.
Anarchy in Our Churches—an editorial.
Cedar Hills Congregational Church, near Portland, Ore. Warren Weber, architect.
First Methodist Church, Midland, Mich. Alden B. Dow, architect.
Warren Memorial Chapel, Montaigle, Tenn. Edwin A. Keeble, architect.
First Methodist Church, Plainfield, Iowa. Schweikher & Elting, architects.
Chapel for the Pacific School of Religion, Berkeley, Calif. Ernest Born, architect.
First Unitarian Church, Minneapolis, Minn. Thorahov & Cerny, architects.
St. Ann's Church, Normandy, Mo. Joseph D. Murphy, architect.

CEMETERY SCULPTURE
Soaring figures by Carl Milles are featured at National Memorial Park, Falls Church, Va.—a new kind of cemetery by Architect Walter Marlowe.

UN DESIGN SYMPOSIUM
Controversial design of the General Assembly Building provokes caustic comment from many, sympathetic understanding from a few.

INDUSTRIAL BUILDING
Design and construction lessons from one of the nation’s largest producers of industrial plants—H. K. Ferguson Co.

LOW-COST SCHOOL

$7,700 PER BED HOSPITAL
In collaboration with Consultant Robert L. King, Architect Don W. Smith has given Anson, Tex. an economical hospital—a case study in cost cutting.

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Eight winners in the magazine-rack design competition sponsored by the Magazine Publishers Association.

MULTIPURPOSE COLLEGE BUILDING
Marcel Breuer’s Arts Center for Sarah Lawrence College in Bronxville, N. Y. is built around a new kind of theater.

BUILDING ENGINEERING

REVIEWS

PRODUCT NEWS

TECHNICAL PUBLICATIONS
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<table>
<thead>
<tr>
<th>KENTILE</th>
<th>KENCORK</th>
<th>KENRUBBER</th>
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<tr>
<td>4.5 BTU/sq. ft/hr./°F/in. thick</td>
<td>0.7 BTU/sq. ft/hr./°F/in. thick</td>
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<td>1/8&quot; 36 BTU/sq. ft/hr./°F</td>
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<td>3/16&quot; 24 BTU/sq. ft/hr./°F</td>
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<td>3/16&quot; 24 BTU/sq. ft/hr./°F</td>
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Based on the "K" factors at top of each table, heat transmission rates through the various thicknesses of KENTILE, KENCORK and KENRUBBER are shown. The "F" means that this is the transmission rate when there is 1°F difference between the top and bottom of tile. The heat transmission rate increases proportionately with an increase in the temperature difference between the top and bottom of the tile; e.g., with 1/8" KENTILE, heat transmission rate would be 180 BTU/sq. ft./hr. if there were 5°F difference between top and bottom of tile.

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Building industry warms to GOP climate, likes most appointees

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

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

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

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

Construction lieutenants. What the construction industry had seen so far of the new administration's top men, it generally liked. Designation of W. Walter Williams of Seattle as the next undersecretary of commerce put a widely respected mortgage banker in a spot to be of much aid to the building industry. Williams, 57 and ex-Washington State GOP chairman, led the highly effective Citizens for Eisenhower movement. Seattle voted him its "most useful citizen" in 1946. From 1948-50, he headed the Committee for Economic Development, stressed the importance of research in developing prosperity. He is president of Continental, Inc.

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

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

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

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

In deference to incoming Republicans, NP Administrator R. A. McDonald announced that the new policy was not to anticipate any revision or extension of controls beyond their April 30 expiration date. Since such a wait-and-see policy meant NPA and its affiliated agencies would be virtually out of business as soon as they made second-quarter allotments for 1953, the sensible course was to speed up relief for construction.

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

The relaxation order, said Administrator McDonald, was the biggest since materials controls were first imposed Oct. 26, 1950. Biggest beneficiary was recreational building, long banned except for what indulgence sponsors could wrangle on hardship pleas. It was granted self-authoriza-
Aluminum delayed. The Jan. 1 date for easing controls covered only steel and copper. Although increased self-allotment limits were set for aluminum, they will not become effective until May 1. Reason: power shortages in the Pacific Northwest and Tennessee Valley have cut aluminum production an estimated 40 million pounds a month. The new rules:

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

- Chorused President Robert H. Pease of Detroit Realty & Mortgage Co. at Pittsburgh MBA clinic the same day: "Most industry is still in multistory buildings. But it is beginning to realize that it costs money to move things several times from floor to floor . . . that this cost can eat it out of house and home ... that it can't live in an old plant any more than in an old house."

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

New York employers pay $7.8 million for welfare

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

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

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

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

Only from such a detailed presentation, thinks Creedon, will Congress get full information on the rate at which funds have been used. From such item-by-item accounting should come a truer-than-ever forecast of the rate of contract awards through the balance of the present fiscal year ending June 30. In this way the legislators will know what has been spent and what is left over in authorization and appropriations.

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

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

The definition of what constitutes permanent construction and how many degrees of temporary construction should be recognized has long perplexed military planners. Creedon has some firm opinions on this score. For one thing, he considers it nonsensical to try to steer for any imaginary concept between temporary and permanent. Under the thinking that is now jelling in Creedon’s office, permanent would be anything built with a life expectancy of 25 yrs. with a low maintenance and operating cost. Temporary would be anything that would last up to five years without excessive maintenance costs.

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

Massachusetts housing bonds flop at 2 ½% 

In September, prices paid for $170 million of tax-exempt public housing bonds sold by PHA translated into an average yield of 2.54%. This month, investors indicated they would take nothing less. Massachusetts housing authorities offered $8.2 million of 2¼% tax exempts on Dec. 3, with a proviso that all bids must be at par or better. They received no bids. Massachusetts decided to proceed with temporary loans, probably await the outcome of the next big federal housing offering ($140 million), before going to market again.

STANDARD BARRACKS. the Air Force is adopting for enlisted men will be three-story concrete-frame, masonry curtain-wall structure with semi-private bathrooms. Army Engineers, who have awarded Architects Harley, Ellington & Day of Detroit contract to prepare working drawings, say bid prices so far indicate barracks will cost no more than present standard USAF design ($1,266 per man) which has separate rooms but central toilets. New barracks improves on pioneer private-bath barracks at Offutt Air Force Base (H&H, Jan. '52) with more lounge space, easy convertibility to BOQ.
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Economists attack theory of building cycles, say public works won't cure big depression

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

- There is no such thing as an 18 to 20 yr. normal construction cycle, which helps touch off depressions. A postwar collapse of US building is by no means inevitable. Instead, with the right government policies, construction can stay at high levels.
- Public works cannot be counted on to offset any major recession. Even their limited use as first aid to counteract lesser business setbacks will require far greater long-term planning, budgeting and coordination of federal, state and local programs. Instead, "government intervention should be the last and not the first step in stabilizing construction and investment."
- Although the historic instability of the construction market has led to belief that its violent ups and downs multiply their effect on the US economy, actually the building industry is more victim than villain. It wavers less than some other major segments of the economy. In the absence of wars, dropping demand for some kinds of construction is often offset by growing demand for others.
- Restrictive practices by employers, labor and government alike have failed to produce the protection against market swings their creators intend. Instead, they have "prevented growth" of the industry by buoying up costs rather than employment, by "discouraging technological advancement and thwarting incentives to increased productivity."

Basic causes. "Instability," write Authors Colean and Newcomb, "is at the heart of the problems of the construction industry. It has given the industry its peculiar pattern: looseness of organization and dispersion of managerial control. . . . It is responsible for an inclination to concentrate technological effort on improvements in adaptability and time rather than on reduction of cost—on the ability to erect an Empire State Building in a year's time rather than to build a house at the lowest possible cost."

Against the theory that construction's violent ups and downs come in depression-producing cycles, Colean and Newcomb offer evidence that the real cause is wars. Looking back over construction statistics as far as the Civil War, they find similar big drops in years following the Civil War, World Wars I & II. Elsewhere, the general trend was up, the setbacks irregular.

How to lick depressions. With many a GOP planner figuring that increased public works are the handiest medicine for any business setback, the two economists' views on the limitations of such remedies took on added importance. It is technically possible, they say, to step up public works enough to offset a 30% plunge in private construction. But this "is not a tool which can ordinarily be used at an early stage of a decline" because it is nearly impossible to tell then what kind of a recession it is. If construction falls off because prices are too inflated, a rush of public works will only support unsound price levels, make the eventual plunge worse. Huge engineering works like dams, harbor improvements and expressways take so long to get going they are hard to use at the right time. Moreover, building contractors and labor cannot usually shift to such heavy engineering work. Thus if highway building were already fairly high, expanding it to fight a recession "may raise prices more than volume."

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

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

Within the industry, the "first line of defense" against boom and bust should be increased productivity, the authors say, "rather than government subsidy or the anti-cyclical use of public works."

Antitrust indictments name nine Detroit roofing firms

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

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for interior and exterior
wall applications

Because it successfully combines beauty, flexibility, permanence, sanitation and long-range economy; because it is mechanically ground and polished to a true, flat surface; because it offers a palette range of ten genuinely distinctive colors that are soft and rich, harmonizing with any color scheme—leading American architects consistently design with Carrara, the quality structural glass.

Here is a wall material which is strong and durable. It is made to withstand rigorous use—indoors and out. It will not absorb odors. Grease, grime, moisture, chemicals and pencil marks cannot affect it. It is a “clean material.” And it is easily kept that way by the simplest daily attention. In fact, merely wiping it with a damp cloth keeps it new-looking and sparkling for years and years. It never fades or stains. And its adaptability offers the architect limitless opportunities for extreme originality of design.

We suggest that you give serious consideration to Carrara Glass in all your plans. And for additional information, refer to your Sweet’s Catalog, Section 13e, or write to Pittsburgh Plate Glass Company, Room 2146, 632 Duquesne Way, Pittsburgh 22, Pa.

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

the quality structural glass

PAINTS - GLASS - CHEMICALS - BRUSHES - PLASTICS

PITTSBURGH PLATE GLASS COMPANY
New York's fabled Robert Moses draws fire on redevelopment scheme for a coliseum

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

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

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

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

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

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

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

Federal law requires that Title I redevelopment produce "predominantly residential" projects. But the coliseum would occupy 145,482 sq. ft. of the site, the proposed housing only 129,874 sq. ft. But by reserving 18,000 sq. ft. of garage inside the coliseum for the housing project, Moses managed to label the area "devoted" to housing as 147,874 sq. ft., or 53.4% of the area.

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

New York state building code adopted by 48 towns

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

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

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

The code got a boost this month from New York's Regional Plan Ass'n. It praised New York's commission for "pro-viding municipalities with building code service of outstanding quality and extent . . . facilities for code drafting, guidance and research . . . which are feasible only on a state-wide basis."
REALTORS’ CONVENTION urges tax aid to fight slums, knocks Title I; market outlook cheerful

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

‑ Predicted President Thomas McCaffrey, Jr., of the Society of Industrial Realtors: “The new administration can only add impetus to industrial dispersion. This will mean additional industrial construction, particularly in planned industrial tracts.”
‑ Forecast Mark Levy, Chicago mortgage and investment specialist, and S. Edwin Kazdin, Appraisal Institute regional vice president from New York: when federal rent control ends in all but critical defense areas, as pledged in the Republican campaign platform, middle-income apartments will rise in cities where the market still warrants.
‑ Said William J. Campbell, industrial vice president of Herbert V. Jones Appraisal Institute from New York: “The trend away from socialism” will spark power and utility projects retarded by threat of government takeover and encourage private housing threatened by public housing competition. Even without politics, a tremendous industrial replacement construction program is in sight as occupants of obsolete, poorly located factories are forced to switch to better-located, single-floor plants to match the efficiency (and savings on high-paid labor) of competitors who already have them.
‑ Boasted Houston Realtor Charles J. Maybee: “The trend away from socialism” will spark power and utility projects retarded by threat of government takeover and encourage private housing threatened by public housing competition. Even without politics, a tremendous industrial replacement construction program is in sight as occupants of obsolete, poorly located factories are forced to switch to better-located, single-floor plants to match the efficiency (and savings on high-paid labor) of competitors who already have them.
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Drop in 1954? Acting Deputy DP Administrator Alvin Mayne suggested 1953 would see the peak of industrial plant construction. He noted DPA has certified fast tax amortization for $23 billion of defense-production facilities. Of these, 57% are completed; 85% will be completed by the end of next year. Said Mayne: “Unless industry itself expands, industrial construction appears likely to take a big drop after ’53.” He saw one cushion: expansion by industries that were denied building materials through the defense buildup.

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

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

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

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

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

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

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

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

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

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

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

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

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

**Build America Better panel probes city deterioration**

Most informative session at NAREB's convention was a panel on the need for urban conservation and preventing needless, economically unsound decentralization. Said moderator and former NAHB president Fritz Burns (below, right of speaker):

"This program could provide the basis for economic stability without war . . . protection against the boom and bust cycle."

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

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

Harley P. Swift (3d from r), president of the Harrisburg (Pa.) Railways: "People, not vehicles, make an area prosperous. When cities will subsidize the users of public transit to the extent they have subsidized users of private automobiles, the traffic problem in downtown areas will be well on the way to solution, if not entirely cured. Transit could be subsidized . . . simply by restricting, not entirely eliminating, automobile use in business areas, . . . facilitating buses and other public transit. . . .

Public transit carries 70% of the people coming into a business area in 6% of the vehicles and uses only 20% of the streets available, while 65% of the remaining 30% are people who will not use their cars between morning and evening."
Karnak Asphal t-Aluminum Roof Coating as developed after extensive research by our laboratories combines carefully selected asphalts and vehicle with full leafing aluminum pigment. The result is a superior product which gives excellent protection and beautifies the structure coated. The aluminum particles leaf as the asphalt base dries, which forms a firm metallic shield that resists weather and reflects the hot sun rays.

Composition roofs are revitalized by the penetrating qualities of the asphalt which in turn is protected by this firm aluminum shield. Rustable metal sidings and roofs are protected against moisture and corrosion. One gallon covers approximately 250 to 400 square feet depending upon the type of surface area.

The quality of Karnak Asphalt-Aluminum Roof Coating is certified by the Warranty Seal which is attached to every container. This is your assurance of the manufacturers' integrity in supplying the best product for the money expended.

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The membrane, of open-mesh construction, supports the waterproofing asphalt material, prevents it from cracking, and insures the uniformity and proper thickness of the asphalt application. Karnak Waterproofing Fabric is available in handy rolls, individually packed in sturdy corrugated cartons for immediate use or indefinite storage. The fabric unrolls evenly, without distortion ... can be applied easily, smoothly, wrinkle-free, right down to the last inch. For positive waterproofing protection on all construction, ask for the Karnak "System" of Membrane Waterproofing.

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

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

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

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

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

The committee suggested UNESCO take its contemporary ideas into the suburbs to Rond Point de la Défense, beyond the limits of subway lines and classic monuments.

Cabinet struggle. The twin blows proved fatal. The French cabinet debated the issue and Reconstruction Minister Eugene Claudius Petit warned rejection of the $71/2 million skyscraper sandwich might provoke UNESCO to move to Italy or Switzerland. But education ministry traditionalists won. On Nov. 22, the French government withdrew its offer of the Porte Maillot site.

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

- A 99-year renewable lease.
- Re-offer of a 3-yr., interest-free loan of 2 billion francs ($35 million).
- Reimbursement of UNESCO's expenses for the rejected plans by Zehrfuss, Breuer and Nervi.
- Removal of some restrictions it placed on the Place Fontenoy site when Beaudoin tried to design for it. Most important: UNESCO would not be required to build up to the semicircular curb as the labor and merchant ministry along side have done.

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

This brought the comedy around full circle to the starting point. Whether it would go around again remained to be seen. Paris architects felt the "harmonious entity" stipulation could well lead French authorities to throw out the new plans as they did the old. Moreover, admitted Zehrfuss in a Figaro interview, to bring forth "harmonious entity" between Gabriel's low, 18th-century Ecole Militare buildings across one street and the bulky merchant marine building across another was a tough job. He suggested trees might line the front of the plot, with buildings at the rear.

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

Construction wages rise 6% in 9 months, BLS finds

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

**NEWS**

**NEW CONSTRUCTION ACTIVITY**

(Expenditures in millions of dollars)

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

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

**Construction activity** in November ran $700 million above October, BLS finds.

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

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**Central unit for CBS Television City opened**

The first unit of CBS' Television City may become the biggest development of its kind since Rockefeller Center—opened last month in Hollywood. The $12 million structure designed by Architects William Pereira and Charles Luckman consists of four studios and three rehearsal halls in the right wing, and a three-story glass-walled service unit at the left containing offices and shops. The ramp around the outside permits scenery hauling, spectator movement. The building has only enough permanent walls to withstand quakes because it is designed for complete flexibility and expandability (as described fully in FORUM last May).
Gas or electric range. Electric refrigerator counter, range-top and sink in one seamless piece. Cupboard and undersink storage all in units 39" to 69" wide.

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Typical are the Essex Apartments in Indianapolis where 390 Dwyer Kitchens save room for more spacious living areas. Dwyer Kitchens enjoy 28-year record for durability and trouble-free operation in rental properties.

This old residence was changed from tax-eater to profit-maker. Dwyer Kitchens were the key to remodeling into quickly rented apartments.

Motels and resort cabins encourage longer stays and better rents with Dwyer Kitchens. Mother gets more vacation too ... enjoys full kitchen convenience with minimum work.

Convenient for coffee, for simple or sumptuous food. Thousands used in offices, stores, banks, television and radio stations, fire stations, schools, churches ... used for night shifts ... and wherever close-at-hand kitchen facilities are needed.

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Dept. F1252, Michigan City, Indiana
PEOPLE: ex-plumbers Durkin, Meany win top labor posts; professor envisions cities weather-conditioned by plastic dome

Two top positions in labor went to men who started as plumbers. Eisenhower's secretary of labor, Martin P. Durkin, 58, was a steamfitters' apprentice at 17, business manager of Chicago Local 597 of the plumbers' union for 20 yrs., director of the Illinois State Labor Department, and since 1943 president of the AFL Plumbing and Pipe Fitting international (see p. 39). (Taking over as acting president of the international: First Vice-President Peter T. Schoemann, president of the Milwaukee Building and Construction Trades Council.)

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

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

Florada's State Board of Engineering Examiners found there was "gross negligence and carelessness" in the design of a municipal bandshell for Hollywood, Fla. by Louis G. Farrant and revoked his civil engineer registration. The board took no action on four other charges against Farrant involving dual retainership and the design of other structures including the Atlas Terminals warehouse where a Yount-Slick lift slab collapsed three times during erection. (AF, April '52, p. 47; Sept. '52, p. 45). Farrant closed his office in Miami after the charges were filed, and, after a public hearing on them Aug. 1, moved to California.

As first pig iron came from its new Fairless Works at Morrisville, Pa., US Steel completed a reshuffling of its high command. Clifford F. Hood, 58, sales-promotion expert, moved up from executive vice president to president, where he will be responsible for production and sales. Benjamin F. Fairless, 62, both president and board chairman since retirement of chairman Irving S. Oals, 65, last spring, will now devote his energies only to the board chairmanship, public policy matters, will continue as the company's principal public spokesman. Harvey B. Jordan, 57, production authority and advocate of research to develop new products, was moved from the presidency of American Wire & Steel, to executive vice president in charge of operations.

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

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

DIED: James W. O'Connor, 77, FAIA, architect for New York public housing,...
Two new schools install
Silvray silvered-bowl lamp fixtures

These two new schools are among the more than 100 that have installed Silvray silvered-bowl lighting units in the past 18 months.

Silvray installations are characteristically free from eye-torturing glare — both direct and reflected. Largely responsible for the visual comfort afforded by Silvray luminaires is their use of silvered-bowl incandescent lamps. Functioning as both a light-source and light-control element, they collect and direct light to the ceiling making it the primary source of diffused light. The resulting indirect light minimizes shadows and reflected images . . . permits certified efficiencies of 80-90%.

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

SEND FOR COMPLETE DETAILS

SILVRAY Lighting, Inc.
107 West Main St., Bound Brook, N. J.

Gentlemen:
Please send me full details on Silvray indirect lighting units.

Name ____________________________
Firm ____________________________
Address __________________________
City ____________________ Zone ______
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Smoot-Holman, Inc. — west coast licensee.
Locks face their most grueling tests aboard ship. Sea duty subjects locks to everlasting motion during every minute of every voyage, and to the continuing corrosive action of damp salt air. During 12 years of this rigorous service on the S.S. America, Schlage Locks have proven their ruggedness and their extreme resistance to corrosion.

Now, U.S. Lines has again selected the time-proven Schlage Lock for use throughout the magnificent, new S.S. United States. Schlage Locks for commercial buildings and residences have the same type of durable mechanism as the locks used on the S.S. United States.

FACTS ABOUT THE S. S. UNITED STATES
THE LARGEST SHIP EVER BUILT IN THE UNITED STATES

Length . . . . . . 990' Gross tonnage Over 50,000
Beam . . . . . . . . . . . . 101' 6" Total passengers . . . . . . 2,000
Depth: Keel to top of Total crew . . . . . . . . 1,000
forward funnel . . . . . . 175' Estimated cost $70,000,000
Number of decks . . . . . . 12 Builders: Newport News
Speed . . . . . 30 knots plus Shipbuilding and Dry Dock Co.

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

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

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THE TIME-PROVEN CYLINDRICAL LOCK
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SCHLAGE LOCK COMPANY OF CANADA, LTD., VANCOUVER, B. C.
Multer, D., N.Y., replied that the committee would probably consider the subject in executive session; make recommendations to the tax-writing Ways and Means Committee.

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

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

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

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

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

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

Automatically attracts store traffic

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

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

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

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

Take advantage of this efficient approach on your own temperature control problems. The experience of the nationwide Johnson organization is at your disposal without obligation. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin. Direct Branch Offices in Principal Cities.
Haxby, Bissell & Belair, architects chose FIAT Duro Flush Type Toilet Compartments to complement the splendid architecture of this fine new school. Naugle-Leck, incorporated was the contractor.

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

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

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

WHEN YOU SPECIFY FIAT ... YOU SPECIFY QUALITY

TOILET COMPARTMENTS
DRESSING COMPARTMENTS
HOSPITAL CURICLES
PRESWOOD COMPARTMENTS*  

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

SEE SWEET’S 22b 

ARCHITECTURAL

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

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

FIAT

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(Chicago Suburb)

Los Angeles 63  
California

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

LETTERS

SCHOOLS

Sirs:

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

Enthusiastically yours,

Fenton Keyes, business manager
Skidmore College
Saratoga Springs, N.Y.

Sirs:

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

Norman G. Aehle, architects
Seattle, Wash.

Sirs:

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

Herold C. Hunt, general supt. of schools
Chicago, Ill.

Sirs:

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

William A. Ganster
Ganster & Hennighausen, architects
Waukegan, Ill.

Sirs:

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

F. C. Thomas, supt.
Barrington Public Schools
Barrington, Ill.

Sirs:

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

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

Jedd S. Reisner
Reisner & Urbahn, architects
New York, N.Y.

continued on page 62
Like the engineers you consult for professional advice and assistance on your building plans, "The Hardware Consultant" (certified) is fully qualified to advise and cooperate with you in the selection, detailing, supervision of installation, and maintenance of builders' hardware.

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

When you deal with an architectural Hardware Consultant, you may be sure that the hardware he recommends will meet the requirements of the structure you are planning—from the point of view of design, function, and performance. For that's his specialty.

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

The Stanley Works, New Britain, Conn.

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HARDWARE • TOOLS • ELECTRIC TOOLS
STEEL STRAPPING • STEEL
3 POWERS Safety Features
Banish "Booby Trap Showers"
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POWERS Thermostatic Water Mixer
Greater Comfort and Safety assured by these 3 features

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

The Most COMFORTABLE Showers Are Regulated by

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

How it Works: Hot and cold water piped to mixer are blended and thermostatically controlled at any temperature desired. For shower or tub bath, Powers mixer handle is turned until water flowing into tub reaches temperature desired. Then bather enters tub. For a shower, diverter spout knob is pulled up diverting water to shower head. When shower is completed, mixer is shut off. Diverter spout flapper valve returns to "tub" position automatically.

To be Really Sure of Safe Showers • Specify POWERS

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

THE MAGAZINE OF BUILDING
BUILD YOUR AIR CONDITIONING SPECIFICATIONS AROUND Curtis

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

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Curtis REFRIGERATING MACHINE DIVISION of Curtis Manufacturing Company
1914 Kienlen Avenue, St. Louis 20, Missouri
98 Years of Successful Manufacturing
Tightest Closing Windows
Ever Made!

TEN TIMES TIGHTER

Than generally accepted standards for casement windows and projected sash

cuts fuel bills or air conditioning costs
for a Lifetime...

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

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

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

Closes Ten Times Tighter Than Generally Accepted Standards...

Here's how: (a) While vents are swinging in toward the frame, the vertical operating bars at each side of window move up. (b) Note how lugs on operating bars engage hooks on vents as the bar moves up...applying the wedging action that pulls the vents in tightly against the frame. (c) The vents are pulled in snug, and pressure against vinyl weatherstripping assures a complete seal (like the door of your refrigerator). Automatic locking has commenced. (d) Final "locked" stage of AUTO-LOK operation...hooks have moved in, adding extra locking action near the bottom of the vents, on both sides...without any strain on hinges.

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

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

LUDMAN LEADS THE WORLD
ONLY AUTO-LOK GIVES YOU ALL 10 OF THESE Outstanding FEATURES

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

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

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

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

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

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

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

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

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

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

Specify Windows on the Basis of Facts

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

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

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

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

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

LUDMAN ENGINEERING & ARCHITECTURAL PLANNING SERVICE
Ludman Window "know how" can help solve your window problems. Our engineering and planning staff is at your service.

LUDMAN Corporation
Box 4541, Miami, Florida
YOU Be the Judge...
Examine AZROCK
From Any Standpoint!

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

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

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

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

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

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

Write today for AZROCK'S New Color Chart and a set of AZROCK tile samples.
When you specify Stark Glazed Facing Tile for school interiors, you can rest assured that your original design concept will retain its freshness for years to come.

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

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

Our new brochure on Modular Masonry contains full specification data. To obtain one, just write us on your letterhead. Our reference in Sweet's Catalog is 41-St.

STARK Ceramics, Inc., Canton 1, Ohio
14305 Livernois Avenue, Detroit 4, Michigan
15 East 26th Street, New York 10, N.Y.
Bids were obtained on solid slab and concrete joist floor construction for this $3,000,000 high school. Concrete joist construction, using a 20" removable metal form, was selected because it showed a saving of 35¢ a square foot.

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

**structure** | **cost estimate**
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Solid Slab | $1.45 per sq ft
Concrete Joist Construction | $1.10 per sq ft
(Using 20" removable metal forms)

**Concrete Reinforcing Steel Institute** • 38 South Dearborn Street, Chicago 3, Illinois
You wouldn't select an antiquated oil lamp to light a modern office. The same should apply to circuit protection.

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

Remember—only circuit breakers assure: (1) positive electrical protection, and (2) swift restoration of service. And only I-T-E breakers embody those important extra features necessary to safeguard modern installations.

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

I-T-E Molded Case Circuit Breakers provide not one, not some, but all these important advantages:

- First cost the last—nothing to replace or repair.
- Safety for personnel—no live parts exposed.
- Quick restoration of service. 3-position operating handle clearly and unmistakably indicates TRIPPED (upon short circuit or overload)—as well as ON and OFF.
- All breakers accurately calibrated and sealed (to prevent tampering) in sturdy, heavy-duty molded cases.
Beautiful Plascor flooring as installed in the Carnegie Free Library, Napoleon, Ohio, by Bernard's Inc. of Toledo, Ohio.

RESILIENT FLOOR TILES

EASY ON THE EYES, EARS and FEET

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

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

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

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

Write, today, for full information and samples!

U. S. STONeware
AKRON 9, OHIO

LETTERS continued

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

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

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

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

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

Buckminster Fuller
Forest Hills, N. Y.

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

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

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

H. H. Houck
Alabama Building Commission
Montgomery, Ala.
Cross off all window maintenance costs with Adlake aluminum windows

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

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

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

THE
Adams & Westlake
COMPANY
Established 1857
ELKHART, INDIANA • New York • Chicago
classrooms
libraries
offices
lecture rooms
gymnasiums
corridors

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

PLB-240
LOW-BRIGHTNESS UNIT

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

V-240
LEADER VARSITY

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

V-400
LEADER OFFICER

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

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

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

Sold and installed by the better electrical wholesalers and contractors

LEADER ELECTRIC COMPANY • 3500 North Kedzie Avenue • Chicago 18, Illinois
Leader Electric-Western • 800 One Hundredth Avenue • Oakland 3, California
Campbell-Leader, Ltd. • Brantford, Ontario • Canada
For modernization, or new construction, Fiberglas Sonofaced® Acoustical Tile offers many design and acoustical advantages. This tile has new and interestingly different decorative possibilities. And noise reduction coefficients up to 70% can be obtained.

Maintenance properties of Fiberglas Sonofaced Acoustical Tile are unique, too. The smooth, unbroken film surface affords extreme ease of maintenance and is highly sanitary.

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

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LETTERS continued

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

E. H. Praeger, engineer
New York, N. Y.

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

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

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

ALUMINUM VS. STEEL
Sirs:
Congratulations on the article “Aluminum for Building” in the September Forum. It should be both interesting and instructive to architects and structural engineers.

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

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

J. Gordon Ainsworth
Kaiser Aluminum & Chemical Sales, Inc.
Oakland, Calif.

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

The design we prepared for the architects and engineers would have required 1,088 cu. yds. of concrete, 68 tons of standard steel and only 19.5 tons of high tensile strength wire to prestress the dome abutment ring.

[As built, the Framingham dome used 440 tons of steel, excluding the steel decking.—Ed.]

On a square-foot basis the above steel quantities show . . . 4.3 psf of total, steel continued on page 74
Pittsburgh's "Golden Triangle," formed by the junction of the Allegheny and Monongahela rivers, was so named when fabulous coal and steel fortunes were made there. Through the years the area at "The Point" became a commercial slum, but today it is a preview of the Pittsburgh of tomorrow.

FROM SQUALOR TO SPLendor

GATEWAY CENTER, being erected by the Equitable Life Assurance Society in Pittsburgh's Golden Triangle, is the largest single project in the transformation of an area of ugliness into one of great beauty and increased business housing. Three stainless-steel-clad office towers on 23 landscaped acres facing the new Point Park are the first of eight to be erected. Occupants of these three modern structures are served by the largest air conditioning system in the world. More than 6,000 room units provide cooling equal to that produced by melting 9 million pounds of ice daily. This system is typical of the many efficiencies. To have had its Flush Valves chosen for installation throughout all these buildings is a source of pride to SLOAN, and another preference that explains why...

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BUILT TO SAVE MONEY

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

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

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

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

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

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

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

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

**GEODESIC DOMES**

Sirs:

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

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

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

Buckminster Fuller's 40' diameter triangle grid (Geodesic) dome shown in your article was designed and calculated by this office. There is a 20% difference in length between the longest and shortest member. The system permits continuous triangle subdivision. The maximum number of different lengths is 50—at this point a ± 5 mil. fabrication tolerance accommodates any further lengths of member required. In this way it becomes possible economically to reduce the size of the individual triangle to the point at which shell mechanics can be applied.

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

Jeffrey Lindsay, director
Fuller Research Foundation
Montreal, Canada

**INDUSTRY EDUCATION**

Sirs:

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

continued on page 78
SAVE HALF* THE INSTALLATION COST—Get Better Heating!

*Actual Savings 49%

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Brown and Matthews, Inc., Contractors.

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WRITE TODAY FOR YOUR COPY OF BUSINESSMAN'S BLUE BOOK OF BETTER HEATING
It gives numerous examples of correct unit heater installation practices to assure efficient heating with real operating economy.
Piedmont Sanatorium consolidates facilities in buildings of firesafe Architectural Concrete

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

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

Joseph H. Saunders, Jr. of Alexandria, Va. was the architect for the new section. Fred N. Severud, New York, was structural engineer. Virginia Engineering Co., Inc., Newport News, was contractor.

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

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- Dogging features at each end of crossbar have direct drive into lever arms. Phosphor bronze compression springs used throughout.
- Top and bottom pullman type latch bolts with independent action, ¾" throw bolt pivoted on monel metal axles, ball compensating vertical rod connections, and steel bushings on cam pins.
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- The 300-foot bridge over Deal Lake in Monmouth County, New Jersey was built in 1941 of treated wood for two reasons: (1) the treated timber structure costs less than a third of what a similar concrete bridge would cost, and (2) the treated lumber resists rot, rust, corrosion and termites. This bridge has now given 11 years of maintenance-free service.

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"Loma Loom" carpet, with the built-in sponge rubber cushion, is easy — and economical — to install. Just lay it down — no base or underlay is needed. Because of the sponge-rubber back, "Loma Loom" carpet moulds to any type of flooring.

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

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

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

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

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

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

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

FRANK LLOYD WRIGHT
FRANK LLOYD WRIGHT, architect: "As the square has always signified integrity and the sphere universality, the triangle stands for aspiration. . . . Here is a church where the whole edifice is in the attitude of prayer.

"Instead of excluding the outside prospect which is beautiful, we have allowed it to come in facing the audience to become part of the background for music and preacher."

MAX D. GAEBLER, minister: "Inside the church, as one faces the prow, the powerful focus upon the pulpit and the strong vertical thrust of the prow create a feeling of unity and elevation which surpasses description. Yet when one faces the hearth room, there is by contrast a warm and intimate feeling which suggests the flux of daily life.

"The utter simplicity of the assembly room is friendly, not austere. The large, clear glass areas, the warm colors, the closeness of the congregation to the pulpit—all this helps to create an atmosphere of directness and honesty, with no barriers of false formalism interposed between minister and congregation. It would be difficult to speak or think anything but the truth in such a setting. Mr. Wright has caught the spirit of liberal religion and has given it architectural embodiment."

THIS IS THE PROW: OUTSIDE, IT IS A 40 FOOT SPIRE; INSIDE, IT FORMS THE BACKDROP FOR PREACHER AND MUSIC
Wright’s "triangle," the thrusting roof, is an astonishing structure. Exterior appearance of a center ridge is illusory; actually two ridges converge at the prow (see diagram). The roof is supported by a series of trusses built entirely of nailed 2 x 4's and 2 x 6's, "a sort of hammer-and-saw artist's field day," according to Taliesin people. Each pair of trusses acts like a center-hinged arch. Top chords, progressively shortening from base to prow, are in the same plane. Lower chords are in a warped plane nearly horizontal at the base and nearly vertical at the prow. This creates an interesting warped ceiling shape. At the prow the three leading trusses rest on a steel beam cantilevered forward from sidewalls and rostrum piers. These trusses in turn extend outward to form an overhang at the sides.
ROOFING IS GREEN COPPER LAID IN STRIPS TO EMPHASIZE SHELTERING LINES

ABOVE, INTERIOR OF LOGGIA; BELOW, VIEW LOOKING EAST ALONG LOGGIA WING
Design of this church began with an abstraction, "unity," which Wright chose as the appropriate theme for a Unitarian building. Translated into tangible terms, the result is an extraordinarily happy combination of function and symbolism.

Wright has taken three customarily separate parts of a church and gathered them into one unit which serves as spire, chapel and parish hall in one. Here is how this dramatically roofed assembly hall works: For worship, movable pews are faced toward the prow; for concerts, movies, plays and lectures, the light plywood pews are turned toward the informal hearth room; for dinners, socials and dances, pews are folded and shifted aside or arranged "living-room style." For small gatherings, the hearth and pulpit ends of the room are divided by a great red, purple and copper green drapery. (This curtain is a story in itself. It was woven by women of the parish from flax, rayon, banana rope, metal ribbon and sisal after a sample worked out by Mrs. Wright. Object: an atmosphere of "well-mannered gaiety.")

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

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

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

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

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

Exclusive of land, the building and contents cost $165,000 ($660 per seat). Added to the cash outlay is an indeterminate value representing volunteer work. All the 1,000 tons of stone in the 16-19” thick masonry walls was loaded and hauled from a quarry 30 miles distant by members of the parish. Working at night, parish members plastered the wings, finished walls, woodwork and floors. Members of Wright’s Taliesin group landscaped the site, plastered and inscribed the assembly room, made furniture, laid the stone slabs of the pulpit. Incidentally, Wright’s father was one of the organizers of the parish in 1879 and Wright has himself been enrolled as a member for many years.
DENSITY AND TRANSPARENCY: AT THE PROW ONE BECOMES MOST AWARE OF MASSIVE MASONRY STRATIFIED AS IN NATURE
A last, close look at the prow. Glass enclosing the apex is held between 2" x 12" louvers and is placed at 25% slant to shut out glare.
ANARCHY IN OUR CHURCHES

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

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

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

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

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

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

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

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

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

For example, the rejection of Ernest Born’s fine design for a seminary chapel (p. 102) dramatizes the problem even the best church architects face in the atavistic attitude of many ecclesiastical clients today. The inexpensive Schweikher & Elting chapel (p. 99) questions whether a church should be designed primarily for worship on the sabbath or for its community-center activities the other six days of the week. The Unitarian church in Minneapolis (p. 106) suggests a completely “secular” approach; the Alden Dow church (p. 95) takes as strong a stand for mystical values. The church in St. Louis (p. 108) emphasizes the importance of other arts—in this case stained glass. And the two little chapels (pp. 94 & 98) remind us that some of the nicest church design today is in small parishes.
This church is all roof, needs no steeple, seats 120 people
Chancel is lighted from sloped windows between exposed laminated fir beams

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

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

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

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

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

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

DOUBLE-DUTY ROOF
eliminates walls,
converts nave into a steeple
WARM MATERIALS AND DETAILING

breathe emotional atmosphere into a simple church form

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

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

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

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

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

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

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

Exclusive of landscaping, cost was $455,000, or 63¢ a cu. ft.
At night, the chancel's skylight effect is maintained with system of reflectors and incandescent lamps.

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

of rustic design costs little, serves all sects well

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

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

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

Designed to serve a 200-home summer colony, the chapel had to be nonsectarian in character while suggesting worship, and had to cost less than $20,000. It does both: All elements of the community like the chapel—and its cost, which was $17,000 or about 38¢ per cu. ft.
MULTI-USE SPACE
created with flexible partitions
in an open single-level plan

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

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

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

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

Bell tower screens entrance to 140-260 seat church, is reflected in shallow pool. South facade (below) is 14'-high glass wall shaded by deep overhang. North exposure was impossible for site reasons. Bell for tower was made by Petit & Fritsen, in Holland.
THE ART which Schweikher & Elting put into their design is as important as the space they got out of it. This church derives its dignity from careful and precise understatement: Nothing could be simpler than the bell-tower construction with reflecting pool outside—and nothing could be more dignified; nothing could be cleaner than the stone altar and the plain cross—and nothing more serene.

In the work of Schweikher & Elting, this church represents a turning point. For many years their designs, conceived in the “prairie region” outside Chicago, continued the Chicago tradition of the first decade of this century. Recently, however, their work has been marked by an increasing simplicity: the simplicity of the rectangular steel frame, the simplicity both of Chicago’s first steel-frame buildings around 1880 and of the new developments initiated by Mies van der Rohe. This is a very conscious change in direction; and future issues of FORUM will further document this change in Schweikher & Elting’s work.
View of typical classroom used as nursery school. Partitions between classrooms (left) can be swung up like garage doors.

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

Classrooms are along north side of assembly room, can be used for overflow seating when sliding walls are drawn back.
CAMPUS CHAPEL: It is traditional to be modern—but it is not modern to ignore tradition

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

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

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

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

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

Born is the sort of artist who cannot help knocking himself out every time he starts work on a problem: when the Pacific School of
Religion asked him to make a study for a chapel, Born went far beyond. Before he even began on the chapel, he studied the neighborhood of the Berkeley campus as well as the site itself; he prepared a master plan for the school (it had never been done before); he went to extraordinary lengths to find a solution that would give the campus a harmony and coherence it had never before had—without compromising his own architectural credo; and only then did he develop a complete building with space for future growth.

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

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

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

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

How Ernest Born tackled the job is discussed on the next page.
First problem: harmony by contrast

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

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

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

Second problem: architecture of Truth

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

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

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

Born's prospects at present may not be bright, but they cannot be hopeless; for this is a building that carries great conviction; a building that has already established a rightful claim in many minds to a place on Berkeley's skyline.
L-shaped steel frames at right are anchored on hillside, balanced on light columns at left. Steel frames are blue, louvers at left are sheathed in copper, finished with teak on inside. Note skylight over chancel.

View of chapel from campanile shows main entrance. On downhill side are well-lit spaces for crypt and services between foundation walls.
Simplicity of structure kept costs low for a brick, fireproof church in a city zone: about 83 cu. ft. or $700 per seat for 725 seats.

Double-glazed window creates no particular heating problem, and late morning services eliminate difficulty of sunlight control.
Classrooms and offices occupy jutting three-story wing which takes full advantage of sloping site.

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

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

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

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

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

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

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

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

Cast concrete squares specially fabricated by contractor bring handsomely patterned light into lobby and vestibule (below). Overflow crowds can be accommodated in meeting room (bottom). It has separate entrance, however, and may be used independently.
North facade with sculpture above main entrance is quiet prelude to south window-mural. Church seats 925.

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

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

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

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

To left of composition's central cross is the Holy Spirit, represented as a dove, above cross of repentant thief. To the right is the Hand of God reaching toward void suggesting unrepentant thief. Mary stands alone on hill of Calvary. Artists' intent was to communicate message of cataclysmic events not only through mental process of allegory but—more strongly—by emotional effect of abstract line and mass.
free, bold sweeps. Biggest opaque area, for obvious reasons, is directly behind the altar. Opaque material is pressed wood painted with oil and wax on both the interior and the clear-glass protected exterior. Besides solving the technical problems of light intensity, this device created an exciting “live” mural responsive to all relative gradations of interior and exterior light.

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

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

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

Sections show how natural and artificial lighting effects are achieved
Lighting gives height to nave. Daylight pours through domes; sanctuary is artificially lighted above ceiling break.

The nave is constructed somewhat like a railroad bridge. Two steel trusses form the entire east-west upper nave walls. The low side ceilings hang from the lower chords of the trusses, the high central ceiling is supported on the upper chords. This yields the free 120' span all the way from narthex to sanctuary wall.
Hovering sculpture
by Carl Milles provides an inspirational highlight for a new kind of cemetery

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

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

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

First reaction: most of them don’t

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

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

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

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

While the critics were happily slugging away at building and magazine alike, a sharp reminder of responsibility came from an unexpected quarter—Paris. There an unregenerate Old Guard was seeking to stop contemporary architecture altogether by vetoing the Breuer-Zehruff-Nervi-Cropius-LeCorbusier-Costa-Markelius-Rogers design for the UNESCO building, which the Old Guard linked with the UN in New York (see News). This left the happy US critics with a sobering decision to make sooner or later. They could bang away merrily and without restraint if they felt that the object of their attack must be demolished at any cost. But they must be aware that in the process they would give great comfort to those who would destroy all that they loved.

Might a more judicious temper not be prudent as well as wise?

A few architects responding to the article were more balanced from the start. Letters are here reproduced in a graded scale, from those of utter condemnation to those of qualified analysis and those of support.

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

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

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

Architect Robert Woods Kennedy, a younger critic, was sure a new element had come in—only a different new phase from that suggested by FORUM. Said he, “It is eclecticism turned modern.”
As ingredients he listed “a little each” of the following: “Le Corbusier cum Niemeyer . . . architectural school circa 1935 [but not 1952—Ed.] . . . New York skyscraper . . . international style circa 1930 . . . store fixture art.” And then, as further elements of “showmanship”—“tin-knockers art painted gold, a ramp on a fragment of the Eiffel Tower, a stairs on Noguchi table legs, ducts and beams exposed like entrails, billious green desktops with baby-blue chairs—glitter, gilt, cute tricks, warm vulgarity. Faith, strength, dignity? No: the mere men assembled within will find little to remind them of the transcendent importance of their task.”

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

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

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

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

“The so-called ‘link’ to the Secretariat is heavy, awkward . . .

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

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

“I think that the analysis which you print is admirable, both in spirit and in method. You have granted the architect the right to be free and have not measured him either by a traditional standard of excellence or by some esthetic dogma. The important thing in all criticism is to determine first the intention of the artist and then, if possible, the extent to which he has realized his intention. In my own opinion no other standard is admissible.” And William Wurster, dean at the University of California, added, “Forum’s article is penetrating, just and tolerant. It does not attempt to praise or criticize but does a fine job pointing out the forces which shaped the building.”
Today's industrial builders are borrowing from the factory managers themselves more and more of the cost-cutting planning methods of big industry. According to H. K. Ferguson Co., which last year erected $66 million of industrial building, key to this new kind of design and construction is learning to see what you don't have to do.

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

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

Cost cutting. This can be a booby trap. Cost of a process plant is measured, not by dollars per square foot, but by cents per pound of product. Architects and engineers in this field must concentrate on operating cost rather than first cost and must help the owner carry this kind of thinking through for every element of plant design. Economies in first cost will, of course, result from bold design simplifications (see below) and from simplification of construction operations, but the architect-engineer who hopes to survive must show the owner how in many cases adding $1 to the first cost of the plant may save $2 a year in operating costs. In the rayon industry, for example, producers like Courtaulds, Ltd. are spending millions for the equipment and the kind of building that almost every plant not frozen by site boundaries must expand sooner or later. Combined with the recent shortage of bricklayers, this need focuses attention on lightweight curtain walls and on a variety of new materials, some of them plastic with the added advantage of admitting daylight. Panel walls like these with simple connections can be easily demounted and moved out as the plant itself moves out. Even where process-plant operators have customarily insisted on concrete walls, Ferguson architects are now promoting the light panel wall which can be easily shifted. For useful details for this kind of wall construction, see p. 125.

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

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

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

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

* A "process" plant converts raw materials to useful products by a basically chemical process, whereas a manufacturing plant is essentially a shelter for machine tools. Process plants are increasing in number, a great increment of the chemical revolution of the interwar years.
The principle of learning to see what you don’t have to do has paid off spectacularly in Ferguson’s program of methods study and preplanning. Executive Vice-President Otto F. Siedler calls the program the “organized application of common sense.” This systematic planning on paper replaces the traditional scene on the job site where foreman and mechanics pore over blueprints, argue about alternative methods, disappear in all directions to get the necessary equipment and materials.

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

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

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

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

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

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

This system was arranged so that the pumping machine had to be stopped only a few minutes while three joints were broken, two pipe lengths and their supporting horses taken out, and the dolly pushed back 20’ to have its discharge pipe reconnected to the main line. Systematic methods planning like this made it possible for
Chrysler Corp. to deliver the pilot model of the army’s newest heavy tank just ten months after the start of plant construction.

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

How to simplify construction procedure

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

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

- **What** is being done, why is it done, what else could be done to get the same result?
- **Where** the job is being done, why, and where else could it be done?
- **When** the job is being done, why, and when else could it be done?
- **Who** is doing the job, why, and who else could do it? (A question asked within the limits of the appropriate craft.)
- **How** is the job being done, why, and how else could it be done?

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

**How to cut the cost of piping**

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

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

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

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

Ferguson planners offer these pointers to anybody planning to set up a piping fabrication shop:
- Job breakdown must avoid “walking delays.”
- Materials must move through shop in a straight line.
- Space around fabrication and welding tables must be sufficient for workers’ safety.
- Power tools and equipment must be the most efficient available.

**ARCHITECTURE FOR CHEMISTRY**

Twenty-five years ago the H. K. Ferguson Co. was a builder of machine shops like everybody else; today the company probably knows more about building plants to make certain basic chemicals (chlorine and alkali are examples) than anybody else in the US. The firm probably owes its present eminence to the fact that its executives were among the first to recognize that chemicalization was transforming US industry. Way back in the booming twenties, when nobody had to stay up nights to make a living in building, H. K. Ferguson and some of his engineers decided to make themselves masters of the emerging new science of process design and building. C. P. Stahlberg, at that time one of the firm’s mechanical engineers, recalls: “We decided that if you can pump water, you can pump sulphuric acid or anything else. So we simply learned the specific gravity and the corrosion properties of whatever we were dealing with and plunged into the equipment design job.” Today Ferguson is one of the few firms which can start with a blank sheet of layout paper and deliver a completely equipped antibiotic plant or detergent plant or a powder plant (to name only a few) about ten months later.
In this 50 million-lb.-a-year rayon plant, process redesign cut the building area to half what has been normally required for this much capacity. This cut-staple plant, typical of Ferguson's integrated approach to design, procurement and construction, shows several innovations spectacular in the rayon industry:

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

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

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

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

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

Open construction was used for part of the Courtaulds' rayon plant. Walls were dropped around the acid recovery process, which is a largely automatic operation, equipped with quality controls.
Room for expansion was a primary consideration in locating and planning this rayon plant for Courtaulds, Ltd. Note how present building was placed to leave room for later addition of two manufacturing buildings between the present building and the widely separated fume stack and fan house. Power plant, rail lines and docks were also placed where they would not block additions to the present building.
Corn Products' refinery at Corpus Christi, Tex. is a pioneering example of open construction applied to chemical process plants. Its open floors solved the problem of how to handle the explosive dust-laden atmosphere.

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

Panel walls on the facade of this caustic building for an electrochemical company fully express the easy detachability of the panels for reuse or replacement. The design gives the feeling that these walls are merely protective curtains for equipment, which is what they are.
OPEN CONSTRUCTION: new kind of industrial structure provides only support and shelter

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

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

1) A new kind of process plant is being built today: it is not an enclosure for machinery, but a sheath for a chemical process—a sheath so closely linked to that process as to merge with it.
2) Chemical production is moving from batch operation toward continuous automatic operation.

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

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

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

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

STANDARD STEEL FRAME for universal use and easy construction

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

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

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

Ferguson's standard frame will carry a concentrated load well above the weight of its uniform load—in other words, reserve load capacity is available for hanging such added pipes and heating and electrical equipment as may be required by changes in process and normal plant expansion.

While this highly simplified steel frame is useful in most parts of the US, it is not economical on the West Coast where the cost of steel is high enough to counterbalance the extra fabricating costs required by a more intricately designed frame.
**PRECAST CONCRETE WALLS**, used more and more by industrial builders, are designed by Ferguson to make possible the use of continuous steel sash. To provide clear column-to-column window openings, the concrete columns (precast in the field) are recessed, and the precast wall panels are attached both above and below the sash banks. Continuous sash is clipped directly to the columns. Thus the concrete wall panels above the continuous windows are supported only by the columns. This support was worked out by embedding matching steel weld plates in the columns and wall panels, and making field welds for rigid connections. Edgar A. Griswold and F. Thomas Collins, Los Angeles, were consulting engineers on the concrete work on this job.

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

The partitions are built of standard light steel sections bolted together. Sections are bolted in pairs to the steel beams supporting the floor above. Top of the partition frame is enclosed with gypsum block. The center portion contains the electrical ducts and supports the service shelf with its service outlet fixtures. Access to the electrical wiring is provided by removable metal plates as shown on the drawing. Lower section houses the piping which is easily accessible through removable panels.
Roof framing compensates for the lack of a storm sewer to accommodate interior downspouts. Tapered steel girders were turned upside down to create a slightly pitched roof drained by perimeter gutters and downspouts.

**HOW TO WEATHERPROOF A LIGHT WALL**

Ferguson's "see what you don't have to do" approach extends right down to the detail level. This wall section shows how Ferguson worked out the simplest kind of system for insulating a corrugated asbestos wall (used above the sill level)—insulation which makes this kind of wall tough competition for the traditional masonry wall. Side walls are insulated with glass-fiber wallboard. Over the large ceiling area is hung expanded metal lath and on top of this is laid 3" glass-fiber insulation. A 6" air pocket between the glass fiber and the roof provides additional insulation. The lath-hung glass-fiber ceiling needs no further finishing.

This section also shows a neat device for licking a tough wall problem—the tender point where the concrete sill joins the brick sill wall. Precast concrete sills, now widely used to speed construction, frequently cause trouble at this point. In normal expansion and contraction of the two materials, the joint section may crack, causing leakage. Ferguson inserts an iron bar in the flashing under the precast concrete sill. This raises the flashing and prevents leaks.
TENT-SHAPED SCHOOL

Instead of walls, a skylight roof.

Result: excellent daylighting, low cost

Here is a simple, obvious way to cut school costs: omit the walls.

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

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

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

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

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

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

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

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

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

Cost data:

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<tr>
<td>Per classroom</td>
<td>16,084.00</td>
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<tr>
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</table>
P. A. WALSH INTERMEDIATE SCHOOL
LOCATION: Morgan Hill, Calif.
ROBERT STANTON, architect
GEORGE C. LENZ CONSTRUCTION CO.,
genral contractor

Economical tent construction gives lighting bonus: toplight through north roof slope of each classroom. Foot-candle and foot-lambert readings are almost identical in two wings. Concentric fixtures on slant work well. Side windows provide ventilation; heating is hot water radiant in floor panels.
In original scheme roof was carried to the ground on noncourt sides of classrooms as in model at left; triangular niche at floor was filled with counters and cabinets. In final scheme wall was pushed out for more windows, greater cubage. Roof structure is 2 x 6" rafters spanning from "A" frames to cross-partitions.
$7,737 PER BED HOSPITAL: a case study in cost cutting

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Cost data (1½ Hill-Burton funds):

\[
\begin{array}{|c|c|}
\hline
\text{Construction total} & \$326,000 \\
\text{per sq. ft.} & 15 \\
\text{per bed} & 7,737 \\
\hline
\text{Complete total*} & 326,000 \\
\text{per sq. ft.} & 20 \\
\text{per bed} & 10,867 \\
\hline
\end{array}
\]

* including fees, site survey, all equipment
Revised plan reduced first floor area more than 11% compared with old scheme. White overlay on revised plan shows outlines of old scheme at same scale.
PRIZE DISPLAY RACKS show designers and building owners how to merchandise magazines—results of magazine publishers’ design competition

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

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

To impress these shortcomings on the design profession, to stimulate better design and to encourage collaboration between designers and magazine distributors, the Magazine Publishers Association in collaboration with Forum last year launched a competition for the best racks completed between Jan. 1, 1951 and Nov. 1, 1952 by architects, designers and store fixture makers.

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

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

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

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

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

Grand Prize and First Prize—Class B—$1,000
Frank F. Ehrenthal, AIA
San Francisco, Calif.

Jury comment: “A special requirement in this class (hotel and office-building lobbies; rail, bus and air stations) is some means for locking the rack up at night without having to remove all the magazines. This problem is solved satisfactorily and ingeniously in this island-type rack which rolls into the adjacent cigar store at night and is locked up behind glass doors. The rack itself is attractive and efficient. The upper shelves are adjustable, and in the dead (i.e., not readily visible) space immediately below them is a flat shelf which should be very useful for extra stock, especially for the big selling magazines displayed on the flats below. It received the Grand Prize on the basis of its over-all excellence as a design for selling magazines, rather than for the ingenuity with which its special requirements were met. The Jury felt that the rack design, quite apart from its roll-away feature, was admirable and could be adapted for use in many types of installations.”
First Prize—Class D—$500
Aaro Mikkola
Helsinki, Finland

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

First Prize—Class A—$500
Vagn H. Lange
Thornhill, Ontario, Canada

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

First Prize—Class C—$500
M. L. Freed
Calgary, Alberta, Canada

"... a large, low island-type fixture, well located and well designed for its purpose as a supermarket fixture."
The way to solve a complex problem is to make it simple

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

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

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

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

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

A glance at these pages proves that Breuer's solution, within a characteristically tight college budget, is something more than a mere expression of these requirements. But in answering these requirements, the architect developed a handful of new ideas and devices that will make theater designers rethink some of their past solutions. For a discussion of some of these devices, turn the page.
LOCATION: Bronxville, N. Y.
MARCEL BREUER, architect
PAUL TISHMAN CO., general contractor
FARKAS & BARRON, structural engineers
BERNARD F. GREENE, electrical engineer
BENJAMIN L. SPIVAK, mechanical engineer
PROF. EDWARD C. COLE, stage consultant
STANLEY C. McCANDLES, lighting consultant
SIDNEY K. WOLFE, acoustical consultant

Common room seen from snack-bar level

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

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

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

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

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

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

Seating plan. To take the place of the usual, heavy and inflexible theater seating, Breuer designed a light seat on a wrought-iron frame, set it in rows 42" apart (instead of the conventional 32") so that late-comers can reach their places without disturbing others. (But unlike "continental seating" the plan retains intermediate aisles.) Alternate rows of chairs are bolted to a continuous floor rail (see cut), can be moved in complete units and stored away. Their space can be filled with tables that will turn the auditorium into a nightclub-cabaret. The remaining rows of seats are fixed in place and set directly upon the ascending steps of the auditorium floor.

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

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

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

During the summer months, the rear of the stage can be opened up through sliding doors to create an outdoor theater (with the audience seated on the tennis courts). These sliding doors also provide a wide service entrance to permit delivery or dispatch of very large props. The college decided against a tall stage house because of the high additional costs and because it seemed a little too elaborate for what is, in essence, a dramatic workshop.
Auditorium as shown in plan above has seats arranged for arena-style performance, with both removable sections of forestage in place. Lighting within auditorium is variable, a combination of downlights and light "washes" over concrete block walls. Note handsome block patterns; these are not merely decorative but also break up sound reflections.
COMMON ROOM AND DANCE STUDIO

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

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

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

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

MATERIALS AND TEXTURES

Breuer feels that, so long as many of our building methods and materials are not industrialized, it is wrong to give a building the slick finish of a 1953 Cadillac. Some of the details he has used here are almost brutally rough, and very deliberately so. He has employed rough stone, painted brick, and flagstone to give his building textural, as well as sculptural, excitement (see cuts).

The parapets around the upper terrace are reminiscent of primitive Mexican peasant building: they are made of drainpipes set in cement and roughly stuccoed on the outside. And in the auditorium, the concrete block masonry is given an unexpected beauty (and an intended acoustical quality) with a pattern of projecting blocks.

All these patterns are supplemented with planes of bright color—the typical Breuer blues and reds. Used largely inside, these accents are visible from the campus through glass walls, help make this building a cheerful symbol of what Sarah Lawrence is trying to do.
Sliding glass walls open up common room to surrounding grounds. Terrace above, behind perforated parapet, is direct extension of theater foyer, can be used during intermissions and for dances on summer evenings.

Dance studio (below) has ceiling made of rough 2" x 6" construction lumber and fluorescent-light inserts. Deep concrete girders were left exposed.
1. Vierendeel trusses save steel and space
2. Loadbearing ducts for radiant floor heating
3. Two-faced stadium cuts costs in half
4. Cost analysis of prestressed concrete
5. Prestressed 60' girders 11% cheaper than steel

1. STORY-HIGH TRUSSES

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

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

These story-height trusses each used only 10½ tons of steel at $207 per ton, or $2,200 in place. Conventional design (33" WF 240 lb. girders plus columns between them) would have required 20 tons of steel and cost $4,100, almost double. About two thirds of 46% saving in weight and cost was due to the greater depth and consequently lighter members in these 13' deep vierendeel trusses, the remainder due to the continuity of rigid connections achieved by welding. For this comparatively small job on-site welding would have been uneconomical because of all the equipment required and the difficulties of inspection. By shop welding these trusses they were built for the same per-ton erected cost as a riveted frame, indicating that outside rigid framing units can be built more cheaply and quickly off the job.

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

Since the vierendeel truss has no diagonal members, high bending moments are developed at the joints that are difficult to control by riveting but comparatively easy by welding. In these trusses all members are rolled sections; top and bottom chords are continuous with 11½' vertical members butt-welded between them. Web stiffeners welded between the flanges of the horizontal chords transfer moment stresses from the flanges of vertical members to the web of the chords. A lattice truss would have been only 10% lighter, and its diagonals would have interfered with the floor layouts.

This addition to the Flatbush Jewish Center required two floors of 18' x 22' classrooms above the auditorium. Vierendeel trusses provide a full 11' floor-to-ceiling height and allow an unobstructed corridor 6' wide to pass through each truss. Architect: Maurice Courland, AIA; structural engineer: Raphael H. Courland.
Central fan blows heated air through bottom plenums into hollow precast floor planks, thence into classrooms at outside walls, where air gets secondary heating by thermostat-controlled finned radiators. Part of exhaust air is recirculated via clerestory plenum, part ejected through exhaust fans in roof.

2. FLOOR PLANK HEATING DUCTS

Hollow concrete slabs double as ductwork in three-way heating system

More and more designers achieve greater efficiency at less cost through integration of structure and mechanical services. Witness savings of $15,000 in cost and a month in construction time on this Tewkesbury, Mass., school, whose precast hollow floor slabs double as warm-air heating ducts.

In this ingenious heating system warm filtered air is blown by a central fan into a 6'-8" x 10'-8" plenum beneath double-loaded classroom corridors. From the plenum warm air flows through damper-controlled slots into the 4½" diameter cores of the precast concrete floor planks and is discharged at low velocity into classrooms at the outside walls as a continuous curtain of warm air. Exhaust air is vented to main corridors then up to a skylit clerestory recirculation plenum which also helps to light classrooms.

For classroom comfort floor temperatures should be no greater than 88°. This limits the heat input to classrooms via floor radiation plus direct air circulation to 75% of peak winter requirements. Therefore a finned booster hot-water convection radiator is added to the outside wall with thermostat control in each classroom.

The wide duct area in the floor slabs achieves the uniform temperature characteristic of panel heating plus draft-free, low velocity and therefore noiseless air at the outside walls. It permits complete flexibility of control both centrally at the fan room and at each classroom. Further, at the fan room the air is sterilized by passing it between germicidal lamps and can be filtered, humidified or cooled as required. During school hours the fan circulates both fresh air and recirculated air but at the end of the working day the ventilators and the fresh air intake are closed and the fan reduced to half speed.

Further economy is effected by placing the classrooms so their narrow sides are exposed to the outside walls, cutting both the heat loss and the length of exterior wall required. Over the outer third of each classroom the roof drops 3½' below a clerestory roof deck. Thus the classrooms receive natural light from three sources—1) the conventional exterior wall windows, 2) an exterior 3½' high clerestory window, and 3) a clerestory window giving on to the skylighted recirculating plenum above the corridor. As a rain break the lower roof deck projects 4' beyond the outside walls, is supported upon masonry interior wall extensions.

Both floors and roofs are built of precast hollow concrete slabs; 24,000 sq. ft. of 6' deep slabs, 12" wide and 18' long, are used in the floors while 20,000 sq. ft. of 8' deep members, 16" wide and 26'-8" long are used in the roof. Floors are finished with plastic vinyl tile set in mastic while ceiling slabs have only two coats of paint on the inside plus the usual built-up roof covering. Live load on the floor slabs is 60 psf, on the roof 100 psf.

Total cost of the 14-classroom school was $396,795. Cost of the precast floor and roof slabs was $62,000 (15.7% of total cost). Architects for this school in Tewkesbury, Mass., were Ashton, Huntress & Pratt; manufacturer of the precast floor slabs, Flexicore Corp.
3. TWO-FACED STADIUM

Unique design and construction keep costs down to $16 per seat

Instead of building two separate stadiums at a cost of $60,000 each, Grand Junction, Col. saved $62,000 by building only one—a two-faced stand which seats 2,400 football fans on one side, 1,200 baseball fans on the other. By-products of this unique design are a 2,500 sq. ft. area for dressing rooms and concessions in space between the two stands, and summer shade for the baseball fans thanks to the cantilevered upper portion of the football stand. Including these by-products and a control and press box atop the upper deck to serve both fields, whole project cost only $58,000, or $16 a seat.

As unique as the dual-purpose design of the stadium itself is the detailing of the cantilevered beams which carry the upper part of the football stand. Their trim, tapered shape was fabricated from standard 12" steel I-beams. Each beam was flame-cut diagonally down the web; one of the pieces was turned end for end; and the two rewelded along the web. This produced an elongated triangular web 15" deep at the supports and 5" deep at the cantilevered end. Extra reinforcing plates strengthen the web over the pipe-column supports.

Lower seats of the 129' long stadium are 8" concrete slabs cast on fill. Upper seats and risers, precast as units, are bolted to the cantilevered steel. By precasting the units while foundations were being prepared, construction time for the whole job was reduced to 90 days.

Spread footings were used because of poor soil structure. The soil is gumbo clay, very hard when dry but like soup when saturated.

Architects: Smith, Hegner & Moore.
Engineer: Milo S. Ketchum.
4. ECONOMICS OF PRESTRESSING

Bidding prices per cubic yard generally favor prestressed concrete—an analysis of the cost factors

Is prestressed concrete cheaper than reinforced concrete or fireproofed steel? That was the No. 1 topic at last month's engineering conferences at both the University of Illinois and the University of California.

US engineers are now familiar with the techniques of prestressing but apprehensive about its alleged high cost. Consequently prestressed concrete has never yet been selected for reasons of economy pure and simple; its use has always been dictated by the need for shallower beam depths than are possible with reinforced concrete or by the need to reduce corrosion by the elimination of tension cracks. That prestressed concrete can now compete on price is indicated by comparable bids on a San Francisco garage (see below), where prestressed girders proved 11% cheaper than equivalent steel.

At the Illinois conference, Prestressed Concrete Engineer Cedric Stainer* discussed some of the basic costs of prestressing. Depending upon the type of structure, its location, and the method and quantity of prestressing used, he said bids for prestressed concrete generally run between $100 and $150 per cu. yd., compared with about $75 for ordinary reinforced concrete. This appears to favor reinforced concrete but 1 cu. yd. of prestressed concrete will do the work of 2 cu. yds. of reinforced concrete. For instance, in the 65' span prestressed girders at Manhattanville College (AF, May '52) 1 cu. yd. of prestressed concrete (containing 120 lbs. of high tensile steel and 72 lbs. of mild steel) replaced 2.4 cu. yds. of equivalent reinforced concrete girders (containing 700 lbs. of mild steel). Equivalent steel girders (36" WF 300 lbs.) would have required over ten times as much steel as these prestressed girders.

Cost of concrete. Average cost of concrete used in prestressed girders is about $50 a cu. yd. This figure includes $16 for the concrete itself delivered on the site by a ready-mix company, $24 a cu. yd. for casting the girders using forms with a limited number of reuses, and $10 more to erect the girders when cast—total $50.

* Cedric Stainer graduated at London University and worked for three years in France with prestressed concrete inventor Eugene Freyssinet before coming to the US. He is now chief engineer with Preload Corp.
Cost of mild reinforcing steel. Besides tensioning steel each cubic yard of prestressed concrete contains 30 to 80 lbs. of mild steel which might cost up to $15, or 10% of the total cubic yard price of the concrete. This steel takes care of small local stresses and generally helps to support the scale cast-in-place work the cost might be nearer 15¢ per lb.

Cost of high tensile steel. Tensioning steel may be in the form of wires, strands or bars and may be either pretensioned or post-tensioned. In wires and strands working stresses are 120,000 psi after all losses. With high-strength alloy bars of up to 1" diameter, lower stresses of 85,000 psi are employed. Thus 140 lbs. of bars is about equal to 100 lbs. of wires or strands. It is worth noting that 1 lb. of high-tensile steel in a prestressed girder does the work of 4 lbs. of mild steel in an ordinary reinforced girder.

High-tensile steel costs between 9¢ and 30¢ a pound. Wire, between 9¢ and 22¢ depending on size, physical characteristics and heat treatment. High-strength bars having lower working stresses and complete with terminal threads cost between 16½ and 20¢ a pound. High-tensile cables, 20¢ to 30¢ again depending on diameter, quantity, etc.

Installation cost. To the cost of the steel must be added the cost of installing it. This includes labor and additional materials for some or all of the following operations: straightening and cutting wires, assembly and sheathing of cables, tensioning, anchoring and grouting of the completely stressed member. Reflecting the number of tensioning operations involved, installation costs vary widely between 10¢ a pound (in large scale precasting of pretensioned beams such as the assembly-line prestressing employed for New York's Pier 57, AF, Oct. '52) to 70¢ a pound for single post-tensioning operations. Thus total bidding price for a pound of high-tensile steel in place may vary all the way from 20¢ to $1, or from $16 to $80 for the average 80 lbs. of high-tensile steel required in a typical cubic yard of prestressed concrete.

To sum up, a typical bidding price of a cubic yard of prestressed concrete is $118, comprised of:

1 cu. yd. of 5,000 psi concrete (at $50) .......... $50
40 lbs. of mild steel reinforcing (at 20¢) .......... $8
80 lbs. of prestressing steel (at 75¢ for 120,000 psi steel) ...... $60

and a typical bidding price for ordinary reinforced concrete is $150, comprised of:

2 cu. yds. of 3,000 psi concrete (at $55) .......... $110
400 lbs. of standard steel reinforcing (at 15¢) ............ $60

These prices (for completed work in place) would favor prestressed concrete. On the other hand this differential is liable to be absorbed by higher labor costs if the prestressing work is handled by inexperienced crews.

With the great variation in cost between different prestressing techniques, it seems wasteful to use any but the most economical one. However, the least expensive method may not be suitable for the structure in question. Prestressed concrete is competitive with conventional steel or concrete construction provided the most favorable combination of techniques is used.

5. LOW-COST PRESTRESSING

Huge 60' concrete girders for parking garage cost 11% less than fireproofed steel

For the first time in its brief US history prestressed concrete has proved cheaper than steel. This record was set in four wide span girders over the entrance of a multistory San Francisco garage. Original designs called for 180 tons of structural steel at an erected cost of $54,000 ($300 per ton) including fireproofing. On the outbreak of the Korean war permission to use steel was withdrawn and 465 tons of cast-in-place prestressed concrete were used at a cost of $48,000 ($103 per ton), a saving of $6,000 or 11%. Ordinary reinforced concrete could not be used because of excessive girder depths.

The heaviest girder weighs 120 tons, spans 60'. It is 7'-8" deep, T-shaped with top flange 8' wide, bottom flange 4' and web 2' to carry a total load of 1,430 kips (940 kips concentrated at midspan). Prestressing is by 28 cables 1½" in diameter with threaded anchorages. In the simple-span girders the cables are post-tensioned from one end; in the continuous girder tensioning is done from both ends to reduce friction loss over the center column. Structural engineers: Ellison & King. Contractors: Barrett & Hilp.

Prestressed girders span 60' over garage entrance. Girders A, B, and C are simply-supported; girder E-F is continuous over three columns. Cables have threaded anchor fittings (see AF Feb., '52, p. 135).
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ARCHITECT: Skidmore, Owings & Merrill
GEN. CONTRACTOR: Cauldwall-Wingate Co.
FLOORING CONTRACTOR: Circle Floor Co., Inc.

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THE MAGAZINE OF BUILDING

SECOND PRIZE—CLASS A—$250
Theis & Co.
Santa Clara, Calif.

"...a wall-type (drugstore) rack—well located, adequately lighted and well designed. It has ample flat space...sloping shelves for upright display....All magazines are visible and easily reached—even in the uppermost rack. (When the lower flat shelves come out too far or when the upper shelf is too high, customers are likely to step on the magazines on the bottom shelf in order to reach the top shelf.) Like the first prize winner in this class, this fixture allows space for a large number of full-cover displays."

SECOND PRIZE—CLASS C—$250
Taylor's Cabinet Shop
Sacramento, Calif.

"...a well-designed wall-type rack with integral lighting. However, the wallpaper pattern used on the wall above the rack is a distraction. Incidentally, designers might do well to avoid flat tops on wall-type racks since storekeepers are often tempted to use them to support other displays."

continued on p. 154
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And here’s where the Carrier dealer comes into the picture. He knows air conditioning. He knows how to use this sectionalized construction in terms of your needs. His experience plus our product give you the kind of air conditioning that’s easily serviced and technically suited to the job.

Remember, there’s a full line of Carrier products, all matched in size and performance to work together. So whenever your plans include air conditioning, call your Carrier dealer. He’s listed in the Classified Telephone Directory. Or write Carrier Corporation, Syracuse, New York.

1. Arrangement includes fan section, cooling coil section, base pan section.
2. All sections from No. 1 with addition of filter section.
3. All sections from No. 2 with addition of heating coil section.
4. All sections from No. 3 with addition of a by-pass section.
If you get Fenestra* Super Hot-Dip Galvanized Steel Windows for your new plant, you'll have windows that will probably never need painting.
And that will save you about $3,600 . . . every few years . . . if yours is a typical plant.
$3,600 saved is $3,600 earned.
No other window is as strong and rigid as a steel window.
No other window will look and behave like new longer than a Super Hot-Dip Galvanized Fenestra Steel Window.

If you want to know the how and the why of these money-saving windows, call your Fenestra Representative (listed in the yellow pages of your phone book). Or write for your free copy of the Fenestra Galvanizing book. Detroit Steel Products Company, Department MB-12, 2296 East Grand Blvd., Detroit 11, Michigan.

Fenestra

SUPER HOT-DIP GALVANIZED STEEL WINDOWS

from the only plant in America especially designed to
Hot-Dip galvanize steel windows
CASE OF THE WALKING WALL

Twice this wall stepped out to let the plant expand. It could just as well be twenty times.

You simply take the wall apart and move it further out, saving the materials and money involved in building a new one. That's what they did at Dayton Power & Light.

The walls of this building are locked-together Fenestra* "C" Panels...long, strong, steel metal units with glass fiber insulation sealed inside.

And, if you build your new building of Fenestra "C" Panels, you'll see it go up area by area instead of inch by inch.

You'll see your walls rise 16 square feet a leap...complete inside-outside, insulated walls. Fine-finished walls that are either prime-painted steel, or aluminum...so smooth that dirt and grease can't get a grip. Walls that are noncombustible. Walls that will walk when you need extra space.

Look at the close-ups of Fenestra Metal Building Panels shown below. Let us explain how they can help you speed the construction of your new building, save structural steel, cut the cost of labor.

Write to Mr. Earle C. Hodges, Vice President, Detroit Steel Products Company, Dept. MB-12, 2296 E. Grand Blvd., Detroit 11, Michigan. *Trademark

Fenestra METAL BUILDING PANELS

...engineered to cut the waste out of building

"C" Insulated Wall Panels. Width 16". Depth is 3". Steel or aluminum.

Acoustical Holorib for acoustical-structural roof. Width 18". Depth 1½".

"D" Panels for floors, roofs, ceilings. Standard width 16". Depth 1½" to 7½".

Acoustical "AD" Panels for ceiling-silencer-roof. Width 16". Depth up to 7½".

*Trademark
For heavy traffic areas

This modern office building features floors of Wright Rubber Tile—both in the building and in the elevators.

nothing wears as well as WRIGHT RUBBER TILE!

Look at the floor of the next elevator you see. The chances are, it has a floor of rubber tile, because no other flooring stands heavy traffic wear like rubber.

And if you could tell the make of rubber tile used, you would be surprised at how often it would be Wright Rubber Tile.

The next time you specify a heavy-traffic floor—remember the elevators! Then specify Wright Rubber Tile with complete confidence.

WRIGHT MANUFACTURING COMPANY
5205 Post Oak Road Houston 5, Texas

WRIGHT RUBBER TILE

FLOORS OF DISTINCTION

* WRIGHTEX—Soft Rubber Tile
* WRIGHTFLOR—Hard Surface Rubber Tile
* WRIGHT-ON-TOP Compression Cove Base

PRIZE DISPLAY RACKS continued

Second Prize—Class B—$250
L.V. LaFave
Grand Rapids, Mich.

"... a small and effectively arranged wall-type rack equipped with a rolldown cover of aluminum for locking up at night. It was felt that this design was suitable for many small lobby stands. Like the grand prize winner, it makes excellent use of the space available in terms of displaying the maximum number of magazines effectively."

Second Prize—Class D—$250
Crescent Woodcraft
Winnipeg, Manitoba, Canada

This rack is well designed for the display of many magazines of many sizes and, like most of the other prize winners, is simply constructed of plywood. However, the detail of the design leaves something to be desired.—Ed.
MODERN GRADE SCHOOL equips cafeteria for planned lunch program . . . food-keeping facilities by Frigidaire

An outstanding example of functional grade school design is the recently completed Pitcher Hill Grade School, ideally situated amid spacious, rolling lawns in North Syracuse, New York. Modern to the last detail, the school provides up-to-the-minute facilities throughout for its student body and faculty.

As a case in point, the school's cafeteria is equipped with a roomy 44 cubic foot Frigidaire Reach-In Refrigerator that maintains the top nutritional value of the food it keeps, while helping to make possible the smooth, fast service a school lunchroom demands.

Frigidaire Reach-Ins, models from 17 to 62 cu. ft., provide large, accessible food storage capacity in minimum floor space. Flowing Cold refrigeration gives uniform food protection. Long life, dependability and economy are assured by all-steel construction, sealed Meter-Miser mechanism and all-porcelain interior.

For further information on Frigidaire equipment suitable for schools, hospitals or institutions, call the Frigidaire Dealer, Distributor or Factory Branch that serves your area. See Frigidaire catalogs in Sweet's Files, or write Frigidaire Division of General Motors, Dayton 1, O. In Canada, Toronto 13, Ont.

FRIGIDAIRE Refrigeration and Air Conditioning Products

Reach-In Refrigerators • Display Cases • Air Conditioners
Ice Cube Makers • Ice Cream Cabinets • Water Coolers
Compressors • Beverage Coolers • Home Appliances
FOUR SHINING EXAMPLES OF HOW RAYNOR SOLVES YOUR DOOR PROBLEMS

The installations illustrated in this advertisement are typical examples of Raynor Wood Sectional Overhead Doors, tailor-made to fit the opening.

These doors were made complete in the Raynor plant—assuring well co-ordinated, closely supervised construction. Many of the details pertaining to the individual installations were worked out by the Raynor Engineering Department—a service that is at your disposal for the asking.

These doors embody the finest in materials and construction and like all Raynor doors, large and small, are equipped with patented Graduated Seal that guarantees an efficient weather tight seal and smooth operation at all times.

For full details on the Raynor complete line of Wood Sectional Overhead Doors and all accessories, see your Sweets file or write direct for the Raynor Catalog.

RAYNOR MANUFACTURING COMPANY
DIXON, ILLINOIS
Builders of a Complete Line of Wood Sectional Overhead Doors
LADDER
AND SUNDECK RAILING

The architectural versatility of ENDURO Stainless Steel is broadened by the many forms in which it is available. Here, you see ENDURO pipe and channel creatively adapted to functional applications. In every shape and form, ENDURO offers you the benefit of handsome architectural effects . . . utility and beauty that outlast the years . . . resistance to rust and corrosion . . . ease of cleaning . . . and client enthusiasm. Even in space-saving thin sections, ENDURO is superbly strong and damage resistant. Where will you use it next? New and exciting designs are waiting only your imagination. There's no end to the ideas that can be interpreted in ENDURO Stainless Steel, because the combination of structural "plusses" it offers are found in no other commercial metal. You'll find more ENDURO details in Sweet's; for special help in developing your ideas, write Republic.

REPUBLIC STEEL CORPORATION
Alloy Steel Division · Massillon, Ohio
GENERAL OFFICES · CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

See Sweet's for data on Republic Pipe, Sheets and Roofing...Electrunite E.M.T....Republic Rigid Steel Conduit....Berger Lockers, Bins, Shelving and Cabinets...Truscon Steel Windows, Doors, Joists and other Building Products.
For Your Files

Shows how to select and specify modern passenger elevators

This booklet for architects is the most complete and helpful ever issued on modern hydraulic elevators for passenger service. It covers the following subjects with photographs, drawings and concise information:

- How to eliminate the penthouse in modern buildings
- Elevator Entrances
- Cars and Doors
- Power Units and Controllers
- Electric Control Systems
- Recommendations and Specifications
- Architectural Data for Plans

As this booklet has just been printed, its contents are not available through any other source.

MAIL FOR YOUR COPY

Rotary Lift Co.,
1116 Kentucky, Memphis 2, Tenn.
Send your new Passenger Elevator Data File to:

Name: ..........................................................
Address: ....................................................

For Top Efficiency Insulated Piping Systems

When you have an insulated piping problem, remember that only the best will give you ALL the advantages necessary to full-efficiency performance of your system. That means Ric-wil Prefabricated Insulated Piping.

Ric-wil provides (1) top-efficiency system engineering, (2) fast, economical installation, (3) the right protection and insulation for the job.

THE RIC-WIL COMPANY
CLEVELAND, OHIO

REVIEW

FRANK LLOYD WRIGHT — Sixty Years of Living Architecture. By Werner M. Moser.

Few American artists have been able to effect the rape of Europa. The complaint generally has been too much bullishness and too little authentic drive. Always a bit more clever than the next fellow, Whistler was accepted because he could beat any European at his own game. Wright is accepted because he is playing his own game and has been doing so, as the title of this Swiss publication indicates, for 60 yrs.

That game is the provocative and profoundly absorbing one of a master spirit, fighting his civilization as he tries to create it. It is what the Italians call terribilita, the quality of a Michelangelo.

Sixty Years of Living Architecture is a profusely documented history of Wright's career with many color plates, photos and plans. Beginning with the famous "Romeo and Juliet" windmill of 1896, svelte and dynamic as it has always been, the book presents a fine panorama of the artist's work — his disciplined adventures in organic architecture.

ARCHITECTURAL FORUM made many of its plates and drawings available for the book and most of the projects described have been covered in past issues of the magazine, but it is good to see them collected here in roughly chronological order. Wright's early works seem even now distinctive and modern: witness the superb Frederick C. Robie House done in 1909 with its bold cantilevered construction and handsomely accented stories; or the Avery Coonley House of 1908, with the photo of its living room showing an interior construction so convincingly modern as to make the furnishings appear displaced and Victorian.

One observes the gradual introduction into Wright's plans of unorthodox angles, as in the St. Mark's Tower (1929) which was never built. Plans on the open angle of the hexagon are developed, on the triangle and the lozenge. Finally, the semicircle (as in the Jacobs House), the circle (the Huntington Hartford Club House) and the fantastic "shell" shape (the Kaufmann Jr. House in Los Angeles) are brought into the artist's powerful working repertoire.

A note on the Huntington Hartford Club House cautions that "similar projects will hardly ever be in request in Europe, [but] we must be careful not to restrict the freedom of our creative thinking, . . . " as impressive a tribute, in its way, as an American artist ever receives from abroad.

The text, which is in German (lengthy continued on p. 166)
Out in the "Show-Me State," a man has to prove himself with action as well as words. That's the only way to tell if he has what it takes. And that's the only way to judge the performance of a roof, too.

Ruberoid roofs have furnished hundreds of successful case histories for architects and builders ... they've proven themselves in action under all conditions. One of their recent applications is the magnificent new Montclair Apartments overlooking beautiful Forest Park in St. Louis, Missouri. 15 stories, 206 apartments, a dozen select shops, a fine restaurant, a 200 car garage ... and to top it all off, a Ruberoid Coal Tar Pitch and Tarred Felt Built-Up Roofing.

The Montclair's architects found the easy solution to their roofing problem in "Ruberoid Built-Up Roofs and Flashings." This 126-page book provides a handy reference of roofing specifications to meet every construction requirement and climate condition. If you don't have a copy we shall be happy to send you one. Just drop us a line or see Sweet's Architectural Catalog, Section 8A/RU. The Ruberoid Co., 500 Fifth Avenue, New York 36, N. Y.
Handy File of Wall-Tex Information for Architects and Builders

Architects told us what they want in a File Folder and here it is! Ten pages of information, drawings, photos of typical Wall-Tex installations, tables for estimates and swatches of the material to help you know Wall-Tex better. See its rich, textured beauty, feel the strong fabric, test the washable colors. See why Wall-Tex fabric wall coverings are used in so many hotels, hospitals, homes, apartments and other buildings.

Entire Line Pre-Trimmed, 24" Wide

Wall-Tex comes pre-trimmed, ready to hang. Rolls are 24 inches wide and edges are straight and true. Any staff decorator can apply the new pre-trimmed Wall-Tex with excellent results. No special tools or skill required. This means easier, faster, better decorating at less cost.

Columbus Coated Fabrics Corporation
Dept. AF-122, Columbus, Ohio
Send your new File Folder and Wall-Tex Sample Swatches.

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To know all there is to know about this patented, packaged, proven means of providing total luminous-acoustical environments you must have this book. A copy is waiting for you.

CUT COSTS of steel reinforced masonry walls with custom designed Dur-O-Wal. Builders, contractors and architects who have used it all agree it's now wise to give every masonry wall this backbone of steel.

DUR-O-WAL TRUSSED

A WORD FOR Design THE WISE...

Dur-O-Wal ... the patented steel reinforcing for all sizes and types of masonry walls ... brings high quality construction into the low-cost field. Don't delay. Learn the facts. Write...

Dur-O-Wal Division, Dept. 651
Cedar Rapids Block Company
Cedar Rapids, Iowa

Dur-O-Wal Products, Inc.
P. O. Box 628
Syracuse 1, New York
The Truscon Ranch Window offers new and attractive features not only for the favorite ranch-home design but also for enhancement of any residential unit following the modern trend.

**Special Features**—The Ranch Window in the larger sizes provides an attractive living-room picture window which, when viewed from the outside, tends to minimize the "wide open" effect characteristic of a large undivided glass area. The medium size units fit very conveniently into window openings for dining rooms, dens and libraries. In the smaller units, the windows are admirably suited for sleeping rooms.

**Sturdy Design and Welded Construction**—The window frames are constructed of specially rolled, extra heavy steel sections, one inch in depth. All joints and corners are securely welded.

**Convenient Ventilation**—Ventilators are of the awning type, hinged at the top to swing outwards at the bottom. The degree of opening is controlled by two adjustable sliding friction stays, one in each jamb and both completely concealed when the vent is in a closed position.

**Available from Warehouse or Factory**—Truscon Ranch Windows are available from key warehouse stocks. Screens, interior steel casings or exterior steel surrounds for all size units are also stocked. Consult your nearest Truscon District Office, local Truscon dealer, or write for further information.

**TRUSCON® STEEL DIVISION**
**REPUBLIC STEEL CORPORATION**

1102 ALBERT STREET • YOUNGSTOWN 1, OHIO
General Instantaneous Hot Water Boosters are more compact, lower in cost than any other unit on the market... boost hot water from regular supply to 190° for sanitary dishwashing in hotels, restaurants, and hospitals. Moreover, they can be installed right at the dishwasher, wherever steam supply is available... just tap into present hot water line. No storage tank or periodic maintenance required... copper and bronze water-ways assure years of trouble-free operation.

Compare the floor space, installation and maintenance costs of General Instantaneous Heaters with other units of equal capacity... you'll be amazed at the greater efficiency and savings provided by these dishwasher boosters. Write for Catalog 60. General Fittings Co., Dept. H, 123 Georgia Ave., Providence 5, R. I.

GENERAL

tankless and indirect water heaters and heating specialties

...at Low, Low Cost!
CLAY TILE...FINES W RAM FOR FOOD SERVICE

Wherever food is handled, prepared or served, certain basic requirements for the surrounding surfaces must be met: maximum maintenance economy, extreme durability, utmost resistance to grease, food acids and cooking fumes...plus the handsome good looks that stimulate both employee morale and repeat customer business.

Clay Tile meets all these standards—as in this beautiful new clay tile cafeteria. Glazed tile will keep the walls permanently beautiful and easy-to-clean. Unglazed tile on the floor will carry heavy traffic indefinitely with minimum cleaning care and maximum wear resistance.

If you design, plan or build food service areas, you'll be rewarded by a fresh look at clay tile. Clay tile is proof against water, fire, staining and scratching. The increasingly wide range of clay tile colors and designs assures unique decorative possibilities for restaurants, cafeterias, diners, commercial kitchens and other areas.

Consult your Tile Handbook for technical information on types and sizes.

Tile Council of America, Room 3401, 10 East 40th Street, New York 16, N. Y. or Room 433, 727 West Seventh Street, Los Angeles, Calif.
Sears Roebuck & Company continues to turn to Raymond for their foundation work . . . Sixteen different Sears stores (seven shown here) in ten States rest on Raymond piles . . . These repeat performances are further evidence that leading industrial organizations consistently utilize Raymond services for their important projects.
Johns-Manville Asbestos Movable Walls are made of noncritical materials. They permit the quick, easy space changes vital to today’s rapidly expanding industries.

- Reallocation of existing space and partitioning of new space can be done easily and quickly with Johns-Manville Universal Movable Walls. Made of asbestos, these walls are ideally designed to help business and industry meet the space problems involved in the defense effort.

  The flush panels have a clean, smooth surface that’s hard to mar, easy to maintain, and will withstand shock and abuse. They’re light, easy to erect and to relocate. The “dry wall” method of erection assures little or no interruption to regular routine.

  Johns-Manville Movable Walls may be used as ceiling-high or free-standing partitions. The complete wall, including doors, glazing and hardware, is installed by Johns-Manville’s own construction crews and under the supervision of trained J-M engineers.

TRANSITONE Movable Walls — A recent and unique development of the Johns-Manville laboratories is the Transitone Movable Wall, with asbestos panels integrally colored. Non-fading pigments are blended into the asbestos fibres, thus eliminate the cost of periodic decorative treatment. The color goes all the way through each panel.

For details about J-M Movable Walls, consult your Sweet’s Architectural File, or write Johns-Manville, Box 158, Dept. MB, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.
Adolph Rupp says, "SEAL-O-SAN gym floor finish must be used on the fieldhouse floor"

COACH RUPP is convinced about what makes the best playing surface. He states: "I specified that Seal-O-San must be used on the floor (of the new Kentucky Fieldhouse), in spite of the fact that almost every other floor finish company has been here asking me to give them a chance to put their product on the floor. I have refused to do so." And he advises Seal-O-San for every school gym floor: "I have endorsed Seal-O-San hundreds of times every winter in letters to schools asking me to recommend the best (floor finish)."

Basketball Coach
Adolph Rupp, University of Kentucky

REVIEWs continued

captions are in English and German), traces Wright's spiritual descent from Ruskin and Morris in England, those bitter and losing opponents of a machine civilization, and from Thoreau and Whitman in our own country. It includes many passages from Wright's own books translated into German for a European audience—and how near his prose is to Whitman's poetry!—outraged, optimistic, and to the last, patriotic.

The paradox of the reactionary romantic (the Byron figure), who is at the same time revolutionary, has never been satisfactorily explained, but here again is the well-documented case history of such a man.

FIRE SAFETY IN THE ATOMIC AGE. By Horatio Bond. Chief Engineer, National Fire Protection Association, 60 Battery March Street, Boston 10, Mass. 1952. 72 pp., including a 7-p. bibliography. Illus. $3

This valuable book details a comprehensive program of fire safety for architects, engineers and building managers concerned with existing and planned buildings in potential target areas.

Experience in World War II showed that four-fifths of the damage in bombed cities was due to fire destruction. Since the extent of fire destruction depends on the combustible objects within a city, the author's object is to reduce the fire danger by rigidly controlled top limits of fire loading. He recommends a top limit of 40,000 Btu (equivalent to 5 lbs. of wood) per sq. ft. for an unfireproofed structure and up to 240 Btu per sq. ft. for a completely fireproofed structure. Responsibility for keeping within these limits falls mainly upon the building manager, but the architect can help by employing a minimum of combustible materials in the construction. The author's conclusions are important in peacetime as well as in wartime.

STRENGTH OF MATERIALS. By Frank J. McCormick. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 177 pp. 6¼" x 9½". Illus. $3.75

Aimed at the student, this book presents an elementary account of the stress analysis of common building materials, notably steel and timber. It includes the analysis of beams and columns and describes the conjugate beam method in detail.

The author, who is professor of applied mechanics at Kansas State College, has perhaps weakened this study by not covering either the relative advantages of different building materials (steel vs. aluminum, for instance), and by not devoting more space to "connections," particularly the importance of high-tensile bolts vs. riveting or welding. Nevertheless this study may be read with profit by architectural students.
A limited flooring budget need not limit the designing of distinctive floors. Outstanding floor effects can be achieved at low cost from the wide color range in Armstrong's De Luxe Asphalt Tile. Its unique swirl marbleization creates an exceptionally beautiful monolithic effect and is equally adaptable to multicolor custom designs.

John F. Hartranft Elementary School
Norristown, Pa.
Davis, Dunlap, and Carver, Architects

ARMSTRONG'S ASPHALT TILE
ARMSTRONG CORK COMPANY • LANCASTER, PENNSYLVANIA
A good point to remember about the Russwin "Stilemaker"

The knob release mechanism of Russwin "Stilemaker" heavy-duty locks has been placed behind the rose for two reasons...

1. To eliminate chances of scratching the rose or knob in the process of installing or removing the lock...
2. To speed installation. These are points that help assure client satisfaction... save time and money. From every angle... design, construction, functions, styling and finishes... every effort has been made to merit your complete confidence in specifying Russwin "Stilemaker" heavy duty locks.

Send for detailed information.

Russell & Erwin Division,
The American Hardware Corporation,
New Britain, Connecticut.

VENTILATED LOCKERS provide pleasant atmosphere for dressing-room occupants

The Air Flow clothes cabinet portends a millennium in locker-room planning as well as an end to hosts of pungent similes. Clean, treated air is circulated through these steel lockers via a built-in ventilating system (see diagrams below) removing odors and keeping clothes fresher and drier than conventional metal closets. Assuring a more sanitary milieu, the new unit is certain to boost morale in factory, school gym and country-club dressing areas. Besides the long-needed ventilation feature, the Air Flow incorporates several other considerate details:

- The cabinet's sloped, louvered bottom with attached shoe holder prevents grit and old papers from piling up in the back corners, also speeds drying of wet shoes.
- Flush fronts and cantilevered benches help give the room a neat appearance and facilitate housekeeping.
- Fittings such as bath holder, storage shelf, coat rod and hooks, and automatic lock are planned for the user's comfort and convenience.

Air Flows may be wall-recessed or mounted in islands with ventilating ducts above and below. (Air travel can be directed according to the system employed.) Each unit measures 15" wide x 18" deep x 9' high and comes in two standard colors—gray and green. List price per locker, knocked down, f.o.b. factory, runs from about $20 to $25 depending on grouping and arrangement. Cost does not cover ventilating equipment or ductwork. Discounts are made on quantity orders.

Manufacturer: Penn Metal Corp. of Pennsylvania, 50 Oregon Ave., Philadelphia 48, Pa.
HYDRAULIC LIFT-ON-WHEELS raises men and material 38' above ground

Performing a somewhat sophisticated version of the Indian rope trick, this mobile personnel lift should soon make itself popular among building and maintenance men. The trailer, built on a strong, pneumatic-tired chassis, utilizes a heavy-duty hydraulic jack to elevate its 8' platform and 3 tons of building material and crew as high as 38'. It is equipped with dual controls—one set on the high-flying top and the other on the grounded carcass. The platform can be rotated in a complete circle—maneuverability needed for handling awkward trusses and pipes. A 7½ h.p. self-starting engine powers the versatile lift and its base is fitted with four stabilizing screw jacks on folding arms for use with heavy loads. Fully retracted with its guard rail collapsed, the machine needs only 13'-6" head room and so can shuttle around inside a plant or large construction job. Should the hydraulic line rupture completely, the lift will descend slowly; and in case of control failure, a by-pass valve in the base regulates the lowering. To keep tools and small items from falling off, the platform is provided with a 6" kickboard. Price, f.o.b. Pasadena, is $4,750.

Manufacturer: Hamlin-Klock Corp., 28 N. Marengo Ave., Pasadena 1, Calif.

PACKAGED PORTABLE RAMP bridges factory dock and truck; cuts costly hand-to-hand loading

Enabling one man and a forklift truck to do the loading work of ten men and two trucks, the Illo ramp can add materially to the efficiency of a factory layout. The unit is shipped completely assembled and can be installed at any loading deck in about 5 min., and adjusted in seconds to meet any truck...

continued on p. 174
Mobilex is a recessed fluorescent lighting system. It is designed for use with grid-type suspended ceilings. Interlocking "tee" rails support Fiberglas* Ceiling Boards and Mobilex units. Mobilex is available in 2' x 2' or 2' x 4' units with a choice of molded plastic, glass or louvered shielding elements.

Mobilex is easy to install. Simply compress the sides of the fixture with "Mobilhooks" and insert it into the grid opening.

The fixture rests on the grid rails. End baffles lock the compression feature into place. No hangers or suspension straps.

Mobilex units may be added or changed at any time. Just remove the ceiling panel and replace it with the Mobilex unit.

Write today for the full Mobilex story.

ALSO AVAILABLE FOR USE WITH OTHER TYPE CEILINGS

Mobilex places in the hands of the architect a new design element ... a flexible new lighting tool that can help him conceive a thousand and one lighting ideas. You can use Mobilex as single units ... build unlimited patterns of light ... or create an entire luminous ceiling. And you can
The trend in school design is to multiple use of space. This provides a means of keeping within school building budgets in the face of rising prices and by reducing costs in one department permits incorporation elsewhere of wanted features. This equipment is now in use in hundreds of schools from coast to coast and is specified by more than 85% of leading school architects.

**In-wall**

**FOLDING TABLES AND BENCHES**

Conversion of activities room to lunchroom for 200 can be made in 8 minutes with no interruption of routine.

**SCHEIBER SALES COMPANY**

Detroit 23, Michigan

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**HOW TO MAKE A BETTER “PACKAGE” OF YOUR SCHOOL PROPOSAL**

---

**To make washrooms really modern**

—specify the Scott No. 943 Recessed Towel Cabinet

Here’s the fixture designed to keep step with today’s growing trend to recess fixtures. It’s one of the many Scott fixtures available to meet the most exacting demands for modern washrooms.

For a detailed dimension and installation drawing of the No. 943 fixture or for the help of a trained Scott consultant, write Washroom Advisory Service, Dept. MB-12, Scott Paper Company, Chester, Penna.

**SCOTT**

Symbol of Modern Washrooms


---

**Long-Span Roof Slabs Provide 8’ Cantilevers, Finished Ceiling**

This $175,000 Florida motel eliminated ceiling plaster, achieved 8’ clear cantilevers easily and speeded construction by using Flexicore precast slabs in 16’ to 22’ 6” spans. Smooth underside of fire-resistant slabs formed attractive panelled ceilings. For catalog and nearest manufacturer, write The Flexicore Company, Inc., 1759 East Monument Avenue, Dayton 1, Ohio.

---

**PRECAST CONCRETE FLOOR & ROOF SYSTEMS**

Catalog in Sweet’s Architectural
Design ideas seem to spring naturally from the versatility of lovely, lasting MICARTA® plastic surfaces. The smart, efficient appearance of the United Fuel Gas Company installation, shown below, was made possible by MICARTA’s combination of long-lasting beauty and year-after-year utility...MICARTA’s ability to handle daily dealings with the public without showing the effects of wear and tear.

MICARTA colors, patterns and wood grains make for fine interiors and practical interiors. This amazing surface will resist grease, alcohol, burns, scuffing and denting. It can be flicked clean with a damp cloth...never needs refinishing, waxing or polishing.

MICARTA has proved itself in prominent installations from hard-working bar tops to discreetly styled wall paneling and wainscoting. Investigate the many-sided possibilities of this modern material. Just fill out the coupon below.
platform height. Both manually controlled and motor driven models are available at $740 and $840 f.o.b. Los Angeles. The electric ramp has a single-phase ½ h.p. motor connected to a ¾", 350 lb. hydraulic pump and can be plugged into any 110 v. outlet. Heavy-duty tension-type coil springs counterbalance both types. Each measures 6' x 8', weighs 1,500 lbs., and has a 10-ton capacity. Manufacturer: John B. Ilo Engineering Co., 2414 East 57th St., Los Angeles 58, Calif.

Translucent plastic takes on a new form in these building panels crimped to correspond to 5-V metal siding and roofing sheets.

PIEGMENTED PLASTIC SHEETS made to match 5-V metal roofing and siding

Marking a subtle step forward in structural plastics, Resolite is adding 5-V crimped panels to its line of translucent polyester resin sheeting. Like the corrugated and flat panels, the new crimped units are reinforced with glass fiber and are about as strong as metal sheets of the same gauge and shape. They can be used alone as siding or roofing, or may be combined with standard metal 5-V units. Application presents no special problem since the plastic panels nest together and are fastened to the frame the same way as the metal—either by screws, nails or bolts. The sheeting sells for about $1 to $1.25 per sq. ft. and, requiring no caulking or flashing, makes inexpensive skylighting for industrial and farm buildings. It is said to be unaffected by weather extremes and most chemicals. Each panel is 26" wide and up to 12' long, and comes in eight pastel colors. Manufacturer: Resolite corp., Zelienople, Pa.

PROJECTING NUMBER PLATES made of lustrous, colored plastic

These neat number plates are molded in several colors of a tough cellulose-acetate plastic. Highly resistant to corrosion and wear, they are suitable for indoor or outdoor use and make smart, inexpensive details for corridors of office buildings, schools, hospitals and apartments. Each tag measures 2" x 5" and projects lengthwise from its own permanently mounted plastic bracket. The ½"-high numerals (or letters) are stamped in white against lustrous green, gold, red or black backgrounds, and are clearly visible at considerable distances. Lightweight, the plate can be cemented to metal or plaster wall surfaces; screws are used to fasten it to wood. The number plates can be ordered with one to four figures and cost 60¢ each in lots of 25 or more. Manufacturer: Plastic Tag & Trade Check Co., Fourth & Saginaw St., Bay City, Mich.

continued on p. 178
Basket-weave using 8” x 16” units

Coursed Ashler variation with 4” & 8” units
Horizontally stacked 8” x 16” units

4” x 16” and 8” x 16” courses

Tooled horizontal joints; verticals wiped out

Horizontally stacked 8” x 16” units 4” x 16” and 8” x 16” courses

Here 8” x 8” units are stacked

A very effective patterned Ashler

THE FAMILIAR THEME—8” x 16” FACE UNITS IN RUNNING BOND

...with exposed WAYLITE Partitions and Bearing Walls

The vast musical literature of the world is limited to a maximum of 13 tones in any one octave... similarly there is a very wide range of harmonious effects to be obtained with Waylite masonry walls of any thickness ... a few of the different handlings are shown here... they are achieved very simply.... Waylite masonry has adequate structural strength—superior thermal insulative qualities—and exposed Waylite interior walls need no acoustical treatment. The Waylite Co., 105 W. Madison Street, Chicago, or Box 30, Bethlehem, Pa.
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As a service to Architects—never before available—we offer a series of nine Specification Data Sheets covering all important masonry uses. To Builders—a series of 19 Service Bulletins, the know-how of Novaproofing.

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**MONUMENTAL ALUMINUM WINDOWS**

are being specified by architects throughout the country for buildings where requirements call for the highest quality in aluminum awning windows. A recent outstanding example is the new plant, office and laboratory building of White Laboratories, Inc. at Kenilworth, New Jersey, incorporating the latest design features, including "lemco" Series 62 Monumental Aluminum Windows. In planning any architectural project, look to "lemco"—see our catalog in Swee"s Architectural File or write for descriptive literature.

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In today's competitive hollow core door market, quality varies greatly. Make sure you get the best value when you specify.

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It will pay you to investigate the Roddiscraft Housemart Hollow Core Flush Door. Compare construction — compare appearance. Roddiscraft Housemart Doors are a finished product — no rough edges — smooth sanded faces — made to last.

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St. Louis 16, Mo. • San Antonio 6, Texas • San Francisco 24,
Calif. • San Leandro, Calif.

Roddiscraft
RODDIS PLYWOOD CORPORATION
Marshfield, Wisconsin
LIGHTING FIXTURE responds to finger touch
An ingenious take-off on human anatomy, the Norwegian Luxo lamp is as utilitarian as it is handsome. Its frank, aluminum shade is mounted on a highly maneuverable arm made up of square steel tubing and nickled springs. Vented to allow bulb heat to escape, the shade is designed for a 60 w. incandescent lamp. Painted white on the inside, it is an effective reflector, diffusing glareless illumination. A finger touch to the shade or bracket moves the light to any position—and it stays wherever put. Several attachments are available for securing the Luxo to different surfaces; bracket A clamps to desk or table lip, B can be fastened to the wall by screws, and C secured to any workbench or any flat surface. Price for the lamp with any one of these three brackets is $21.95. (Architects and designers receive a 25% discount.) Bracket D, a weighted felt-bottomed base for desk-top use, is also available at an additional $4.25. Choice of finishes are: in glossy enamel—ivory, gray and light green; and in matte enamel—black. The Luxo carries Underwriters Laboratories' approval. Each unit is shipped assembled. Manufacturer: Form & Function, 212 Fifth Ave., New York 10, N.Y.

JUMBO SAFETY SWITCH made for industrial wiring systems
Rounding out its line of 30, 60 and 100 amp. safety switches, Trumbull is now manufacturing a 200 amp. 600 v. fusible and no-fuse model for heavy duty service. Tagged HCI (stands for high-capacity interrupter) the front-operated switches feature arc-quenching action much like that of circuit breakers. Visible contacts are projected and withdrawn with pistonlike rapidity and force. Grid pins break up the arc, divide it into a series of smaller arcs, dissipating the heat. This type of design results in minimum wear and tear on the contacts. Standard equipment on all models is a felt gasket which keeps out dust and dirt. List prices for the switches range from $79 for the 2-pole, 240 v. a.c. size to $133 for the 4-wire, 600 v. a.c. unit. Manufacturer: Trumbull Electric, Department of General Electric, Plainville, Conn.

LIGHTWEIGHT BRICK TONGS have spring lock for easy handling
Toting up to eight bricks a load, the 2 1/4 lb. magnesium Mag Liner tongs are simple to use, continued on p. 182

CONSIDERING FIRE PROTECTION?
THE COMPLETE STORY . . . YOURS FOR THE ASKING!

You've undoubtedly pondered from time to time on the value of fire protection. You've heard that certain types of fire safety can save you money—that sprinkler systems pay for themselves. Yes—you've probably heard a lot about fire protection but because of the technical complexity involving economic considerations, security factors and application, you've wondered what most of it is about.

That's why we published "The ABC of Fire Protection." It's a comprehensive book that contains all the facts and— they're presented in a manner understandable by the layman—sufficiently defined for an exacting technician. Insurance interests have readily recognized the value of this literature. You will too! Use the coupon to get your free copy or telephone your nearest "Automatic" Sprinkler representative today.

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THE MAGAZINE OF BUILDING
3 Different Models of the Sanistand Fixture Now Available

with the addition of a tank model for normal water pressure installations

With the introduction of the new tank model of the Sanistand fixture, this women's urinal now meets installation requirements of any rest room. For the new tank model—which has all the same outstanding features that have made the pedestal and wall-hung models so popular—can be installed where direct pressure valves cannot be used. An eight gallon tank supplies sufficient water for flushing and refill. All three models of the Sanistand fixture offer the same convenience and cleanliness for women that the standing urinal does for men, since users need not sit on or touch the fixture in any way. The slanted rim, extended lip and convenient 18-inch height of the fixtures discourage misuse and help keep rest rooms neater, more attractive. The genuine vitreous china fixtures—which are available in a variety of attractive colors—feature siphon-vortex flushing action with jet which empties bowl contents quickly.

You will add to the popularity of the buildings you plan when you include these sanitary fixtures in rest room specifications. All three models of the Sanistand fixture are suitable for modernization work too. Usually can replace existing water closets. For further information on rest room planning send for a copy of the Better Rest Room Guide.

AMERICAN RADIATOR & STANDARD SANITARY CORPORATION, Dept. AF-122, Pittsburgh 30, Pa.

AMERICAN - Standard
First in heating ... first in plumbing

Please send me, without obligation, your new Better Rest Room Guide including complete information on the Sanistand fixture.
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At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee, and face the life-saving facts about cancer as presented in our new film “Man Alive!” You'll learn, too, that cancer is not unlike serious engine trouble—it usually gives you a warning:

1. any sore that does not heal
2. a lump or thickening, in the breast or elsewhere
3. unusual bleeding or discharge
4. any change in a wart or mole
5. persistent indigestion or difficulty in swallowing
6. persistent hoarseness or cough
7. any change in normal bowel habits.

While these may not always mean cancer, any one of them should mean a visit to your doctor.

Most cancers are curable but only if treated in time!

You and Ed will also learn that until science finds a cure for all cancers your best “insurance” is a thorough health examination every year, no matter how well you may feel—twice a year if you are a man over 45 or a woman over 35.

For information on where you can see this film, call us or write to “Cancer” in care of your local Post Office.

American Cancer Society

MAN ALIVE! is the story of Ed Parmalee, whose fear weakens his judgment. He uses denial, sarcasm and anger in a delightful fashion to avoid having his car properly serviced and to avoid going to a doctor to have a symptom checked that may mean cancer. He finally learns what a difference it makes (in his peace of mind and in his disposition) to know how he can best guard himself and his family against death from cancer.
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Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.
to use, easy to carry. Their span can be adjusted and locked in place in one operation by means of a tension spring and ratchet. The *Mag Liner* sells for $10.95.


---

**SLIDE RULE picks right wood beam for any light construction job**

Designers who spend long hours over formulae figuring wood-beam dimensions will soon find warm spots in their breast pockets for Engineer Everett Rader’s slide rule. The new device reduces the chore of selecting joists, rafters and girders to a few finger movements. If any four of the five factors—span, load, fiber stress, spacing and beam size—are known, the fifth can be determined in seconds on the plastic rule. In a typical rafter-sizing problem, the user sets the load per sq. ft. indicated on Scale B opposite the desired span on Scale A. He then moves the arrow on Scale C beneath the fiber stress of the lumber species chosen and reads the rafter size required on Scale D. (A convenient table on the back of the rule lists basic fiber stresses under normal load conditions for common and select structural grades of fir, southern pine, hemlock, spruce and that anonymous timber, “general.” Alternate Scales B and C printed on the reverse of B and C are used to design members which should not be allowed to deflect more than 1/360 of the span, such as those above plaster ceilings. Price for the little daisy, including a simulated leather case and instruction manual, is $2.50.

*Manufacturer:* Everett Rader Co., Dept. AF, Box 122, Bowling Green Station, New York 4, N.Y.

**BONDING CHEMICAL joins dissimilar metals without danger of galvanic action**

*Chemotec* is an unusual bonding agent that can be used to join metals to each other, one metal to another, or metal to ceramic, glass or wood. In a typical plumbing application, pipes or elbows can be shipped with the bonding agent already applied to the surfaces to be connected. The pipe fitter merely assembles the parts and grips the joint between the jaws of a portable resistance heater. The heat sets up a chemical reaction which changes the molecular structure and fuses *Chemotec*. In a few seconds a leakproof, corrosionproof bond is formed with a tensile strength of 5,000 psi—stronger than a soldered joint. The agent is available in rod, powder, paste and liquid forms. *Chemotec* costs about $2 per lb. in 100 lb. lots.

*Manufacturer:* Chemotec Div., 172nd St. & Northern Blvd., Flushing, N.Y.

*Technical Publications p. 186*
The AiResearch plant in Arizona is a perfect example of foresighted design at work. A few months after completion of the original unit of 100,000 sq. ft. area, an additional 54,000 sq. ft. was needed. Farsighted Architect Hess took this in stride... for it was necessary only to remove the Q-Panel walls, extend the steel frame, and put back the original walls with the necessary amount of new material to complete the job.

Q-Panel walls enable any owner and architect to build for the present with the future in mind. Although easily moved to new locations, Q-Panel walls are at the same time permanent construction, with insulation value, construction speed, and architectural appearance that recommend them for industrial, commercial, and institutional buildings of every description.

From coast to coast, Q-Panel buildings stand as monuments to farsighted architectural design and industrial management.

**Q-Panel Quick Facts**

**Materials**—Metallic-coated Steel, Galbestos, stainless steel, aluminum on one or both sides. Other materials on special order.

**Size**—2'-0" standard modular width. Lengths up to 25'-0", depending on material used.

**Weight**—Varies with metals selected but averages 4 1/2 lbs. per square foot.


**Strength**—Great strength permits widest spacing of horizontal supports to meet the required wind load, thereby saving structural steel.

Architect—
Howard P. Hess, Los Angeles

Engineer—
Donald Douglass
When Re-Use Counts—Specify Plywood Forms

MEASURED in terms of cost per use, Douglas fir plywood ranks as one of the most economical of all form materials. On apartments, office or factory buildings, plywood form sections can be used to job completion—eliminating the expense of rebuilding forms once the job is under way. Plywood deserves ordinary care in handling, but it does not require extreme caution at every step and is far more rugged than other panel type materials. The exact number of re-uses obtained vary with grade and the care it receives on the job. Builders report up to 10 to 15 re-uses with Interior-type PlyForm twice as many with Exterior-type PlyForm and new overlaid plywood panels. See grade data below.

Only Plywood Offers All These Advantages

- Plywood forms create smooth, finish-free surfaces
- Economical! Plywood forms can be used over and over
- Plywood forms speed work—save time and labor
- Plywood is strong, rigid—yet light, easy to handle
- Plywood forms are puncture-proof, water and mortar tight
- Plywood has superior nail and lath holding properties
- Plywood is easy to work with hand or power tools
- Plywood provides sheathing and lining in one material
- Plywood is easy to work with hand or power tools
- Plywood provides sheathing and lining in one material

Douglas Fir Plywood

PLYFORM

These registered grade-trademarks positively identify special concrete form grades of Douglas fir plywood. Interior PlyForm (highly moisture-resistant glue) gives multiple re-uses. For maximum re-use, specify Exterior PlyForm with 100% waterproof bond. Other panels also available to meet specific job requirements include plastic-surfaced and hardboard-faced Douglas fir plywood. Be sure of quality, Specify grademarked plywood every time!

Plywood Forms Play Important Role in Parkmerced Project

Three prime factors—re-use, speed and appearance—dictated specification and use of plywood forms for both interior and exterior concrete surfaces on the new Parkmerced apartment project, San Francisco.

According to W. A. Bender, superintendent for Starrett Bros. & Eken, Inc., contractors on the job, plywood panels gave up to 15-18 re-uses, helped speed formwork application time and construction costs by about 20 percent and produced uniformly smooth, finish-free concrete surfaces. In fact, Bender reports, plywood-formed ceiling slabs were smooth enough to be painted after a minimum of grinding and application of spackling material—permitting a savings by eliminating expensive plastering.

Large built-up form sections 11 feet high and ranging from 20 to 49 feet long, were used on the walls. Forms were built of ¾” Exterior plywood, nailed to 2x4 studs, 12” o.c., backed by 2x4 and 3x4 walers. After each pour, sections were stripped and raised to the next story. Forms were used 13 times on the eleven 13-story tower buildings, then in some cases re-used further on the two-story Colonial type apartment buildings which dot the 200-acre tract.

Parkmerced was planned and built by Metropolitan Life Insurance Co. General Contractor: Starrett Bros. & Eken, Inc., Dinwiddie Construction Company was the subcontractor on concrete work. Leonard Shultze & Associates were the architects, with the firm of Thompson and Wilson serving as architectural consultants.

PlyForm Calculator Available

A handy slide rule calculator which gives plywood form construction data is available for $1.00 from Douglas Fir Plywood Assn., Tacoma, Wash. Included with the PlyForm calculator is a leaflet of design assumptions.
**Standard Tie-Hole Spacing Gives Extra Re-Uses**

Careful planning of tie-hole spacing and use of varying-size plywood form sections is paying off in extra re-uses on the Clover Park School job in Tacoma, Wash. On the job, 8'-long Exterior plywood form sections were pre-built in 3', 4' and 5'-heights to form concrete walls of the school which range in height from 2' to over 16'. Necessity of drilling new tie-holes for each pour was eliminated by pre-drilling holes so that placement of tie-rods is standardized. Holes were made by stacking plywood and drilling with a template positioning guide.

The idea was developed by Roy Hartman, partner, Standard Construction Company, Tacoma. He reports that by eliminating drilling and form re-construction as the job progressed they were able to get better than 25 re-uses—and the plywood will give additional uses on subsequent jobs.

**Single Wall Construction Used For California Studio**

A single thickness of Exterior-type Douglas fir plywood attached to the inside of 4x4 posts serves as the exterior walls of this striking Corona del Mar, California, ceramics studio and shop. Designed by California Architect Frank Gruys, the structure also uses Douglas fir plywood roof sheathing.

Exterior-type fir plywood was specified for single thickness walls because of the unique combination of properties which permits the panels to act simultaneously as both a structural and finish material.

Because good lighting is needed for work done in the studio, the building features large glazed areas. With so many windows, the insulating quality of double walls is not important. In addition, the mild climate provides good conditions for the use of plywood single wall construction.

Exterior walls of the Kay Finch studio are A-A grade Exterior plywood placed on the inside of 4x4 posts on four foot centers so that the plywood presents a smooth wall on the inside. Windows are top hung or are in fixed sash between posts.

The overhanging roof which reduces sun glare forms a definite architectural feature. Exterior plywood 7/8" thick is used for deck ing beneath built-up roofing.

**When Appearance Counts—Specify Plywood Forms**

How smooth can concrete be? As smooth as the material against which it's cast. That's why plywood-formed concrete surfaces are smooth, dense, uniformly attractive. Large panel size automatically reduces fins and joints to an absolute minimum. Exact-size Douglas fir plywood concrete form panels are tough, rigid, dimensionally stable. Stark monolithic surfaces, curved surfaces, rustication lines, fluting and other special architectural design effects are also easily achieved with plywood forms. For free catalog, write Douglas Fir Plywood Association, Tacoma 2, Washington.

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- Plywood forms create smooth, fin-free surfaces
- Economical! Plywood forms can be used over and over
- Plywood forms speed work—save time and labor
- Plywood is strong, rigid—yet light, easy to handle
- Plywood forms are puncture-proof, water and mortar tight
- Plywood has superior nail and tie holding properties
- Plywood is easy to work with hand or power tools
- Plywood provides sheathing and lining in one material

**Douglas Fir Plywood**

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- Interior PlyForm (highly moisture-resistant glue) gives multiple re-use. For maximum re-use, specify Interior PlyForm with 100% waterproof bond. Other panels also available to meet specific job requirements include plastic-surfaced and hardboard-faced Douglas fir plywood. Be sure of quality, specify grademarked plywood every time!
PIPING. Armco Foundation Pipe. Armco Drainage & Metal Products, Inc., Middletown, Ohio. 8 pp. 8½" x 11"

Deals with sizes, mill service and field advantages of Armco's pipe shells, pile shells, and caissons.

STEEL. Special Purpose Steels for Architectural Beauty and Permanence. Armco Steel Corp., Middletown, Ohio. 8 pp. 8½" x 11"

Covers properties and finishes of stainless steel, porcelain enameling iron, and zinc-treated sheet metal.

STORE FIXTURES. RHC Display Equipment, Catalogue No. 52-G. Reflector Hardware Corp., Western Ave. & 22nd Place, Chicago 8, Ill. 72 pp. 8½" x 11"

Cataloguing a comprehensive line of metal merchandising equipment—including binning hardware, window and counter stands, and floor racks—the publication introduces Reflector's Spaceboard and Space Klip fittings for perforated panel displays.


Twelve detail drawings and text explain how to glaze industrial buildings with flat panels of Plexiglas. Includes tabular data on solar heat and light transmission, as well as recommended thicknesses for openings of various sizes.

STEEL. Guide to Steel Selection. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. 4 pp. 8½" x 11"

Characteristics, mechanical properties, and uses of hot-rolled and cold-finished carbon and alloy steels.


Describes and pictures various operations in the manufacture of stainless-steel equipment for laboratories, hospitals, schools and industrial plants.

LIGHTING. How to Get Nature Quality Light for School Children. Libbey Owens Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio. 8 pp. 8½" x 11"

Readable text and good illustrations in this booklet explain the American Standard Practice for School Lighting recommendations to school officials and designers. Case histories and photos of "daylight walls" are included as well as typical cost figures. Some of the pictures show windows of contemporary schools glazed with Thermopane insulating glass.

continued on p. 190
Are YOU risking fires like these?

WHEN DISCOVERED BY OUTSIDERS, fire in this 6-story brick, wood-joisted warehouse had progressed too far to save the building. Such losses can be prevented with Fenwal DETECT-A-FIRE® thermostats on the job. Incorporated in a properly engineered alarm or release system they react instantly when temperature of the surrounding air reaches the danger point.

YOU REDUCE EXPENSES as well as risks, when you specify DETECT-A-FIRE thermostats in your fire detection equipment. Their long service life, corrosion resistance and repeatability provide built-in extra value that assures long-term economy. Fenwal DETECT-A-FIRE thermostats are listed by @... approved by ©.

MOST TERRIFYING OF ALL are hospital fires, when removal of helpless patients is an extra hazard. Loss of lives and property in institutional fires are preventable with efficient, automatic fire detection systems — alarm or release type — actuated by Fenwal DETECT-A-FIRE thermostats. No risky delays! No false alarms! No other fire detection units are so positive.

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Figured glass presents a practical solution to your expansion or remodeling plans. It is a non-restricted material in plentiful supply preferred by architects everywhere both for its functional applications as well as its rhythmic beauty. Exterior walls or internal partitions of figured glass by Mississippi protect privacy, yet flood rooms with soft, comfortable “borrowed light”. A modern material, it adds distinction as well as utility to any structure. Figured glass is practical to maintain...simple to install...easy to clean...never "wears out".

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A summary of the latest information including specific engineering details, dimensions, properties and safe load tables for spans - 4 to 44 feet.

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UGLY? Yes, and it may also be a sign of more trouble to come. Mineral salt deposits on the surface often indicate moisture within the walls. Water entering through shrinkage cracks in the vertical joints of the coping, plus that absorbed by the parapet, seeps downward. One result is shown. Another of more serious consequence is the damage to interior walls and ceilings.

A REMEDY: Through-wall flashing installed as detailed below.

ANAConDA Through-Wall Flashing does a better job. Its zigzag corrugations and preformed dam assure drainage in the right direction—toward the roof. The corrugations embedded in the mortar prevent lateral movement in any direction. The flat selvage bends without distortion to form a neat counter flashing.

Standard types for 8" and 12" walls are available. Special sizes may be ordered with variable widths of corrugations and selvages up to an over-all width of 47". One-piece corners for 8" and 12" walls are also standard. For complete information and suggested specifications—write for ANACONDA Publication C-28.

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