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Record spending for new construction continues, but tighter mortgage money worries builders

Total spending for new construction rose to a new monthly record in September, and brought construction expenditures for the first nine months of this year to $36.4 billion, about 1 per cent higher than for the same period in 1957. The volume of spending for September alone was about $4.8 billion, which was 3 per cent higher than in September 1957.

The most striking feature of the latest government report on building outlays was the upsurge of private residential construction. Spending for new dwellings; units in September ($1.3 billion) was 11 per cent higher than in September 1957, and in the first nine months of 1958 ran 2 per cent ahead of 1957. The Department of Labor announced that 108,000 new private units were started in September, raising the seasonally adjusted annual rate of new starts to 1,220,000—the highest rate in three years. For the first nine months of this year, the annual rate works out to 1,054,000 new starts compared with only 985,000 in the first nine months of last year.

Public building, meanwhile, rose 6 per cent over 1957 in the first nine months of this year, largely because of the quickening pace of highway construction (up 10 per cent over the first nine months of 1957), and a 69 per cent increase in spending for public housing, mostly Capehart Act housing—i.e., new units on military installations. The highway building speed-up has proved a particular blessing for cement manufacturers, who last month announced that shipments were well above seasonal levels, particularly in the Midwest.

However, most cement manufacturers doubted that there would be a price increase soon, for despite rising wages and fuel costs, capacity is still well above seasonal levels. The quickening pace of highway construction, particularly on the private residential sector, which accounts for 26 per cent of all building (see below).

Total spending for new construction was off 10 per cent in the first nine months was 29 per cent below the nine months of 1957, and brought construction expenditures for the first nine months of this year to $36.4 billion, about 1 per cent higher than for the same period in 1957. The volume of spending for September alone was about $4.8 billion, which was 3 per cent higher than in September 1957.

The big question in the building outlook now is the possible effect of tighter mortgage money on the volume of new construction, particularly on the private residential sector, which accounts for 26 per cent of all building (see below).

Tighter mortgage money threatens home-building revival

The specter of tight mortgage money, so tight that it could again cripple home building as it did last year, was giving bankers, builders, and economists the shivers last month. John C. Hall, president of the Mortgage Bankers Association, summed up the feelings of many: "After a few months of a reversal of the downward trend in interest rates, we face the prospect of having funds diverted from mortgage investment as rapidly as they were turned toward it last winter."

Home building has experienced a remarkable recovery in the past few months, with new starts hitting an annual rate of 1,220,000 in September, well above the nine-year low of last February (915,000). This has been due largely to easier conditions in the money market resulting from a combination of lower interest rates and an infusion of new funds into mortgage investment. But last month this picture was already changing drastically. The $1 billion in emergency funds that was handed to the Federal National Mortgage Association last April for buying government-insured mortgages has been exhausted, and interest rates in the money market generally have lately taken a sharp swing upward. Even the Federal Housing Administration experienced the pangs of money shortage when it announced that it had already run through most of the $4 billion in new insuring authority that Congress granted it last year. The year-to-year lag in September was only 1 per cent. But office building construction, which was up 10 per cent for the first nine months, began showing the first signs of weakness in September—volume of new office construction was 3 per cent below September 1957.

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Two of the biggest minus areas in building are industrial building and the construction of stores, restaurants, and garages. Industrial building was down 41 per cent in September as compared with September 1957, and for the first nine months was 29 per cent below the similar period in 1957. Although store building was off 10 per cent in the first nine months, signs of a recovery (predicted last month by FORM Consultant Miles Colean) are showing up. The
spring. In an effort to husband its fast-dwindling insurance fund, FHA has set up a new system under which it will not make firm reservations of insurance funds for new mortgages, but will only issue a less binding "agreement to insure." Under this system, home builders may have more difficulty getting mortgage money from lenders, as the new commitment will not be so binding on FHA as was its usual commitment method.

Due to the government's long-standing policy of putting interest rate ceilings on federally insured or guaranteed mortgages—which are all-important in the housing market—yields on these mortgages look increasingly unattractive as yields on other securities—particularly government and corporate bonds—rise. Mortgages insured by the Veterans' Administration, with an interest ceiling of 4.75 per cent, are already far out of line with the general market (5.5 to 6 per cent), and mortgages insured by the Federal Housing Administration are selling at discounts of 2 to 3 per cent. There has already been a shrinkage in requests for appraisals by VA—they dropped 6.5 per cent in September, to the lowest monthly mark since last April.

Another indication of how tight mortgage money has become recently was the heavy amount of mortgages—$9 million in one week last month—offered to FNMA as part of its secondary market program. As money tightens, builders and lenders offer mortgages they hold to FNMA, in order to get cash with which to make new mortgages—at higher rates.

Some Congressmen are concerned about the possible effects of tighter money on home building. Senate Majority Leader Lyndon B. Johnson (D, Texas) said a new housing bill would have "the highest priority" when Congress convenes. Representative Albert Rains (D, Alabama), chairman of the Housing Subcommittee of the House Banking & Currency Committee, said last month that the "first order of business" in considering housing legislation in January ought to be an additional $1 billion in new funds for FNMA.

Actually, the present mortgage market is not likely to get any better in the near future. Although the shortage may not become so severe as last year, the Federal Reserve Board has indicated that it intends to adopt a firm policy against inflation on a broad front. Just two weeks ago, the Fed raised its discount rate—the interest rate it charges member banks when they borrow from the Fed—from 2 per cent to 2.5 per cent. This follows a 1/2 of 1 per cent increase last August. More important, the U.S. Treasury, which early last month borrowed $3.5 million selling short-term issues at attractive rates, still has a staggering amount of refinancing to do in coming months ($30.8 billion in six months), and must carry it out in the face of heavy competition for investment funds from corporations, states, and localities.

As Forum Consultant Miles Colean said recently: "Much depends on how the Treasury handles its staggering financing operations, and the way in which the Federal Reserve gives it an assist."

Chicago renewal project approved over protests

Chicago's $38-million Hyde Park-Kenwood urban renewal project met its severest test last month, when the housing and planning committee of the City Council finally approved plans for the redevelopment as drawn up by Webb & Knapp Incorporated and the University of Chicago (Forum, April 1958). The decision marked the end of the first round of a bitter struggle that has seen Catholic, Negro, and Communist pressure groups allied in a common cause against the redevelopment proposal for the 900-acre site on the South Side.

Leading the battle has been Monsignor John J. Egan, executive director of the Cardinal's Conservation Committee for the Chicago Archdiocese, which is the largest archdiocese (nearly 2 million Catholics) in the U.S. Egan is basically opposed to the Hyde Park-Kenwood project for three reasons:

He wants more public housing for low-income groups. There will be 84 units of low-rent housing built in the area under the plan, and Egan wants at least 200 units.

Egan says no land should be cleared until it is immediately ready for re-use.

He wants a "coordinated" relocation program (about 19,000 persons will be moved from the area) in stages to avoid overcrowding in other areas of the city.

Joining Egan in opposing the plan were various Negro groups (including the NAACP) both in the area and outside it. One of the most vociferous objects was James West, executive secretary of the Communist Party of Illinois, who characteristically reviled the plan as "a design by certain banking interests to wall off a select section of the city from the tidal wave breaking out of the blighted ghetto next door."

The Catholic opposition to Hyde Park-Kenwood has put Chicago politicians, particularly Mayor Richard J. Daley, in an uncomfortable position. Daley, a Catholic, has backed the plan consistently, although he does not rule out possible minor changes to soothe the pressure groups. One well-known Catholic layman, Jerome G. Kerwin, a professor at the University of Chicago, disagrees with Egan, and says that "many people of my own faith are concerned" over the church's stand.

Leaders of other faiths do not agree with Egan either. Rev. Leslie Pennington, of the First Unitarian Church, warns that any additional public housing should be well scattered "to avoid concentration of social problems." Rabbi Jacob J. Weinstein has urged adoption of the plan in order "to preserve the harmony of races, nationalities, creeds, eggheads and squares, Bourbons and Babbitts, who have made it the colorful and exciting neighborhood that it is."

The hassle over Hyde Park-Kenwood, and particularly the Catholic church's role in it, is being closely watched by all city officials interested in urban renewal. In a magazine article last spring, Egan indicated that the execution of the whole urban renewal program is open to serious question. He said, "There are alarming indications that this program, which affects the lives of hundreds of thousands of individuals and the existence of so many institutions such as our Catholic parishes, is beginning to slip away from the people who eventually must pay for it and must endure inconveniences for its execution."

One of the prime purposes of urban renewal, of course, has been to lure upper- and middle-income families (which are usually white) back into the city by providing new housing and pleasant urban environment. This approach necessarily involves displacing lower-income families to other areas, and frequently means building public housing. If there should be a concerted effort by the Catholic church to oppose this approach, it would cause a reappraisal of the whole renewal program, and, in some areas, kill it completely.
Which building won the competition?

One of the biggest architectural competitions ever held closed last month with the final judging of the eight designs for a new Toronto city hall shown below. The eight finalists had been selected from 520 contestants from 42 countries, and each of the eight got $7,500. The five judges were unanimous in picking a winner from the eight, all of which the jury termed "of an exceptionally high standard." To find out which entry won, turn to page 9.
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The five judges of the competition were Sir William Holford of Great Britain, Ernesto Rogers from Italy, C.E. Pratt from Vancouver, Gordon Stephenson from Toronto, and Eero Saarinen of the U.S. Professor Eric Arthur of the School of Architecture, University of Toronto, was professional adviser and nonvoting chairman. Saarinen, Rogers, and Pratt reportedly favored Rewell's design from the first, but Holford and Stephenson were opposed to it, largely on practical grounds.

Holford and Stephenson agreed that Rewell's design is the most imaginative of the entries, but they questioned its suitability to the site and "as an answer to the requirements of the administrative program." Their specific criticisms may very well lead to fairly heavy revisions in the design, although the basic concept of two curved towers cupping a saucer-shaped assembly hall will probably remain. These are the main criticisms of the minority:

1. The blank concrete walls of the towers "shut out the city" to the north, east, and partially to the west. (The walls facing into the assembly hall are to be glass.) The minority suggests that these walls, rising 356 feet for the higher tower, and 290 feet for the other one, could have "an adverse effect on the future redevelopment" of the area.

2. The "internal circulation" in the building complex is too complicated, making movement from one structure to another more difficult than it should be.

3. The council chamber itself, nestled between the two skyscrapers, has "defeats as working accommodation, and a poor outlook."

4. "The form of construction proposed for the office towers is probably the most expensive which could be devised for vertical slabs," [it will cost] "much more than the council had in mind."

Rewell's design won enthusiastic support from all the jury as "the most original in conception of any of those submitted." The jury added, "Its monumental qualities are of a high order and it is a composition of great strength. Its shape is distinctive and dramatic, setting it apart from other structures in Toronto and from administrative and office buildings everywhere." Holford himself called it "a new symbol of civic administration ... it combines the symbolic with the practical for the first time in such a public building."

Toronto is bound by the rules of the competition to go ahead with Rewell's design, and Mayor Nathan Phillips and other city officials have already voiced their enthusiasm for it. Cost of the project may be the biggest stumbling block, however (some unofficial estimates are that it might cost as much as $30 million), and there will probably be further revising of Rewell's design to cut down on its more costly elements.

**Executives propose Lower Manhattan renewal**

A few months ago, a new group called the Downtown-Lower Manhattan Association was formed with the purpose of framing plans for the future development of what are probably the most valuable 564 acres of real estate in the world. Last month, the association, headed by the Chase Manhattan Bank's vice president, David Rockefeller, and Seamen's Bank for Savings' president, John D. But, came up with its first proposals. They constitute a broad framework for the redevelopment of lower Manhattan, focusing on traffic improvements, land use and urban renewal, and putting aside, for the time being, the sticky questions of who pays how much and for what.

The lower Manhattan area presents some of the most peculiar urban problems ever faced anywhere. To start with, only 1 per cent of its area is residential (about 4,000 persons live there, mostly in the area just east of City Hall), yet on any working day there are over 400,000 persons in the area. And downtown Manhattan's streets are not much wider today than they were when Peter Minuit clumped about them. But to accommodate the flood of commuters, streets are a necessity, so there are plenty of them—about 46 per cent of the area is paved of some sort. Most of the buildings are not skyscrapers at all, despite the clichés about Wall Street canyons. In fact, 52 per cent of all buildings in the

---

**THE WINNER AT TORONTO**

Viljo Rewell (pronounced Rev-ell), 48-year-old Finnish architect, was in Zurich, Switzerland when the news reached him that he had been picked over 519 other entrants as winner of the international competition for the Toronto City Hall. Rewell's first reaction was, "I'm thrilled beyond words," as he prepared to make his first trip to Canada. Rewell is a graduate of Helsinki's Institute of Technology, and worked for a while as assistant to Finland's famed Alvar Aalto. So far, all his work has been in Finland, where he has designed apartment houses, office buildings, factories, schools, churches, and a nine-story hotel in Helsinki. He is superintendent of the Museum of Finnish Architecture, and he says architectural competitions in Finland "have an important position in our traditions." Rewell has three daughters, and is an ardent yachtsman. When asked by the Toronto Star if he was Finland's most prominent architect, Rewell replies, "I don't like to say it, but I might rank about second."

**TOURO TOREDHAN**

Lower Manhattan, showing two major renewal areas, as proposed by the Downtown-Lower Manhattan Association (see above).
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Most of these old-law tenements downtown—are over 100 years old, and are being demolished, including the Chase Manhattan’s new 60-story tower. Consequently, the area is one of great contrasts, where the population is either a tidal wave or a puddle, buildings either 60 stories tall or three, and the great investment and commercial banking houses rub shoulders with the West Side Produce Market and the Fulton Fish Market.

The recommendations of the association, prepared with the aid of Skidmore, Owings & Merrill, would clear up much of this ambiguity. The report recommends that both the fish market and the produce market be moved elsewhere in the city, that the lower East Side piers be redeveloped to include a heliport and small boat basin. With the fish market and its immediate environs gone, the way would be open for the further development of more financial area skyscrapers. A redevelopment area on the West Side, in the section surrounding the produce market, would be redeveloped for industrial and heavy commercial use. Some new housing would be provided, including luxury apartments at Battery Park, which would double the number of residents presently in the area.

The association hopes that the city will first tackle its street widening recommendations, and then the redevelopment areas according to its plans. And it says it is “prepared to seek financial support for redevelopment projects either within our membership or from outside sources,” the latter presumably referring to federal urban renewal funds. Whether the association’s plans ever bear fruit will depend to a large degree on how powerful its arguments appear to the many cities—and federal—agencies with which it will have to deal.

### Rationing of renewal funds meets opposition

The federal urban renewal program, which only recently was beginning to show the first tangible evidence of nine years’ labors, is now facing the most severe fiscal crisis since its inception. The trouble started in late summer when Congress failed to pass an omnibus housing measure, which would have included at least $250 million a year in capital grant funds for the Urban Renewal Administration, and possibly more. This left URA with a bare $54 million with which to make new commitments to municipalities for urban renewal projects. President Eisenhower quickly released $100 million in funds which he had postponed spending since 1955, but this still left URA with less than half the amount of funds needed to meet some $362 million of applications for urban renewal money.

Two months ago, URA attempted to solve its problem by setting up a rationing formula based on the population of the cities applying for funds (FORUM, October 1958). This aroused a cry of protest from many cities, particularly those of medium size which had large urban renewal projects planned. (Buffalo, New York, for example, has applied for a total of $18 million in capital grants from the federal government. Under the new formula, Buffalo would get only $2.5 million.) Planners and municipal officials alike complained that the formula represented a reversal of URA’s policy of encouraging big projects and the redevelopment of large areas, rather than the piecemeal type of small projects that marked the early days of slum clearance under Title I. They argued that large projects can seldom be chopped in half—or less—and many of these projects will have to be abandoned if federal aid is cut back.

Last month, URA softened its rationing program somewhat by allowing cities which could not feasibly cut back the size of their applications to assume a stand-by status for federal funds. Then, if at some future time more federal funds are available, URA will process the application in the full amount, and the city will retain its position in the waiting line for federal funds. However, the latest URA directive warned that “no assurance can be given at this time as to whether consideration of these applications will receive or the manner in which they will be handled if consideration does become possible.”

Cities that elect to go into this stand-by status may find themselves with a long wait. URA Commissioner Richard L. Steiner told FORUM last month that if the renewal program continues at the rate of only $250 million a year, the “stand-by” cities will be out of luck. “The rationing formula itself was geared to an annual level of $250 million,” Steiner said. Steiner defended the formula by observing that “If we had not developed the formula, the 25 cities at the top of the list would have exhausted our funds. By using it, we will be able to approve projects in 90 cities.”

The brightest hope for cities that elect to keep their capital grant applications at their original levels, rather than trim them according to the URA formula, is that Congress may approve an urban renewal program larger than...
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the one the administration has recommended ($250 million a year for six years). Some housing officials guess that URA would have to have at least $350 million a year for six years to go back to a first-come, first-served basis.

Housing officials ponder urban renewal's future

Last month, San Francisco's Mayor George Christopher stepped to the podium to welcome the 25th annual convention of the National Association of Housing and Redevelopment Officials. In the course of his brief address, Christopher noted that "the road to slum clearance and blight removal is not an easy one," and members of the audience nodded knowingly at each other as he said it. For NAHRO's formal proceedings were largely overshadowed this year by the brouhaha that blew up in the convention city just as some 1,600 NAHRO officials were gathering. First there were charges that some city employees were speculating in slum land, in-

volving possible conflicts of interest. Then Mayor Christopher asked to have a new director for the city's Redevelopment Agency, a "younger, more vigorous man" to replace 65-year-old Eugene Riordan, who would be asked to remain on the staff. Christopher later had to argue for approval by the Board of Supervisors of the $300-million Golden Gateway redevelopment project, which had to be approved (it finally was), in order to hold a $5 million federal grant. Finally federal Housing & Home Finance Administrator Albert M. Cole announced that HHFA was checking into the "slowness" of renewal in San Francisco, adding that "San Francisco is behind most other cities of its size in its redevelopment program." All in all, Mayor Christopher, and his city, had provided a most striking example of just how rocky the road to slum clearance can get.

In the moments when NAHRO members were not discussing Christopher's problems, they were mostly concerned with the future of the federal urban renewal program, and the effects of the recently adopted formula for rationing Urban Renewal Administration funds (see preceding story). Many of the speeches and informal sessions dealt at length with the necessity for getting the program on a sustaining basis, something NAHRO has long pressed for. In its resolutions, NAHRO called for a federal renewal program of $600 million a year for the next ten years, an increase in the federal government's share of renewal costs from two-thirds to 80 per cent, and elimination of the requirement that renewal be predominantly residential.

Underscoring the need for a broader program of urban renewal were several estimates of what the cost of renewal would be in the future. New York State Housing Commissioner Joseph P. McMurray estimated that the country will need a whopping $425 billion in private and public housing and urban renewal funds in the next decade. McMurray said that the present annual output of new homes (about 1.1 million a year) should be doubled just to keep up with annual housing needs. McMurray cited New York's plan to allow the state to pay one-half of each city's portion of renewal costs (which is only one-third of the total cost, the federal government paying the other two-thirds). Martin L. Millsapugh Jr., assistant commissioner of program planning with URA, said that the country could spend as much as $2 trillion on future redevelopment.

M. Carter McFarland, economic director for HHFA, made what is probably the first on-the-record admission that federal requirements for a "workable program"—usually the first step a city must take to get federal urban renewal aid—are almost nonexistent. (HHFA has so far approved 546 workable programs.) McFarland said: "So far the only communities denied certification are those unwilling to try," and added that a small town could get approval if it merely said it would name a committee to study its local problems.

Before the housing and renewal officials wound up their business, they elected John R. Searles Jr., executive director of the District of Columbia Redevelopment Land Agency, to be the president for 1958-1959. Searles succeeds Phillip Tripp of New Bedford, Massachusetts.

Briefs

Boo! Boo-hoo: Yale University no sooner got its spanking-new, Eero Saarinen-designed hockey rink finished than the New Haven tax assessor plunked the $1.2 million structure on the tax rolls. The university argues that the building is part of its educational plant, and should be tax-exempt. The tax assessor claims that it is taxable because, like the Yale Bowl, which is assessed for $700,000, it will charge admission. The rink has been assessed for $350,000, and annual taxes would total $13,561.

A vote for Metro: Dade County, Florida voters last month cast an approving vote for the nation's only formal metropolitan government. By a 74,000 to 50,000 tally, county voters killed a charter amendment that would have granted autonomy to the 26 municipalities in the county. If the amendment had passed, the 16-month-old metropolitan government might have been nullified by a secession of many of the municipal governments, which don't favor the county-wide government, even though the voters evidently do.

The city disposable: Columbia University Professor J. Marshall Miller, director of the first International Seminar on Urban Renewal recently held at The Hague, declared that cities should be "disposable." Planners and architects, said Miller, should stop trying "to build for all eternity. We should design structures, perhaps whole cities, to be written off more quickly."
RG 3 to 30 tons

Completely wired and piped unit including controls, circulating pump and operating charge. Hermetic compressor. Extremely quiet in operation. 8 models.

HE 20 to 60 tons

Completely assembled from matched components including all internal wiring and piping, controls and gauges. Hermetic compressor. Operates smoothly and quietly. 6 models.

DE 20 to 125 tons

Factory assembled from matched components, delivered complete with motor coupled to direct drive compressor, controls mounted and wired, and holding charge of refrigerant. Starters optional. Quiet, compact, reliable. 9 models.
Here is a completely new line of Acme packaged water chillers, in a full range of sizes, which pack more capacity in less space than ever before. Size has been cut as much as 50%, weight as much as 30%, and costs have been reduced, too. Now you can have the simplicity of a completely factory-assembled packaged unit . . . the rugged reliability for which Acme equipment has always been known . . . and the smooth, quiet performance that you have always wanted—all wrapped up in a smaller, lighter, lower cost package.

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In addition to this great new line of packaged water chillers, Acme offers a complete range of water-saving and cooling distribution equipment for both wet and direct expansion systems. Get the full story on the new Acme Packaged Water Chiller line and on other components for a complete Acme system. Call your nearby Acme sales engineer or write directly to the factory.

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Sales Area, Deering, Milliken & Co., New York City. Designed by the Knoll Planning Unit.

Carson & Lundin, architects
Herbert Matter photograph
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35,000 square feet of functional glass

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Architect: Nichols & Butterfield, West Hartford, Connecticut

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Architectural Forum / November 1958
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ARCHITECTURAL FORUM / NOVEMBER 1958
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Doors close and elevator will take passengers to their desired floors. No overcrowding. Doors are closed automatically and courteously when the last passenger enters—or when the elevator becomes substantially loaded."

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Rondo has a feeling of rhythm that makes it exciting in a wide variety of residential and public interiors. It is also an ingenious way to hide an unsightly ceiling without structural changes. The model shown here provides a broad flood of down light over a wide area. Concentric louvers banish glare. Available in pierced brass or eggshell textured opal glass in ten and six light models at our showrooms and at the authorized distributors listed left. For the full-color 40-page Portfolio Collection Catalog, write on professional letterhead to Dept. R, Jersey City 5, New Jersey.
Iowa


Missouri

University of Missouri: Three 9-story residence halls and a single cafeteria unit for women students being constructed at the University of Missouri, Columbia, Missouri. Keywall is being used in this vast project. Architect: Hellmuth, Obata and Kassabaum, St. Louis, Missouri. General Contractor: D. C. Bass & Sons, Enid, Oklahoma.

Kansas


Indiana


Campus buildings are getting greater reinforcement at lower cost

Architects accept Keywall masonry joint reinforcement for building projects at colleges and universities. Look at these new classroom buildings and residence halls at four leading universities. Masonry joints on these buildings are being reinforced with Keywall for added strength, greater crack resistance.

The ability of Keywall to increase lateral strength and reduce shrinkage cracks in masonry has been demonstrated on job after job. Recent tests confirm this superior quality. Architects know they're getting effective reinforcement at a savings.

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Lets nurse control temperatures in sterile areas and in areas where control by occupants is undesirable. She can also communicate with these same areas.

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A mobile bedside table which can incorporate: room temperature control, nurse intercom, clock, telephone outlet, light dimmer and control, other functions.

Fire detection and alarm
Sounds alarm and flashes light showing fire's exact location. Supervisor can direct quick action. Fire-sprinkler system, if used, can be tied in to same panel.

Utilities consumption records
Gives daily departmental metered record of power, steam and chilled water used. Connected to high speed typewriter, will fill in regular accounting forms.

Mechanical failure detection
From panel, supervisor can spot trouble at any point in air conditioning, plumbing or other mechanical system, send crews to remedy before breakdowns occur.

This new control concept from Honeywell enables a building to almost take care of itself—automatically.

Called a Supervisory DataCenter*, it lets one man do the work of crews. For it places all the functions shown above—and any others that benefit from centralized control—under the supervision of a single control center.

It's easy to operate, requires no special training. And its maintenance can be handled through a low cost service agreement. Each control center is custom designed. Even before blueprints are started, a Honeywell specialist will work with you and your engineer to allow free expression of your ideas, as they apply to both design and function.

It's at this original planning stage that his specialized control knowledge can be useful in developing a system that will save the most money for your client. For more information about this new concept, call your local Honeywell office or write Minneapolis-Honeywell, Department MB-11-147, Minneapolis 8, Minnesota.

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The Pershing Municipal Auditorium is a showplace in Lincoln, Nebraska. It is a monument to General Pershing and a monument to air conditioning. Thirteen McQuay Seasonmaster units and ten McQuay water coils provide year 'round air conditioning for this modern structure. To be sure that your next air conditioning job functions at its very best, see your McQuay representative. He will be glad to assist you in any air conditioning heating or refrigeration problems you may have.

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McQuay Horizontal and Vertical Seasonmaster central station air conditioning units. They are available with water coils, steam coils or direct expansion coils. Removable panels permit complete accessibility for inspection or service. All Seasonmaster units are made with the exclusive McQuay Ripple-Fin coils. Seventeen sizes available. Range from 640 cfm to 38,000 cfm.

McQuay horizontal and vertical Seasonmaster central station air conditioning units. They are available with water coils, steam coils or direct expansion coils. Removable panels permit complete accessibility for inspection or service. All Seasonmaster units are made with the exclusive McQuay Ripple-Fin coils. Seventeen sizes available. Range from 640 cfm to 38,000 cfm.
A roundup of recent and significant proposals

IBM RESEARCH LABORATORY

On a 224-acre tract in Yorktown, New York, the International Business Machines Corporation will build the two-story, crescent-shaped research laboratory (shown above). Scheduled for completion by late 1960, the glass-and-rubble-faced structure will house roughly 1,500 employees and will be the firm’s largest single research center and administrative headquarters for other IBM laboratories. Over-all floor space: 450,000 square feet. Architects for the project: Eero Saarinen & Associates of Bloomfield Hills, Michigan.

APARTMENT SKYSCRAPER FOR DOWNTOWN CLEVELAND

In downtown Cleveland, a 24-story apartment tower (above) will be built by Developer Theodore W. Berenson of Boston and Cleveland Attorney Sydney N. Galvin. To be known as Town House, the reinforced-concrete, glass-clad building will have 420 suites and a four-level parking garage beneath a landscaped terrace. Architects for the project, which will cost $6.5 million, are John Hans Graham & Associates of Washington, D.C. The project will be started next spring and is scheduled for completion by 1960.

OFFICE BUILDING FOR PASADENA

The model below is of the six-story Independent Life Insurance Building to be built at Pasadena, California, from plans by Welton Becket & Associates. A $1.2-million structure, it will be faced with vertical aluminum colonnades and gold anodized aluminum grillwork. The insurance firm, which will move its main headquarters from Los Angeles, will occupy two floors; the other floors will be leased.
The University of California will erect a seven-story, H-shaped education-psychology building (left) with a campus concourse running beneath the bridge of the H. To be finished by 1960, the building will have 15 classrooms, animal research facilities, library, and a special dead-sound chamber. Its exterior will be of metal and glass panels marked with freestanding columns. Cost: $7 million. Gardner A. Dailey & Associates of San Francisco are the architects.

Skidmore, Owings & Merrill have planned a student union building for the Illinois Institute of Technology (right) which looks very much like the many Mies van der Rohe-designed buildings around the campus. The $2.4 million steel-and-glass project will have clubrooms, bowling alleys, billiard and card rooms, cafeteria, and a small theater. Over-all floor space: about 100,000 square feet.

Twenty-six stories high, with a gross floor area of 960,000 square feet, the Indianapolis City-County Building shown below will be the tallest and largest office building in the state of Indiana. The building's center tower section, which will be used for administrative offices, will be sheathed in gray glass. The exterior of the two wings flanking the tower will be of Indiana limestone. One wing will house police facilities, the other will contain 16 courtrooms. A three-level, 625-car parking garage will be located beneath the building. Expected to cost about $28 million, the project is the design of Allied Architects & Engineers Incorporated.

The circular section of Pacific High School in San Leandro, California (above) will be topped with a concrete shell and will contain 19 wedge-shaped classrooms around the outer rims of its two floors, a cafeteria in the center of the first floor, and a library in the center of the second. An L-shaped building containing science, homemaking, art, and shop facilities, as well as a gym (upper right hand corner) will be connected to the classroom section by enclosed walkways. To be built on a 30-acre site, the reinforced concrete project will be faced with porcelainized panels. It will accommodate 1,900 students. The architects are Schmidts, Hardman & Wong of Berkeley. Cost: about $3.3 million.
Los Angeles Office Tower

By the spring of 1960, the Signal Oil and Gas Company will be headquartered in the 15-story, $5-million office building pictured at left. Now under construction at the corner of Wilshire Boulevard and Beaudry Avenue, in Los Angeles, the 200,000 square-foot structure will be sheathed with porcelain, glass, and gold anodized aluminum panels. C.L. Peck and Robert S. Norman of Los Angeles are financing the building, which is the design of Pereira & Luckman.

ULTRAMODERN SCHOOL FOR THE BLIND

The Missouri School for the Blind (Saint Louis) is adding to its original plant (at rear in photo above) five dormitories, an infirmary, classrooms, offices, and enclosed courtyards, all handsomely styled to eliminate any institutional stigma. Designed by St. Louis Architects Pearce & Pearce, the project will be faced in pink brick, limestone, blue-tinted glass, and bright-colored porcelain panels. Cost: $891,500.

Jail Without Bars in Detroit

Inmates at Detroit's Wayne County Jail (above) will be imprisoned behind walls of milk-white glass backed by black steel grillwork, instead of bars. To be built at the corner of Beaubien Street and Gratiot Avenue behind the present jail, the new eight-story building has been designed as maximum-security detention quarters for 251 male prisoners. Architects for the project are Eberle M. Smith Associates of Detroit. Cost: about $2.3 million.

Public Housing for San Francisco's Chinatown

Architect John S. Bolles has designed three 12-story apartment towers (above) to provide low-rent public housing for 150 families and 44 elderly single persons in San Francisco's Chinatown. The apartment blocks, to be built by the San Francisco Housing Authority, will enclose play courts and a shaded Chinese garden with moon gate and reflecting pools, and will be topped by a community laundry with open-air drying docks. Cost: about $2.2 million.

Doctor's Village for Houston

A 6.5-acre professional "village" for doctors and dentists will soon be built in Houston, Texas, by Joseph P. Holland. The $2-million project, planned by Houston Architect Boone Amyx, includes ten one-story clinics, accommodating 50 doctors, a two-story commercial corner containing a drugstore, restaurant, florist, and gift shop, and a 36-room hotel for out-of-town patients.
During 1957 these nine new schools, plus fourteen other school building projects, were completed in Columbus, Ohio. All are equipped with Hubbell specification grade wiring devices.

Such acceptance of a product by the entire building "team", has prompted the use of a new word in Columbus. The word is "Hubbellized", meaning that Hubbell quality wiring devices are installed throughout a building for greater wiring dependability, safety, convenience and trouble free operation.

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A complete list of the "Hubbellized" Columbus, Ohio schools, including names of architects, consulting engineers and electrical contractors, is shown at right.
in Columbus, Ohio During 1957

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Electrical Contractor, American Electric Works

Beaumont Elementary, 2155 Fenton Street
Architect, David Schackne, Jr.
Consulting Engineer, Gould H. Ayres & Associates
Electrical Contractor, Haines Electric, Inc., Grove City

Linmoor Junior High, 2001 Hamilton Avenue
Architect, David Schackne, Jr.
Consulting Engineer, Gould H. Ayres & Associates
Electrical Contractor, McCarthy Bros. Electric Co.

Cranbrook Elementary, 908 Bricker Boulevard
Architect, Wm. R. McDonald
Consulting Engineer, Gould H. Ayres & Associates
Electrical Contractor, Perske Electric Company

Scottwood Elementary, 3392 Scottwood Road
Architect, Brooks & Coffing
Consulting Engineer, Gould H. Ayres & Associates
Electrical Contractor, Berls Electric Company

Clearbrook Elementary, 31 N. Seventeenth Street
Consulting Engineer, Robert S. Call & Associates
Electrical Contractor, Berls Electric Company

Colerain Elementary, 499 E. Weisheimer Road
Architect, Kellam & Foley
Consulting Engineer, Morton A. Bialyk
Electrical Contractor, Berls Electric Company

Valleyview Elementary, 2981 Valleyview Drive
Architect, James H. Horoyd & Robert H. Myers
Consulting Engineer, H. A. Williams & Associates
Electrical Contractor, C T H Electric Company

Arlington Park Elementary, 2400 Mock Road
Architect, Tibbals-Crumley-Musson
Consulting Engineer, Tibbals-Crumley-Musson
Electrical Contractor, American Electric Works

(All firms are in Columbus, Ohio, unless otherwise indicated.)

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55
A MODERN CONCEPT FOR
Heating, Ventilating
and Cooling of Schools

By F. J. KURTH, Vice President
in Charge of Engineering, Anemostat Corporation of America

Educational efficiency

The Anemostat Dual Duct High Velocity System provides a controlled and healthy environment in accordance with the highest standards of comfort and is therefore conducive to more vigorous activity in the classrooms. It is a modern heating and ventilating system, carefully researched and new in concept, and is economical to install and operate. It is an effective heating and ventilating system, which later can be readily adapted to air conditioning by the addition of a central-station type refrigeration system.

Because large sums of money must be spent for new schools, it is important to study all factors which will improve educational efficiency. Though well constructed and equipped, many new schools are not provided with modern heating, ventilating or cooling systems which furnish comfort during all seasons of the year. Experience has shown that a proper climatic condition will improve student and teacher efficiency to the extent of a cumulative gain of approximately twenty percent.

System design

First the volume of air required for a classroom must be determined. In most communities this is regulated by local codes on a cubic foot per pupil basis.

Although requirements vary in different localities from ten to thirty cubic feet of fresh air per minute, there are other factors which must be considered: for ventilation purposes, when cooling is not used, a large volume of air will, of course, do a better job than a small volume; however, the introduction of from 1000 to 1200 cubic feet of air per minute is adequate. If air conditioning is installed, the engineer may specify air temperature differentials of 30° or more between the supply air in the cold duct and the room temperature—Anemostat Air Diffusers will diffuse air at high temperature differentials without draft.

Location and type of units

The location of the units in the classroom is determined by the climate of the community in which the school is located and the construction of the school with particular reference to glass areas. When winters are severe the under the window type units must be used and two units per classroom should be installed as shown on the layout. The return air can be moved through corridors, ducts in corridors or exhaust plenums in the corridor ceilings.

In schools in mild climates or in colder climates where double glazing is used, the sidewall units will do an excellent job of year-round heating, ventilating and cooling. Two units providing from 500 to 600 CFM each per classroom are recommended. The return air can be returned to the fan through corridors, corridor ducts or plenums.

When two units are installed in a classroom, both are controlled by one
thermostat which should be located on an inside wall.

**Ducts**

The ducts can be installed in various ways depending on the type of structure: beneath the floor, on classroom or corridor ceilings, in roof spaces or on top of the roof. If tile or transite pipe is used the ducts can actually be buried in the ground. Because no water or steam is used, the ducts can be run in practically any space, as corrosion or trapping is not a problem.

**Equipment room**

For reasons of economy, the fan room or rooms should be so located as to keep the duct runs as short as possible. However, there is no problem in running ducts long distances; dual duct systems in commercial buildings often have duct-runs of over 500 feet. The fans are usually of the Class II type and can be either the forward or backward curve type. Consideration should be given to fans of the air-foil type, which are designed for quiet operation at high pressures.

Mechanical or electrostatic filters are generally used in high class commercial buildings and should also be considered for schools. Clean, filtered air properly diffused at controlled temperature is the answer to health and comfort in classrooms.

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Bronze sheets and extrusions were used extensively in remodeling the entrances and lobby of an office building. Interlocking, channel-shaped extrusions, detailed at right, formed trim, modern floor-to-ceiling panels. Architects: Thalheimer & Weitz, Philadelphia. Fabricator: John G. Leise Metal Works, Philadelphia.

The decorative and functional louvers covering the second floor of this modern structure are extrusions of architectural bronze (see detail at left). The decorative tinted glass panel is framed with Anaconda Red Brass rectangular tube. Architects: Albert C. Martin & Associates, Los Angeles. Fabricator: A. J. Bayer Company, Los Angeles.
The structure that links together the three basic units of Pittsburgh's John J. Kane Hospital is called the Core Building. This facility is an orderly system of corridors that serves as a main traffic artery for staff and patients. In a way, the Core Building functions as a "Public Square" within this Hospital City of hope and rehabilitation for the aged.

With the exceptions of two passageway connections, both sides of the Core Building are uninterrupted curtain walls of alternating panels of functional Glass Blocks and plate glass.

Psychological security dictated part of the thinking behind this design. The Glass Block panels, set at regular intervals, help create the feeling of solid, protective balusters in a huge railing. This aspect of the design works toward overcoming the "falling off" sensation that many people, and particularly the aged, experience when walking near the outside edge of a multi-storied building. The need for this security-impression is heightened here because handrailings, close to the curtain wall, support feeble, halting patients as they move from one area to the other, or pull themselves in wheel chairs.

Therapeutic value provided additional support for the curtain wall design. Because monotony is so much a part of the lives of so many of the patients, the Kane Hospital planners
determined that the interplay of voids and solids, and the varied effects of incoming light in the corridor areas, would considerably increase the interest level of the environment.

Exterior interest and harmony were final considerations. Texture, substance, and a non-institutional appearance were all requirements that the Glass Block panels helped to satisfy.

The Glass Blocks used in the Kane Hospital were manufactured by Pittsburgh Corning Corporation. These Glass Blocks, identified as Prism B, are designed to reduce glare and heat, and transmit diffused and softened daylight. Their insulation value is equal to an eight-inch thick masonry wall. This feature lowers heat loss. And the maintenance-free characteristics of the PC Glass Block panels blend effectively with the other materials used in the curtain wall.

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ORIGINATORS AND MANUFACTURERS OF KLIEGLIGHTS
Arthur Vining Davis' latest Florida real estate venture blocked by SEC; Neutra gains new honors

Arthur Vining Davis, 91-year-old multimillionaire (Fortune magazine rates his fortune in the $400 to $700 million category) who over the past 12 years has swapped most of his vast holdings of Aluminum Company of America stock for Florida real estate, ran into an obstacle in his latest realty venture. A few weeks ago, Davis announced through two New York investment firms that he was going to consolidate all his Florida land holdings (some 100,000 acres in southeastern Florida) into a new corporation to be called Arvida Corporation. The holdings of Arvida would be worth over $100 million, including the $22.5-million Boca Raton Hotel and Club, which Davis bought in 1956. In order to build houses and shopping centers on some of the vast acreage he owns in Dade, Broward, and Palm Beach Counties, Davis proposed to sell $25 to $30 million of stock in Arvida. However, the Securities & Exchange Commission pounced on Arvida and its two broker-dealer firms—Carl M. Loeb, Rhoades & Company and Dominick & Dominick—and got a temporary injunction restraining them from further "violations" of the Securities Act of 1933. SEC claimed that the Arvida announcement was in fact part of a sales campaign to sell stock prior to registration of the issue with SEC.

Davis' legal battery got a court order vacating the restraining order scant hours after it was issued. SEC then filed a complaint against the broker-dealers in federal district court, and prepared to hold its own hearings on the case.

SEC based its court case largely on a survey of ten stock dealers, who, it said, already had reservations for about 40,000 shares of Arvida stock, at around $11 a share. (Such a practice of getting "intentions to purchase" is not uncommon, say Wall Street broker-dealers.) If SEC should prove that the announcement did, in fact, constitute an attempt to sell stock prior to registration, it could revoke or suspend the registration of the broker-dealers, as well as their memberships in the National Association of Securities Dealers.

NEUTRA RECEIVES AWARDS

Peripatetic Architect Richard J. Neutra returned from a tour of Africa recently to collect a new heap of garlands. From Vienna, he received word that he had been elected an honorary member of the College of Academicians of Fine Arts of Venice, a venerable institution of some 200 years. This preceded by two weeks his being awarded the grand prize of the city of Vienna, Austria, for his "outstanding achievements in the field of architecture and city planning."

Neutra, who was born in Vienna 66 years ago, said on receiving this award: "I feel strangely at home in Manila, or Lima, or Madrid. A local boy of Vienna cannot help but be a sort of cosmopolitan boy . . . he is brought up to make constructive comparisons between Johannesburg, Caracas, and the great capitals of Europe and our own country . . ."

The "local boy from Vienna" further underscored his cosmopolitanism when he reported that the building pace in Africa is furious, from schools in Ghana to a film projection center in East Nigeria, which is supposed to help acquaint natives with peoples of other lands. And the African trip itself was not without garlands: Neutra was invited to become an honorary member of the East African Institute of Architects, which represents the profession in Kenya, Uganda, and Tanganyika.

CORNER IN HARDWOOD

Wall Street's most epic battle for corporate control this year involved one of the nation's leading hardwood flooring companies, E. L. Bruce Company of Memphis, Tennessee. The other protagonist was Edward M. Gilbert, a director of Empire Millwork Corporation, manufacturer of lumber and plywood, with headquarters in New York City. Gilbert, who had long eyed Bruce covetously, saw his chance to buy a continued on page 71
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THE MODERN STYLE IS
controlling stock interest early this year. At the time Gilbert started buying, the stock was selling for around $17 a share, and before he was finished he had bought some $5 million worth himself (around 120,000 shares of the 314,600 outstanding) while his associates, including his father, Harry Gilbert, president of Empire Millwork, held another 50,000 shares. But in the process of buying control of Bruce, Gilbert had left some wreckage in his wake. His spirited purchases boosted the price of Bruce stock to $77 per share by last June, and speculators had sold short—i.e., borrowed stock, then sold it with the intention of buying it back later on the open market at a lower price—some 15,500 shares. At this point, the American Stock Exchange, on which Bruce was traded, suspended trading in the stock, because it claimed there was not an adequate floating supply of the stock to make a market. The short sellers, who had borrowed most of their stock from Gilbert interests, were forced to make deliveries and scrambled to get stock to do so. As they could only buy stock on the over-the-counter market, where there was not much left, they pushed the price to an astronomical $192 a share. Gilbert finally said that he would not press for delivery of the borrowed shares, and the price dropped to around $40.

Gilbert's group finally gained half the seats (seven out of 14) on the Bruce board of directors, and Gilbert himself will head the executive committee. C. Arthur Bruce and E. L. Bruce Jr. will retain their posts as chairman and president, respectively.

Now Gilbert is looking elsewhere for new acquisitions. His dream—an integrated supply empire, producing a full line of building materials.

NEW JOBS: A ROUNDUP

In Miami, Florida, Los Angeles Mayor Norris Poulson fended off quips about the seventh-place L. A. (formerly Brooklyn) Dodgers long enough to assume his post as president of the U. S. Conference of Mayors, taking over from New York's Mayor Robert F. Wagner at the Mayors' annual convention. Poulson said he will seek to improve federal-municipal relations, and the mayors made it clear that they thought one way to start would be for the federal government to loosen its purse strings a bit. Among the resolutions: a call for a $350-million-a-year, ten-year urban-renewal program, including a step-up in the federal share of renewal outlays, a $100-million-a-year, four-year airport-construction program. Chances of getting the latter are slim, as President Eisenhower vetoed a $437-million airport construction grant program recently.

James W. Cawdry, Seattle builder, was nominated for the presidency of the Associated General Contractors and John A. Volpe, one-time Federal Highway Administrator (1956) from Malden, Massachusetts, for the vice presidency at AGC's midyear meeting in Atlanta, Georgia. Nomination is tantamount to election in AGC. Cawdry, now vice president, will succeed present President Fred W. Heldenfels Jr. of Corpus Christi, Texas.

Peter Selz, former chairman of the Art Forum, which held a number of group shows and devoted its "Gallery" to the close-linked art and architecture of James Lamantia, 35, winner of the Prix de Rome for architecture in 1948. Lamantia, who studied painting in Rome in the winter of 1949-50 under the Fulbright Act, has followed a dual career ever since, and he finds that his two fields of interest complement one another nicely. Lamantia, a native of New Orleans, graduated from Tulane in 1943 and from Harvard's Graduate School of Design in 1947. In 1950 he joined the architectural firm of Burk, LeBreton & Lamantia (one of New Orleans' busiest firms and winner of the Gulf States Regional AIA's first honor award in 1957). He has had his paintings, both water colors and oils, exhibited in a number of group shows and has had one-man shows in Dallas, New Orleans, and Havana.
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Kansas State Office Building, Topeka, Kansas. John A. Brown, State Architect (at time building was designed).
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“DrafTite has proved itself to us completely during the year we’ve been in this new building,” says Paul F. Clark, Secretary-Manager, State Office Building Commission.

Let DrafTite prove itself to you. Call on our engineering facilities or send for our catalog illustrating DrafTite standard sizes and shapes for every type of window and door.

*Trademark

Kansas State Office Building, Topeka, Kansas. John A. Brown, State Architect (at time building was designed).
Windows, 1300 series by Cupples Products Corporation.

1,998 WINDOWS face the weather in this dramatically modern Kansas State Office Building at Topeka . . . and every one of them keeps the weather out—absolutely!

How? These top-hung, inswinging aluminum windows by Cupples are glazed with insulating glass and double weatherstripped with wool-pile DrafTite* (Weatherstrip A-67 available in galvanized steel, aluminum and stainless steel cores). The result is better insulation combined with easier window operation.

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This school design shows how aluminum can help meet today's pressing school needs

Aluminum permits full use of economical shop-fabrication of the building components you design... readily lends itself to newer, better, altogether-different applications.

The fold-out table-window panels; the outdoor screen; and the roof's brightly colored bracing panels—our architect's concepts... created to emphasize the economy and design opportunities aluminum offers in non-residential construction.

HERE'S how one architect uses aluminum to help him provide more room for study and play in attractive, friendly surroundings.
Working with hypothetical school requirements, our architect shows, in the rendering and plan, some ways he would use aluminum to attain his effect, with very special reference to color and the metal's economy in the repetition of shop-fabricated elements.

Today's fabricating methods make aluminum one of the most efficient materials you can use in the employment of low-cost shop fabrication. Made to your design specifications by a fabricator of aluminum products, building units come to the construction site ready for fast, trouble-free assembly. Lightweight, dimensionally uniform aluminum gives you building elements that are easily handled, fit perfectly. Savings in time, labor and structural costs are appreciable!

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THE FORUM

EASTERN’S STAR

BIG ARCHITECTS

Forum:
I compliment you on your analysis of the big architects (Forum, September 1958). Your magazine has rendered another invaluable service to the profession.

CLARENCE S. THALHEIMER, architect
Thalheimer & Wells
Philadelphia, Pennsylvania

Forum:
Your survey of the 100 biggest architectural firms was the greatest comedy of the day and a complete waste of time by all participants. It revealed nothing except information for the Revenue Department, and an opportunity to become a dollar egomaniac in the eyes of the profession.

ROBERT M. LITTLE, architect
Miami, Florida

Forum:
Does it take these monster organizations to handle their monster clients? The answer, of course, is no.

HARRY WEESE, architect
Harry Weese & Associates
Chicago, Illinois

Forum:
We are happy to note such vigorous growth in a profession which is so important to the welfare of the country and to the national defense. Your article will interest everyone in the construction business, both government and civilian.

EDWARD J. SHERIDAN, director of construction
Office of the Assistant Secretary of Defense
Washington, D.C.

Forum:
An analysis of your published results lends some justification to our apprehension about the accuracy and efficacy of this venture. We realize your motives were of the best and are sorry that, in our opinion, the results do not justify the effort.

THOMAS F. ELLEBEE, president
Ellebee & Company, architects and engineers
Saint Paul, Minnesota

Forum:
I have heard this report discussed quite a bit in our area and would like to make a suggestion. It is difficult for any architectural firm to estimate "the amount of construction put in place" in any given year and, as a result, some of the firms' figures represent the amount of work under contract in 1957 and under contract in 1958. These projects take anywhere from three to five years to work out of an office. Therefore, the figures are duplications. I would like to suggest that the figures used to arrive at the largest firms in the U.S. be based upon the average number of employees per year.

If you feel that the volume of work should be the guiding factor, then a truer picture would be given by the amount of fees received per year. This figure would represent construction put in place as well as drawings produced.

ALBERT S. GOLEMON, architect
Golemon & Rolfe
Houston, Texas

Forum:
Your list of the 100 biggest architects might lead some readers to conclude that SOM is based in New York and that the information given applies solely to our New York office. This is far from the case, for the figures reflect the four offices which we maintain in New York, Chicago, San Francisco, and Portland, Oregon.

ROBERT W. CUTLER, architect
Ilildmore, Goywett & Merrill
New York, New York

FREE SCHOOLS

Forum:
I was interested in the article "Schools for ‘free’" in your October issue. It is evident that some such methods must be employed in certain cases if other means of financing bog down.

THOMAS T. CRENSHAW, architect
Sargent-Webster-Crenshaw & Folley
Watertown, New York

Forum:
The prospect of "schools for ‘free’" frightens me. Isn’t it conceivable that, as the idea of free schools catches on, the quality, size, plan concept, etc., will become more and more the prerogative of the mass builder? What happens to the desire for progress in educational methods, fostered by the educators, citizens interested in education, and school boards—progress which is being continued on page 84
RICHARDS-WILCOX MANUFACTURING COMPANY
MANUFACTURING COMPANY
"SCHOOL EQUIPMENT DIVISION"
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Grace McWayne School, Batavia, Illinois
Raymond A. Orput, Rockford, Architect

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PARTITIONS 23rd ED
WARDROBES 23rd ED

Forum:

The building of a new school by a speculative builder as a "come on" is justified only in terms of immediate need for the school to be in operation at the time families move into the homes.

On every other count there seems to be strong objection to the practice. Obviously the home builder in producing his school will be under the temptation to provide a big show for little money, possibly at the expense of future maintenance. It is well known how speculative home builders pay more attention to details in bathroom chrome, shower enclosures, kitchen cabinets, and similar accessories than they do to such basic considerations as waterproof basement, adequate roof drainage, and top-quality construction and equipment where it does not show. Not every speculative builder yields to this temptation, but it is a far healthier situation where the temptation does not exist.

LESTER W. SMITH, architect
Sherwood, Mills & Smith
Stamford, Connecticut

Forum:

This is a pathetic and ineffectual way to go about getting the school facilities America so sorely needs. It certainly assures our children getting obsolete school facilities.

When land to the average home builder is simply something he loads with houses in an unnatural arrangement of roads and lots which considers the future home owner last of all, how can he be expected to do any more than act accordingly on any school he proposes to build and give (?) to the community.

CHARLES M. GOODMAN, architect
Washington, D.C.
Office area in Connecticut General Life Insurance Building. Movable partitions, dividers, walls, doors and planter boxes are all surfaced with Consoweld laminated plastic. (Upper right) Luncheon tables in employees' lounge, also Consoweld surfaced.

7 Uses for Consoweld in new Connecticut General Offices

Movable Partitions
Dividers
Walls
Doors
Planters
Luncheon Tables
Work Surfaces

By design, a new concept in modern office efficiency ... by specification, a showplace of proved modern building materials and techniques—Connecticut General's new home office in suburban Hartford stands out as a product of creative vision and planning.

Consoweld was one of the advanced products specified for this outstanding new building. Hundreds of thousands of square feet were used on movable partitions, dividers, walls, doors, planters and luncheon tables. Colorful ... durable ... functional, Consoweld laminated plastic surfacing is a product designed for new ideas—to bring out the best in your ideas. A full line of research-tested patterns and solid decorator colors provides an unlimited variety of eye-pleasing combinations. Consoweld is available in stock panels up to 12 feet long and up to 60 inches wide, for use in a wide range of interior applications, horizontal and vertical. Postforming material is also available for use on contoured surfaces, such as countertops, window stools, and other specialized installations.

Send coupon for facts about Consoweld. Free Data File folder serves as an idea starter.
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The Forum
cont’d

people have an investment of thought as well as money, they have a genuine feeling of ownership and responsibility. Obviously, in a community with no population this highly desirable condition is impossible to create. We are simply left in the hands of the home builders and the state or county authorities. And even if the builder does his conscientious best, the resulting school will never have the same acceptance or affectionate respect.

Perhaps your excellent article will help to stimulate some thoughtful answers to what seems to be an insoluble problem.

PHILIP WILL JR., architect
Perkins & Will
Chicago, Illinois

DEEP WATERWAY

Forum:
Your article on the Saint Lawrence Seaway (Forum, September 1958) implies that Detroit will have a 27-foot-deep channel in 1959. The 27-foot channel will reach Toledo in 1959, but the necessary dredging of the connecting channels to Detroit will not be completed until 1962 according to the U.S. Corps of Engineers. Until this dredging is completed, the deeper draft vessels cannot serve Detroit when loaded to their maximum load lines. This means that Toledo will be the western terminus of the Saint Lawrence Seaway next year and until 1962.

JOHN W. YAGER, mayor
Toledo, Ohio

FLLW

Forum:
Bravo! Every article in your series on modern architecture I have found lucid, stimulating, and apropos. And in the final installment on Frank Lloyd Wright (Forum, September 1958) you have presented the finest story and essay-length appreciation of the Old Man I have yet read. For your sensitivity to and understanding of his unique, highly personal exponency of the American tradition, I have only admiration.

LANDIS GORES, architect
New Canaan, Connecticut

Forum:
...superb!

SHIRL MOHOLY-NAGY, professor
School of Architecture
Pratt Institute
Brooklyn, New York

Forum:
Your article on Frank Lloyd Wright stresses the inspirational forces involved in the combining of spaces, but there is another force that is quite apparent in...continued on page 88
Because the extruded aluminum mullions serve a dual function, structural and ornamental, extremely close tolerances and freedom from bow and camber were required. These one-piece aluminum extrusions—more than 1700 in all—ranged in length from 23 feet 10 inches to 26 feet. They are Kaiser Aluminum alloy 6063, finished with a five-minute etch.

For both architect and fabricator...aluminum is an invitation to achievement. With more useful properties than any other construction material, it offers the architect almost unlimited opportunity for expression. It is light and strong, resists corrosion, reflects light and heat, offers permanent natural beauty with minimum maintenance.

And because it can be formed by any known method and accepts such a variety of finishes, it gives the fabricator unsurpassed opportunity for creative contribution to building construction.

Kaiser Aluminum Architectural Representatives are working closely with architects and fabricators throughout the country to help apply these advantages of aluminum to architecture. Their service is available without obligation to any architect or fabricator who is interested in the opportunities that aluminum offers.

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Why this building created a NEW STANDARD of Porcelain Enamel panel FLATNESS

90,000 square feet of porcelain enamel makes the Ford Central Staff Office Building in Dearborn a big project, but it is more than that. Here for the first time the Ing-Rich-developed "Ford Panel" was used. This design, now widely used and accepted as the ultimate in panel flatness, assured Ford a surface which varied not over \( \frac{1}{16} \)" in any direction over 15 square feet. Let us send more details.

**Architect:** Skidmore, Owings & Merrill, New York

**General Builder:** Bryant and Detwiler, Detroit

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The Forum

con't'd

Wright's work that was voiced by Louis Sullivan: "Take care of the extremities and the rest will take care of itself." This is an excellent rule in any work of art. The eye, ear, and mind all seem to rest at extremities, and when these extremities are satisfying, the composition seems superior.

You never find a line in Wright's work that does not end in a careful touch. This is one of the least understood characteristics of his work and every bit as important as his special relationships.

**Alden B. Dow, architect**

Midland, Michigan

**Forum:**

It is as difficult to describe with words the space of a Wright structure as it is adequately to photograph the structure. Therefore, I think your author has done exceptionally well.

It is unfortunate that magazines such as *The Forum*, and her sister publications, *Life*, *Fortune*, and *Time*, have not given Wright the support he has deserved, and in effect have attempted to mold public opinion toward a boxlike commercial architecture.

Instead of an Air Force Academy designed by Frank Lloyd Wright and standing as a national shrine, we have a series of little Lever Brothers buildings up against the rocky mountains.

**Harold C. Price Jr.**

H. C. Price Company

Bartlesville, Oklahoma

*The Forum* has devoted more space to Wright and his buildings (including Reader Price's office-apartment tower in Bartlesville) than to the work of any other architect.—ED.
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The frame is predominantly of Geon rigid vinyl with aluminum trim sections; sash is completely of Geon. There is no pitting, rusting, corroding or warping. The window unit can be manufactured in colors, or painted to match house trim.

There is no metal-to-metal contact in the specially designed seal. No pile or metal weatherstripping is required. Yet these windows can withstand water infiltration tests with pressures equal to 45 mph winds.

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Dur-O-wal is custom-fabricated to lay flat and tight in the mortar bed. It is the recognized standard of quality, preferred for its unexcelled performance.

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Mortar — Class A1
ASTM Standard C-270-52T.
8 x 8 x 16 — Haydite Block
Av. Comp. Str. 1275 psi

Weights per thousand feet — Extra Heavy Dur-O-wal 257 pounds; Standard Dur-O-wal 187 pounds; Rolled Netting Type 113 pounds; Deep Weld Ladder Type 139 pounds.

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MAGIC-DOOR controls that open and close doors automatically do double duty. They complement the modern design of your entrance and, whether located at entrance or service doors, provide functional efficiency your clients appreciate.

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See Sweet's Architectural File or write for A.I.A. File No. 16-D and the address of the MAGIC DOOR Representative in your area to Magic Door Sales, The Stanley Works, Dept. K, 1005 Lake Street, New Britain, Conn.

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VETERANS MEMORIAL BUILDING

in Columbus, Ohio, with...

THE "OVERHEAD DOOR"
TRADE MARK

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Columbus, Ohio

CONTRACTOR
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- **Safety:** In event of cable breakage, safety bottom fixture prevents falling of door.

CONCLUSION:
This special requirement is common for Overhead Door Corporation’s Special Services Division. Architect and factory-trained craftsman of Overhead Door Company of Columbus worked closely to achieve the solution, which was guaranteed for two years against faults, workmanship, material or device failures.

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There's quite a difference between these two hospitals, one located in an urban medical center and the other having the design freedom characteristic of modern, suburban construction. But beyond mere location each is representative of its particular era. Their comparison illustrates the present trend to simpler, less ornamental design.

These buildings are identical, however, in one important respect: both flat roof decks are protected with Koppers Coal-Tar Pitch Built-Up Roofing. And it is because of outstanding service records, as typified by the Koppers Roof on the Pollak Hospital—now beyond its 20-year bond period with no sign of repair required—that architects are specifying this quality roofing material for modern buildings! Whatever your present commercial, industrial or other non-residential design project, flat roofs are best protected with Koppers Coal-Tar Pitch Built-Up Roofing. For coal-tar pitch is the only roofing material with "cold-flow," the self-healing property that removes the threat which small surface checks and cracks pose to other roofing materials. This, plus its superior waterproofing quality, makes coal-tar pitch unequalled for long-lasting, trouble-free roofing protection.

Your local Koppers roofing specialist has a presentation, "The Long, Low Look" which contains useful design information for flat-roof buildings. He'll be glad to make an appointment with you and your engineering staff to review this helpful information on built-up roofing. Call or write Koppers Company, Inc., Tar Products Division, Pittsburgh 19, Pa. District Offices: Boston, Chicago, Los Angeles, New York, Pittsburgh, and Woodward, Ala.
Dangerous myths about school costs

Evaluating the true merit—and cost—of a school building program can be an exceedingly tricky business, especially for the untrained citizens who comprise most school boards. FORUM tried a year ago to help these citizens by publishing a detailed scoring system devised by Dr. Nickolaus L. Engelhardt Jr. ("How to compare school costs," November 1957). In this issue, on page 104, the process is carried a step further, with a critical and detached comparison between schools which are relatively new and comparable in size but vary in the effectiveness with which the money was invested.

Since these schools are identified, readers who are sufficiently interested are in position to check what is said. This is, alas, not the way in which the high-kiting controversy over schoolhouse values and costs has generally been conducted. In particular, those writers who have hit on the term "school palaces" have had themselves a field day, making lurid accusations of extravagance without identifying the communities in question.

The temptation to resort to glossy phrases such as "school palaces" seems to persist. The latest school-palace story appeared, again in the Digest, last month—the condensation of an article more than a year old, by Dorothy Thompson, which was originally published in Ladies' Home Journal for August 1957. This article is especially fascinating because it compounds some strange reporting with an indictment which is really a quarrel with a major aspect of American civilization. The town which Miss Thompson accuses of wastefulness but which she does not name is Woodstock, Vermont. Another central fact which Miss Thompson does not report is that Woodstock takes great pride in its new high school. The town may, of course, be wrong. Miss Thompson may be right. Yet the town did manage to acquire its "palace" at a square-foot cost of $10.80, which was below the national average of that date (today's national average has risen to over $13) and in a geographic district whose building-cost index is comparable to the national average. Apparently Woodstock did not agree.
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that its tax rate was “being upped beyond the capacity of most parents to pay,” for it voted for the bonds better than two to one. The superintendent, Clarence Amsden, says citizens have almost unanimously told him they like the school, and Benton Dryden, editor of the Weekly Vermont Standard, has received no letters of protest.

The gymnasium, which Miss Thompson finds “worthy of a fashionable athletic club”—really a standard high-school gym—is modestly equipped. And since any standard high-school gym can seat 1,200 as a public hall, the local architects, Helmer & Cole, would seem to merit praise, not blame, for equipping it with a stage for the double purpose. Woodstock, in going in for home economics and shop, is either as right or as wrong as most America is. This is cause for debate and not for consternation.

Newsmen say that the mothers who have visited the school since the article appeared have “100 per cent disagreed with their Barnard neighbor’s criticism of the home economics section.” And these mothers saw the actual school, in which Miss Thompson is reported not to have set foot since its completion a full year ago.

The temptation to discuss the Thompson doctrines on the relative cost of single-story vs. two-story buildings, on the ocular effects of glass walls, on the relative cost of “decorator colors” vs. schoolhouse brown, and on many other issues calling for judgment, must be passed by with the remark that responsible school people and architects find most of these problems more complicated than Miss Thompson does. For example, although it is perfectly true that a two-story plan “secures twice as much room under one roof and on one foundation,” the greater fire-safety problem of a school with stairs calls for far more expensive fireproof construction of both stories because the pupils can-

Woodstock’s bargain-rate “palace.”
What makes one school "better"?

Here are two schools of approximately equal cost and size. Why is one excellent and the other merely adequate? The answer may lie in something as intangible—and important—as space.

"The greatest enemy of educational architecture today," said a leading U.S. architect recently, "is the Puritan ethic—the philosophy that if you are spending money and enjoying yourself, you must be wrong; if you're suffering, you're in good shape."

Whether the general mediocrity of U.S. school building can be blamed on Puritanism is debatable, but it has certainly been demonstrated that school boards and school architects are under constant pressure from tax-weary citizens to keep their spending to a minimum. This impoverished attitude of most U.S. communities toward school building is, undoubtedly, the chief reason for the "minimum" quality of most new schools. Yet, lack of municipal money is not always directly to blame. As the two schools contrasted on these pages show, excellence need cost no more than mediocrity. And as the four schools on pages 110 to 123 show, space and high-spirited architecture are two luxuries that can often be purchased at relatively little cost.

The school shown at upper right is the Collins Elementary School in Livingston, New Jersey, by Architect Frederick Elsasser. It is typical of schools now being
Corridors can be restrictive tunnels 8 feet wide, like those in the Collins School in Livingston, New Jersey (above), or pleasant and instructive passageways like the 9-foot-wide corridors of the imaginatively designed Homestead School in Garden City, Long Island (opposite page).

Exterior design of the Homestead School (left) and the Collins School (above) epitomizes the difference between mere adequacy and excellence. Whereas Collins' sturdily built, awkwardly proportioned main entrance looks like a sham colonial portico, Homestead's chief architectural element, the chimney and gable of the multipurpose room, is skillfully proportioned and thoroughly contemporary.
WHAT MAKES ONE SCHOOL "BETTER"?

A point-by-point comparison

built in a spirit of long-suffering devotion to duty. The most significant point about the Collins School is not its cost ($18.70 per square foot—slightly above average for its geographic area) nor its undistinguished appearance. It is, rather, that the architects, faced with various choices for economy’s sake, took the first answer available—make it tighter. And in so doing they skimped on the most important thing a school offers: space for learning. Their classrooms, designed to hold 30 children, have a clear floor area of 22 feet by 30 feet—barely up to the New Jersey State “recommended minimum.” It was doubtless a good impulse to use long-lasting, low-maintenance materials. But, considering the cramped space that resulted, the question is whether, for instance, terrazzo in the corridors at $1.50 per square foot installed might not in this case have yielded to vinyl tile at half that cost and the difference put into building the classrooms larger.

The Homestead School in Garden City, Long Island (right) was, by contrast, conceived initially and throughout its various planning stages as a building that should give the most generous school, in terms of space and spirit, for a reasonable cost. Reasonable cost, according to the school board’s research, would come to $18 to $19 per square foot. The question of specifically what kind of space should be provided was answered in part by the well-known School Architects Perkins & Will, and in part by Homestead’s supervising principal, Mrs. Betty Vazquez, who served as chairman of the faculty committee on school construction. She, too, had economy to consider, but her primary concerns were: to leave teachers alone (i.e., uninterrupted by “special skills” teachers) in classrooms large enough and well enough equipped to demand imaginative use; and to provide accessible and sheltered outdoor areas for teaching and games. The result of this collaboration is a school that saves on materials in order to experiment with space, form, and color. Painted concrete-block walls are used unashamedly, as are asphalt tile floors and unprepossessing chalkboards and tackboards. What is lost in long-term maintenance economies is more than regained by an imaginative and generous design that is already getting the best work out of children and teachers alike. Homestead, says Mrs. Vazquez, “is that rare and wonderful building, a piece of architecture from the ground up.”

On the following pages, FORUM analyzes in some detail the advantages of this school that recognizes the educational benefits of architecture, as opposed to a school that allowed itself to be talked out of better architecture by cost considerations.

The statistical similarities between the Collins School

continued on page 196
of excellence vs. mediocrity.

Large classrooms, like those at Homestead (left), measure 27 feet by 37 feet, have more room for flexible arrangements of basic furniture than do the rooms at Collins (right), which measure 22 feet by 30 feet—339 square feet smaller. Note the difference in wall materials: plaster is used at Collins; painted concrete block, which is considerably less expensive and equally acceptable acoustically, is used at Homestead.

Adequate overhang is necessary to avoid the kind of makeshift sun protection that the Collins teachers must often resort to (right). At Homestead (left) the overhang is a full 3 feet, as compared to 2 feet at Collins. The sun problem is magnified at Collins by the fact that the classrooms face east and west and can only with difficulty be shielded from the low-angled morning and afternoon sunlight.

Informal multipurpose room at Homestead (left), which is opened up whenever possible to take advantage of its access to the larger of the school's two interior courts, is furnished as comfortably as the playrooms in the surrounding houses (note the fireplace). By contrast, the expensive multipurpose room of the Collins School (right) has all the warmth of a drillhall. Its remoteness from home and nature is emphasized by the giant's-height windows through which no child could ever see.

Floor plans of the two schools show the sprawling, episodic character of Homestead (left) and the constricted space at Collins. The generous classroom space at Homestead is supplemented by outdoor teaching spaces in the two courts and surrounding grounds.
Home-grown schools
Educational plants, like ears of corn and baking potatoes, are influenced by the regions in which they grow—but perhaps not to the extent imagined by Cartoonist R. O. Blechman.

Four first-rate schools

1. A light, winning design in metal (right).
2. A school that inspires craftsmanship, page 114.
3. A campus plan two stories high, page 118.
4. A trap for cost critics, page 120.

Modern schools no longer surprise Americans any more than do modern factories or stores. Yet the modern school has developed more slowly than most other building forms. The birth of the modern schoolhouse occurred a half-century ago when U.S. attitudes toward both education and architecture began to be more experimental. Many years were then spent in borrowing techniques and materials from other, faster-changing building types; schools began to look like modern houses, factories, and commercial buildings. Then, in the adolescence of school architecture, designers of the post-World War II years began to invent their own techniques, designing ingenious—and sometimes gimmicky—new methods for getting daylight into classrooms, for example.

Graduation from the tentative years is finally upon us. This year, the American Institute of Architects granted two of its five top design awards to schools* (both of them by the same architect, Mario Ciampi), and this means something. School design has, at last, achieved maturity, together with a calming down in technique. The best new modern schools, four of which are shown on the following pages, have an inspiring intangible quality about them that goes far beyond the earlier goals of modern school architecture: the environments which they create are, in themselves, high-spirited stimulants to learning.

Sonomi Elementary School (facing page).

1. A prize school that achieves lightness and beauty with simple materials.
"The now almost antiquated concept of cutting and fitting each piece of wood in the field is no longer economical or consistent with progress." This steely statement by Mario Ciampi did not lose in translation to classrooms. Indeed the idea gained so much in structural integrity and grace that this modest building was given a top honor award by the American Institute of Architects at its convention in Cleveland this year.

Why is this school so good? In making its award, the AIA jury honored the building particularly for the cheerful mood it sets. Here is a design, the judges implied, that went to the factory to be built, but came out livelier than most handicraft, a sonnet composed on a slide rule. It is light, gay, and explicit; children can look at it and almost understand how it was put together.

How did Ciampi achieve this extra beauty with ordinary industrial materials? The picture above shows the answer particularly well. First he fined down the structure to a minimum and opened up walls with glass, and he used color happily. But then (as shown overleaf) he gave the products of the rolling mills and glass factories some rough, warm neighbors—end walls of concrete block and redwood—and he shaped them subtly.
SONOMA ELEMENTARY SCHOOL, SONOMA, CALIFORNIA.
ARCHITECT: Mario J. Ciampi; LANDSCAPE ARCHITECT: Lawrence Halprin; STRUCTURAL ENGINEER: Ellison & Sedgewick; MECHANICAL ENGINEER: Buonaccorsi & Murray; ELECTRICAL ENGINEER: Charles Von Bergen; GENERAL CONTRACTOR: Herbert Crocker Company.

Structural frame is exposed throughout the entire building. Paths from the classrooms to the central toilet rooms are protected down the sides of the classroom rows by the same overhangs to the south that serve as sun shields.

Inside the classrooms (right) the structure is clearly visible. Steel roof decking, left exposed, makes a good ceiling for breaking up reverberation. Because the partitions between rooms are topped with glass, light seems to come into the classrooms from all directions—in fact, it does, in varying degrees.
Solid end walls are anchors for the spidery structure of the rest of Sonoma Elementary School.
First school built on this site in 1894 bore California Mission trademark.

1952 addition (left) was utilitarian but unimaginative architecturally.

Newest buildings (below) were completed last year. Library is in the foreground, the multi-use building in the background.
On a single school site in San Mateo County, California, is trapped a unique case record of evolving school architecture. Three very different schoolhouses built here over a half-century span are all still in use; indeed, they are all part of the same school. Viewed together they show that the poise of a regional architecture is learned slowly.

First, in 1894, the innocently decorated wood structure shown in the photo (above, left) was built. Many classes graduated. Then, in the early 1950's, new classroom buildings were added in a style that stressed efficiency, economy, and stark simplicity, those sometimes tiresome virtues in architecture. Then, most recently, after new growth in the neighborhood, the school board asked a pair of architects to give them a building which would really fit their casually beautiful site.

The school they got contrasts sharply with Ciampi's factory-finished school, shown on the pages preceding; the children who go to the Portola school will be surrounded every day by familiar kinds of wood and masonry put together with loving craftsmanship—an unspoken lesson the children can carry into their own future living environment.
PORTOLA VALLEY SCHOOL, SAN MATEO COUNTY, CALIFORNIA.

**Entrance** to the new addition to the Portola school opens on a quiet, tree-rimmed parking and loading zone for school buses. To shelter the entrance, the designers continued the laminated Douglas fir girders from one building to the next and roofed them.

**Overhead connection** between the wings creates a protected play space. Warm colors and natural finishes of materials were carefully retained in order to avoid too much feeling of newness compared with the older wings.
Sliding doors are a feature of the Portola school, and the areas immediately outside the classrooms are screened by fencing to extend the interior partitions outdoors and define each classroom's own yard. Some room overhangs are opened with louver boards.

Concrete-block walls are exposed both inside and outside, and a long skylight rides the roof peak, allowing the classrooms to be oriented to the best view instead of to the steadiest light. Small photos (above) are interiors of the older wings.
Entrance hall in each classroom wing is used also as art classroom.

Campus common occupies central area among complex of buildings.
3. A two-story campus school with the easy atmosphere of home.

This school design is one which connects strongly with the tradition of its surroundings, in this case Pennsylvania’s rocky fields. Welsh Valley Junior High School’s large walls are made of the same chunky native stone as many of the houses to which its school buses commute. For further informality, ceilings are as low as the law would allow; the roofs have a pleasant pitch and overhang; many of the indoor partitions are naked common brick.

Psychology, more than simple tradition, is behind this. Like the designers of the schools on the preceding pages, these architects were out to build a school that would seem neither overpowering nor dull to the adolescents who were to spend their days there. Avoid these two faults, they decided, and you eliminate two big teaching barriers. So they built a school as familiar and pleasant as the sturdy stone houses nearby, but much less inhibited in plan (below).

The strategy behind the floor plan evolved from a shrewd stipulation by the school-board client: the building must be planned so that any approach to education could be accommodated, e.g., the school must be adaptable to separating students by age groups, or throwing them in together. The solution is a school for 750 pupils that could possibly be used as six separate five-room teaching units. For there are three two-story classroom buildings of ten rooms each, and each floor has identical, independent facilities to teach the whole curriculum.

PHOTO: LAWRENCE V. WILLIAMS

WELSH VALLEY JUNIOR HIGH SCHOOL, PENN VALLEY, NARBERTH, PENNSYLVANIA.
FOUR FIRST-RATE SCHOOLS

4. A $3.5 million high school that was a bargain.

Here is a school that is a beautiful mousetrap for those sturdy citizens who like to rise and proclaim stoutly that children are being educated in palaces, or in needlessly lavish country-club surroundings. This new high school in San Angelo, Texas has a man-made lake and a dozen separate buildings on its 30-acre site (expensive land in town, acquired by condemnation, not cheap real estate, a long bus ride out of town). The buildings are almost all air conditioned, except, of course, for the big swimming pool. There are snack bars, views on little courtyards, and facilities for teaching and learning that few junior colleges can match, certainly not San Angelo Junior College, nearby. And unlike most campus-type schools, this one has pleasant walks, planting areas, benches—in short, a campus!

And when the accusations of "splendor" come forth, they fade quickly. For even with a $3.5 million price tag this is not an expensive school. It is a big one, and a good one. It was built for 2,150 students, actually accommodates 2,500, and could take 3,000. Its glory is that it has benefited from the economies of bigness. The architects have saved on the mechanics of building—repetitive construction, mechanized erection techniques—but then have shrewdly spent some of these savings on amenities, so that this building group totally lacks the mind-killing monotony of the usual large high school. For the cost figures on this school bargain see page 122.

Campus plan of San Angelo Central High School (left) permits separation of academic area from areas of noisier activities such as gymnasium. There are separate academic buildings for sophomores, juniors, and seniors. One boundary of the pleasant campus is the North Concho River (with a municipal golf course on the other side); another is the city botanical garden. Artificial lake (bottom of photo) on the 30-acre site has a larger function than charm. It is also a pool for site drainage. The site was a hilly one for Texas (photo, right) and the architects disturbed few contours.

SAN ANGELO CENTRAL HIGH SCHOOL, SAN ANGELO, TEXAS.
Cost breakdown:

**BUILDING CONSTRUCTION**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>General construction</td>
<td>$1,815,048</td>
</tr>
<tr>
<td>Plumbing</td>
<td>$99,928</td>
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<tr>
<td>Heating and ventilating</td>
<td>$379,691</td>
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<tr>
<td>Electrical</td>
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<td>Cabinetwork</td>
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<td>Painting</td>
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**FIXED EQUIPMENT**

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<td>Kitchen</td>
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<tr>
<td>Science and bleachers</td>
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<td>Draperies</td>
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<td>Stage</td>
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<td>Auditorium seating</td>
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<tr>
<td><strong>Fixed equipment cost</strong></td>
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**MOVABLE FURNITURE AND EQUIPMENT** | $144,751

**SITE DEVELOPMENT**

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<td>Paved courts, terrace</td>
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<td>Parking</td>
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<td>Fencing</td>
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<td>Sewage system</td>
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<td>Electric service</td>
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<td>Outdoor equipment</td>
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<tr>
<td>Concrete-brick walks</td>
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<td>Landscaping construction</td>
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<td>Planting</td>
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<td><strong>Site development cost</strong></td>
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**PROFESSIONAL FEES**

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<tr>
<td><strong>LAND</strong></td>
<td>$325,000</td>
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</table>

**Total cost** | **$3,541,714**

**Patterned paving** was made economically of concrete, enlivened with brick strips. The tops of the benches which are scattered across the campus are also cast concrete.

**Auditorium** is the most spectacular building at the San Angelo school. Framed in steel, it is circular in plan; its roof is a fan of folded planes.

**Classroom buildings** have relatively little glazing on the exterior. This keeps the heat gain down and makes air conditioning more economical. Care was taken also to keep glass shaded from the sun.
Storage facilities for students, on the ground floors of the classroom buildings, have simple shelves instead of expensive lockers.

Classrooms are walled with glass on the corridor side, but the view across the hall into other classrooms is partly blocked by solid partitions enclosing the air-conditioning machinery located in the center of the hall, as shown in the photograph below.

Wide stairway from the classroom level to the storage space below is needed for the sudden heavy traffic at the end of classes. In the center of the hall on the upper level is seen one of the three mechanical "islands" which house the air-conditioning equipment for the classroom building. END
One hundred general contractors account for $2.5 billion of building construction annually, more than 7 per cent of all the new building in the U.S.

Building's biggest contractors

The 100 biggest general-building contractors in the U.S. last year were responsible for more than 7 per cent of all the construction that went into new buildings. These 100 firms, comprising fewer than two-tenths of 1 per cent of the nation's 85,000 general-building contractors, completed nearly $2.5 billion of construction out of an estimated $34 billion that went into buildings. Moreover, the 83 firms, for which work breakdowns are available, accounted for: 25 per cent of all office and warehouse building; 15 per cent of industrial building; and 19 per cent of hospital construction.

These findings are based on a comprehensive and unprecedented FORUM survey of 480 leading general-building contractors. On the following pages are listed the 100 largest contractors, ranked according to volume of building construction put in place in 1957. The figures shown exclude heavy construction (e.g., dams, highways, etc.), industrial process-plant construction (petroleum refineries, ore reduction facilities, etc.), and all work done for a firm's own account (which bars builders such as William Levitt from the list). The directory also excludes four general contractors and four package builders who would probably rank among the top 100, but from whom no data could be obtained.*

The 100 contractors on this list do not, of course, account for anywhere near so much construction as do the 100 biggest architects (FORUM, September 1958). The $2.5 billion of new construction put up by the 100 contractors was only a little more than half the $4.4 billion of construction designed by the 100 largest architects. Further, no contracting firm approached the $250 million of new construction accounted for by architecture's biggest firm, Giffels & Rossetti. While there are various reasons for this gap, the main ones are the extra man-hours and investment required to construct a building, as compared with designing it, and competition: there are nearly nine times as many general contractors as there are architects.

The biggest building contractor last year was New York's George A. Fuller Company. Its estimated $135 million of building construction put in place shaded the $125 million of second-ranking Turner Construction Company, also of New York, and was well ahead of the $104 million of Del E. Webb Construction Company of Phoenix, which was third. In fourth place was Philadelphia's John McShain, Incorporated (an estimated $60.5 million of building construction put in place), followed by Detroit's Darin & Armstrong, Incorporated ($59 million).

Behind these leaders there were seven other firms which individually completed from $40 million to $60 million of new buildings; 29 others with $20 million to $40 million; and 59 with less than $20 million.

Among the 83 firms which classified their work, the biggest constructor of industrial plants and research buildings was Darin & Armstrong, which completed $55.6 million of factory-research facilities. No. 1 in offices was George A. Fuller ($86.4 million); in housing, Del E. Webb ($81 million); in schools, Huber, Hunt & Nichols, Incorporated of Indianapolis and T. C. Bateson Construction Company of Dallas ($10 million each); and in hospitals, T. C. Bateson ($22 million).

On the whole, the contractors expect 1958 to be a somewhat better year than 1957. Of 80 firms that estimated their work for this year, as well as last, 42 expected to improve their showings in 1958. Of the others, 31 expected to do worse, while 7 foresaw no change. The estimates of the 80 companies indicate that, as a group, they expect to put in place 7.4 per cent more construction in 1958 than they did last year. This optimism on the part of the biggest builders reinforces the many signs that construction has once again resumed its strong uptrend.


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Note: The FORUM directory of the 100 biggest building contractors, together with lists of the 100 biggest architects and the 100 biggest building clients, may be obtained by mailing 25c per copy to ARCHITECTURAL FORUM, 9 Rockefeller Plaza, New York 20, N.Y.
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<th>Firm</th>
<th>1957 ($000)</th>
<th>1958 (est.) ($000)</th>
<th>Industrial &amp; research</th>
<th>Office</th>
<th>Residential &amp; institutional</th>
<th>School</th>
<th>Other</th>
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NOTES: 1/Forum estimate; $1/total for fiscal year. Dollar figures include each firm's proportionate share of joint venture projects. Plus or minus signs indicate actual amount is slightly more, or less, than amount shown; some figures are averages of high and low estimates by firms. N.A. means data is not available. "Other" construction includes stores, banks, garages, restaurants, churches, social and recreational buildings, military structures, public utility buildings, prisons and courthouses, and transportation terminal buildings.
<table>
<thead>
<tr>
<th>Firm</th>
<th>1957 ($000)</th>
<th>1958 (est.) ($000)</th>
<th>Industrial &amp; research</th>
<th>Office</th>
<th>Residential &amp; hospital &amp; institutional</th>
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Celtic towers in Killarney, like those shown above, suggested the form of the new U.S. Embassy building (below).

For Eire, a new "Celtic tower"

The proposed U.S. Embassy for Dublin will be a blend of Irish tradition and modern American concrete technology.

When Connecticut Architect John Johansen was asked by the State Department to design its new embassy office building in Dublin, he faced three problems: first, a problem in diplomacy—how to design a modern embassy that would have some reference to local traditions; second, a problem in site planning—how to design a building that would look right on a pie-shaped corner lot; and third, a problem in monumentality—how to give his building the kind of ruggedness that suggests permanence.

Johansen found the answers in many places and many periods. Where he found them, and how he translated them into a fascinating and distinguished design (left), are explained on the next four pages.
Robust facade patterns of Dublin Embassy (above) consist of precast, structural concrete elements. Site plan (below) shows the moat that surrounds the cylindrical building, also demonstrates how this simple plan-shape makes effective use of a difficult lot.

The Dublin Embassy will be a four-story building, doughnut-shaped in plan. Three stories will be above grade; the fourth will be a basement, surrounded by a 20-foot-wide moat, filled largely with planting. Two bridges span this moat to give access to pedestrian entrances; a ramp down into the rear portion of the moat gives access to a parking lot and garage.

Architect Johansen arrived at this unusual scheme in a very logical way. Faced with the need for a freestanding building (for security reasons, among others), he first determined that the one form that would not turn its back upon neighbors was the cylinder. Since his site was a 30-degree, pie-shaped corner lot, with two neighbors to the rear instead of the usual one, the
Cylindrical buildings, common throughout Ireland, suggested the form for Johansen’s embassy. Top (left) is the early nineteenth-century defensive tower near Dublin in which James Joyce wrote parts of Ulysses. Below is Dublin’s seventeenth-century Rotunda, a theater building remarkably similar in shape to the proposed embassy. The Rotunda is also located on a corner lot. At bottom is a portion of the National Library of Ireland, with its circular court. Johansen found the circular motif also in Celtic crosses and jewelry.

Basket-weave pattern of the façade was first suggested to Johansen by the interlaced, interwoven motifs found in Celtic stone carvings, jewelry, and the illuminations in the “Book of Kells,” the eighth-century Irish manuscript of the four gospels. He was also influenced by Saarinen’s London Embassy project with its precast façade units (top right) and Designer Erwin Hauer’s sculptural concrete screens (bottom right). The result of these influences was a continuous circular façade, with one-story-high precast units which act structurally. These units, made up of twisted I-shapes (see next page), interlock to create a “concrete basket” whose weave moves into the light and sway from it.

cylinder proved to be especially suitable. Other facts favoring the cylinder: it complied with all setback regulations, it preserved most existing trees, it produced the maximum volume possible within any given peripheral length and, in Johansen’s words, “a circular building does not destroy the space it occupies.”

Moreover, Johansen found many a precedent for his cylinder in Irish tradition. “The circular form is prominent in all early Celtic-Christian design,” he points out. “It is found in the early round towers of the fifth century and, much later, in the defensive towers of Napoleonic times.” In Dublin itself, the cylindrical building has cropped up again and again: The Bank of Ireland and the Rotunda (now a theater), both built in the seventeenth century, use a circular plan to deal with very similar, pie-shaped corner sites.

Even the structure of the building (see the next page) attempts to blend with Dublin tradition: the rusticated granite base within the moat recalls common Dublin practice; and the precast façade units are of Portland limestone—a material widely used in the city.

Apart from the Georgian Society of Dublin which finds the building too bizarre, most Irish architects are pleased with Johansen’s design. Fearful at first that the U.S. might import a metal-and-glass cube, Dubliners are relieved to see a building that is polite without being condescending, and that treats Dublin as a mature city, worthy of the best that U.S. architecture has to offer.
Structural walls consist of story-high, pre-cast units of reconstructed portland limestone, shaped like a twisted letter I. Drawing (at left) shows how the structure is put together, with ring-shaped floor beams weaving in and out of the wall surface. Projecting scuppers drain balconies which occur in alternate bays; the remaining bays are filled with fixed glass (see plan, below). The structural system is used both for the periphery of the building and for the smaller ring around the central court. Prestressed floor slabs span the 26-foot distance between these two concentric structural cylinders.

Doughnut-shaped plan (above) has a ring of offices centered upon a three-story-high covered rotunda. Three massive shafts contain elevator and stairs. Circular galleries overlook the rotunda and provide access to offices. The module around the periphery of the building is 7 feet 6 inches, and every office is at least two modules wide. (Since there are no corner offices to designate the rank of the occupant, important embassy officials will get offices three or more modules wide.) Left: exterior wall detail showing alternating bays of balconies and windows.
Interior spaces are shaped by structural system. Above: a view at main-floor level into the central rotunda, showing the galleries that ring this space. Rotunda measures 50 feet across, is lit through clerestories above. It serves as the main lobby for the embassy. Below: ambassador's office, showing alternating windows and balconies. All drawings shown here were prepared by Johansen himself.
One day in early May of this year, even the most hardened New York subway riders and commuters looked twice at one front-page story in their newspapers. A builder named Erwin S. Wolfson, it said, planned to put up a 50-story, $100-million office tower smack on top of the train platforms of Grand Central Station. The building would house some 25,000 office workers, shuttling them up from the area's molelike passageways on 100 elevators and moving stairs, offering them restaurants and exhibition spaces, three new legitimate theaters, parking for 2,000 cars. When complete (by 1962 if all went well), the building's 3 million square feet of floor space would easily surpass the rentable areas of Manhattan's two biggest office towers, the RCA and Empire State buildings. In fact, plunked down on New York's most strategically central site, Grand Central City would be the biggest commercial office building in the world.

There have been other ambitious schemes for Grand Central, of course. In 1954 Realtor William Zeckendorf pictured the magnificent 1913 terminal torn down in favor of a glassy blockbuster 80 stories high, complete with sidewalks in the sky and helicopters blithely landing 1,000 feet up. This time, however, the grand old high-vaulted terminal room is to be left intact, and the tower built right behind it on the site of a lower and less beautiful building used for offices, mail, and baggage handling (see sketch). This time, moreover, the promoting group is headed by Wolfson, and he has been serious enough to negotiate an 80-year land lease with the New York Central and New Haven railroads.

In New York's phenomenal post-war building boom, Erwin Service Wolfson, 56-year-old chairman and principal owner of Diesel Construction Company, has been responsible
The head of Diesel Construction has quietly built a solid career in real estate. Now he proposes to build the world's biggest commercial office building on New York's most strategic site. 

by Ogden Tanner

for probably more new office space than any other single investor-builder. As promoter, contractor, part owner and manager of ten office buildings (and two apartment houses) erected since 1946, and as general contractor for seven other office buildings, Erwin Wolfson (no kin to company raider Louis Wolfson) has helped erect close to $300 million worth of Manhattan's glittering, jagged new skyline. He has, moreover, a strikingly high reputation among members of his profession. "Erwin," summed up a fellow realtor recently, "knows money. He also knows tenants, and location. A lot of promoters don't know construction; Wolfson does, and he doesn't have to ask questions. But probably the biggest thing, in New York real estate anyway, is that you can count on his word. Wolfson's honest, and he has a lot of friends."

The compleat builder

Wolfson is hardly the needle-eyed, cigar-chomping type of real estate speculator. A trim, courteous, and friendly man whose taste runs to conservative gray suits, he would look as much at home at a college faculty meeting as he does mapping building strategy in his four-room office-apartment suite on Manhattan's West 58th Street. Here Wolfson administers his real estate empire from comfortably modern quarters. As a building investor, he has his own staff of 20; as chairman of Diesel's board, he oversees the operations of another staff of 20 in a nearby building under President Carl Morse, a graduate engineer with 27 years of experience in New York construction.

When he does not have to stay in New York overnight, Wolfson himself joins the ranks of the commuters filing through Grand Central. From the Port Chester, New York station, 29 miles up the line, he drives home to a 30-acre "sort of farm" in the rural suburb of Purchase, where he and his wife Rose and their 18-year-old son (now at Harvard) and 13-year-old daughter live in a 14-room neo-Georgian manse designed by Delano & Aldrich. Every week end Wolfson gets in three to five hours of riding (he owns four horses), swims energetically in his pool, often has neighboring realtors and builders over for a game on his new tennis court. ("As in business," says one opponent, "Erwin is always polite. But he hates to lose.")

On Tuesday nights, Wolfson, a Cincinnati University graduate (A.B., 1924), leaves his office and catches a cab downtown to the New School for Social Research, where he keeps up an old college interest by taking a night course on American foreign affairs. ("Sometimes," he says, wistfully, "I think I'd rather be a diplomat.") In other spare time he devotes his considerable energies to the Westchester County Parkway Commission, the Academy of Religion and Mental Health, and a wide range of Jewish philanthropies from Brandeis University to Israel's Technion institute of engineering.

Early bubbles

Born the son of a Cincinnati pants manufacturer, Erwin Wolfson got his first sweet taste of real estate in 1924, when, fresh from college and pondering a teaching career, he decided to take a month's vacation in Florida. Swept up in the excitement of Florida's land boom, he bought a couple of lots for $500, built a small house for $6,500—and promptly sold the package for $20,000. The month's vacation turned into a two-year adventure, and Wolfson built more houses, a few apartments and small commercial buildings. Then, in 1926, Florida's real estate bubble burst, and the 24-year-old builder watched his young fortune quickly disappear.

Deciding to give New York a try, Wolfson traveled north and got a job as an "assistant to the assistant timekeeper" on an office building going up at 2 Park Avenue. During the next few years he supervised a score of buildings for the old Abe Adelson organization. Then the building bubble burst in New York, too—and the whole country—and Wolfson and a lot of other people started looking around for something to do. With Saul Lautenberg, another young Adelson associate, he founded the Diesel Electric Company, started installing private power plants in buildings to save operating money for depression-hit owners who had been buying their steam and electricity. When mortgage money opened up again, the partners began to put up whole buildings, changed the name of the firm to Diesel Construction and worked their way up through larger and larger projects until Lautenberg's death in 1952. Then Wolfson bought out his partner's estate and started building on his own.

The Grand Central project is far and away his most ambitious under-
The equal arts of James Lamantia

Ever since the Nude descended the Staircase, modern art's abstract forms and astonishing colors have puzzled and occasionally outraged the general public. The conventional view that modern art should be a representation of the real world has been severely battered. But recently there have been indications that even modern art can have something to do with life; that the forms and images the modern artist puts on canvas are not necessarily taken out of his hat.

Artist-architect James Lamantia, for example, has found that the design principles that control his abstract painting are also dominant in his architecture. Or, as he puts it: "Painting and architecture are equal arts; you say some things in one and some things in the other. But what you have to say is ultimately the same." This linkage can be seen clearly in the comparison of one of Lamantia's New Orleans buildings (above) with one of his paintings (right)—and in the similar pairings on the following pages.
The bold white slashes and deep shadows of Lamantia's student club building at Southwestern Louisiana Institute (opposite page) are repeated in the tones of his vigorous gouache and ink drawing (above).
The complex intertwining of a small Lamantia wood carving give the same illusion of aspiration found in the lofty campanile he constructed for St. Catherine of Siena Church, in Metairie, Louisiana.
The contention of light and dark, shape and shadow in a Lamantia-designed New Orleans storefront (above) is the major theme of the oil painting below.
The balanced shapes and stripes of a Lamantia abstraction in oils (above) are recalled by his stark decoration for the chapel of a Louisiana church (right).
Within the next few years the growth of U.S. construction is probably going to put an end to most of today’s worries about overcapacity in building materials. Since 1956, when the construction boom broke its stride, overcapacity in building-materials production has been much in evidence, particularly in cement, brick, gypsum board, and lumber. But by 1962, and possibly sooner, a significant change should occur. The revived growth of new construction—an aggregate gain of 7.5 per cent in physical volume over the next four years, according to FORUM's estimates—will absorb most of the idle capacity that exists today. And by 1967 construction will have grown so much, close to 43.6 per cent over 1958, that adding capacity, rather than using up existing plant, may well be the serious problem.

This conservative estimate of the long-range construction-materials outlook, is drawn from a special FORUM survey of present capacity and future needs for four key types of building materials—structural steel, brick and tile, gypsum board and lath, and portland cement. The projections, which are probably minimal, are based on: 1) the average ratios prevailing between yearly production (or shipments) of each material and the annual physical volume of construction in the decade 1948-57; 2) the application of these ratios to FORUM's ten-year forecast of new construction (February 1958) which conservatively predicted a building volume of $57.3 billion.

Great growth in materials output will be needed to keep up with boom construction spending, which will reach a record of $70 billion a year in 1967. Present steel capacity will be inadequate even for 1962's building requirements. Brick, cement, and gypsum producers will have to expand plant as much as 22 per cent by 1967.
The upswing in construction will quickly use up the excess plant that now worries building materials manufacturers. **BY FRANK FOGARTY**

soon: more materials capacity

billion in 1962 and $70 billion in 1967 (in constant 1957 dollars). The study reveals that, barring rapid technological change in the use of materials, the present capacity for cement, brick and structural tile, and gypsum products, will be just about adequate to meet new construction needs in 1962, but will fail a good bit short of 1967 requirements (considering the long lead times involved in new plant construction, planning will have to start soon for the facilities to meet these needs). In structural steel, where rolling-mill capacity only lately has been boosted enough to meet demand, new expansion will be needed even before 1962. More specifically:

**Portland cement** required by the construction industry in 1962 will amount to about 364 million barrels, compared with the industry's present capacity of an estimated 406 million barrels and output in 1958 of about 304 million barrels. While the industry has been running at about 76 per cent of capacity this past year, it considers its most efficient operating rate to be about 90 per cent. On such a basis, cement would have, with its present facilities, slightly more than enough capacity to meet 1962 requirements—406 million barrels against a needed plant of 404 million barrels. But by 1967 it will have to have facilities for 493 million barrels, or nearly 22 per cent more plant than it has now.

**Brick and tile** producers will have to turn out the equivalent of about 9.9 billion bricks for 1962 construction against this year's output of roughly 7 billion. Thus, at an 85 per cent operating rate, which brickmakers consider optimum (the rate this year: about 50 per cent), the industry would need a maximum capacity of about 11.6 billion brick in 1962. Since brick capacity is now somewhat more than 13 billion bricks, an excess plant of roughly 1.5 billion bricks will remain. By 1967, though, the surplus will vanish, and brickmakers will have to expand capacity to 14.3 billion bricks a year.

**Gypsum board and lath** capacity is now about 10 billion square feet a year, enough to meet 1962 needs for 7.9 billion square feet (assuming operations at 85 per cent of capacity against this year's 75 per cent). By 1967, gypsum requirements will soar to 9.7 billion square feet, and plant will have to expand to 11.5 billion square feet, or 11.5 per cent more than it is now. Most of this expansion, i.e., about 1 billion square feet of capacity, is already planned.

**Structural steel** rolling capacity, 7 million net tons in 1958, is roughly 1 million tons short of what will be needed in 1962. On the average only about 60 per cent of total mill shipments of heavy structural shapes winds up as fabricated steel shipped to builders. Assuming this ratio will apply in 1962, about 8 million tons of rolling capacity, at 100 per cent operations, will be needed to produce the 4.8 million tons of fabricated shapes that construction will require (actually all of this added capacity is planned now and should be completed by 1960). By 1967, the construction industry will need 5.8 million tons of shapes. Rolling capacity will thus have to expand again to almost 9.7 million tons.

All of this indicates clearly that, long range, the building-materials industry has been on fairly solid ground in pushing expansion as it has over the past few years. The only trouble was that materials manufacturers pushed ahead of construction's short-run growth prospects. And they were then caught by the slump in housing and in commercial and industrial building which helped produce a declining physical volume of construction in 1957.

Cement, for instance, began a large-scale modernization and expansion of plant during 1954 and 1955. By 1958, its capacity was up more than 30 per cent over 1955. But because of the easing in construction, cement output will actually be lower this year—by 3.8 per cent—than in 1956. In the same vein, clay products manufacturers expanded their plant 16 per cent between 1954 and 1957, yet production last year was off 4.2 per cent from 1954. Much the same pattern holds for gypsum products, where capacity doubled from 1954 to 1955 only to be followed by a 15 per cent drop in production in 1957 against 1955. And it undoubtedly applies to other materials industries where capacity data is unavailable (e.g., in lumber, where softwood production has dropped 15 per cent since 1955, one estimate is that there is now enough mill capacity to meet the softwood needs of at least the next ten years).

On the whole, most materials-manufacturing executives view this burden of overcapacity fairly calmly. The general pickup in the economy, the brightened outlook for housing, and the increasing signs that construction may soon rise to new record levels, have reinforced the feeling that the worst is over. Meanwhile, even the surfeit of the last few years has not completely stalled expansion. The cement industry, for example, plans to build seven new plants in the next three years, almost 13 million barrels of additional capacity. The main reason for the expansion: the highway program which will be one of the most formidable forces in construction's record decade ahead. Hence once again, the pains of overcapacity appear to be passing, as they always do in a dynamically expanding economy. **END**
In the heart of Denver, this new department store offers a pleasant plaza, an extraordinary show window—and plenty of parking space.

Mid-city "shopping center"

Department-store front of anodized aluminum forms a honey-colored backdrop for the generous plaza and the glassy sidewalk shop.
Last August a big, new department store unlike any other in the U.S. opened in Denver, bringing to the heart of that city the four basic amenities of the suburban shopping center: 1) convenient, self-service parking; 2) one-stop shopping; 3) an inviting atmosphere of open space; and 4) that less tangible, but highly magnetic attraction—newness.

Developed by William Zeckendorf's Webb & Knapp, and designed by Architect Ieoh Ming Pei and Associate Architects Ketchum, Gina & Sharp, the gleaming $14-million project occupies half of Webb & Knapp's two-block, $35-million Courthouse Square—just one block from Zeckendorf's other Denver landmark, Mile High Center. Not so elaborately detailed as Mile High but, appropriately, more commercial looking, the store consists of two sharply contrasting structures set beside a spacious, tree-shaded plaza and sunken skating rink. Alongside the main store stands the widest-spanning hyperbolic paraboloid shell structure in the U.S., measuring 113 feet by 132 feet (FORUM, July 1958), serving as a street-side women's accessory shop and as the main entrance to the store. Its shape, radically different from any other in the downtown landscape, dominates 16th Street, Denver's busiest thoroughfare, and its huge triangular glass walls provide an eye-catching, four-sided show window for the main store. (Both buildings are leased by the newly merged May Company and Daniels & Fisher department stores.)

The square (266 feet by 266 feet) main-store section rises four stories tall behind the shell and the plaza. Except for a recessed band of display windows along the plaza level, its broad, mullion-ribbed face is an unbroken wall of honey-colored, aluminum panels. Specialty fabricated, these panels are used to enclose the entire main-store section and can be replaced with glass panels of the same size whenever additional display windows are needed.

Four main sales floors, each containing more than 50,000 square feet of merchandising floor space, a budget basement, and an unfinished penthouse containing fan rooms, cooling tower, and future expansion space are located in this section. The interiors, designed by Ketchum & Sharp, are...
noteworthy for their bold use of brilliant color and lighting and the way most of the space has been broken down into small, intimately scaled shops.

Beneath both the May-D & F buildings and the plaza a vast, three-level parking garage (see preceding page) stretches through to the basement of the 21-story Hilton hotel (which is now under construction in the adjoining block and is also part of Zeckendorf's Courthouse Square project). The garage, an independent concession leased by Parkrite-Denver Company, has space for 1,160 cars and is connected to the store by elevators so customers can park and go to any floor in the store or hotel, or to the shops and restaurants in the underground concourse, without going outdoors.

The May-D & F project is already a thriving commercial success and a top tourist attraction. By night, the big accessory shop gives strollers an enticing view of glittering boutique-type merchandise—dramatically lit by a maze of multicolored "jackstraw" light fixtures (designed by Ketchum & Sharp). By day, under Denver's unusually brilliant sun, the main store section gleams like a gigantic gift box. The honey-locust trees fringing the plaza, the white banners blowing at the south end of the skating rink, and the sight of many Denverites casually enjoying the open space, all add up to a festive setting for selling.

Indeed, this elegant store may well breathe fresh life into urban retailing generally. At the time of its conception, back in 1945 when Zeckendorf contracted to buy the municipally owned Courthouse Square site for $818,600, the advent of the suburban shopping center was casting a small, but gloomy, shadow on the future of downtown merchandising all over the U.S. Since then, with suburbia growing at an even faster pace, that shadow has lengthened steadily. As a result only a handful of department stores (fewer than ten) have been built within the core areas of U.S. cities during the last decade. Zeckendorf's hope was to build a downtown retailing center so dazzling that it would bring the suburban shopping dollar back to the city. Judging by May-D & F's sales thus far, it appears that, in Denver at least, he is doing just that.
Inside the accessory shop shell (photos left) lighting, soundproofing, and air conditioning are achieved, respectively, by suspended "jackstraw" fixtures, a ceiling pattern of 3-inch glass-fiber cubes, and four cooling towers (not shown).

Store interior, designed by Ketchum & Sharp, uses a wide variety of brilliant colors to highlight goods on display. Most department stores subdue their colors so as not to upstage the merchandise.

Plaza skating rink (decorated with shrubbery in photo at right) will be used in summer as an open-air restaurant. Behind the rink (see plan), a neatly detailed, canopy-covered stair well leads to the budget basement, concourse, and garage.


New hope for standardization

Modular dimensioning can work an industrial revolution in building. But it still needs wider understanding and deeper research and development.

BY LAWRENCE LESSING

THE 4-INCH CUBE, adopted as the U.S. basic module for building by the American Standards Association, is shown in the grid structure at the top (left). On this three-dimensional lattice (background), all building dimensions—height, width, depth, thickness of wall, floor, and other components—may be coordinated. When all building products are made in whole multiples of the basic module with allowance for jointing—as shown in the steel section, brick, block, and other components (left)—all parts fit without wastage. Thus design, manufacture, and construction may be coordinated to industrial mass production, with fewer part sizes, lower costs, great labor saving on the site.
What the universal screw thread and other dimensional standards were to the early industrial revolution, Modular Measure, or the standardization of building components to coordinated dimensions, is to the building industry today. The modular system and its further development holds the promise of a vast increase in productivity, lower costs, and a final joining of the industrial revolution by the building arts. But these benefits cannot accrue until the whole industry, from architect to builder, is working in modular scale.

In 1945 the American Standards Association, after investigation, designated the 4-inch cube as the base U. S. module, the first step toward practical use. On this three-dimensional unit and multiples thereof, as on a grid (see diagram opposite), all building design, planning, manufacture of components, construction and assembly could be coordinated to produce more efficient, economical building. Last year, after some 12 years of promotion and slowly rising interest, the Modular Building Standards Association was formed under the substantial sponsorship of the American Institute of Architects, the Associated General Contractors of America, the National Association of Home Builders, and the Producers' Council. Last month a permanent executive director, Byron Bloomfield from the AIA, was appointed to press for wider acceptance of modular measure. Thus there has been progress, but all of it startlingly recent, slow, small in volume, and still marked by wide misunderstanding and resistance.

**Module's belated birth**

Nothing, perhaps, is more indicative of the glacial movement of ideas in the building arts and trades than that only now are they beginning to grapple seriously with the problem of standardization, two centuries after the start of the industrial revolution. The modular measure idea, in fact, is little more than 20 years old. All the present development dates from 1936 and a single book, *The Evolving House*, the posthumous work of a wealthy New England engineer and textile manufacturer, Albert Farwell Bemis, who devoted the last 15 years of his life to the first research study of dimensional coordination in building. His "cubical modular method" (*Forum*, April 1937) theoretically did for building what another Yankee invention, Eli Whitney's principle of interchangeability of parts, did for factory mass production a century before.

The first big confusion as to what Bemis had done arose from the fact that modules had been used as simple units of measure and proportion almost from the beginnings of architecture. The Greeks took as a module the radius of a temple column, to which all other dimensions of the building were then related. And various systems, some as purely mystical as Pythagorean numbers, have flourished since the time of Vitruvius. The latest is Le Corbusier's Modulor, a system based on a modular ratio of 1.618 to 1, which attracted a certain cult after World War II, being supposed to scale dimensions to the human form and yield a series of proportions which he called the Golden Mean. More prosaically, many modern buildings are built on a repetitive modular scale, individually selected, such as the design modules notably used by Frank Lloyd Wright almost from the start of his practice.

But none of these is true modular coordination. Rather they are systems of esthetic proportioning, selected by the architect, often having to do only with the rhythm of a façade or major structural members. They are not mathematically commensurate in all dimensions (e.g., the sum of a number of smaller components is seldom equal to another larger component) and they are used without any over-all relation to component dimensions, interior floor and room dimensions, or construction, which is still carried out largely by the old cut-and-patch method, laboriously fitting together materials on the site. As industrialism moved further into manufacture of building components and subassemblies, the lack of a common measure in building design led to a wilderness waste of odd sizes for various components. Once there were 600 different sizes of metal windows alone, for instance.

Bemis, whose original modest purpose was to aid low-cost housing, sought a module that would be esthetically neutral, allowing any architectural style or scale to play within its boundaries, yet limiting the number of dimensions sufficiently to allow mass production to release its great cost-cutting powers. He fastened on the cube because it contained all the spatial dimensions in which buildings are actually built and because most of them are rectangular. He narrowed down the optimum base cube size by experiment to 3 or 4 inches because these offered the best compromise in multiples to fit traditional brick and frame-house materials and construction practices. Finally, he decided that the module must be considered in practice as the sum of the building component plus the jointing.

**Everybody gains**

Whatever the standard cubic module eventually decided upon, Bemis had hit upon a fruitful, abstract, spatial idea, occurring to no one before, by which all building parts and dimensions could be made to fit together in a great variety of ways. If architects would design buildings on a modular reference grid, and if manufacturers would produce all building products in a range of sizes that were multiples of the base module, then construction would consist simply of assembling or dropping materials, components, and equipment in place without fitting operations or waste. By making all walls, floors, and ceilings conform in thickness to the module, interiors would automatically be modular, easy to subdivide and finish off with modular products.

For the architect such modular design could mean a great simplification and saving in drafting procedures, eliminating the anomaly of figuring dimensions to fractions of an inch. (Practice has shown savings up to 15 to 25 per cent in drafting and checking costs through time saved in dimensioning and ability to reuse sections and details interchangeably.) For manufacturers it could mean, in addition to the essential economy of longer production runs on fewer sizes, an incalculably large saving on the costs of distributing and stocking excessive numbers of component sizes. For the contractor it could mean rapid, labor-
saving assembly of buildings on the site, with less confusion and chance of error in following plans. And, in the end, it could mean cheaper, more precise, and better buildings for all.

The rise of the cube

No significant progress was made in the modular idea until World War II. Then the need for swift reconstruction in war-torn England and Germany pushed these countries toward the modular cube. A vast and successful experiment in Britain, using various large-sized modules ranging from 3 feet up to 10 feet, quickly raised over 175 prefabricated schools of pleasing variety in a five-year period. The German Standards Association settled on a series of standard modular sizes for buildings, and the Scandinavian countries set going a well-developed research program, now bearing fruit. More recently, the European Productivity Agency of the Organization for European Economic Cooperation, with 11 member countries participating, has made a thorough study of modular coordination, settled on a 10-centimeter cube (close to 4 inches), published an excellent handbook, and is currently engaged in a program in which each country is erecting two modular demonstration buildings for study.

Ironically, nothing so ambitious has yet occurred in the U.S. The readiest adherents to modular measure have been the manufacturers, though no one yet knows how many or exactly what products are available in modular sizes. The clay products industry generally has gone over to modular dimensions, making available in most regions, for instance, a modular brick that is close to the old “standard” brick in dimensions but fitting, with mortar joints, into some multiple of 4 inches. Panel board, sheathing, glass block, and metal panels are to some extent available in modular sizes. The aluminum window industry is moving to modular; some other metal windows are following suit. And an industrial committee is studying with the ASA the problem of setting modular standards for integrated ceilings. But all this is still only a small part of the vast, dispersed building products industry, and some items, such as modular bricks, have met with only limited success.

The main block to modular progress is still the architect, that key figure in any substantial move to modular construction. A recent broad survey of professional practices by the AIA, which elicited over 70 per cent response, found that about 50 per cent of individual architects and firms use some form of modular design (including simple proportioning modules for individual buildings), while 17 per cent design on the standard 4-inch modular reference grid. This is better than anyone expected, but still indicates that only a small part of the profession is actually using modular coordination in day-to-day office practice. Moreover, while the list includes some fair-to-middling-sized local firms, such as C. E. Silling and Associates of Charleston, West Virginia, and a range of modular buildings from offices and air terminals to schools and hospitals, no big architectural offices or top “name” architects, with the exception of Walter Gropius, have supported the movement.

Most architectural objections to modular measure have been systematically exploded. The argument, for instance, that conversion to modular design cannot take place until more modular products are available, is countered by the fact that modular design has been advantageously used as a simplification of drafting procedure even where there were no modular products to draw on, and that no great number of such products will be available until more architects specify them. But the hardest argument to down is the charge that modular measure is too restrictive, too deadening to freedom and creativity of design. There are some actual technical limitations to the 4-inch module, as will be seen in a moment, but modular measure as a system has no more inherent limitations for art than meter in poetry or the harmonic scale in music.

A universal standard

What many architects have failed to grasp is the abstraction that modular measure is simply a three-dimensional scale that will allow architecture to play more fully on the modern industrial organ. Almost any modern building design may be converted to modular by giving or taking 2 or 3 inches in significant dimensions, and modular buildings thus far are hardly distinguishable at a glance from traditionally designed structures. Moreover, there is no law that modular measure need be used exclusively throughout a design or that it cannot be departed from for special purposes, but the economic advantages of such a standard for the bulk of building are overwhelming. The architect who stubbornly maintains that his module is the linear inch has failed to understand the mathematical and philosophical implications.

The architect is faced with the fact that industrialism inevitably presses toward further and further standard-
ization, much of it bad. The number of prefabrication schemes, packaged buildings, proprietary curtain-wall systems, integrated floor and ceiling systems, held to a manufacturer's individually selected dimensions, is constantly growing. The only hope of architecture for countering this trend is to embrace a more universal standard, which will satisfy the pressing need for economy, more housing and building, yet allow flexibility in design and a wider choice of truly interchangeable components. Evidence is mounting that the 4-inch cubic module is only the first important step toward this goal, that additional standard dimensions are needed for greater flexibility, and that most of the architectural resistance might be overcome by this development.

Future development in modules

The British experiment in school building following the war showed up some serious defects in limiting dimensions to a single basic module. While the 4-inch module works well enough in small sizes, such as components for houses, in larger sizes, such as wall spandrels and ribbon windows for large buildings, it is difficult to match various dimensions. The lack of subdivisions at the small end of the scale also cramps detailing and certain types of construction, such as reinforced concrete, where thicknesses limited to 4, 8, and 12 inches do not follow the best, most economic practices. The British Building Research Station therefore undertook some basic research on modules, and out of this in 1955 came a brilliant proposal for extension of the system by Ezra D. Ehrenkrantz, a young American architect and MIT graduate, working in England on a Fulbright Fellowship, and now assistant research architect at the University of California at Berkeley.

Ehrenkrantz proposed that the 4-inch module be integrated into a broader three-dimensional framework or numerical pattern employing three geometrical numbers series. The first is a doubling series: 1, 2, 4, 8, 16, etc. The second is a tripling series: 1, 3, 9, 27, etc. And the third is an additive or Fibonacci series (after the Italian monk who discovered it): 1, 2, 3, 5, 8, 13, etc., in which the last two terms in the series are always added to give the next number. When these three series are combined in a three-dimensional way on three cards (see diagram above)—the additive series reading down the columns on each card, the doubling series across the columns, and the tripling series in the third-dimensional plane—a pattern of whole numbers results which can be put together in a great variety of ways and still be made to add up to almost any desired sum. What is set up here is a more abstract (i.e., mathematical) spatial model than the simple cube for the coordination of dimensions.

The total pattern contains a group of related dimensions which in effect gives greater flexibility to planning on the basis of a 4-inch module, a 3-inch module, Corbusier's Golden Mean, and many other modular possibilities, yet limits the number of product sizes below even those of the 4-inch module between 0 and 12 feet. From this pattern the manufacturer could select an integrated series of component sizes, and the architect could then coordinate the best components of many manufacturers in a single building in new ways and new rhythms. For instance, instead of the rigid repetitive rhythm of two 24-inch-wide wall panels, three 16's, or four 12's to make up a 48-inch wall section, many other off-beat rhythms are available in the new system, such as 30 + 18, 16 + 32, 12 + 16 + 20, 12 + 18 + 18. Components would be standardized, but the building would be left flexible to design.

Research needed

The proposed modular system is not simple and needs intensive study. "What we really need," said Albert G. H. Dietz, MIT engineer, in a speech before the Massachusetts Building Congress, "is a system which gives maximum flexibility with the smallest number of individual parts. This is a problem for research. It is a numbers game, if you will. Mathematicians can handle this sort of thing... But this in itself is not enough. Research of this type requires close coordination among the engineers, the architects, the builders, the men in the field, and the research men. This is a job for the building industry as a whole."

For this kind of basic building research, however, the U.S. as yet has no counterpart of the British Building Research Station and no private equivalents. The new Modular Building Standards Association has scant funds for a year and is canvassing the industry and the professions for membership pledges. And this work embraces only education, no research. If not enough active support is forthcoming, the modular movement may languish for still another decade. Yet a solution to the problem of standardization in building would benefit not only the U.S. but the whole hard-pressed world in its present population explosion.
TECHNOLOGY

Garages:
mechanical
vs. ramp

Every major city of the U.S. is facing the same problem: what to do with its burgeoning automobile population. A vast parking industry has sprung up to meet this challenge, offering $41\frac{1}{2}$ billion worth of storage facilities, including an impressive array of mechanical systems and complex building designs.

Two of the newest ideas are sketched on the following pages: one is an electromechanical system (opposite page, top) for midtown New York, with space for 230 cars and operation by a single attendant. The other is a self-service nonmechanical system for 800 cars (page 152), for downtown Minneapolis.

In essence, these systems represent the most advanced approaches to the parking problem. But neither mechanical systems nor self-service types have yet solved completely the fundamental problem of too many cars and too little space downtown. Mechanical systems (like those sketches at right) make efficient use of small space, but bog down when car-handling efficiency is most essential, i.e., at peak capacity. (Generally, a mechanical system handles one car per minute per elevator.) Self-service systems, on the other hand, are more efficient at peak, and less costly to build and maintain, but demand greater areas of scarce downtown real estate.

The center of a large city can probably never provide sufficient garage space for every driver. As the Bureau of Public Roads points out: the population of the large U.S. city (over 1 million population) is 72 times that of the small city (10,000 to 25,000), but the area of the large city’s central business district is only eight times as large as the small city’s.
Mechanical garages

NEWEST MECHANICAL SYSTEM will be incorporated in the Midtown Park garage (above), to be completed in midtown New York next year. This highly automatic system, with a 230-car capacity, requires only one attendant, was designed by Engineer Mihal Alimanski, in cooperation with the Otis Elevator Company. Motorist drives onto one of two parking stations on the ground floor, then walks to the attendant's desk; attendant removes a numbered key from a central control panel, setting elevator in motion. The elevator moves into position adjacent to the car, which a fork-lift conveyor is extended from the elevator and under the car's wheels. Conveyor picks up car, moves it laterally into the elevator, which carries it to the locker corresponding to the numbered key; the same conveyor lifts the car into its locker space. On departure, the driver gives his key to the attendant, who brings the car down to ground level by inserting the key into the control panel. This system is especially adaptable to long, narrow lots, because cars are lifted sideways into lockers. But cost is relatively high: around $9,000 per car space.

MOST POPULAR GARAGES, of the mechanical type, are those developed by Pigeon Hole Parking, of Spokane (sketch left, and photo opposite page), with 64 units in operation, and Bowser Engineering of Des Moines, with 23 units. The principal differences between the two systems: Pigeon Hole supports its hydraulic elevator on the ground; Bowser's electric elevator is suspended from the roof. The elevators in both systems move both horizontally and vertically; thus, as the sketch indicates, an incoming car can be carried to any available stall within the elevator's reach. Another difference: Pigeon Hole moves a car from the elevator to the stall via a dolly, which is operated from a control mechanism on the elevator; in the Bowser system, the car is driven in and out of its stall by an attendant.

Pigeon Hole's latest installation, a 14-story garage in Columbus, Ohio, on a lot measuring 62 feet by 67 feet, has a capacity of 192 cars. Bowser's latest is an 11-story structure in Boston, on a lot measuring 184 feet by 114 feet, and has a capacity of 630 cars.

Pigeon Hole estimates the cost of one of its structures at $1,300 to $1,800 per stall, excluding cost of land; Bowser says its cost per stall is $1,600 to $2,500, depending on design, excluding land cost.

TURNTABLE PLATFORM is the key element in this mechanical system, designed by Parkmaster Systems, of Spokane, Washington. A turntable arrangement permits one elevator to carry two cars at a time, also enables two-deep parking. A self-propelled shuttle, operated from a control station over the elevator platform, slips under the car and carries it to and from its stall. One disadvantage of the Parkmaster system: extra moving is required if the desired car happens to be parked in a back stall. Two units have been built, one in Spokane and the other in Winnipeg. The Spokane unit is built on a lot measuring 53½ feet by 104 feet, with seven levels and a capacity of 163 cars; the unit has been in operation for about a year. The 342-car Winnipeg installation is made up of two eight-level Parkmaster units. The cost per stall is about the same as that of Pigeon Hole.

MODIFIED FERRIS WHEEL, designed by Auto Park Towers, Incorporated, of Jackson, Mississippi, resembles a system which Westminster experimented with in the thirties, then discarded as impractical. The new system is said to be more practical because of improved equipment, e.g., speed-regulating devices. Auto Park has built two models and hopes to build a 20-car unit soon. Any number of units can be built, side by side, then operated from a single control panel. With only a single unit, this system may be too costly. Designer, P. J. Scott, says that a unit can be built for "less than $2,000 per stall."

SIMPLEST DEVICE for mechanical parking is this four-car unit developed by Simmons Industries Incorporated, of Albany, New York. "This unit is powered hydraulically, works something like the lifting mechanism on a fork-lift truck. By lifting two cars off the floor, provided there are at least 15½ feet of headroom, the system simply doubles the parking space of any lot or garage. One obvious problem: if a parked car on the rack is wanted, the car beneath it must be moved so that rack can be lowered. The largest single installation will be in Chicago's new Fidelity office building, where 29 four-car units will provide capacity for 116 cars. Equipment cost, per space, is $1,000 to $1,600, depending upon the number of units ordered. The first installation was made in Washington in 1955."
THE RAMP GARAGE has one big advantage over a mechanical system: speed. The six-level structure shown here is soon to be completed in Minneapolis, and can discharge 800 cars per hour, compared with only 150 to 200 per hour in most mechanical garages equipped with three elevators. In this self-service ramp system, handling operations can overlap, and the cost per car space is slightly under $1,200, which is less than the cost of most mechanical garages. The disadvantage of any self-service ramp system is its demand for space, e.g., this garage requires 320 square feet per car, including aisle and ramp space; mechanical garages require less, about 250 square feet, including elevator space.

The Minneapolis garage, designed by National Garages, Inc., of Detroit, for the downtown area, consists of six sloping floors, interleaved in such a manner that the facility is actually two separate parking decks of three floors each. The top sketch (left) shows one-half of the structure; incoming cars ascend via the sloped parking levels until they reach available spaces; on departure, cars move to the spiral ramp and down. Bottom sketch shows how the second set of parking floors is meshed with the first set. The advantage of separating the system into two distinct garages is that flow of cars within each is made smoother: note that cars on black decks never make contact with cars on white, even when coming down ramps.
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A focus on current architecture

PATTERNED COMPANY HEADQUARTERS

Behind a façade of white marble ribwork, the Deering-Milliken Company’s new headquarters on Sixth Avenue in Manhattan welcomes textile buyers into big open floors full of other striking patterns: there are, for example, the neat ranks of salesmen’s desks (left, below) and the orderly geometry of filing cabinets and sample drawers used as space dividers (left). Overhead, meanwhile, a checkerboard ceiling alternates dark aluminum panels housing air-conditioning outlets with white plastic squares for lights. On the upper floors, movable metal partitions topped by glass fit into the ceiling grid (above), separating outside conference rooms, showrooms, and offices from the central reception, display, and office areas. Architects: Carson & Lundin. Interior designers: Knoll Planning Unit. Contractor: Turner Construction Company.
SEASIDE SUITES
Near San Juan, Puerto Rico, Philanthropist - Conservationist - Real Estate Developer Laurence Rockefeller has launched a new resort as romantically scenic as his earlier Caneel Bay Plantation in the Virgin Islands—but not so posh. At a cost of some $6 million, Architects Goldstone & Dearborn of New York and O’Kelly & Mendez of Puerto Rico have built nine two-story, concrete-framed beach houses, simple in form (left) and manageable in price ($45 per room, American plan). Each unit contains 12 rooms, each of which can be used individually or grouped with others to form a large suite. Contractor: Caribbean Enterprises Company of Puerto Rico.

POOLSIDE APARTMENTS
In Los Angeles, near the University of Southern California campus, Architect-alumnus Richard Dorman offers students and other apartment dwellers a pleasant environment for patio living, downtown. Dorman’s new Trojanaire Apartments, which contain 38 moderate-rent apartments ($100 to $125), open onto a Pompeian inner court, where tenants can relax on a sun terrace or in a 20 by 40 foot swimming pool. Entrances and bedrooms are off galleries around the outside, away from poolside activity. The simple wood-frame structure is brightly detailed with latticed sunscreens and colored wall panels. To the rear is a parking lot for 25 cars. Total cost, including pool: $180,000. Contractor: M. Saltman.
PARKSIDE PLANT

In an attempt to please neighbors and attract employees, the Square D Company (automation equipment) has set its new $3.5-million Milwaukee plant in a shaded oasis just off the highway. In front of a long, clean-lined factory, Square D’s offices, cafeteria, and reception lounge look out on a big, free-form artificial lake which doubles as a fire reservoir and cooling pond for air-conditioning water. Lush planting around the waterhole closely matches that of a park across the road. Designer: Brooks Stevens & Associates. Architects: Grasshold-Johnson. Landscaper: Franz Lipp.

HILLSIDE CHAPEL

On a secluded redwood slope above Whittier, California, the angular planes of the Hillside Chapels’ copper-clad roof rise in folded aspiration above the mass of a solid, earthbound stone base. In a merger of building and landscape, the nave opens out to a view of the valley through a high gable end of rose-tinted glass, and the rough stone walls angle out to embrace the fountains and reflecting pools of a churchyard garden (see plan). In front, a slim, three-flanged steel pylon rises 80 feet high to mark the entrance. The 122-seat chapel, one of three dotting the quiet burial glades of Rose Hills Memorial Park, was designed for funerals, but some visitors have asked to be married there. Architect and engineers: Albert C. Martin & Associates. Contractors: L. E. Dixon.
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FOR SCHOOLS, office buildings, hospitals and single- and multi-residence dwellings, Weldwood Architectural Flush Doors provide distinctive good looks and structural integrity. There are numerous constructions for interior and exterior use: the Weldwood "Stay-Strate" Door with Weldrok mineral core, the Weldwood Staved Lumber Core Door, as well as Weldwood Hollow-Core Doors. For heavy-duty applications, the Custom Royal Door, made with Micarta® or other high-pressure laminate, or the Weldwood Evergrain Door, with protective overlaid faces, provide exceptional durability combined with handsome appearance.

The new Weldwood Sound Proof Door is a well-engineered product which combines handsome appearance with efficient sound control. We believe it to be the finest door of its type on the market.

All Weldwood Flush Doors can be supplied prefinished in standard or custom finishes, as desired.

SEND FOR DETAILED BOOKLET

United States Plywood Corporation
55 West 44th Street, New York 36, N. Y.  
Please send me Booklet No. 1765—"Weldwood Doors."

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Address........................................
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WELDWOOD® DOORS

Products of UNITED STATES PLYWOOD CORPORATION
114 branch showrooms in United States and Canada

Architectural Forum / November 1958
PITTICO®
SASH
NO. 72-A

Beautiful in its simplicity, this PITTICO double-face sash is noted for its strength and sturdy construction. It is one of a wide selection of PITTICO sashes, sills, heads, jambs, bars and mouldings available for complete harmony of design in every store front. Consult your PITTICO Store Front Metal Representative, or refer to Sweet's Architectural File—Section 21.
The mark of
dependability
in tough
chemical
service . . .
everywhere

Low in cost, light in weight, completely corrosion resistant, shock-proof; these are just a few of the many features of the new DURCON laboratory sinks. Durcon is an epoxy resin, modified by The Duriron Company. DURCON sinks have coved corners and dished bottoms to prevent the accumulation of contaminants. They weigh up to 60% less than competitive materials. Cast DURCON sinks are available from stock in twelve standard sizes. Special sizes can be fabricated to meet virtually all requirements.

For full information, send for our free Bulletin PF/5. Address Durcon Department, The Duriron Company, Inc., Dayton, Ohio, or contact your nearest laboratory equipment manufacturer.

THE DURIRON COMPANY, INC. / DAYTON, OHIO

Branch Offices: Baltimore, Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Houston, Knoxville, Los Angeles, New York, Pensacola, Philadelphia, and Pittsburgh.
Curtain Wall by Adlake

Fabricated to the most exacting specifications, in satin or anodized finished aluminum, complete with spandrel panels of porcelain enamel, glass or patterned aluminum. Engineering and design assistance available on request.

Complete satisfaction guaranteed.

Building: Shell Oil Co., Indianapolis, Ind.
Architect: Everett Brown Co.
Contractor: Berling & Sons
Type: Adlake Curtain Wall

The Adams & Westlake Company
NEW YORK ELKHART, INDIANA CHICAGO
Established in 1857
PNEUMATIC GEODESIC DOME
pumps up like an air mattress

By applying R. Buckminster Fuller's geodesic principle to an air-inflated structure, a Connecticut corset manufacturer (Berger Brothers Company of New Haven) has come up with a multipurpose, portable, nylon dome-shelter (photos, above) that is easy to erect and remarkably sturdy for its weight.

Whereas other air-inflated structures now on the market are "air-supported"—relying on interior air pressure—the new Geodome is not, and does not require a constant air supply from a blower. Instead, it is self-supporting, consisting of pneumatic panels of neoprene-coated nylon.

To erect the Geodome, these panels are simply pumped up, simultaneously, much like an air mattress. Once the dome is inflated the compressor can be disconnected, and windows or doors left open, since each air-filled panel maintains its pressure individually. Approximate inflation time: 5 minutes.

Weighing just 200 pounds a 16' -foot-diameter model is light enough to be lifted by two men, yet strong enough (according to the manufacturer's tests) to bear snow loads of as much as 90 pounds per square foot and ride out gale winds of up to 120 miles per hour. In addition, the pneumatic method of stiffening the panels provides an insulating dead air space of about 3 inches; and deflated, the entire dome can be folded to fit easily into the back of a jeep or station wagon.

Two models are now in production. One (the 16'-foot unit mentioned above) has 8.3 feet of center headroom, and 218 square feet of floor space. The other, being built for the Air Force, has a 48-foot diameter, center headroom of 24 feet, and a floor area of 1,810 square feet. Still priced too high for most industrial or commercial uses, the 16'-foot Geodome sells for $6,500. A price for the larger model has not yet been announced.

Manufacturer: Berger Brothers Co., 135 Derby Ave., New Haven, Conn.

PAPER-THIN LIGHT DIFFUSER
also serves as soundproofing

The Wakefield Company of Vermilion, Ohio, has introduced a new translucent ceiling panel which not only serves as a diffusing medium for electrical lighting, but also provides soundproofing said to equal that provided by 3 inches of acoustical tile. Called Super-Wakon, the panel looks and feels much like a rigid sheet of white parchment. It consists of a clear vinyl "paper" faced on both sides with a porous cellulosic film. The core is about 0.001 inches thick and perforated with holes about 1/16 inch in diameter. Light is diffused by the facing films and by a pigmented resin used to bond the films to the core. Sound is absorbed in the facing's tiny pores. Installed cost for the complete

continued on page 178
Modern developments in building construction, with trends toward a more monolithic structure, the increased use of insulating materials, and the use of glass and other impermeable materials in the shell area, have introduced new problems in the form of condensation and the uncontrolled migration of free water. Some of the more common types of damage resulting from condensation, are the blistering and peeling of paint, loosening of plaster, efflorescence of masonry, interior dirt patterns, mechanical destruction of structural elements, warping and rotting of floors and the incursion of termites. Many past studies have treated vapor problems symptomatically, attempting to deal with a manifest difficulty. Here is a technical manual, the first of its kind, explaining moisture movement, condensation problems and modern control methods for moisture and vapor movements. The manual gives factual proof of the effectiveness of impermeable materials in restraining moisture migration.

This book, now available free of charge through the courtesy of W. R. Meadows, Inc., has been specifically prepared to assist architects and engineers in protecting structures from migration of water in its various forms. Write today for your copy.

"DESIGN TECHNIQUES FOR CONTROLLING MOISTURE & CONDENSATION IN BUILDING STRUCTURES"

W. R. MEADOWS, Inc.

W. R. MEADOWS, INC., KIMBALL ST., ELGIN, ILLINOIS DEPT. 6
Gentlemen,

[Please send, without obligation on my part, a copy of the "DESIGN TECHNIQUES" Manual.]

NAME
ADDRESS
CITY
STATE

178
white) plastic. While roughly one third of the light passes through white egg-crate strips located directly beneath the lamps, the balance of light is indirectly reflected from the ceiling through the colored panels—thereby creating a luminous color-glow that has little or no glare. Maintenance is easy, since panels can be simply lifted out for cleaning or repairs; the panels' egg-crate structure is said to aid in soundproofing. And, since most of the Colordesil ceiling surface is open, sprinkler heads can be mounted out of sight on the original ceiling.

Panels are available in pastel shades of red, pink, blue, green, and yellow. A single basic module measures 8 feet 2 1/2 inches by 6 feet 3 inches. Cost per square foot, excluding lamps and installation charges: about $3.

Manufacturer: Silvray Lighting Inc., 100 W. Main St., Bound Brook, N.J.

MAMMOTH EARTH-MOVER
has separate motor for each wheel

With an eye to the country's multimillion-dollar road building program, R. G. LeTourneau, Incorporated has put on sale a new line of supersized, self-propelled earth scrapers that are the largest and most powerful in the world. Shown below is the baby of the line, a 70-ton giant that in one scoop can pick up and move 50 cubic yards of dirt—or almost twice as much as the biggest machines now on the market.

Another major difference between the LeTourneau scraper and conventional models is that each of the new machine's four rubber-tired wheels is individually powered by a high-torque electric motor—a concept that took the company 11 years and $12 million to develop. Tremendous traction is the result: if one wheel slips on a slick surface, the power going to that wheel is automatically redirected to the other three wheels. Overall power is supplied by a 600 horsepower diesel-electric engine. Biggest model in the line: a 125-tonner with a gargantuan 100-cubic-yard capacity. Prices begin at $100,000.


SPRAYED-ON UPHOLSTERY

gives chair weather-tight skin

The new Aeon Chair marks a significant innovation in furniture construction in that it is upholstered with a coating of

continued on page 180

on this side it's a window . . .

Mirropane® is a window and a mirror at the same time. When you watch from a darkened room you can see through the glass to observe how handicapped children are taught.

on this side it's a mirror!

In the lighted room, the same window is a mirror to teach pupils how to form words with their mouths and lips. And since they can't see you through the mirror, they are not self-conscious or distracted.

MIRROPANE HAS MANY USES in schools, hospitals, banks, jails, stores... anywhere you need a material through which to observe without being observed.

For complete details, call your L-O-F Distributor or Dealer (listed under "Glass" in the Yellow Pages). Or write to Liberty Mirror Division, Dept. LM-158, Libbey-Owens-Ford Glass Company, 608 Madison Ave., Toledo 3, Ohio.

MIRROPANE

THE SEE-THRU MIRROR

LIBBEY·OWENS·FORD GLASS COMPANY

Toledo 3, Ohio

Architectural Forum / November 1958 179
Now better than ever! Anchor Hinges*

EI = Easier Installation. End of jamb leaf anchor plate is beveled for faster, easier installation.

GS = Greater Strength. Anchor plate is longer, so two of the six screws go into door top rail, providing greater strength.

NA = Neater Appearance. Anchor plate is narrower, so it is entirely concealed in top section of door.

McKinney Anchor Hinges eliminate door and hinge damage before it starts. On your next job... school, hospital, store or other public building... protect your client and yourself by specifying McKinney Anchor Hinges. Write now for illustrated catalog 93 and templates.

McKinney Anchor Hinges

PITTSBURGH 33, PA. / IN CANADA: MCKINNEY-SKILLCRAFT LTD., ST. CATHARINES, ONTARIO

U.S. PATENT NO. 2,825,747

sprayed-on plastic. The chair (above) is constructed this way: a tailored, %2-inch-thick sheet of vinyl foam is laminated to a glass-fiber-reinforced polyester shell; then (as shown in the photo above) a specially formulated, heavy vinyl is sprayed over the foam cushioning—and over the back and underside of the shell—to form a tough, waterproof, weather-tight skin that has no seams or laps. The result is a comfortably cushioned, multipurpose chair that can be cleaned with soap and water, used outdoors as well as in. Available in 12 colors, on either regular, swivel, or stacking legs of tubular steel, the Aeon Chair costs from $45 to $60.

Manufacturer: Aeon Industries Inc., Box 208, Gracie Station, New York, N.Y.

PRESSURE SWITCH
has novel internal mechanism

The Bryant Electric Company of Bridgeport, Connecticut has put on sale a new wall switch (below) which is radically unlike conventional types in both form and
function. Known as the Fashion Plate, it is operated by a large flat-faced actuator which is simply touched on top for "on," at bottom for "off." This uniqueness of design relies on internal toggle arms (instead of the customary coiled springs) that are moved up or down by the actuator as it rotates, seesaw fashion, on a fixed center support (see drawing). Designed to fit standard wall boxes, the switch has a black or white plastic frame-plate and an ivory plastic actuator. A translucent actuator, which can be painted or backed with wall paper to match a room's decor, is also available. Retail cost for a single pole switch: about $2.

Manufacturer: Bryant Electric Co.,
1421 State, Bridgeport, Conn.

PLASTIC WEATHERSTRIPPING is low in cost and easy to apply

Weatherstop, a new plastic weatherstripping for metal or wood doors and windows, is composed of a soft, gray vinyl tube (similar to that used on refrigerator doors), inserted into a thin strip of rigid, but flexible, white vinyl (drawing below).

It is applied to jambs and header with tacks or an adhesive. The material will not rust, discolor, peel, or crack, and being flexible it will adjust itself to uneven or warped surfaces. A precut set, enough for one average-sized door, includes two 7-foot pieces and one 3-foot piece. Price per set: $4.96.

Manufacturer: Weatherstop Co., Inc.,
506 McKercher Bldg., 2631 Woodward Ave., Detroit 1, Mich.

LIQUID FLAMEPROOFING protects most interior fabrics

Draperies, upholstery, rugs, displays, etc., made of cotton, wool, silk, linens, burlap, paper, viscose rayon, and other cellulosic materials, can be effectively protected against flame by a new liquid flameproofing called MS-2. Application is by spraying or dipping. Nonpoisonous and odorless, the colorless solution will not stain or stiffen materials and will not wear off or vacuum out. However, the manufacturer reports that MS-2 will not prevent charring; it is ineffective on certain synthetic
continued on page 182
For Unsurpassed Sound Proofing
specify FOLDOOR because...

... the new dual sound-retardant FOLDOOR can cut sound transmission better than any other fabric covered folding door on the market. That’s no idle claim—it’s supported by impartial scientific laboratory tests.

Think what this new development means to you. Take the Hotel Monica, for example. They found they could schedule two simultaneous social functions in their Ballroom—with no fear of the dance band’s down-beat drowning out the convention speaker in the other section. That means double usage—double revenue—from existing space.

You can apply this same principle wherever you have meeting rooms—your school, your church, your restaurant. Whether planning new facilities or remodeling old ones, it will pay you to investigate the new Holcomb & Hoke dual sound retardant FOLDOOR. You’ll be space—and money—ahead.

For complete details, call your nearest FOLDOOR distributor—or write us direct.

DECORATIVE METAL PANELS eliminate horizontal mullions

The photos and diagram below are of a new line of cast-aluminum spandrel panels recently introduced by the Michaels Art Bronze Company (Covington, Kentucky) as part of its metal curtain wall system. The panels are of special interest in that they bring custom metal tracery within the budget range of small- or medium-sized buildings (stamped panels, long a common decorative material, are economically feasible only when used in volume on large projects). They also feature a special, cast-in mullion (see diagram) which eliminates the need for horizontal mullions, thereby simplifying the structural nature of the facade and visually accenting the vertical mullions. The panels are available in a variety of exterior textures, colors, and designs, are backed by 2 inches of glass-fiber insulation and faced inside with 16-gauge steel. Approximate cost per square foot: $6 to $8, or about the same as conventional, flat-surfaced aluminum panels.

Manufacturer: Michaels Art Bronze Co., Inc., P.O. Box 668, Covington, Ky.
CONCRETE FORM LUBRICANT
leaves smooth, glossy surface

The Shell Oil Company is marketing a new lubricant for concrete forms. Before casting, Shell Form Compound, a grayish-white waxy substance, is mixed with water and sprayed, with standard spraying equipment, onto the forms. Key advantages claimed for the product: it dries fast, permitting easy stripping of forms; it gives concrete a smooth, glossy surface, and leaves no deposits. (Conventional oils or waxes not only tend to build up a tough film but also stain the concrete and often cause pits and other surface blemishes.) One gallon, when diluted, will cover approximately 500 square feet. Cost per gallon: about $1.

Manufacturer: Shell Oil Co., 50 W. 50th St., New York 20, N.Y.

CELESTIAL MURALS
bring outer space to interior walls

Astro Murals, pictured here, are vivid blue-black and white photo enlargements of celestial phenomena. They are now being marketed as decorative wall coverings for Sputnik-age schools, institutions, and offices. Ten different subjects (spanning the heavens from Saturn to the Great Nebula in Andromeda) are available, mounted or unmounted, in sizes ranging from 2 by 3 feet to 7 by 9 feet. The vinyl coated prints sell for about 90 cents per square foot on heavy paper, twice as much on cloth.

Manufacturer: Astro Murals, Inc., 231 W. 58th St., New York, N.Y.

GERMAN DRAFTING PENCIL
has smearproof plastic lead

The German-made Duralar pencil now on the market for architects, engineers, and draftsmen has a plastic, instead of graphite, lead which is completely smearproof when used on mylar plastic tracing films. Though easily erasable Duralar tracings can be handled over and over without loss of detail—and absence of light-reflecting graphite assures sharp, clear photographic reproductions. Available in five different degrees of softness, the pencils sell for $2.00 a gross.

NEITHER SNOW NOR SLEET NOR RAIN NOR SUMMER'S HEAT WILL EVER FAZE

Soak it.  
No effect on Insulrock.  
Freeze it. Ditto.

Here is why:
Insulrock is used to rough treatment by Nature before it's ever used on any job. Insulrock is stacked and stored outside, to "weather-cure" slowly, after it's made. Rains pelt it. Snow and ice give it a hard time. It sits and "seasons" in the sun. And none of this exposure to the weather has any adverse effect on Insulrock!

Insulrock is weather-resistant. So you be weather-wise. Use Insulrock. Don't abuse it, of course. But be confident that it will stand up under normal building conditions.

Portland-cement uniquely bonds full 32-inch-wide Insulrock slabs—for additional resistance to abrasive handling, even the surface is sprayed with an indurating cement coating that adds strength, improves appearance (no loose fibers drooping from surface).

Of course, Insulrock—the Portland-cement bonded slab—is incombustible (UL listed). It insulates, summer and winter. Resists insects, fungi. Dries completely, after being thoroughly wet, and doesn't lose strength. It's acoustically and economically effective in cutting down noise nuisances.

Investigate Insulrock savings. Get details today.

In insulrock's year-around weather resistance makes Insulrock perfect for outside exposed areas, like this overhang.

Technical note: soaked, frozen, thawed, then dried out, Insulrock retains original strength, is stronger than minimum specifications, works 100% efficiently for you.

Insulrock dares the elements. Outside storage proves unequalled durability under all-year weather pounding.

America's Broadest Line of Building Materials

INSULROCK COMPANY
Division of The Flintkote Company
Office: EAST RUTHERFORD, NEW JERSEY
Plants: LINDEN, NEW JERSEY
RICHMOND, VIRGINIA
NORTH JUDSON, INDIANA
A man’s home is his castle—or is it?

Make sure your home guards your family’s happiness and security. Make certain it is safe, sound, in good repair. Decay feeds on small flaws ... peeling paint, cracked walls, loose shingles, splintered steps.

Start your repairs now. Prices are reasonable, financing is easier, supplies are plentiful. You can protect your investment ... increase the value of your home ... save time and trouble by acting right away.

Your example will encourage others. Just as one rundown home can start a slum, one well-kept home can start a neighborhood-improvement program ... help bring you more enjoyable community conditions.

Keep up your home, then give active support to your local urban renewal programs. Help yourself by working for the preservation of good neighborhoods ... the rehabilitation of shabby neighborhoods ... the renewal of worn-out neighborhoods.

Your support is essential all the time, but particularly vital today. Homes and neighborhoods are the bulwarks of our personal and economic security. Your home and neighborhood-improvement efforts now can help assure that security, and bring you more personal benefits in many ways.

For practical, effective information—write today to

ACTION
American Council To Improve Our Neighborhoods
Box 500, Radio City Station, New York 20, N.Y.
Office building? Lay a firm foundation of good *interior* design. Specify drapery and upholstery fabrics by Thorp... from your nearby Thorp office.
HOUSING CODES, THE KEY TO HOUSING
CONSERVATION. (Three volumes.) Published
by New York State Division of Housing, 270
Broadway, New York 7, N.Y. Free.

These three brief volumes do an excel-
 lent job of identifying the main causes of
 urban rot and suggesting possible reme-
dies. They are the result of a two-year,
 $145,000 study of housing codes conducted
 by the New York State Division of Hous-
ing, two-thirds of the cost of which was
 borne by the Federal Housing and Home
 Finance Agency. Housing standards and
 their enforcement were surveyed in 43
 New York communities of less than 50,000
 population each, and in all of the state's
 15 cities of more than 50,000—except New
 York City.

The first volume catalogues the muni-
cipal size of omission that may cause
 urban blight after the growth of slums. It
 points out that among the 45 communities
 of less than 50,000 population that were
 surveyed, 27 had no regulations whatever
 requiring the proper maintenance of
 housing, and 30 had no regulations requir-
ing the enforcement of such regulations.

To some people the Tennessee Valley
 Authority and its dramatic structures repre-
 sent one of the high points of demo-
cracy in action. Others consider it a dan-
gerous giant-step toward socialism. But,
 regardless of political attitudes toward
 this huge project (it covers an area three-
fourths the size of England), the physical
 achievements of the TVA are now a proud
 part of American architectural history.

To many hands the story of the
 spread of Christianity across the U.S.
could become a great piece of Americana.

In eloquent hands the story of the
 spread of Christianity across the U.S.
could become a great piece of Americana.

THE BUILDING OF TVA. An Illustrated His-
tory. By John H. Kyle. Published by Louisiana
State University Press, Baton Rouge 3, Louisi-
ana. 162 pp. 7 1/2" x 10 1/4". $7.50.

In eloquent hands the story of the
 spread of Christianity across the U.S.
could become a great piece of Americana.

In eloquent hands the story of the
 spread of Christianity across the U.S.
could become a great piece of Americana.
Architects & Engineers:
Skidmore, Owings & Merill

Welsh, Peck, structural consultant
Sophie & Mennele, mechanical, electrical

General Contractor:
George A. Fuller Co.
Anticipating tomorrow's electrical load in New York's newest skyscraper

52-story Union Carbide Building will STAY modern with Milcor Celluflor — 900,000 square feet of it!

Today, offices use three times as much electricity as they did only 10 years ago. With the growing trend toward electronic office equipment, they're bound to use even more in the years ahead. That's why architects of the Union Carbide Building specified Milcor Celluflor.

It provides for complete electrification of floor areas. Cells spaced six inches o.c. serve as raceways to handle complex cable systems for power and communications. Outlets can be installed anywhere on the floor. They can be relocated or new ones added—or circuits can be changed—without costly alterations.

Electrical flexibility is just one advantage of Celluflor. Others include savings of steel, footings, construction time, and overhead. See Sweet's, section 2a/In — or write for catalog 270.

Milcor Celluflor

It pays ... in many ways ... to specify Milcor Steel Building Products

It pays . . . in many ways . . . to specify Milcor Steel Building Products

INLAND STEEL PRODUCTS COMPANY Member of the Steel Family
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DEPT. K • ATLANTA • BALTIMORE • BUFFALO • CHICAGO
CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • INDIANAPOLIS
NEW ORLEANS • NEW YORK • ST. LOUIS.
Today's trend: distinctive lighting fixtures... and more of them

Far More Decorative! More Practical...
Gives Better Control of Light Levels

Huge, cumbersome, unsightly lighting fixtures are fast becoming unmourned relics of the past. Through the multiple use of highly decorative units for general, local and accent lighting, architects and decorators are achieving complete coordination between exterior and interior design. They are free to unify or diversify the visual effect or "feeling" of the architectural whole.

And the practical advantages equal the esthetic:

- Virtually EXACT control of light levels at every point in any area.
- Complete harmony of design among all fixtures whether for accent, local or general lighting.
- Simple, relatively inexpensive change of decorative values when desired.
- Easier maintenance.

Those and other "Inspiration-Lighting" ideas by MOE Light are embodied in a helpful catalog, "Lighting for Commercial Installations"—yours with the compliments of MOE Light if requested on your professional letterhead.
What other people are saying

CITY CHARACTER

The most charming cities result from lack of planning. This was the disquieting conclusion reached by Paul Jacques Grillo, professor of architecture at the University of Notre Dame, in a talk before the Great Lakes District Regional Conference of the AIA.

The beauty and greatness of cities lie in their personality. Character, as rare in architecture as in men, is also the most cherished quality in both. We know that we may fall in love with a city because of its extraordinary charm and uniqueness—certainly not because it is clean, easy to drive through, or because it makes a lovely picture on a piece of paper.

What places remain on the list of cities with charm and personality—friends we dream of visiting again? Are they not all cities that could win grand prizes for their filth? Istanbul, Venice, Marseilles, or Lisbon. They all are old cities grown out of nowhere, without plan, without architects, flouting all rules, ignoring all the laws and even the name of town planning, but realizing organic miracles of art and delight for the pedestrian. They are all cities in size, but villages at heart.

Now, if we take our American cities and try to list also the ten dearest to our hearts, cities that mean something to us, cities that gave us a thrill the first time we discovered them—a thrill that we feel again and again as we come to know them better—we may find high on the list down-town Manhattan, San Francisco, New Orleans, or even the microscopic Carson City, Nevada.

What do we find particularly successful in the design of these towns? Certainly not the narrow crooked streets of down-town Manhattan, the 20-per-cent slopes of the most idiotic and dearest streets of San Francisco, the flytraps of New Orleans, and the dirt road that proudly calls itself the main street of Nevada’s capital city.

What we are aware of is a sensation of constant surprise, of delighted expectancy. We feel as though we were led by the hand of a friend into wonders of enchantment and new impressions.

If we try to analyze the greatest successes in city architecture in the U.S., we find them to be the result of sheer planning heresies. If our forefathers had followed the rules, we would not today enjoy the superbly crazy trip up San Francisco’s Powell Street in a cable car where strangers meeting for the first time become best friends within two blocks. We would not have this supreme restaurant in Carson City that advertises itself as not being in Duncan Hines. The tip of Manhattan and its disorderly skyline would not make our heart skip a beat when our ship, back from abroad, turns the point of the Narrows at dawn—because we would have instead some kind of military skyline of a rhythmic pattern of well-classified boxes à la Le Corbusier.

ART MEETS ARCHITECTURE

It will not be easy to entice art out of the galleries, museums, and private collections, where it has been driven, into man’s everyday environment, where it belongs. But the experiences of Architect Victor Gruben in integrating art and architecture prove that it can be done. These experiences were the basis of his recent speech before the Architectural League of New York.

Art and architecture are like two people who haven’t seen one another since early childhood and suddenly meet again, acting clumsy and awkward. Their communications are slow and troublesome. They have grown apart over the years. They can’t remember each other’s faces and characteristics, and both feel upset about the peculiarities which each of them has acquired in the long years of separation.

In architecture, as in the arts, the problem lies not in style. Organic architecture and functional architecture both can be happy with art in their fashion. There is, however, one style of architecture rather dominant in this country, setting clashing and awkward. Their communications are slow and troublesome. They have grown apart over the years. They can’t remember each other’s faces and characteristics, and both feel upset about the peculiarities which each of them has acquired in the long years of separation.

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In architecture, as in the arts, the problem lies not in style. Organic architecture and functional architecture both can be happy with art in their fashion. There is, however, one style of architecture rather dominant in this country, setting clashing and awkward. Their communications are slow and troublesome. They have grown apart over the years. They can’t remember each other’s faces and characteristics, and both feel upset about the peculiarities which each of them has acquired in the long years of separation.
much as these are facts which can be proven to be true, we are not engaging in any devious activity if we proceed along these lines. We are only living up to our professional duty of giving the client not just what he wants but what he ought to want.

And finally, we have to sell the idea of integrating art with our environment to the public. The public, which for a century and a half has seen art only in the zoos of museums and art galleries, is bewildered and scared if it meets up with the beasts outside their cages. Maybe art, when let out of the cages should, at least for a time, not roar too loudly in order not to create the panicicky screaming: "The lions are loose!"

One of the family

Art itself, used to the life behind the iron bars of the zoological gardens, accustomed to being fed by expert keepers in cages labeled as to species, is, when let free, just about as scared as the public.
Erection started July 1. Five weeks later the entire building was enclosed with Moynahan aluminum curtain walls . . . walls that will remain weathertight during the years ahead.

Moynahan curtain walls assemble rapidly because they are scientifically engineered and precisely manufactured. Their resistance to the forces of nature has been proven over and over again in the wind tunnel at Flat Rock. Here, wind and water have been smashed against standard curtain walls in excess of 120 miles per hour without any indication of leakage or seepage.

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outdoors. Close cooperation was necessary to assure proper effectiveness, weather resistance, wind resistance, and proper outdoor scale.

What are the results of the common efforts of the 20 artists participating on these projects, and ourselves? [For some of the results in Gruen’s Detroit and Minneapolis shopping centers, see photos, left.] Nothing earth-shaking has been accomplished. The individual works of art will be judged differently by various people. Some might be regarded as outright corny, and others as too highbrow, but that seems rather unimportant. What is significant is that we have succeeded in creating environments which, freed of mechanized traffic and other disturbing influences, give an opportunity for people on foot to look, observe, and contemplate. We have tried to live up to this newly found chance of bringing people and the arts together. We have done so not only through sculpture and murals, but also through graphics expressions, landscaping, and street furniture.

The concrete results of these efforts were many:

- We have broken through the “unsound barrier” which clients had erected in their own minds against the use of anything not purely utilitarian in architecture.
- We have done so in the framework of projects which are true expressions of our society which, whether we like it or not, is a business society, and we have met the problem head-on in purely commercial surroundings.
- We have brought the public on a familiar footing with art. The 25-million shoppers who visit these centers yearly take these expressions of art now in their daily stride. Housewives arrange their rendezvous at the “giraffe” or “the golden trees” and the children climb on the “bear.” There is a general naive enjoyment of the fountains and the sculptures.
- Finally, the artists who have worked with us enthusiastically have come to the realization that their work can be a dynamic part of man-made environment. Thus we have progressed somehow against certain prejudices prevailing between art and society which Herbert Read has described as follows:

“The notion of an art . . . divorced from the general process of social development is an illusion; and, since the artist cannot escape the transformation of life which is always in progress, he had better take stock of his position and play his part in the process. If he believes in the reality and the importance of the artistic activity in itself, he must see that that activity is integrated with the other social activities which constitute the active totality of social development.”

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WHAT MAKES ONE SCHOOL "BETTER"?
continued from page 106

and the Homestead School are striking. The gross floor areas are quite comparable (23,000 square feet vs. 26,710 square feet), as are the total costs ($430,121 vs. $459,082). The socio-economic factors involved are almost identical, each school having been set in the midst of a fast-growing community characterized by owner-occupied homes in the $15,000 to $20,000 price range. On the other hand, there are some differences, as there are between all schools: Collins has a kitchen for noon meals, Homestead sends the children home for lunch (a fact that has been taken into account in FORUM's cost comparisons); Collins has a school population of 415 in grades kindergarten through sixth, Homestead has 325 enrolled in grades kindergarten through third.

But the big difference between the two schools lies in net educational area. This includes all of the space

Further comparison

Special subjects (music, art, etc.) are taught in two totally different environments. At Homestead (above), which leaves its activities room free for library browsing, pupils are taught music and other skills in their own room by their own teacher. At

Imaginative play areas outside the Homestead School (above) offer built-in equipment, can double as outdoor classrooms. Collins'
used by children and faculty for teaching, administration, special activities, and recreation; it does not include Collins' kitchen, either school's boiler room, or corridors. Collins, the less generous school, has a net educational area of 12,757 square feet; Homestead's is 17,685 square feet. In terms of area per pupil, therefore, the contrast is between Collins' 31 square feet of net educational area per child and Homestead's astonishing 54. And, in terms of the dollars spent on each educational square foot per pupil, the more "luxurious" school turns out to be the better buy: dividing the total educational area into the total school cost, each foot of educational area works out to an estimated $34 at the Collins School and only $26 at Homestead. This last factor, usually overlooked, provides the truest measure of the two schools' relative economic value.

of excellence vs. mediocrity.

Collins (above), the pupils are taken to a special activities room, where the conditions are even tighter (15 feet by 22 feet, 11½ inches) than those in home rooms.

play fields, by contrast, are bare and formalized, allowing no integration of indoor and outdoor spaces.

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Truscon will be happy to work with school officials, architects, and builders in varying the basic concept to meet local traditions and customs.
taking to date. Wolfson freely admits that he is up against one of the toughest combinations of problems a promoter or a builder could face. There are first, the ordinary real estate problems. "As in any commercial office building," says Wolfson, "the first question is: will it rent, and at what price? Then, of course, you have to get tenants, and then mortgage money—a lot of both in this case. Once the land and tenant leases are signed, you've reached the point of no return. You're hooked, and everything you have is on the line."

In Grand Central, Wolfson also has the considerable structural problem of meshing the footings for a 50-story building into the fan of railheads and platforms coming into the station, without disrupting the 500-odd trains that enter and leave daily. This detail alone could cost as much as $4 to $5 million over "normal" foundations for this size of building. There is also the problem of moving 25,000 people, plus visitors, in and out of what is already the most heavily traveled area in town.

To complicate matters further, Wolfson would like to balance economics against esthetics and come up with a truly significant piece of civic architecture for Grand Central City. In the past, Wolfson, like other speculative builders in Manhattan, has produced only buildings which have, in effect, been designed by highly competitive rent schedules, by New York's ancient "wedding-cake" zoning envelope, and by the present widespread fixation on bland, shiny curtain walls. On this job, however, Wolfson decided to get some first-rate design advice. From a list of leading architects supplied by his own longtime architect, Richard Roth, Wolfson picked the two top names and hired as consultants Walter Gropius, former dean of Harvard's School of Design, and Pietro Belluschi, present dean of MIT's School of Architecture.

Roth's original design, which was tailored to Wolfson's specification of 3 million square feet of rentable space, is undergoing further study. The first counterproposal by the new consultants was for a slimmer, more freestanding tower with slab sides faceted into a shape that in plan resembles an elongated hexagon or lozenge. But the Gropius-Belluschi plan provided for only 1.5 million square feet, which Wolfson's figures show would be uneconomical on this highly valuable site. Present studies are being made on a compromise of some 2.5 million square feet (which would still top the RCA building's 2.3 million square feet).

The search for the ideal combination is proceeding. Yet, like other realtors, Wolfson is still genuinely puzzled about how to integrate good architecture with good business. "In a heavily built-up place like New York," he says "doing anything to improve the city is so terribly, terribly costly. Our 'wedding cakes' are not the architects' fault, but the fault of competitive economics and New York zoning, and the builders who must work within their bounds."

Perhaps Wolfson will not be able to bridge the gap between New York's tight economics and the great architectural spaces and structures the city sorely needs. Perhaps Grand Central City, if it is built, will have to be an architectural compromise. But chances seem good that it will be built, for as even one skeptic about the project concedes, "When Wolfson starts something, he usually succeeds."
FOR ROCKEFELLER CENTER'S NEW TIME & LIFE BUILDING

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IN ALUMINUM

BY

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A continuing review of international building

At a bend in Venice's Giudecca Canal, Architect Ignazio Gardella has built a villa that offers an unusual solution to the problem of relating a contemporary building to more venerable neighbors. Whereas the eighteenth-century church next door is balanced and serene, the villa is irregular and lively (see details above and far left). But the villa is not so offbeat as it first appears: it is painted in traditional colors (brick-red plaster, white trim, green shutters), it repeats the church's tall windows, and, more importantly, it works as a mediator between the classic church and the neighborhood's more raffish buildings (left).
Prefabrication in Germany has reached the point where a distinctive electrical parts factory can be built for minimal cost with the aid of imaginative architects. Using prefabricated masonry wall and roof panels (below) to cover a simple steel skeleton, Essen Architects Schulze-Fielitz, von Altenstadt, and von Rudolf devised a basic factory for $1.50 per square foot (not counting foundation and heating), 25 per cent below average cost. Yet the factory fits winsomely into the rural landscape (left).

HUNGARIAN BRUTALITY

Beyond Budapest, 45 miles from the Soviet border, stands a new tobacco processing plant that, in its formidable appearance, tells much about Hungary's current architectural style. The planner of the building, Rimanóczy Gyula, designed it for three operations: tobacco storage (1), curing and fermentation (2), worker education (3). He then constructed the plant with a bare, reinforced concrete frame and with cladding so indiscriminately brutal that it might conceal anything from a prison to an old-fashioned gasworks.

SWISS FINS

Like Frank Lloyd Wright's famous Price Tower, this 15-story office building tower for the J. R. Geigy Company (chemicals) in Basel, Switzerland has a strongly textured look and is marked by stabilizing fins that jut out from the building's mass. But unlike the Price Tower whose interior is ingeniously divided into living and working spaces, the design of Swiss Architects Martin and Karl Burckhardt offers a more standard floor (see plan, top). Also, the fins of this building do not radiate out from the center, but are actually wind-bracing devices which are shaped to contain air-conditioning ducts and other necessary services.
WINGS OVER LONDON

The upswept roof line and cantilevered balconies of London’s newest apartment building, Great Arthur House (below), would appear sprightly in any city, but in London they look downright shocking. For the city’s building codes have long militated against the building of anything that is experimental, either esthetically or structurally. Architects Chamberlin, Powell & Bon got their design approved on the basis that everything was functional (the wings on the roof contain two 5,000-gallon water tanks—see sketch, right; the balconies help stabilize the inner cross walls). Functional or not, the building offers about the most delightful view (from the rooftop “Belvedere”—left) and roofscape (right, below) to be found in London.

FRAMED IN RIO

The renowned Brazilian Architect Affonso Eduardo Reidy has designed an intimate theater in Rio de Janeiro that, in contrast with his usual gigantic, undulating structures, is quite modest and precise. He has made the difficult job of bringing a theater’s many elements under artistic control look easy by putting the three major elements under a simple, M-shaped concrete frame and by sheathing the sides in textured wood and aluminum panels. Out front is a canopy which mirrors the theater’s dominant form.

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