Stated objective of Eggers and Higgins, architects of Canada House, was to create "a modern up-to-date 27-story office building so unique in location, modest size, and quality materials and equipment that it must appeal to tenants of prestige who desire executive offices expressing exclusiveness, dignity and good taste." In line with this objective, Richmond Plumbing Fixtures were selected. The high quality, enduring beauty and minimum maintenance inherent in Richmond Plumbing Fixtures make them deserving of your next project...whether commercial, industrial, institutional or residential. Write for complete catalog or consult Sweet's Catalog File.
CURRENT ARCHITECTURE

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The Swedish “Skame” system first erects a concrete core, then builds out from it with sandwich panels.
US Steel Structural Steel for church
erected in 10 days

St. Catherine of Sienna Church, St. Louis, Mo. Architects: Carroll & Dean; Structural Engineer: John P. Nix; General Contractor: M. J. Lawlor; Structural Steel Fabricator: Mississippi Valley Structural Steel Co.

The use of USS* Structural Steel for the new St. Catherine of Sienna Church in St. Louis accomplished four purposes. First, it permitted a beautiful modern design unobstructed by columns and shaped for good acoustics. Second, it speeded up construction. The steel was fabricated in three weeks and erected in 10 days. Third, it assured maximum strength, safety and durability. Fourth, it kept costs low.

Structural steel is a versatile material that lends itself to modern construction. It can be easily fabricated for domes, arches and long roof spans. Where weight is a problem, the new high-strength steels such as USS Tri-Ten* brand permit lighter construction without sacrifice of strength. These steels can be formed, welded or riveted in much the same manner as regular structural carbon steel.

QUICK DELIVERIES! Recent expansion of production facilities assures quick deliveries and continuing availability of steel shapes and plates to accommodate the increasing demands of the construction industry. Just call the nearest office of United States Steel. The telephone number is listed in local directories.

For your copy of “Hot Rolled Carbon Steel Shapes and Plates,” a handbook containing details, dimensions and weights—write to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

Auditorium roof fabricated from USS Structural Steel in three weeks and erected in 10 days, using standard shapes and plates.

United States Steel Corporation – Pittsburgh
Columbia-Genoa Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

United States Steel
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architects & engineers
Del E. Webb Construction Co.
general contractor
Howe Brothers
plumbing contractor
Crane Co.
plumbing wholesaler & fixture manufacturer

AN ARCHITECTURAL TRIUMPH

* The new $20-million Union Oil Center, Los Angeles, is a complex of four ultramodern office buildings which occupies more than a square block — nearly 5 acres. The three principal buildings, which form a "U," are joined only at lobby and mezzanine levels. The 13-story Home Office, highest structure in the city, forms the base of the "U." Facing it from the opposite side of a cross street and joined by pedestrian bridges, is a 2-story building housing a large auditorium, lounges and cafeteria. In the main building electronically controlled, operatorless elevators serve all 13 floors. High speed escalators serve the lobby and the six floors above, and also all floors in the two 4-story buildings. All buildings are comfortized by a high velocity dual-duct air conditioning system. Facades of all buildings are metal and glass. Windows are top-hinged and in-swinging to permit cleaning from inside. For these praiseworthy Union Oil Center buildings Sloan Flush Valves were specified.

Sloan Flush Valves
FAMOUS FOR EFFICIENCY, DURABILITY, ECONOMY

Another achievement in efficiency, endurance and economy is the Sloan Act-O-Matic shower head, which is automatically self-cleaning each time it is used! No clogging. No dripping. Architects and Engineers specify, and Wholesalers and Master Plumbers recommend the Act-O-Matic — the better shower head for better bathing.

Write for completely descriptive folder
Building volume in first half totaled $22 billion; signs increase that 1958 will be a record building year.

Spending for new construction in the first half of 1958 almost exactly equaled spending during the first six months of 1957—about $22 billion. And construction activity is building up a head of steam that should carry it to a new all-time record for the year—to at least the $49 billion total volume that Forum forecast last February. Expenditures in the second half should exceed the first by at least 4 per cent.

Perhaps the most encouraging indication of how strong building will be in the second half of 1958 is the contract award figure announced a few weeks ago by F. W. Dodge Corp. Awards in May totaled $3.4 billion, almost 1 per cent higher than the previous highest month on record—May 1957. The key area of residential awards showed a 4 per cent rise, while awards for commercial and factory buildings, long a laggard area, rose 1 per cent over May 1957.

Total nonfarm housing starts in the first six months of this year hit their highest level since August, 1955. Private starts alone were the highest in two years, and were put in place at a seasonally adjusted annual rate of 1,090,000. For the first six months, the seasonally adjusted annual rate of private nonfarm starts was 983,500.

Public housing starts have continued to be an important factor in the overall housing picture. In the first six months of the year, public housing starts totaled 36,000 units, which is the highest percentage (7 per cent) of total starts since 1962.

Future home building promises to be strong, too. Applications for new home mortgages insured by the Federal Housing Administration totaled 33,427 in June, down slightly from May's total but still more than 50 per cent higher than in June 1957. For the first six months of this year, applications for new home mortgages totaled 162,900, or 82 per cent higher than for the same period of last year.

Besides contract awards and FHA applications, there are other signs of a rise in future building activity:

- The American Institute of Steel Construction reports that bookings of new orders for fabricated structural steel climbed 8 per cent from April to May, and hit the highest figure for any month since June 1957.

- U.S. Steel Corp. revealed that its capital expansion schedule this summer is at the highest level in the company's history—$1 billion.

- Safeway Stores, Inc. (more than 2,000 stores) has stepped up the expansion of its grocery chain. Chairman and President Robert A. Magowan cited easier money as one reason for building 175 new stores this year instead of the 150 that had been originally projected. But he also said that lower building costs, due to keener competition for contracts, has been a factor. "We're letting contracts now for a cost of $7.50 to $8 per square foot," Magowan said. "A year ago we were getting nothing below $9."

- General Electric Co. resumed work on its $5 million Lamp Division research building in Richmond Heights,

---

BOX SCORE OF CONSTRUCTION
(Expenditures in millions of dollars)

<table>
<thead>
<tr>
<th>Period</th>
<th>Jan.-June</th>
<th>1957</th>
<th>1958</th>
<th>1958/1957</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIVATE BUILDING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonresidential</td>
<td>735</td>
<td>4,250</td>
<td>4,575</td>
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</tr>
<tr>
<td>Industrial</td>
<td>193</td>
<td>1,376</td>
<td>1,813</td>
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<tr>
<td>Commercial</td>
<td>315</td>
<td>1,653</td>
<td>1,645</td>
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<tr>
<td>Office buildings, warehouses</td>
<td></td>
<td>169</td>
<td>986</td>
<td>849</td>
</tr>
<tr>
<td>Stores; restaurants; garages</td>
<td></td>
<td>146</td>
<td>667</td>
<td>796</td>
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<tr>
<td>Religious</td>
<td>70</td>
<td>389</td>
<td>400</td>
<td>-3</td>
</tr>
<tr>
<td>Educational</td>
<td>46</td>
<td>257</td>
<td>247</td>
<td>+4</td>
</tr>
<tr>
<td>Hospital; institutions</td>
<td></td>
<td>51</td>
<td>303</td>
<td>227</td>
</tr>
<tr>
<td>Residential (nonfarm)</td>
<td>1,530</td>
<td>7,650</td>
<td>7,736</td>
<td>-1</td>
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<tr>
<td>Public utilities</td>
<td>528</td>
<td>2,768</td>
<td>2,572</td>
<td>+8</td>
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<tr>
<td>Total Private*</td>
<td>2,974</td>
<td>15,508</td>
<td>15,720</td>
<td>-1</td>
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<tr>
<td>PUBLIC BUILDING</td>
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<tr>
<td>Nonresidential</td>
<td>402</td>
<td>2,148</td>
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<td>Industrial</td>
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<tr>
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<td>Military</td>
<td>95</td>
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<td>Highways</td>
<td>580</td>
<td>2,210</td>
<td>2,113</td>
<td>+5</td>
</tr>
<tr>
<td>Sewer; water</td>
<td>120</td>
<td>644</td>
<td>647</td>
<td></td>
</tr>
<tr>
<td>Total Public*</td>
<td>1,402</td>
<td>6,558</td>
<td>6,338</td>
<td>+3</td>
</tr>
</tbody>
</table>

*Minor components not shown, so total exceeds sum of parts.
** Less than 1 per cent.
---

Architectural Forum / August 1958
Ohio, just outside Cleveland. This project was one that had been post-
poned a year and a half ago when GE cut back its capital spending pro-
gram. With three other projects that are being reactivated, the Richmond Heights project makes a total of $12.5 million in new building that the divi-
sion has resumed in recent months.

Union Carbide Corp. has resumed work on one of the buildings in its $15 million research facility in Westchester County, New York. Last February, Carbide had called a halt to the project, citing "uncertain economic conditions." A survey by the National Associa-
tion of Real Estate Boards indicates a coming boom in apartment construc-
tion, which has been strong all year. Of the 211 real estate boards surveyed, 73 per cent of those in metropolitan areas foresaw either a higher level of apartment building, or one at least as
high as at present. Apartment building throughout the country has been strong all year. The Bureau of Labor Statis-
tics estimates that multifamily residential building is currently higher than
at any time since 1953. In the first quarter of this year, apartments made
up 17 per cent of total housing starts, while in the housing boom of 1955,
they comprised only 9 per cent of starts. For the first six months of this
year there were 35 per cent more starts under FHA apartment building
programs than there were for the same period last year.

Besides the rising activity in private building, there are signs that public
building, which has been booming all through the first half of this year, is
growing still stronger. In the first half of 1958, all public building—federal,
state, and local outlays for sewers, hospitals, schools, military, highways,
public housing, etc.—was up 3 per cent over last year, to over $5.5 billion, indi-
cating a record volume for the year of
over $15 billion. Highway construction,
the biggest single category of public
building, was up 5 per cent above last
year to an annual rate of $5.5 billion,
and school building was 3 per cent
higher (to a total of $1.4 billion) than
in the first six months of last year.

In the first six months of the year,
sales of state and local bond issues
totaled $4.4 billion, about 27 per cent
higher than last year. In New York
City, for example, first half building by
the city was running 25 per cent ahead
of last year, and contracts for new
construction totaled $40 million in the
first half, 82 per cent higher than in the
same period of 1957.

Architects hear their role challenged
at AIA convention in Cleveland

More than 1,000 architects met in
Cleveland last month to engage in a
week of intensive self-analysis. And
although the annual convention of the
American Institute of Architects had
no special theme this year, most of the
speakers seemed to address themselves
to the question, "Is the Architect
Equipped to Meet the Challenge of the
Next Quarter Century?" Judging from
the tone of most of the speeches and
discussions, the answer appears to be:
he could do much better.

In his keynote address, for instance,
young (42) Philadelphia Architect Vin-
cent G. Kling asked his fellow archi-
tects, "Can we discuss long-term capital
flows, corporation tax structures, real
property values, automobile traffic flow
and next year's building costs?" (From
the restless shifting in the audience,
the answer of many of the architects
seemed to be No.) His questions re-

tected the growing uneasiness among
architects because corporate and public
building clients today have teams of
specialists which possess a formidable
array of knowledge which the architect
is expected to match but seldom can.
Kling warned that perhaps too many of
the profession, lacking this knowl-
edge, were becoming mere "technicians
and skin-merchants producing brochure
architecture around the feasibility
studies of others," instead of "full-
ledged architects."

Kling also discussed the rise of "a
new corporate being, growing rapidly
at our side, and threatening to over-
shadow us — the package dealer." Kling's advice on this thorny issue:
"The package dealer is meeting a very
real need today, and instead of trying
to prove he is not, we had better con-
centrate on how we can meet that need
better."

Kling's suggested remedies: "We
must match the client's broad require-
ments and specialized demands with an
equally broad and equally specialized
service. And we must demonstrate
our capacity—not merely an enthusi-
amism — to handle large and complex
projects." He recommended that the
AIA broaden its products research pro-
gram. Basically, Kling concluded, archi-
tects must make an effort to "partici-
pate more actively in the decision-mak-
ning process, both as individuals and as
an aggressive professional fraternity."

Kling's theme was an effective key-
note. In the sessions that followed,
panelists and speakers continued their
mass introspection. Architect Herbert H. Swinburne, of Philadelphia,
for example, declared that architecture
has not kept pace with other profes-
sions "in asserting leadership in design
and construction for the coming atomic
age." Said Swinburne: "The architect
is losing this leadership because he
does not properly understand his cli-
ent; he is trying to maintain the status
quo of the practice of architecture
when that practice is changing rapidly
and drastically." Swinburne's pro-
posed remedies:

Architects should understand more
about psychology to 'better understand
the art of persuasion and how to
change attitudes.'

Architects should make better use
of economists, sociologists, and anthro-
pologists to deal "more precisely with
an exploding population and great urban concentration."

As it happened, the AIA program committee had invited an eminent anthropologist to speak—and she almost stole the whole show. Professor Margaret Mead, of Columbia University, a much-traveled expert on primitive societies, provided the architects with at least one reason for turning to anthropologists for a fresh viewpoint by deliv-

ering a delightful and provocative talk.

"One of the things that is going to have to happen in our changing society," said Mrs. Mead, "is not only that the architect will have to take more responsibility than he has at present for a wider position . . . but he is going to have to be involved in more and more planning of a variety of sorts so that each unit will have some growing relationship to every other unit—it is no good designing a good community in a bad region, no use designing a community for the wrong people to live in, and you can't make a decent human society a one-class, one-religion, bedroom suburb."

Action on the East Front

Besides ruminating on their professional destinies, the AIA members took time to reaffirm the stand they had taken in conventions in 1957, 1955, '56, and '57, that the East Front of the U. S. Capitol be restored in its present position, rather than rebuilt 22½ feet away. (Rebuilding of this front 22½ feet forward is required by a law passed in 1955 but not yet executed.) The convention action confirmed the AIA Board's opposition to moving the East Front and its support of the Smith-Clark amendment, now before the Senate as S.2883, and parallel bills in the House. The "East Front" resolution was the Number One issue of the convention. It was debated for over two hours before a vote was taken which showed 225 of the delegates present for the resolution to "take all necessary steps to restore and preserve the historic East Front," and only 49 against it.

There were active contests for all top AIA offices this year, and most of the active politicking was done in the rooms of the Cleveland hotels. Toledo's John N. Richards emerged as president, defeating Alexander C. Robinson III (Forum, July 1958), and perpetuating the AIA tradition that the first vice president advances to the presidency. Other new officers are: first vice president, Philip Will Jr., of Chicago; second vice president, Henry L. Wright, of Los Angeles; secretary, Edward L. Wilson, of Fort Worth, Texas; treasurer, Raymond S. Kastendieck, of Gary, Indiana.

All in all, this convention of the AIA seemed to consider for the first time the working consequences of the "New Century" which was the theme of last year's centennial celebration, but which seemed last year to become lost in the celebrating. Not only did this year's convention pose serious questions for architects as individuals in a changing society, but it also raised some fundamental questions about the Institute itself and its adequacy as a functioning organization to promote the architect's role of leadership.

TEXACO'S WEST COAST BUILDING

Since the easing of building height limitations in 1956, Los Angeles has been the scene of a flurry of high-rise office building construction. One of the latest offices to be completed is the 15-story West Coast headquarters for the Texas Co. Designed by Welton Becket & Associates, the building is T-shaped, with porcelain enamel panels hung on an aluminum framework, and reinforced concrete covering the exterior of the ends of the "T." Off-street parking is provided in an adjoining four-story, 330-car garage.

"Can we discuss tax structures . . .?"

Senate passes $2.5 billion housing bill

The U.S. Senate approved a $2,475 million housing bill last month, after some nimble legislative maneuvering by Senate Majority Leader Lyndon B. Johnson (D, Texas). The Senate trimmed $475 million—and one key feature—from the $2,950 million bill voted out by the Senate Banking Committee, which Republican Senator Homer E. Capehart had vowed to fight on the floor of the Senate. (Forum, July 1958.)

Capehart did win a couple of points although the main part of the Committee bill stayed intact. He was successful in trimming the urban renewal program from $350 million a year for six years to $300 million a year for six years. (This is still nearly 40 per cent above the $1.3 billion program requested by President Eisenhower, and there is no provision for a declining share of federal aid, as the President requested.) Capehart also succeeded in cutting back loan funds for building college classrooms and laboratories from $250 million, as proposed in the original bill, to $125 million.

Perhaps Capehart's most significant victory came in his battle to trim the bills' public housing features. He succeeded in cutting the number of new public housing units authorized for fiscal 1959 from 35,000 to 17,500. (This is not too meaningful, however, for there is still a backlog of over 60,000 authorized units that have not been scheduled for construction yet.) And, even more damaging to the efforts of those who want to give the public housing program a new look, Capehart succeeded in striking out the section that would have permitted "overincome" families either to purchase their units, or to continue rental occupancy if there was no other suitable housing available for them.

Most of the other important public housing provisions of the committee bill remained unscathed, however. The sections that give local housing authorities more control over the operations of their projects were not altered (see page 9). Other features of the Senate bill:

- A $400 million loan program to stimulate the construction of college dormitories.
- A $150 million program of direct housing loans to veterans.

continued on page 9
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no door equals the air-vented all
wood grid core construction of the

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SUPER SATIN SURFACE

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A program to guarantee $250 million of private loans to colleges and universities for the construction of classrooms and laboratories (this is in addition to $125 million in direct loans).

The Administration, which asked for an over-all housing bill calling for only $1.16 billion in spending, is currently fighting the Senate's $2.5 billion measure in the House, Housing & Home Finance Administrator Albert M. Cole argued last month that the urban renewal provisions of the Administration bill, calling for $1.3 billion for six years instead of $2.1 billion, are "adequate and reasonable" considering an already strained budget and taking into account the "volume of projects which cities can be expected to undertake."

Public housing officials favor local autonomy

The housing bill passed last week by the Senate provided the main topic of discussion for the four hundred public housing officials who gathered in Washington for the 27th annual National Housing Conference. NHC had a major role in drafting the controversial public housing sections of that bill, and backed the bill solidly in its policy statement. The bill, however, drew sharp criticism from Housing & Home Finance Administrator Albert M. Cole, who told the assembled public housing officials many things they did not relish hearing.

Cole hit hardest at the provisions that would give local housing authorities the power to set income limits for tenants, to fix rent schedules, to hire independent auditors for their operations. If the Senate bill is enacted, PHA will henceforth have to accept the books as audited by a reputable private auditing firm paid by the local authority.

The feature that bothers Cole and PHA most, however, is the one that lets local authorities keep one-third of their net rental receipts for improving their projects, etc. Local authorities have long chafed under PHA's intensive scrutiny of their finances and other operations. If the Senate bill is enacted, PHA will henceforth have to accept the books as audited by a reputable private auditing firm paid by the local authority.

The need for low-rent public housing—lack of sites for public housing, segregation problems, the high cost of urban land, the unwillingness of lenders to make loans to displaced, middle-income urban families.

Forecasting that population in the U.S. will increase to almost 230 million persons by 1975, the NHC called for a "sustained housing production rate of at least 2 million dwellings a year, approximately double the rate of recent years." And it added that public expenditures for community facilities to meet the demands of expected population growth will have to triple over the current rate of approximately $14 billion a year.

Glickman drops Carnegie Hall skyscraper plan

Manhattan's colorful skyline—which already includes gold, green, silver, bronze, and blue office towers—will have to wait a while to round out the spectrum. This became apparent last month when Realtor-builder Louis J. Glickman announced that he had abandoned plans for building a bright-red, porcelain-enamel 44-story skyscraper on the site of Carnegie Hall. Glickman, who took an option on the Carnegie site about three years ago, says that the reason he gave up on his red skyscraper was that "I did not dare to put the New York Philharmonic out on the sidewalk."

The Philharmonic, which has for years played in Carnegie Hall, was continued on page 11
We thought of a lot of fancy names for this new PC glass product. But they seemed considerably less articulate than the quiet simplicity of the product itself. We settled on what seemed natural—the 4x12. The outside faces are smooth for practical reasons. But an acid-etched appearance gives character and texture to the interior faces. The product is available with a white insert screen, a green-tinted screen, or plain. And, of course, there's color. At present, four ceramic face hues, with more to come. But most important—the new size—4x12. A break with tradition that gives architects a new proportion in-solving design problems. Only PC has this product, so call or write. Pittsburgh Corning Corporation, Dept. Pittsburgh 22, Pa. In Canada: 57 Bloor Street West, Toronto, Ontario.
scheduled to move into its new auditorium at the Lincoln Center for the Performing Arts in 1960 (see page 74), but that date has been delayed by lawsuits (FORUM, July 1958) and Glickman decided he could no longer afford to wait. He says that he has already lost some $200,000 in the cost of options themselves, plus the cost of preparation and presentation of plans for the $22 million red skyscraper.

Although Glickman’s plans for the Carnegie Hall site are stymied, he says he is still interested in the site. “The growth of the city is in that direction,” he says, “and we are definitely interested in it.” (Last year Glickman announced the purchase of the General Motors Building, only a block away from Carnegie Hall.)

Fading Carnegie Hall itself, built in 1891 by Andrew Carnegie, may not necessarily have been spared as a result of Glickman’s withdrawal. Robert E. Simon, president of Carnegie Hall, Inc., said last month that “Perhaps the men who own and manage buildings in the U. S. and Canada met several weeks ago in Toronto, some of them expressed mild concern that vacancies in office buildings were higher in the first six months of this year than in the previous six months (3.64 per cent compared to 3.16 per cent). But members of the National Association of Building Owners & Managers (NABOM) did not dwell too long on that statistic. There was too much good news to contemplate, and too many serious problems of a different nature to wrestle with at their 51st annual convention.

On the business side, rents are still going up. Average rental rates per square foot rose 6 per cent in 1957, from $3.88 to $3.76. Average rental income—including vacant areas—rose from $3.35 to $3.47 per square foot, a gain of 3.6 per cent in 1957.

The rise in rents was partially offset by a rise in operating expenses from $2.47 to $2.59 per square foot. But this rise was not sufficient to prevent building owners from realizing a record high average operating net income for offices of 97.1 cents per square foot in 1957.

The state of the office building and managing business always provides the main topic of conversation at NABOM conferences, and this year questions were raised about the need for more information with which to measure the prosperity of the industry. Outgoing President Maynard Hokanson announced the formation of a new NABOM Economic Council to handle special programs and market studies to aid the industry. The goal: to provide sufficient office space for business requirements without “overbuilding.” (NABOM’s new president: John I. Hill of Houston, Texas.)

In one of the convention addresses, George R. Bailey, of Chicago, chairman of NABOM’s Building Planning Service Council, referred to a friendly running debate on construction problems that he has with Chicago Architect Helmuth Bartsch, a partner of Holabird & Root & Burgree. “I occasionally accuse Bartsch of overlooking costs to obtain effect,” said Bailey, “and he accuses me of sacrificing effect to save on costs.” But he quoted Bartsch as saying that the situation is improving: “Owners are much more willing today to contribute a part of the ground floor to the community by using it as a foreground for their building or as a plaza. Planting is again used more often and it all helps to bring relief to the monotonous jungle of architecture which has in the past given our large cities a pretty dismal look.”

“Today,” Bailey noted, “when new buildings must frequently be rented at rates 50 per cent above prevailing rates in the best existing buildings, the selling problem is severe, and in many instances we have permitted the glamour of height and modern treatment to outweigh comparative costs. But there must be features of real value to justify increased rents (premiums of $2 a square foot in many cases) in addition to merely air conditioning and high intensity lighting. In a medium-sized city, where a building must be designed for multiple occupancy, and it therefore would be difficult to capitalize on very large floor areas, it frequently is advisable to build 20 stories of 10,000 square feet each, rather than 10 floors of 20,000 square feet. The unit cost may be greater, but not enough to offset the advertising value and glamour of the higher building.”

At other NABOM sessions that dealt with various aspects of the “down-town” problem:

Frederick G. Gardiner, chairman of the Municipality of Metropolitan Toronto, said “neither expressways alone nor rapid transit alone will solve the [metropolitan transportation] problem, but a well-planned combination and integration of the two is essential.” He reported that the Toronto Metropolitan Council has decided to proceed with plans for a new $200 million, 10-mile-long east-west subway, to supplement its 6-mile-long north-south line completed in 1954.

continued on page 13
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Prudential Insurance Company Vice President S. Westcott Toole said his company's several outstanding new regional headquarters buildings erected since World War II in central city prime locations (FORUM, June 1955) were largely responsible for the company's moving from second into first place in several consumer surveys to determine which insurance companies the public knows best.

**Missile bases top 1959 military building list**

As fiscal 1959 gets under way, it is apparent that a major shift in the pattern of military construction has been built into the new spending budget: for the next 12 months, missile bases and their supporting facilities will account for over 60 per cent of the $1.7 billion of military building authorized. (This total does not include $200 million of military public housing under the Capehart Act.)

This is the highest percentage yet; last year missile facilities took an estimated 45 per cent of total building outlays. And the missile share will continue to grow, say military experts. In a few years, as much as 90 per cent of all military construction spending may be for missile facilities.

This emphasis on missiles will have two significant effects on the building industry:

- Future installations will require more heavy building materials—cement, structural steel—than ever before, and less lumber and lighter-weight materials.
- More military projects will be located on remote sites, where supplies of materials and labor will not be readily available. This will pose logistical problems for architects and for builders.

Meanwhile, however, despite the generally higher trend of prices for many building materials and for labor, contractors are continuing to submit lower-than-anticipated bids for military jobs. This is largely because in many areas where military building is strong, there has been a lull in private construction, so contractors have submitted low bids just to keep their working crews together. The Defense Dept. estimates that about 60 per cent of all construction bids in the past few months have been below government estimates of what the jobs would cost. END

**BRAZIL'S JUNGLE CAPITAL**

One of the most ambitious, start-from-scratch building projects of all time is Brazil's building of a new capital city in the midst of a desolate jungle area some 600 miles north of Rio de Janeiro. Brasilia, as the city will be called, was the dream of Brazilian President Juscelino Kubitschek, and last month he saw the beginning of his dream coming true. The first two major buildings of the new city were opened: the President's own palace, called the Palace of Dawn (pictures, below), and a glass-walled 135-room hotel (lower right). A small chapel (right) was also completed recently. Under construction are apartments, government ministry buildings and other buildings. Brasilia, which in ten years is expected to be a city of 500,000 persons, will cost at least $70 million, probably eventually nearly $1 billion, including private investment. The over-all plan for the city was by Architect Lucio Costa.
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**Los Angeles gets an aluminum showplace**

The new Union Oil Center in Los Angeles is an architectural showplace for beauty and practicality combined in Alcoa Aluminum.

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BUILDING: Union Oil Center, Los Angeles, Calif.
OWNER: Union Square Building Corporation, Los Angeles, Calif.
ARCHITECT: Pereira & Luckman, Los Angeles, Calif.

ALUMINUM SUBCONTRACTORS:
Façades, Spandrels and Solar Shades: Universal Corporation, Dallas, Tex.
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A roundup of recent and significant proposals

**ARCHITECTURAL SCHOOL FOR CANADIAN CAMPUS**

Next September the University of Manitoba will inaugurate the two-story structure above—the first building in Canada built solely for the teaching of architecture. Designed by Smith, Carter, Katelnikoff Associates of Winnipeg, the podium-mounted steel-framed school will be faced with precast concrete panels, transparent and opaque glass. Offices and exhibition space will be on the first floor; drafting rooms on the second. Cost: $833,000.

**DIVINITY SCHOOL IN SOUTHERN CALIFORNIA**

Shown above is the master plan for the Southern California School of Theology, a $5 million graduate school to be built in Claremont, California. Dominated by a central chapel, the 15-acre campus will provide academic and housing facilities for 300 Methodist students. Building area: 200,000 square feet. Architects: Pereira & Luckman.

**LIBRARY AND FACULTY CENTER AT BRANDEIS UNIVERSITY**

At Brandeis University in Waltham, Massachusetts a $2 million library and a $600,000 faculty center will be built from plans by New York City Architects Harrison & Abramovitz. Set on a high terrace paved with blue and white stone chips, the glass-and-brick library (top photo, below) will be three stories high with 102,680 square feet of usable floor space. Scheduled completion date: September 1959. Also of glass and brick, the faculty center (bottom photo) will contain dining areas, lounges, meeting rooms, and other clublike facilities, as well as guest rooms for visiting lecturers in an adjacent wing. Total area: 16,100 square feet. Completion is set for late this fall.
THREE 300-ROOM HILTONS

To its string of 29 hotels the Hilton Hotels Corp. will add the three at left (top to bottom) in Baghdad, Athens, and San Francisco. The 12-story, $8 million Baghdad Hilton, to be built by the Iraqi government, from designs by Welton Becket & Associates of Los Angeles, will be Baghdad's largest hotel. The $5 1/2 million Athens Hilton, also 12 stories and the largest in Athens, will be built by Greek Shipowner Apostolos Pezas. Architects: Warner, Burns, Toan & Lunde of New York and Prokopios Vassiadis of Greece. The Hilton Inn which is now under construction a half mile from San Francisco's International Airport, will open its 300 roadside rooms this December. Designed by William Tabler of New York City, it will cost $2 1/2 million.

THREE-PART DEVELOPMENT FOR BROOKLYN HOSPITAL

An $11 million development for Brooklyn's Maimonides Hospital is planned in three major phases: 1) a $1 million, four-story outpatient center (lower left); 2) an 11-story, 576-bed medical-surgical pavilion (center); and 3) a nursing school and research center (right). The outpatient building, now under construction, will have aluminum-framed glass spandrels and exposed concrete columns and beams. Architects: Skidmore, Owings & Merrill. Present hospital facilities are shown at left.

CANADIAN INSURANCE TOWER

In downtown Toronto the Prudential Insurance Co. and Tusca Investments Ltd. will build this 20-story, $12 million office tower to house Prudential's Canadian operations. The building's first four floors will be sheathed with bronze-trimmed glass; the rest with glass and quartz-and-granite panels separated by vertical fins of stainless steel. Floor space: 350,000 square feet. Architects: Page & Steel and Peter Dickinson Associates.

MANHATTAN OFFICE BUILDING

Thirty West Broadway, a 14-story Manhattan office building, will be erected by Builder Erwin Wolfson on property leased from Columbia University. The block-square structure, containing 300,000 square feet of rentable floor space, will be faced with white brick spandrels, blue tinted windows. Architect: William Lescaze. Cost: $5 million.
IOWA OFFICE BUILDING

For the Maytag Company’s main offices, the Des Moines architectural firm of Brooks-Borg has designed this 152,000-square-foot building now under construction at Newton, Iowa. The three-story structure will be faced with sculptured, buff-colored panels of precast concrete. Vertical tile strips with slot windows will separate the panels. The project will be ready for occupancy by late 1959.

SCREENED COURTHOUSE IN NEW JERSEY

This five-story, penthouse-topped courthouse (foreground) will be built by the Middlesex County Freeholders in New Brunswick, New Jersey. The steel frame project, which is the design of Alexander Merchant Associates, will have a pearl-colored, pierced terra-cotta façade and a total floor space of 72,000 square feet, excluding penthouse. Scheduled for completion by 1960, it will cost $2.3 million. The 13-story building at rear is a proposed jail.

WASHINGTON STATE LIBRARY

Seattle Architect Paul Thiry designed this seven-story library as part of his development plan for the State Capitol at Olympia. The $1 1/2 million structure, scheduled for completion by next January, will have 69,000 square feet of floor space. Construction: monolithic concrete waffle slab; exterior facing of cut stone.

MORGUE FOR MANHATTAN

An ultramodern, $3 1/2 million morgue (above) is now under construction at the corner of 30th Street and First Avenue in Manhattan. Designed by De Young, Moscovitz & Rosenberg, the six-story structure will have an exterior of gray glazed brick, aluminum, and glass. Mortuary facilities (120 trays), autopsy and examination rooms will be in the basement. Upper floors will be used for laboratories, library, lecture rooms, offices, and a museum. Completion: 1960.
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ADAPTABLE to your best designs is just one of many advantages of Reznor gas-fired duct furnaces. Ask your Reznor distributor for the complete story or write for your free copy of "Modern Heating".

Reznor Manufacturing Company, 40 Union Street, Mercer, Pa.
Learn the money-saving method for better shower construction

The cross section sample being shown in the photograph above clearly and simply demonstrates why the FIAT PreCast method of shower floor construction is the answer to an age old building design problem. It takes but a few minutes to see how this one-piece floor has many, many advantages over old fashioned, built-on-the-job shower floor construction. It is immediately evident that this solid, monolithic unit does away forever with any problems of leakage. The cut-away view shows how the integral flange forms a watertight seal between the floor and shower wall material (whether tile, plaster, wallboard or structural glass). You can examine how the drain is cast permanently into the floor material and how the inclined floor and raised shoulders deflect water downwards toward the drain. You will appreciate the substantial savings of on-the-job labor and understand why the low installed cost of a PreCast FIAT Floor makes all other shower floor methods obsolete.
As a Decorative, Structural and Functional material, Irving Grating offers a wide variety of architectural applications in all types of structures.

Curtis Hall, Temple University, Philadelphia
Nolen & Swinburne, Architects
An unusually light and transparent appearance is achieved in this new 4-story classroom building by the extensive use of IRVICO type CC pressure-locked aluminum grating as sunshades. These help reduce air-conditioning costs and help control sky glare. They also serve as window cleaning walkways.

Angell Hall, University of Michigan
Kahn Associated Architects and Engineers, Inc.
Vestibule mats of Irving grating prevent excessive grit, mud and wetness from being tracked into corridors of public structures, office buildings, schools and the like. Grit, rain, snow and slush drop through the open-mesh grating to receptacles below which can then be flushed into sewers. Thus a clean entrance is always assured, and the cleanliness of the interior is in turn preserved.

Capital Building, Waikiki, Oahu, Hawaii
Wimberley and Cook, Architects
Beauty and utility are combined in the balcony railing around the second floor of this new office and retail store building through the use of IRVICO type AA.

Consult local classified telephone directory in principal cities for nearest Irving Sales Engineer (or request AIA No. 14P20 directly).
Although **Mies van der Rohe**, 72, is probably best known for his crisp, ramrod architecture, he is also revered as a teacher. At the end of the recent school year, however, the Illinois Institute of Technology, where Mies has taught architecture for 20 years as director of the school's Department of Architecture, announced Mies's retirement.

Mies leaves IIT with more than fond memories. He has designed all the new buildings on the Institute's 110-acre campus on Chicago's South Side (Forum, November 1952). And he has been a magnet for architectural students from all over the world.

Mies will continue to work and live in Chicago, even though his academic career has run its course. He plans now to devote more time to his own office, where he is working, among other things, on urban renewal apartments for Newark, New Jersey, Brooklyn, and Manhattan, a rum-makers' headquarters in Cuba, and a U.S. consulate in Sao Paulo, Brazil.

**WOMEN ARCHITECTS MEET**

About a week before the American Institute of Architects held its annual convention, another distinguished architectural group met in conclave. The Association of Women in Architecture, meeting in Los Angeles, heard a keynote address from **Rita Lawrence**, artist and pottery designer, who said: "Women's prime attributes of greater sensitivity, understanding, and emphasis upon the human element is of inestimable value in a man's world of competitiveness and aggression."

New officers of the association, elected for two-year terms, are: **Mary Jane Fournier** of St. Louis, president; **Doris Danna**, vice president; **Jane Godfrey**, secretary, and **Barbara Uthe**, treasurer.

**STEINMAN'S BRIDGES**

David B. Steinman, 72, builder of some 400 bridges around the world, took time from designing a bridge to span Turkey's Bosporus to watch the dedication of his most ambitious effort so far—the 5-mile-long, $100-million Mackinac Straits Bridge, the longest and most expensive suspension bridge in the world. Although the bridge was first opened to traffic last fall, its dedication was held off until the start of the tourist season, with its influx of vacationers into Michigan's Upper Peninsula.

For Steinman, it was a significant event, a triumph for his theories of building "rigid" suspension spans instead of "flexible" spans, such as had been advocated by other engineers for years. (The flexible idea suffered a major setback in 1940, when the bridge spanning the Tacoma, Washington, Narrows twisted and vibrated to destruction in a windstorm.)

Recently Steinman, who directs the building of some $2 million of bridges a year from his Manhattan headquarters, has spent most of his time designing the Bosporus span which would have a 2,214 foot center span, sixth largest suspension span in the world. (First is Golden Gate Bridge, with a center span of 4,200 feet. Mackinac Bridge has a center suspension span of only 3,800 feet, but gains its title as the world's longest over-all span by reason of the long reach of roadways on either side of the suspension section.)

Steinman still has bridge-builder's dreams, and would eclipse all his previous efforts with a plan to bridge the Strait of Messina, between Italy and Sicily, with a bridge having a 5,000 foot center span. So far, this is just in the talking stage, but Steinman, who already has seen many dreams materialize, hopes to see it built.

**CURTAIN WALL WINS IN PHILLY**

Last month, Forum reported that Philadelphia architects were renewing their pressures to get a bill passed by the City Council that would allow them to join
building design changes...

1935: Building Number 8
Gulf Research & Development Company,
Harmarville, Pa.

1957:
Production Research Building
Gulf Research & Development Company,
Harmarville, Pa.
Engineers & Constructors: Wigton-Abbott Corporation,
Plainfield, N. J.

but

KOPPERS COAL-TAR PITCH
is still the preferred roofing material

The buildings at Gulf’s Research laboratories trace in their design the architectural trends since the establishment of this activity in 1935. Building 8 is one of three original structures; the latest addition to Gulf’s extensive research facilities is the Production Research building, designed by Wigton-Abbott and now nearing completion. Both have one thing in common: they are protected with 20-year Bonded Koppers Coal-Tar Pitch Built-Up Roofing.

All the flat-roofed buildings at Gulf’s modern research center are covered with Koppers Bonded Roofing, including the new, staff-designed Nuclear Science building and the Automotive Products laboratory, widely acclaimed as a model of its type.

Proved protective ability is a prerequisite in the selection of a roofing material for research buildings housing expensive equipment. That’s why Gulf and its architects specified coal-tar pitch. And the excellent service record of the Koppers Roof on Building 8 during, and beyond, its 20-year bond period is typical of the long-lasting, trouble-free protection which only coal-tar pitch, with its unique waterproofing and “cold-flow” properties, can give.

Recommend Koppers Coal-Tar Pitch, the quality roofing material, to safeguard your client’s investment. You’ll find helpful specification information in our Sweet’s Architectural File 12-B, 8a/Ko. The Koppers representative in your area can provide additional data and render valuable service. Koppers Company, Inc., Tar Products Division, Pittsburgh 19, Pa. District Offices: Boston, Chicago, Los Angeles, New York, Pittsburgh, and Woodward, Ala.
People
cont'd
most of the U.S. in the use of curtain walls. The bill would permit use of metal panels without excessive masonry backup for exterior nonbearing walls. Such a bill had been bottled up in a special council committee for two years, largely, it seemed, through the delaying efforts of Brick Contractor John B. Kelly. The situation was sharpened by the announcement that Sylvester J. Lowery would build a $20 million, 30-story apartment building in Penn Center of curtain-wall construction. But Lowery was stymied until the City Council saw fit to act.

Late in June, the council did act. By a 15 to 2 vote, it passed the bill allowing curtain-wall construction (without a four-hour fire-resistant masonry wall backing up the panels).

Lowery himself says: "I was tremendously pleased. Now we won't have to stick to Model-T architecture in the city. We'll be free to choose the best designs. I hope to be the first to use panel wall in Philadelphia." Lowery estimates that construction will start sometime in October, and three to four months will be cut from construction time by use of panel walls instead of masonry.

WAGNER PICKS REALTY CHIEF

New York City's Bureau of Real Estate is slowly digging its way out of the scandals that have smothered it since early this year (Forum, March 1958). Last month, Mayor Robert F. Wagner announced that he had finally come up with a man to replace Percy Gale Jr. as head of the bureau. The Mayor's choice: Bronx Real Estate Executive J. Clarence Davies Jr., 46, chairman of the nonprofit, private Citizens Housing & Planning Council, and president of the Bronx Real Estate Board. Davies will work temporarily with City Planning Commission Chairman James Felt, who has been acting director.

PASS THE MILTOWN, SALVADOR

Visitors to the annual convention of the American Medical Association in San Francisco a few weeks ago were startled by one of the exhibits—a 60-foot-long, parachute-silk-covered caterpillar-shaped structure that undulated like the pickup bag on mother's old-fashioned vacuum cleaner. At each end of the caterpillar, two 6-foot-high butterflies seemed to be struggling to escape. Spectators could walk through the caterpillar, and be dazzled by huge paintings showing butterflies flapping across wastelands studded with flying trees and human forms minus large chunks of their midsections.

The exhibit was the work of Surrealist Artist Salvador Dali, who was commissioned by Wallace Laboratories, manufacturers of a tranquilizer drug called Miltown, to formulate a "visualization of the transition from mental turmoil to tranquility." Dali's answer was the caterpillar, called "Crisalida," which Dali has called "a new form of my cosmogony." Dali points out that "The outer structure of Miltown is that of a chrysalis, maximum symbol of the 'vital nirvana' which paves the way for the dazzling dawn of the butterfly, in its turn the symbol of the human soul."

Wallace Labs paid the Spanish-born surrealist $35,000 for designing the undulating chrysalis, and the complete cost of the structure was $100,000.

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<tr>
<th>FORM</th>
<th>56,360</th>
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<td>42,460</td>
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<tr>
<td>RECORD</td>
<td>35,670</td>
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Above: Mahon Stainless Steel Curtain Walls employed in the construction of the EDISON JUNIOR HIGH SCHOOL, West Mifflin Boro, Pennsylvania. Lamont H. Button and Paul F. McLean, Architects. Nicholas Lo Dienne, General Contractor. Below: UNION PACIFIC RAILROAD'S NEW DIESEL LOCOMOTIVE REPAIR SHOP at Salt Lake City, Utah. Walls of this modern building were constructed with Mahon Prefabricated Aluminum Wall Panels.

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Warren H. Ashley, Architect
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This photograph, made with natural lighting, makes an interesting demonstration of the value of large glass wall areas in schoolrooms.

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Fees... squares... marbles

ARCHITECTS' PAY

Forum:
Your article on architects' fees (FORUM, June 1958) is excellent. I found the historical background of the development of the percentage fee system very interesting. I believe that the fixed percentage fee for architectural services is obsolete. One of the major shortcomings of the lump-sum percentage fee is the layman's belief that the full percentage fee is retained by the architect personally, whereas it includes all his costs as well. I have changed my method of charging to a fee-plus-cost.

ERNEST J. KUMP
The Office of Ernest J. Kump, architects
Palo Alto, Calif.

Forum:
I have read your article "How much should architects be paid" with great interest and have considered the suggestions some architects have proposed for a new fee structure. I feel that a fee expressed as a cost per square foot more clearly rewards the architect for the services he has rendered. The most important part of this method would be the better public relations it would engender. Because the architect's fee would not be directly associated with the cost of the building he would not be suspected of having "padded" the building to increase his fees.

LOUIS J. DRAKOS, architect
West Hartford, Conn.

Forum:
We agree that there are many advantages in the method of doing preliminaries on a cost-plus basis and then doing working drawings for either a percentage fee or a lump-sum fee. We have used this method in commercial work where the final scope of the project may only be established after considerable architectural and economic analysis has been made. In such situations, we find that businessmen are prompt to recognize the reasonableness of this procedure for setting fees.

ROBERT ANSHEN
Anshen & Allen, architects
San Francisco, Calif.

Forum:
We make every effort to put all our preliminary work on a cost-plus basis, the working drawings and supervision to be negotiated for a fixed fee. Under this arrangement we charge for principals' time at a rate which is less than would be charged for consultation work. This justifies the overhead and "profit" on principals' salary at this preliminary stage.

We are constantly concerned with the special services asked of principals, strictly outside contractual demands, such as help in fund raising or furnishing. We feel strongly that these services should be separately charged for and that clients should be forewarned of this possibility.

ALEXANDER S. COCHRAN
Cochran, Stephenson & Wing, architects
Baltimore, Md.

Forum:
I found your article on fees so interesting that I thought that a comment might be helpful.
We have thought up a variation of the fee arrangement you credited to Robert Cutler of Skidmore, Owings & Merrill. We, too, find that the preliminary work on a development frequently gives us trouble out of proportion to the total fee and have suggested to some clients that this part of the work be done on a payroll basis and that the remainder of the work be based on three forths of the normal fee.

If the client makes his mind up promptly and does not require changes, it is conceivable that, even on a complex assignment, the preliminary work to be done by the architect can be covered by something slightly less than 25 per cent of the normal fee. However, if, as so often happens when dealing with a large board of directors, the preliminaries get pushed around a great deal, the cost to the architect can be several times the sum normally allocated to it.

Our method of charging gives the client the advantage of coming out better than even, but also protects the architect against the other probability.

GEORGE F. HELLMUTH
Hellmuth, Obata & Kassabaum, Inc., architects
St. Louis, Mo.

SQUARE WORTH SAVING

Forum:
We are pleased to see Washington Square included among the architectural examples which the FORUM would like to see preserved ("Architecture worth saving," FORUM, June 1958.)

Of course, the fact that we can point out a square worth saving is not the only criterion. Continued on page 58
with pride to the FORUM article is of tremendous help to us at this juncture in our campaign to preserve Manhattan’s Washington Square. That Forum has provided us with support pretty well demolishes Commissioner Moses’ reference to the Citizens Group to Save the Square as “an unreasonable opposition.”

MARIE CONKLIN, executive director
Joint Emergency Committee to Close Washington Square Park to Traffic
New York, N. Y.

NONPOROUS MARBLE

Forum:
We would like to call your attention to misuse of the word “porous” to describe marble in the product review of Tri-Seal marble spray (Forum, June 1948). As you probably know, marble is not a “porous” material. Actually it is one of the least absorptive of building materials, having an absorption characteristic of less than ½ of 1 per cent.

JOSEPH P. MOORE, president
Moore & Co., Inc.
Stamford, Conn.

BUILDING SCIENCE

Forum:
One of the most stimulating articles that I have recently read is your article entitled “Needed: a building science” in the May issue of Forum.

Unfortunately while it is true that manufacturers have been very prolific in putting new products on the market, it is equally true, for the most part, that these new products have been developed without real knowledge of end-use performance requirements—the type of requirements that can be established only through sound basic research. As a result the building industry is failing to provide the type of environment for living of which it should be capable.

On the one hand architects spend a disproportionate amount of time attempting to appeal to the sense of sight to the neglect of the other senses which stimulate and motivate human beings. Heat, light, and sound considerations, for example, are often given only very superficial thought. Since architects have the responsibility for designing our living enclosures it would seem that they should in some way also have the responsibility for determining more about what it is they are trying to design. There would today seem to be a preoccupation with novelty, shapes, and materials without understanding what they accomplish.

On the other hand, we have a number of basic material producers who in a number of instances are doing a creditable job
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July issue of "THE FORUM"

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of basic research but who are doing the basic research primarily to learn more about the properties of the basic materials so that more and more products can be made from their materials. Undoubtedly this has resulted in some high quality products but it has many times resulted in serious misapplication of materials. The material producers are actually confronted with the same problem that confronts the architect—an insufficient knowledge of the end result that should be achieved.

J. M. ROEHM, director of research and development
Kawneer Co.
Niles, Mich.

ADDENDUM: GUAM

Forum:

To supplement your article on our fee problem with Guam (FORUM, May 1958), let me add that: 1) We have never sought to sue Guam—we have tried repeatedly to negotiate our differences, and we are advised that removing the impediment to suit may pave the way for amicable negotiation. 2) Committees on Interior and Insular affairs of both the Senate and House wish to correct faulty legislation which uniquely keeps Guam immune from suit—not for our private benefit, but in the public interest. 3) We have had the finest relationship possible sustained over years, and have the highest regard for the Guam legislature, which has surely done its best to conduct business fairly; it passed a bill at the last session submitting themselves to suit, but the governor "pocket-vetoed" it.

ROBERT E. ALEXANDER, architect
Richard J. Neutra and Robert E. Alexander
Los Angeles, Calif.
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Beams and girders are prestressed
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Architectural Forum / August 1958
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America is the land where fashions swing en masse, and if this is true of the sack dress and the elongated automobile, why should it not be true of architecture? This year the fashion seems to run to the arabesque screen wall, the pierced grille, the peek-a-boo, which is made of concrete block precast, or of scroll-sawed wood, or wrought iron or brick or sewer tile or cut-off metal tubing. Architect Edward D. Stone has made beautiful buildings with some of these, but must this style be quite so universal?

A couple of months ago, FORUM remarked on the fact that "ornament rides again," but we took note of other wall ideas besides the screen. On page 94, the Gallery shows some of these rich possibilities. Sculptor Henry Moore turns out to be a fine carver of brick for modeled walls, and Sculptor Tino Nivola does a fine job of modeling figures in sand which are then tilted to stand vertically. Mosaics are a more familiar idea, but none the worse for that, in the hands of the right man—or the right woman.

And the new decorative possibilities go beyond walls. In Yamasaki's conference building for Wayne University (page 78) and Rudolph's projected office building (page 110) for the Blue Cross in Boston, the decorative character gets into the very bones of the buildings, their columns and floor beams. This is a quite romantic approach to modern architecture, and on page 104 there is a discussion of the way it fits with the attitudes of the public.

To return to those screens: one reason why ornamental architecture went out of style for about thirty years, except in the hands of Frank Lloyd Wright, was that ornamental themes, when repeated mechanically over and over again, became so quickly obsolescent. The recurrence of lace panties even on the tennis court depends for effect on being intermittent. Buildings always wrapped in lace can become monotonous even faster than the dull nudities of speculative office buildings. To use the vernacular, how about curtains for screens for a while, except in selected places where surprised delight will greet them?

Better statistics

A top-level group of U.S. business, farm, labor, and research organizations recently suggested a beautifully simple way for the federal government to improve the calibre and usefulness of its statistical gathering program. In a letter to President Eisenhower the Federal
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Editorial continued

Statistics Users' Conference pointed out that while government fact-seekers now amass a vast amount of statistical data on past economic activity, and some information about present production, spending, etc., they collect virtually no data on the future spending intentions of government agencies, and private groups, or individuals. In the absence of such expressions of intent, says FSUC, economic forecasters must rely almost entirely on statistics about the past and present in making their predictions—with predictably uncertain results.

Obviously, no statistics on future intentions can match the accuracy of statistics that measure past activity—in the building field or anywhere else. Yet private surveys of spending intentions (e.g., such as those conducted by FORTUNE magazine) have proved to be valuable adjuncts to the increasingly pertinent art of economic forecasting. If such private surveys were to be supplemented with government data on spending expectations, says FSUC, short-range economic forecasts—including building forecasts—would be immeasurably improved.

The Statistics Users Conference suggests three specific series of data, which would go far toward improving forecasts of building activity. It proposes that the federal government simply add a few questions to its present survey programs in order to obtain: 1) quarterly estimates of the planned outlays for public works and defense by federal agencies; 2) a similar quarterly survey of anticipated spending by states and municipalities; and 3) monthly reports from contractors of their anticipated expenditures and expected housing starts.

FORUM has long argued that the available statistical data on construction activity and building prospects are woefully weak, particularly as a basis for measuring short-range building prospects. To be sure, forecasting, in a free society, will always be a precarious business at best, but the FSUC proposal, if adopted, would at least have the virtue of using first-hand information to help uncloud the forecaster's crystal balls.

A fallow field

Economic historians will surely record the fact that the robust health of U.S. building during the 1957-1958 business recession was one of the economy's major underlying strengths. Even at the recession's low point, which occurred along about April 1958, $3.7 billion worth of building was put in place in the U.S. And in May 1958, according to the F. W. Dodge report, the country's greatest monthly volume of construction contract awards ($3.4 billion) was recorded. In the building industry, certainly, it was hard to realize that there was a serious recession. And now building is on the upswing again.

But there is one important building field that is still lying fallow—or very nearly so. Urban renewal, despite a great deal of talk, and the standing offer of federal subsidies, remains an empty phrase. In the nine years since Title I of the 1949 Housing Act went into effect, only ten urban renewal projects have been completed. Builders, by and large, have shown little appetite for getting into the potentially profitable business of cleaning up the slum-ridden, traffic-clogged cities.

Red tape is partly to blame. And so is the industry's congenital mistrust of new pursuits. But the main trouble is the lack of political and citizen leadership at the local level. Someone has to take the initiative to get a renewal program started and, so far, too few city dwellers have been willing to do so.

Fortunately, there are scattered indications that more citizens are coming to realize the urgency of city renewal. Last May, for example, the influential Committee for Economic Development announced that its major subject of study this year would be area development. And in New York last month, two civic groups got together to form the Downtown-Lower Manhattan Association, which will spur the revival of that congested area. Leadership of this sort is encouraging. But a great deal more of it will be needed before our cities can become decent places in which to work and live. END
Lincoln Center: “a new kind of institution”

Here is an interim report on the most ambitious cultural center ever planned: Lincoln Center for the Performing Arts. Curtain time: 1961.

In spite of his many talents, John D. Rockefeller 3rd will probably never equal P. T. Barnum or the late Mike Todd as a theatrical impresario. Certainly if either of those gentlemen had been promoting the $75 million Lincoln Center for the Performing Arts, Inc. in Manhattan (of which Rockefeller is president) they would surely have come up with a more exciting description of the project than his recent phrase that it is “a new kind of institution.” On the other hand, neither Barnum nor Todd could have outperformed Rockefeller and his associates in the maze of fund raising, urban renewal negotiations, and planning operations they have undertaken over the past three years. Their goal: construction of the most concentrated, and expensive complex of cultural facilities in the world.

The $75 million Lincoln Center, which will be the heart of the $205 million Lincoln Square redevelopment project, envisions $51 million of new buildings, $14.5 million to be spent on scholarships, new productions, and special projects, and containing, demolition, and contingencies. The Center will bring together three world-renowned institutions: the Metropolitan Opera, the Philharmonic-Symphony Society of New York,
Lincoln Center will replace three blocks of West-Side slums that now lie between Central Park (bottom) and the Hudson River.

and the Juilliard School of Music.
Perhaps the most revealing indication of the broad-scale thinking behind Lincoln Center, however, are the other facilities planned. The Lincoln Center board also plans to erect a theater for the dance and operetta, a repertory drama theater, a library-museum of the performing arts, and a hall for chamber music and recitals. It hopes, moreover, to encourage the formation of completely new performing groups in these latter fields to match the Met as an opera company and the Philharmonic as a symphony orchestra. Already at work at this task are two advisory councils—one for a school and performing company of the dance under the temporary chairmanship of Dean George D. Stoddard of New York University; the other a council on drama which has as a special consultant, Broadway Producer Robert Whitehead.

No "Aida"

Today, the section around Lincoln Square, just off Broadway between West 62nd and West 66th Streets, in Manhattan, looks somewhat like the shabbier sections of Paris. But the image the planners cherish for the future (see drawing above) is that of a paved plaza fitted with fountains and sculpture—and, hopefully, outdoor cafés. At the head of the plaza will be the 3,800-seat opera house; on either side, the 2,400-seat concert hall, and the 2,200-seat theater for dance and operetta. To the left of the opera house behind the theater for dance and operetta will be a city park. To the right, an esplanade will connect the larger plaza to a smaller court across 65th Street. Here, raised above a row of shops facing Broadway, will be the library-museum, the dormitories for Juilliard and a restaurant. Next to the opera house on this side will be the Juilliard school buildings and a 1,200-seat repertory drama theater.
With this vision before them, the organizations participating in the project are planning banner seasons for the year when they move into their new homes—hopefully beginning in 1961. The Met, for example, will use the $4-$5 million of funds it will derive from the sale of its present building at 39th Street and Broadway to mount new productions and for the start of a much-needed endowment fund.

Juilliard, meanwhile, plans to transform itself from a 1,200-student school of music into a 500-600-student advanced professional school of all the performing arts—dance, drama, and music. With its own 1,000-seat auditorium, Juilliard will be able to push the frontiers of these arts as only a school can. “You can be sure,” says Juilliard President William Schuman (a noted contemporary composer), “that we will not inaugurate our auditorium with a performance of Aida.”

Last month, with nearly half of its $75 million campaign fund in hand (a $5 million contribution from Rockefeller's father, John D. Jr., brought it to this point), with the patient prodding of Construction Director Otto L. Nelson Jr. of New York Life (Forum, June 1958) paying off in rapidly maturing construction plans, and with relocation of the nearly 1,500 families living on the site well underway, Lincoln Center seemed safely past the dream stage.

But as Wallace K. Harrison, the coordinating architect of the Center and the architect of the opera house, points out, this does not mean that much is settled yet about the buildings themselves beyond their disposition on the site. The basic decisions to date have been taken in such mundane areas as the planning of the backstage of the Met and the layout of the underground system of garages, concourses, and taxi ramps which will link the buildings.

Harrison, a past master at coordinating great schemes (in addition to coordinating the planning of Rockefeller Center, his experience includes the United Nations complex and Idlewild airport) decided with the board that the best results would be obtained if each building in the Center was in the separate charge of an independent architect. Therefore, while he is planning the opera house, his partner, Max Abramovitz, will be architect of the concert hall. The theater for dance and operetta has been given to Philip Johnson, the Juilliard commission to Pietro Belluschi. Architects for the other buildings have not yet been selected.

**Old opera hand**

Harrison is probably the most experienced opera-house architect in the U.S.—even though he has never built one. As he puts it: “I’ve been working on an opera house for nearly 30 years.” The reference is to his work on Rockefeller Center, which was originally planned as an opera house. When the depression buried
The board, however, turned up discouraging evidence that a privately supported organization like the Met (the U.S. is virtually the only country whose government does not subsidize the performing arts) could not afford to buy enough land for a new house, even if an adequate site in a good location could be assembled. The only hope seemed to lie in a provision of the National Housing Act of 1949, which provided for so-called Title I urban renewal projects.

In 1951, New York's many-hatted Robert Moses, chairman of the city's Slum Clearance Committee, offered the Met a part of the New York Coliseum site at Columbus Circle. But just when the Met board had the necessary $1.2 million pledged to purchase the site, Moses withdrew his offer. Main reason: failure of the contemplated plan to meet the urban renewal law at that time.

When another opportunity arose to participate in an urban renewal project in 1954, the Met was ready. And this time, the New York Philharmonic Society, with its lease on venerable Carnegie Hall nearing expiration and Juilliard, which was planning an expanded curriculum, immediately joined with the opera group to propose a complete cultural center for the performing arts.

**Markups and cutbacks**

The New York Slum Clearance Committee's plan for the Lincoln Square redevelopment project embraced 18 blocks of squalid westside slum territory stretching from Columbus Circle to West 70th Street.

The area was tentatively allocated to three primary developers. Fordham University got the two southernmost blocks for an 8,000-student campus of law, commerce, education, and social service. (Architects: Voorhees, Walker, Smith & Smith.) The Lincoln Center for the Performing Arts was allocated three blocks fronting on Broadway. The northern 13 blocks were allocated to residential housing and commercial use. Originally, a parcel of Broadway commercial frontage north of Lincoln Center was set aside for Developer Roger Stevens, who planned a group of five legitimate theaters for the site.

In May 1955, the U.S. Housing and Home Finance Agency set aside $10 million for the Lincoln Square project, but as the plan developed, it was obvious that the federal subsidy (under the urban renewal law the federal government pays two-thirds of the write-down on the land, the city one-third) would be considerably more. Consequently, in October 1956, HHFA approved the request of the Slum Clearance Committee for an increase in the federal grant to $24.6 million.

In January 1957, the city finally requested $34 million of federal help, but this time HHFA balked. The commercial segment, including that Stevens' theater project, was then eliminated, and the HHFA set aside $26.2 million for the revised Lincoln Square project. The city's one-third share thus stands at $13.1 million, more than $7 million of which will be paid out in the form of city-provided improvements to the area such as street widenings, parks, and the construction of a municipal garage under the Lincoln Center plaza. The balance will come in the form of cash.

Meanwhile, the Lincoln Center planners had discovered that the three-block area allocated to them (actually 2 1/4 blocks, or 8 acres, after the public park area is subtracted) would be too small for the facilities planned. Since it was impossible to use any part of the park site for the Center development (Moses plans to build a band shell there), Lincoln Center could only expand to the north of the allocated site, where a half-block was available. Although details of the acquisition must still be worked out, HHFA has set aside money for advance

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**continued on page 158**

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By combining the richness of historic art with the technology of modern architecture, Minoru Yamasaki has given Detroit’s Wayne University a conference center of extraordinary beauty.

Yamasaki’s serene campus center

Mirrored in its reflecting pool, the conference center is a palace of subtle colors and rich materials. The central hall (see plan, above), clearly visible from outside, is topped by gleaming crystal diamonds. The wings of travertine marble extend along the pool’s mankato stone wall.

The newly completed McGregor Memorial Conference Center on Wayne University’s mid-Detroit campus manages, despite its serious academic function, to look as graceful and sun-filled as a dream palace. The center is to serve as an on-campus meeting place both for university students and for local civic groups. It might easily have been a sober, stodgy building, but by a happy meeting of several liberal minds and an outstanding talent, style carried the day.

Architect Minoru Yamasaki (see page 84) was able to design into the center some of the visual delight remembered from his recent travels abroad: the distinctive, sharply etched skylight recalls roof profiles of Renaissance palazzos; the pool serves the same reflective purpose as water in Japanese temples; the balance of the building’s mass is coolly classic. Yet the diverse influences assembled here fit together with machineline precision. And, perhaps more important, the design elements are honest expressions of the building’s functional plan and structural system.

Lawyer Cleveland Thurber, chairman of the building committee of the civic-conscious McGregor Fund, which contributed the $1,172,000 for the building’s construction, is sufficiently impressed by the result to be undismayed by the substantial increase over the $800,000 original cost estimate. “By giving us beauty,” he said recently, “Yamasaki gave us the best possible memorial.” Wayne University’s President Clarence B. Hilberry shares Thurber’s appreciation: “It’s the only college building I’ve ever seen that makes people stop and look up. It makes you want to stretch taller.”

The university has already done some stretching. Its enrollment has risen from 10,000 to 20,000 since World War II, and it has signed on Yamasaki to design a master plan for 63 cramped, Detroit acres. The McGregor Conference Center now stands as gleaming, convincing evidence that an urban campus can be the right place for splendor.
A pierced concrete wall separates the conference center from its undistinguished, mid-town neighbors, providing what Yamasaki calls “a politely controlled environment.” Above the wall the west façade presents an exciting composition of slender verticals (marble-faced exterior columns, 10 feet on centers) and zigzag horizontals (the folded concrete ceilings).


Three concrete islands, now landscaped only with potted yews set amid sparkling white marble chips, will eventually contain sculpture, other planting, and objets d’art. The “sculpture garden” makes the tight space between the conference center and neighboring university buildings seem almost spacious (see plan, page 83). The Japanese-style rocks arranged in the pool actually came from an Ohio river bed.
The central hall of columns serves both as a passage through the building and as a lounge for conference-goers. It appears to slice the building into two identical halves, leaving exposed the triangular ends of the V-shaped, concrete ceiling beams. The triangular pattern is repeated in the skylight, whose crisscross ribs reunite the building at the top of the hall. Other unifying visual elements are the green marble-slab bridge that spans the hall at the second floor level and the brilliant, turkey-red carpet. The hall is terminated at either end by a lofty glass cage (detail above) and by handsome doors of heavy, sculpted aluminum (detail below) by Sculptor Lee Du Sell.
Opening onto the hall from the conference rooms on both floors (left) are teak, copper-colored doors. The interior columns are metal-cored, wrapped in fireproofing concrete, and sheathed in beautifully fitted, 2-inch marble panels.

A small conference room looks out through gray glass, floor-to-ceiling windows, and a honeycomb veil of gray aluminum at the suburban Detroit houses across the way. At night (below) the conference center lends a palatial touch to the neighborhood.
The large conference room (right) easily seats 250, takes full advantage of the 15 foot height and 40 foot clear span of the ceiling. Its roominess (note the folding partition) was the basic specification from which Yamasaki began working. In the rear wall is a door to the small pantry.

A new master plan will spread beauty across the campus.

The master plan sketch (above) and a model of one segment (right) show Yamasaki's proposed education building (1) placed across Second Boulevard from the conference center (2). The education building, built of three-story-high concrete "trees," succeeds in carrying Yamasaki's decorativeness into structural prefabrication. Together, the education building and the conference center comprise a new architectural group that will set the general pattern for further campus development. Outstanding U.S. architects will be invited to design the new buildings, adhering to the established principles of controlled environment, careful land use, and architectural imagination.
As typically American as the big Chrysler he drives, Detroit's Minoru Yamasaki nevertheless draws artistic inspiration from another heritage.

Just as the dedication of Wayne University's McGregor Memorial Conference Center droned to an end, the presiding speaker announced: "There is of course no need to introduce you to the man whose genius you have felt all around you today: Mr. Yamasaki!" Architect Yamasaki rose warily, tucking his black tie into his blue cord suit, was startled to see the entire audience rising with him. He then received one of the longest and most deserved rounds of applause ever given to modern architecture on a university campus.

Both for wiry (5 feet, 5½ inches, 130 pounds) Minoru Yamasaki and for the profession of U.S. architecture the big hand was important. To him personally it proved that his recent and profound reappraisal of 46 years of life and 20 years of practice had received critical support. To the profession generally the applause and other signs across the country indicated that a structurally obvious, technologically advanced, but decoratively rich architectural style had succeeded in winning the hearts and treasuries of American building clients.

"It makes me real sick when I walk into a building that isn't true to its original concept," says Yamasaki. And he says it with the confidence of the man who has, at length, found out what is true in his own life. Sitting with his family on the terrace of their handsomely remodeled, 130-year-old farmhouse 15 suburban miles from Detroit, Yamasaki looks as deceptively serene as a sunning panther.

American architect Yamasaki
He has even built a small office beside his home where he hopes to spend a contemplative morning every day of the working week from now on.

His mother and father have come East from Seattle to round out the comfortable home; his family and the poolside good things of American life seem much nearer to his heart than business. But to see in Yamasaki only the comfortable architect who has arrived would be a mistake. For despite his outward serenity, he is still very much interested in controlling the big (30 architects) architectural firm of Yamasaki, Leinweber & Associates as tautly as ever.

A childhood memory of Seattle during the twenties is Yamasaki's mother coming home in tears from an incident on the local bus. A ma­tron had moved from her seat beside Mrs. Yamasaki to sit next to a dirty, snoring—but undeniably white—migrant worker. The fact that the same thing had happened the week before and would surely happen soon again made it only more frightening.

**From salmon to serenity**

Yamasaki's school-age summers were spent in Alaska. With other Seattle-born, Japanese-descended boys of his neighborhood Yamasaki was shipped off for two months to the canneries of the North. His reward: $50 each month, a steady diet of salmon and rice, and a defensive hardening of his body and sensibilities.

But life had a number of compensations. Chief among them was the knowledge that he was going to be an architect. This decision had been quickly made when his archi­tect uncle stopped off at Seattle on a trip to Washington, D. C. from his practice in Japan to bid on the projected U.S. Embassy in Tokyo. He took time to show his drawings to a wide-eyed, teen-aged nephew. A youthful resolve was formed then that, unlike most, lasted to maturity.

As soon as Yamasaki was able to get his architectural degree from the University of Washington, he headed East, away from prejudice, toward a career. But he found that New York in 1935 was "a city of unemployed geniuses," that he could only get a job in a Japanese importing firm wrapping dishes. "I was real good at wrapping," he recalls with a smile that suddenly lights all his reflective face; "a lot better at wrapping than at book­keeping, where I was a total failure." During a week's vacation he volunteered at the office of Francis Keally to help with competition designs for the Oregon State Cap­ital. When the firm won the competition, Yamasaki found himself with a job as a working architect.

From there he played the shifting, jumping, part-time teaching and sometime studying game that the depression and the marginal profes­sion of architecture called for, getting to know most of the young architects and designers who are now in charge of the firms through which they passed with such rapidity. And somehow he also found time to woo and win a wonderfully talented nisei girl who had come East to study piano. They were married two days before World War II broke out.

George Nelson, one of Yamasaki's closest friends and a leading New York architect and industrial designer, remembers a pivotal incident. Yamasaki was with Raymond Loewy at the time, but the two friends were looking for jobs together on the side. Nelson found a client who wanted to remodel a brownstone. As Nelson recalls: "When we were supposed to go up and see him, Yama thought I should go alone. It was wartime and Yama thought the guy might be 'sensitive' about the Japanese angle. I said, 'Yama, if he is, we don't take the job.' I don't think Yama's ever forgotten it."

He has not. But neither did Yamasaki in those difficult years forget what he wanted even more than jobs or reassurance. He frankly wanted to be an outstanding American architect. And when an invitation came in 1945 for him to become design chief at Smith, Hinchman & Grylls in Detroit, he worried briefly about his lack of experience in a large architectural office (S. H. & G. was a booming office of 600 men), considered more important the fact that Detroit was in the industrial heartland of the country, and left New York as soon as it could be arranged.

"Yama has never lacked professional confidence," Nelson and other friends explain, "but there was a remembered inferiority that had to be purged." It stayed with him at S. H. & G. through his many standard jobs and occasional opportunities to show his virtuosity (the most notable opportunity being Detroit's miesian Federal Reserve Bank Annex, FORUM, March 1950). The inferiority stayed with him during the formation of his first partnership, Hellmuth, Yamasaki & Leinweber. It was still there after the critics had praised his St. Louis Airport (FORUM, May 1956). And it was doubtless the major reason, along with the rapid pace he had been setting himself, for his nearly fatal ulcer attack in 1954.

But that did the trick. As Yama­saki puts it: "I hadn't been able to order my life. I felt that something was missing and that I had to keep running after it. But look: everyone has a complex. It took the ulcer to show me what mine was—that I was Japanese."

**From Kobe to Athens**

By one of fate's happy tricks, the U.S. State Department intervened at this point, asking Yamasaki if he would be interested in trying a design for the American Consulate General's office and staff quarters at Kobe, Japan. He would indeed. And in the execution of that commission he not only designed the best official U.S. building in Japan since his uncle's Embassy (FORUM, Feb. 1958), continued on page 166
Housing for the independent aged

The elderly need housing in the normal community far more than peace, quiet, and a beautiful view.

BY JANE JACOBS

One of every 12 Americans living today is at least 65 years old—the age at which a person statistically becomes elderly. As the number of elderly grows from 15 million to an estimated 21 million by 1975—perhaps to far more when cancer and heart disease are controlled—the problem will be to help the aged stay active, healthy, capable, and interested in life, and to spare them from strictly custodial institutions. Aside from the obvious human reasons for such a goal, the local tax burden for avoidable custodial care could become appalling as the number of aged increases.

And how well the independent aged get along will be influenced greatly by four factors, all having to do with their housing: 1) how their housing is designed, 2) how well it fills the most obvious gaps in the current supply, 3) where it is located, and 4) what services are knit in with it.

Good planning for the elderly is far removed from the old aim of providing protective havens with a beautiful view. Today, the elderly have quite different plans of their own. For the medical revolution that has made life beyond 65 a commonplace has been accompanied by a social revolution—the unprecedented independence of the elderly in American life. More than 70 per cent of the elderly maintain their own households, mostly as single or two-person families; two-thirds of these own their homes, one-third rent. Even among those receiving public old-age assistance, two-thirds today maintain their own households. As for the 20 per cent of the elderly who live with relatives and the 5 per cent who are lodgers in others' households, every sampling indicates that a large proportion would eagerly choose to live by themselves if they could afford it.

Less than 5 per cent of the elderly are in institutions—chronic hospitals, nursing homes, and various types of public and private communal living establishments—and the reason the proportion is not larger is that the elderly themselves, as a rule, cling fiercely to independence as long as they can. This instinct is sound, for if one thing is sure among many unknowns of how best to provide for the elderly, it is this: loss of independence and sense of purpose, and withdrawal from the mainstream of life, are the surest prescriptions for inducing senility and deterioration.

Yet the independence of the elderly is, in a sense, illusory and always precarious. For most elderly people there comes a time—it comes in the 60's for some—when they can maintain independence and usefulness only with outside encouragement and help in any of a huge range of practical matters. Among the statistics of tragedy are those indicating that a probable 25 per cent of elderly hospital patients could be discharged and could manage for themselves if only they had apartments where they could get certain relatively inexpensive but crucial services—where, for example, the bathroom is built so it can be used by an old lady with a bad knee.

Design for bathing

In an apartment or house designed for the elderly, the most crucial single feature is the bathroom, mundane as this sounds. Bathrooms are responsible for more difficulties, accidents, and embarrassments to the elderly than any other feature in their homes. Nothing extraordinary has to be done with this room, but it should embody a few essentials: for example it should have clear, wide, straight-line, well-lighted access from the bedroom. Falls at home are the leading cause of accidents among the elderly, and a majority of these falls occur between 10 P.M. and 6 A.M. (For more details, see page 89.)

Aside from improving the bathroom, major design points include: single-level construction if possible, and railings where steps are unavoidable; nonskid floors; no thresholds; low shelving; electric kitchens, large enough for eating space; over-all lighting of higher than usual
intensity; heating designed for 76 degree temperature instead of 68 degree; and plenty of closets. The last point sounds minor, but is not. Parting with possessions and mementos is a tremendous and destructive wrench to elderly people. The one-bedroom apartments in a public housing building for the elderly recently completed in Somerville, Massachusetts, for example, have three closets plus a walk-in storage space, and the housing director reports it is none too much.

Play it down

But special design can be carried too far. A chief fault with much housing specifically designed for the elderly, reports Dr. Wilma Donahue of the University of Michigan, a leading authority on gerontology, is that it overemphasizes the protective devices. Nobody is cheered by being constantly reminded of age and disability, and architects who go ramp-and-rail happy are doing the elderly no service. The less noticeable any special features are, the better. And of course there are many elderly who get along very well, for many years, in ordinary housing.

In spite of the gratifying number of elderly who are making out reasonably well, three major gaps in the supply of housing for the aged remain unfilled.

There are not enough well-located, small houses available for purchase by those whose present homes are burdensome. Among elderly home owners, 29 per cent have houses of six or seven rooms and another 11 per cent have eight rooms or more. FHA in 1956 liberalized its regulations on mortgages and on trade-in down payments for purchasers over 65; it estimates that about 2,500 to 3,000 homes a year are now bought under these provisions. But there is no estimate of how much increase this represents over home purchases by the elderly in previous years. Presumably the gain is not great. One difficulty is that in most metropolitan areas small homes are apt to be located in the kind of mushroom suburb where people are immobilized without cars and nothing whatever is close at hand, neither conveniences,

Two pioneer projects

A high-rise building (above) with 88 units for low-income people, built in Cleveland in 1955, was among the first public housing projects planned for the aged, and it is still one of the best. It is surrounded by low buildings for younger families, adjoins a playground, and has ground-floor club and craft rooms used by elderly people throughout its section of the city. Apartments for couples (which rent for 25 per cent of tenants' income) contain 525 square feet and are convertible to two units for single persons (see plans, right). The project has two drawbacks: doors are too narrow, and passages too circuitous to permit use of a stretcher.

A housing project in Vienna, Austria (below), includes 27 apartments for the elderly (black units on site plan), grouped around their own gardens and surrounded by housing for younger families. The idea is to permit younger residents, as they age, to move to new apartments within the same neighborhood. Planner Albert Mayer stresses the same point for U.S. planning: "In any sizable development, a portion of the housing should almost automatically be designed for the elderly."
services, health care, work, or interests.

There is not enough suitable rental housing close to town, with at least some helpful services, such as housekeeping aid, included. In 1956 FHA liberalized its mortgage regulations on rental housing for the aged sponsored by nonprofit organizations; two such projects have been completed, 24 others are in progress or actively projected, and 30 more are being prepared for FHA application. But FHA liberalization is not enough. Few old people have the cash to pay rents of $90 a month, and the greatest need is for two-and-a-half-room city apartment rental housing close to town, where they already lived, an eighth moved away for other reasons—to be closer to families, return to the home town, or the like. Similarly, before the Upholsterers' Union planned its Florida retirement center, a canvas of its widely scattered membership over the age of 55 showed that only 20 per cent would be interested in moving to Florida; the others said it was a fine idea for someone else but they would stay in Chicago or Milwaukee.

It is much simpler to say where housing for the elderly should not be located; i.e., on a site isolated from a normal community. Unfortunately, just such sites have been standard in the past for "old people's homes" and the stereotype is hard to shake. Even today a discouraging amount of the tribute to progressive thinking on gerontology is only lip service. Consider, for example, a report accompanying a proposed Baptist Church development for the healthy elderly in Georgia. It dwells admirably on the importance of an in-community location: "Generally, old people do not choose to be set apart from the complexities of town life. The opportunity to be with people of all ages, make new friends, partake in civic, political, religious, and cultural activities separate from and in combination with the home programs is an integral part of social living to be participated in as much as possible." But the resulting project? An isolated, rural, "old folks' village."

The isolated institution or "village" tends also, Dr. Wilma Donahue points out, to become far too protective and dictatorial in small ways, to the point where its residents have no real privacy. "Old people want privacy without isolation; they get isolation without privacy instead." On the other hand, in larger matters, the isolated institution tends not to be protective enough. "The second-rate medical care which is almost inevitable in isolated places is very disturbing," Dr. Donahue reports. "It can only be second-rate health care, no matter how carefully it is planned, because not even city hospitals can get enough qualified staff these days."

How intimately to mix old people in the general community is a nice problem. At Cleveland's Cedar
A hotel for the aged

The old Detroiter Hotel in downtown Detroit was renamed Carmel Hall (right) and remodeled into housing for the aged, under sponsorship of the Catholic Church. It is enormously popular, owing largely to its downtown location close to social activities and public transportation. The old people especially like nightlife; some stay out until 1 A.M. Rent and board rates begin at $125 per month. The ground-floor remodeling includes a walled terrace partly covered by the overhang of the chapel above it. The coffee shop (see plan) is a snack facility of a type much used and appreciated by elderly people whenever it is included in housing. Architects, Leo M. Bauer & Associates.

Simple bathroom aids

Bathroom for the elderly in Cleveland project has grab-bars at toilet and an improved type of grab-bar at the tub which gives the user assistance when needed most while climbing in or out. A portion of the more usual wall-fastened grab-bar, with which the tubs are also equipped, shows in the upper right hand corner of the photo. Bathrooms for the elderly should also have doors 3 feet wide for manipulating wheelchairs or crutches, extra-large medicine cabinets, and a call bell near the toilet. In a San Antonio project recently planned, the bell will sound in neighboring apartments instead of in the caretaker's, as an encouragement to the mutual aid found in normal neighborhoods, and a discouragement to unnecessary institutionalization.
Apartments, public housing for the aged is in a high-rise building (see page 87), surrounded by two- and three-story housing for families with school-age children. On the premise that the aged should not be separated even to this extent, four apartments among the twelve on each floor were allocated to families with children under five years of age. Theoretically this makes good sense. But Architects Mayer, Whittlesey & Glass, consultants to the Cleveland Housing Authority on three forthcoming projects which will include buildings for the elderly, report that in practice the high-rise mixture does not work out so well as hoped. The noise and furor of the children within the building irritate some of the old people, and conversely the dominating presence of the aged, in so unnaturally high a proportion, represses the young families. They are too close, particularly in the common balconies and the laundry. The presence of younger families with children in the adjacent buildings works out fine.

Another version of this problem came up in Orange Gardens, an excellent retirement village of 140 homes developed by Dr. George E. Beauchamp, a retired official of the Veterans Administration, as his own retirement project. The development is within the town of Kissimmee, Florida (population 10,000), and a surprising number of young families there wanted to buy Dr. Beauchamp's houses for the elderly. Deciding that the mixture would be an asset to the social atmosphere, Dr. Beauchamp nevertheless managed some separation. Families with children (about 25 per cent of the total) occupy certain streets, families without children are on others. This has worked very successfully. The better the housing for the elderly, the more frequently this question will arise, because houses or apartments well-designed and well-located for the aged are also eminently suitable for young families with a child or two.

Help over the rough spots

The biggest unsolved problem is what kinds of services to provide along with housing, either as general community services for the aged, or adjuncts to public and privately sponsored developments for the aged. Virtually everyone dealing with the elderly is agreed on the results to be aimed at: health and personal security, independent action, social experience and inclusion in a group, useful activity. But how to help the independent elderly over the rough spots, the ones that defeat them prematurely, has had the least investigation and experiment. How important is help with nutrition and how can it be handled best? What combinations of medical help work best? How much difference does a personal physician make, in addition to clinic and hospital care? At what point should old people who are ill be separated from the healthy? How much encouragement should be given to social life, hobbies, volunteer work or sheltered workshop jobs? What combinations of shopping help, housekeeping help, and visiting nurse service can aid independence over a longer period? Where do you draw the line between imperative services and demoralizing overprotection?

There is no end of theorizing on these matters, but very little practical guidance for planners because there has been so little experiment or flexibility in trying such services. And there has been almost no experience at all in providing a wide range of services to meet the wide range of problems affecting any group of independent aged.

The problem of services is, in turn, inseparable from another practical problem for planners: How many elderly households should be grouped together in any one project or development? Many authorities favor 100 old people as a maximum if there is no intermixture of younger families, on the grounds that handling of the individual's problems will be institutionalized in larger, unixed groups. But until there is more experiment in administering for the independent aged, nobody can really know.

These, then, are the most pressing problems for the future. How to design physically good dwellings is only part of the housing problem of the aged; where the dwellings are and what goes with them is of the essence.

Union housing for the aged

Salhaven Village, 15 miles north of Palm Beach, Florida, is the retirement and health resort of the Upholsterers' International Union. Salhaven now has about 30 residents; as more join, new houses and lodges will be added (see site plan, above). Rentals, based on one-quarter of income, average $50 a month for a house (furnished), $35 for a bachelor unit. The medical and convalescent facilities are mainly for younger, employed union members needing health care; a general vacation resort to adjoin the village and a small upholstery plant are also being considered for the future. Owing to racial segregation in most Florida municipalities, this village was built outside corporate town limits. The isolation thus imposed is at least partly countered by the presence of younger union members and the well-staffed and financed general medical facilities.

To the left of the dramatically situated auditorium (photo 1, opposite page) is a screened social center (4) which eventually will be enlarged. All special facilities, such as the medical dining terrace (2) and rehabilitation rooms (3), are used both by permanent residents and visiting union members. Retirement cottages (6) are unusually neat in design, inside (5) and out. Plans shown are for two basic units, to which screened porches, carports or extra rooms can be added. The site plan, in an overdesire to avoid crowding, spreads the cottages out too thinly, making unnecessarily long walking distances. Many residents, still spry, have adopted motorized three-wheelers, originally intended for the staff members. Architect, Rufus Nims. Project manager, Milton Harry. Interior design, Mark Lintner. Structural engineer, Walter Harry of H. J. Ross & Associates. Mechanical engineer, Jerome Curley. Site consultant, Russell Vannest Black.
A committee of experts has come up with an ingenious proposal for encouraging community beauty without impeding design flexibility.

Can civic beauty be legislated?

Hundreds of U.S. communities, over the years, have adopted legislation intended to combat civic ugliness. Yet many U.S. cities and towns continue to grow progressively uglier. Perhaps the truth is that beauty cannot be legislated. But perhaps, too, the ordinances themselves are partly to blame. Often, these laws simply force the community into a strait jacket of stylized design.

Here is a flexible and imaginative plan for encouraging civic beauty. It is excerpted from a recent 160-page report, prepared by a joint committee of the New York Chapters of the American Institute of Architects and the American Institute of Planners, in cooperation with the Regional Plan Association, and entitled, “Planning and Community Appearance.”

There are no formulae, no rigid principles through which beauty can be assured and ugliness banished. This is true of a single building or of a whole neighborhood. An attitude which emphasizes conformity with restrictions can only lead to a dull uniformity based on the “safe” repetition of what is known to be officially acceptable. Yet the appearance of things exposed to the public view remains a matter of important concern to the whole community.

The first faltering steps toward improving community appearance have been made by lay officials with little or no expert advice. It may be revealing of what people seek, however, to consider some of the half-truths which have stimulated communities to enact “architectural” control. For example:

- That copying the styles of buildings designed in the past can substitute for new approaches to a better designed future.
- That the good design of individual buildings, without regard to their placement and surroundings, assures the harmonious appearance of the community as a whole.
- That uniform height, style, setback, or alignment of buildings will automatically result in a beautiful neighborhood.
- That visual order necessarily requires segregating buildings by types or uses.
- That beauty is incompatible with the repetition of forms from building to building.
- That requiring arbitrary variation of exterior details is a cure for the basic monotony of poorly designed housing developments.
- That prohibiting features like billboards, roadside stands, and junk yards is a satisfactory substitute for their careful design and appropriate placement.

Theories such as these arise from real dissatisfaction from the ugliness people see all around them. Misunderstood though the theories may be, the laws based on them do protest against the results of present methods and procedures of community development.

Wanted: positive character

Our central idea about the creation of community beauty is that the approach must be primarily constructive. The community must act affirmatively, through the exercise of its planning powers to enable the designers of structures and spaces to create things that are beautiful. We must release the creative impulse in all our urban designers—in physical planners, artists, architects, landscape architects, engineers; we must not seek primarily to regulate, prohibit, restrict.

The adoption of a community design plan, as a component of the municipality's legally adopted master plan [just as utilities, transportation, land use, parks, and schools are components of the official master plan], is the means by which an over-all community esthetic form may be determined and expressed; and it is the essential community action by which the creativity of individual architects may be released toward achieving individual and group effects of greatest beauty. The design plan should indicate for the various parts of the community the esthetic character which is to be encouraged.
"Wherever street intersections are T-shaped ... the sites thereby given special prominence should be made available for buildings of special purposes and shapes." (Above: Manhattan’s Grand Central terminal.)

We therefore suggest that in each municipality the local planning agency be assigned the responsibility for preparing a plan and a program as an important part of the municipal master plan and its implementation (see box). The plan and program should be improved and amended from time to time, as community development progresses and new esthetic opportunities are perceived. We hold that reasonable measures pursuant to such a plan and program are a proper exercise of the police power in the interest of the general welfare.

Where the eye is caught

The most visually pleasing communities appear to be those in which an underlying and evident geometric order is softened and enlivened through variety among its component parts. While one might base a design plan upon an uncompromising gridiron or a perfect spider-web, a more human ideal might be to introduce meaningful irregularities so as to get as far as possible from rigid geometry without, however, losing the clarifying trace and imprint of an underlying form.

To do this we must treasure natural irregularities of the site: rocky outcroppings, ravines, escarpments. We must preserve and frame the vistas made possible by changes in levels. We must develop lookout places and make them accessible. We must boldly create the lines, textures, spaces, and the landmarks by which pattern is made evident.

Our modern city-building techniques have, on the contrary, been erasing urban landmarks for several generations. We level our hills, dwarf our public buildings with nondescript commercial structures, hide civic halls and even some churches within hotels and office buildings. Zoning further suppresses landmarks. It tends to enforce a uniformity in which each thing is matched in every possible way by its neighbor. As huge a monument as the Empire State tower, though seen easily from 20 miles away, is so forced to the back of its lot by zoning that it fades as a local landmark within a city block or two.

On the other hand, because of its prominent placement, the modest Washington Arch dominates the whole lower end of Fifth Avenue in New York. Similarly, the Washington Monument in Washington, the Arc de Triomphe and Eiffel Tower in Paris, and the domes of the Capitol in Washington and Saint Peter’s in Rome all dominate many areas and views throughout their cities because of their careful placement.

Wherever street intersections are T-shaped or wherever streets and pedestrian ways bend perceptibly, the sites thereby given special prominence should be made available for buildings of special purposes and shapes. Such buildings should not be limited in height or design to the requirements of the adjoining zoning districts. These are the points in the over-all municipal design pattern where contrast rather than conformity is appropriate.

It appears well within the general welfare concept under the police power for special sites of this kind to be earmarked for special buildings even though they involve only a single lot in a given area. Moreover, it would be an appropriate use of the police power to protect such sites and buildings from being

continued on page 162
The glowing window wall of a church in Hem, France (above) by Artists Jean Barillet and Alfred Manessier uses thick chunks of colored glass set in reinforced structural concrete, rather than traditional symbolism, to achieve its religious pertinence.

The abstract shapes (left) that climb the brick façade of the Netherlands' Building Trades headquarters in Rotterdam (below) grew from the imagination of the great British Sculptor Henry Moore. Moore sought a bas-relief pattern that would combine the "physical realities" of the present with the artistic traditions of the past.

On many a brightly colored, strongly patterned wall, these days, a welcome message is being written: modern architecture has made up with modern art. The long period of separation appears to be over. A new period of exuberant association has begun which holds great promise for collaborative works of wit and beauty.

Like the vivid murals of the cavemen and the symbolic wall patterns of the classicists, the walls shown on the following pages introduce to the spaces in which they stand suggestions of human experience and scale. That, perhaps, is the timeless function of art.

But more than any previous walls of history, these strive to be independent, vigorous works of art in themselves. The total wall, not merely the details of it, have received the artist's attention, with the result that function, structure, and scale are highlighted and defined.

By daring to contrast his work against a building's rhythms and textures, the artist has shown that he remains the architect's oldest yet liveliest friend.
Architectural art is now to be found even in such unlikely places as the concourse of a New York City junior high school where Muralist Max Spivak was invited to create a bold, indestructible wall. His arrangement of standard, unglazed tile expresses tile's colorful, two-dimensional properties while admitting its peculiarities (it is difficult to cut on lines other than vertical, horizontal, or diagonal).

Cinder block was the surface Muralist Anton Refregier had to cope with in his design for the Tokeneke elementary school in Darien, Connecticut. He laid out the blocks on the floor of his New York studio, worked colored cement into them to serve as a setting for children’s mosaic materials: marbles, pebbles, sea shells. The numbered blocks were then trucked to the site, and built into a mural-wall.
After Sculptor David Hare had hung his hollow brass forms in the cramped lobby of an office building on Manhattan's Third Avenue, he realized the spatial effect was not what he wanted. To get a greater sense of nature's three dimensions and to make the work an integral part of the wall, he cut gouges 4 inches deep into the plaster.
In suburban Philadelphia, home-owner Mel Richman commissioned Painter Hugh Wiley to design a series of panels on a wall behind the glass front of his modern house in order to show that the wall was there. Wiley emphasized the reality of the wall by making it a tactile experience even for passers-by: latex-based, concrete layers were raked, stippled, and spotted with other materials to give them the desired come-touch-it effect.

Combining his peculiar sculptural medium of sand-molded concrete with the latest curtain-wall construction methods, Sardinia-born Sculptor Constantino Nivola created a façade for Hartford’s Mutual Insurance Company (below) that is one of the most ambitious art walls yet built. Both in size (110 feet long, 30 feet high) and formful inventiveness (right), Nivola’s mural is distinctive and monumental.
One hundred U.S. corporations account for a massive 15 per cent of total U.S. spending for industrial-commercial construction. Here, for the first time, a ranking of the biggest spenders.

Building's biggest customers

The 100 corporations listed on the facing page and overleaf accounted for nearly one-seventh of all the money spent by private business last year for industrial, commercial, and public utility construction. These firms representing a mere two-thousandths of 1 per cent of all the business firms in the U.S., accounted for $1.8 billion of the $12.8 billion spent by U.S. business for construction in 1957. What is more, 42 per cent of all the outlays for private industrial construction last year came from the treasuries of the 71 industrial corporations on the list.

These findings, which measure for the first time the tremendous impact of America's largest firms on construction activity, are drawn from a two-month survey of the 1957 building outlays of 700 of the biggest U.S. industrial corporations, utilities, transportation companies, merchandising firms, insurance companies, and commercial banks. From this group, the 100 companies which spent the most for building last year have been ranked according to the dollar volume of their outlays for construction.*

The directory reveals that these top 100 companies spent $9.5 billion for construction, land, and equipment last year, a whopping 26 per cent of the total capital spending of U.S. business. ($1.8 billion, or 19 per cent of this amount went into buildings.) The directory also shows that:

- Among the 100 corporations, nine spent more than $200 million apiece for buildings, land, and equipment; 13 spent from $100 to $200 million; and 25 spent from $50 to $100 million. Lowest capital outlay on the list: $7.1 million (by Square D Co.).
- Fifteen corporations spent more than $50 million for buildings alone, and 38 others had expenditures of from $10 million to $30 million.
- Of the 71 companies which reported their estimated building outlays for 1958, as well as for 1957, only 12 expect to spend more this year than last. Those planning the biggest increases are Prudential Insurance (up 154 per cent, primarily because of its new 12-building office center in Boston) and Pan American World Airways (up 71 per cent because of new terminal and maintenance-base construction at New York International Airport). Against this, Square D Co. and Whirlpool Corp., which have completed expansion programs, will slash their outlays by 100 per cent. On balance, the survey indicates the building outlays of the 71 companies as a whole will drop 32 per cent to $910 million.

The biggest spender

By far the best single customer that the building industry had last year was American Telephone & Telegraph Co. AT&T's outlay of $215 million for construction (8 per cent of its $2.6 billion capital spending) was almost 70 per cent greater than the $127.3 million spent by second-ranking Ford Motor Co., and more than three times Western Electric's $65.9 million outlay. The fourth largest spender was Kaiser Aluminum & Chemical which spent $65.8 million, followed by General Motors ($55 million).

Nine of the top ten building clients in 1957 were industrial corporations (the only exception: AT&T, a utility). Of the top 25 companies, 21 were industrials (Safeway Stores and Sears, Roebuck, both merchandisers, placed eleventh and sixteenth respectively, and Commonwealth Edison, a utility, was twentieth).

Indeed, industrial companies dominated the entire 100 list. Seventy-

*Not included: ten petroleum companies (which do not segregate their construction outlays), and seven other corporations (U.S. Steel, Bethlehem Steel, International Paper, Inland Steel, Youngstown Sheet & Tube, National Steel, and Metropolitan Life) which did not supply data.

The 100's share

<table>
<thead>
<tr>
<th>TOTAL BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12.8 billion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INDUSTRIAL BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.38 billion or 14%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Building outlays by the 100 largest clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.85 billion or 14.5%</td>
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</table>

<table>
<thead>
<tr>
<th>Building outlays by 71 industrials</th>
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<td>$1.32 billion or 10.7%</td>
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<table>
<thead>
<tr>
<th>Building outlays by private business for new industrial, commercial, and public utility construction</th>
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</thead>
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<tr>
<td>$1.38 billion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total building outlays by private business for new industrial, commercial, and public utility construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12.8 billion</td>
</tr>
</tbody>
</table>

100
The 100 largest building clients*

<table>
<thead>
<tr>
<th>Company</th>
<th>Home office</th>
<th>1957 Building outlays</th>
<th>1958 (est.) Building outlays</th>
<th>1957 Total capital outlays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 American Tel. &amp; Tel.</td>
<td>New York</td>
<td>215,000</td>
<td>185,000</td>
<td>2,566,000</td>
</tr>
<tr>
<td>2 Ford Motor1</td>
<td>Dearborn, Mich.</td>
<td>127,300</td>
<td>N.A.</td>
<td>376,500</td>
</tr>
<tr>
<td>3 Western Electric</td>
<td>New York</td>
<td>65,900</td>
<td>75,300</td>
<td>152,500</td>
</tr>
<tr>
<td>4 Kaiser Aluminum &amp; Chemical</td>
<td>Oakland, Calif.</td>
<td>65,800</td>
<td>1,300</td>
<td>229,300</td>
</tr>
<tr>
<td>5 General Motors1</td>
<td>Detroit</td>
<td>55,000</td>
<td>46,000</td>
<td>377,000</td>
</tr>
<tr>
<td>6 International Business Machines</td>
<td>New York</td>
<td>54,622</td>
<td>32,000</td>
<td>326,337</td>
</tr>
<tr>
<td>7 Aluminum Co. of America</td>
<td>Pittsburgh</td>
<td>47,700</td>
<td>23,000</td>
<td>207,500</td>
</tr>
<tr>
<td>8 Kaiser Steel</td>
<td>Oakland, Calif.</td>
<td>45,800</td>
<td>28,300</td>
<td>137,400</td>
</tr>
<tr>
<td>9 American Can</td>
<td>New York</td>
<td>36,300</td>
<td>14,300</td>
<td>91,500</td>
</tr>
<tr>
<td>10 Anaconda2</td>
<td>New York</td>
<td>35,232</td>
<td>20,570</td>
<td>56,992</td>
</tr>
<tr>
<td>11 Safeway Stores*</td>
<td>Oakland, Calif.</td>
<td>35,000</td>
<td>N.A.</td>
<td>67,000</td>
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<tr>
<td>12 Consolidation Coal</td>
<td>Pittsburgh</td>
<td>34,608</td>
<td>17,640</td>
<td>39,627</td>
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<tr>
<td>13 Caterpillar Tractor*</td>
<td>Peoria, Ill.</td>
<td>34,000</td>
<td>N.A.</td>
<td>73,500</td>
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<tr>
<td>14 Boeing Airplane</td>
<td>Seattle</td>
<td>31,000</td>
<td>10,000</td>
<td>44,000</td>
</tr>
<tr>
<td>15 Union Carbide</td>
<td>New York</td>
<td>30,179</td>
<td>20,000</td>
<td>190,513</td>
</tr>
<tr>
<td>16 Sears, Roebuck</td>
<td>Chicago</td>
<td>26,500</td>
<td>N.A.</td>
<td>52,949</td>
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<tr>
<td>17 United Aircraft</td>
<td>East Hartford, Conn.</td>
<td>26,000</td>
<td>22,000</td>
<td>49,800</td>
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<tr>
<td>18 Du Pont (E. I.) de Nemours</td>
<td>Wilmington, Del.</td>
<td>24,543</td>
<td>N.A.</td>
<td>220,000</td>
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<tr>
<td>19 Seagram (Joseph E.) &amp; Sons</td>
<td>New York</td>
<td>24,300</td>
<td>15,000</td>
<td>24,700</td>
</tr>
<tr>
<td>20 Commonwealth Edison</td>
<td>Chicago</td>
<td>23,518</td>
<td>26,500</td>
<td>207,753</td>
</tr>
<tr>
<td>21 Olin Mathieson Chemical</td>
<td>New York</td>
<td>22,065</td>
<td>8,000</td>
<td>77,130</td>
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<tr>
<td>22 Reynolds Metals</td>
<td>Richmond, Va.</td>
<td>21,252</td>
<td>23,526</td>
<td>101,981</td>
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<tr>
<td>23 Procter &amp; Gamble</td>
<td>Cincinnati</td>
<td>20,400</td>
<td>N.A.</td>
<td>59,300</td>
</tr>
<tr>
<td>24 Westinghouse Electric</td>
<td>Pittsburgh</td>
<td>20,006</td>
<td>N.A.</td>
<td>65,512</td>
</tr>
<tr>
<td>25 Douglas Aircraft</td>
<td>Santa Monica, Calif.</td>
<td>19,983</td>
<td>6,346</td>
<td>32,183</td>
</tr>
<tr>
<td>26 General Electric6</td>
<td>New York</td>
<td>19,504</td>
<td>N.A.</td>
<td>153,600</td>
</tr>
<tr>
<td>27 Armco Steel</td>
<td>Middletown, Ohio</td>
<td>18,367</td>
<td>N.A.</td>
<td>82,920</td>
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<tr>
<td>28 Minnesota Mining &amp; Manufacturing</td>
<td>St. Paul, Minn.</td>
<td>15,900</td>
<td>7,400</td>
<td>34,000</td>
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<tr>
<td>29 Pittsburgh Plate Glass</td>
<td>Pittsburgh</td>
<td>15,751</td>
<td>13,000</td>
<td>64,003</td>
</tr>
<tr>
<td>30 Dow Chemical</td>
<td>Midland, Mich.</td>
<td>15,300</td>
<td>13,000</td>
<td>170,000</td>
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<tr>
<td>31 Martin</td>
<td>Baltimore</td>
<td>15,235</td>
<td>8,000</td>
<td>24,734</td>
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<tr>
<td>32 Continental Can7</td>
<td>New York</td>
<td>15,000</td>
<td>N.A.</td>
<td>62,300</td>
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<tr>
<td>33 McDonnell Aircraft</td>
<td>St. Louis</td>
<td>14,744</td>
<td>N.A.</td>
<td>17,273</td>
</tr>
<tr>
<td>34 Monsanto Chemical</td>
<td>St. Louis</td>
<td>14,400</td>
<td>10,000</td>
<td>54,404</td>
</tr>
<tr>
<td>35 National Dairy Products</td>
<td>New York</td>
<td>14,282</td>
<td>N.A.</td>
<td>51,284</td>
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<tr>
<td>36 Philadelphia Electric</td>
<td>Philadelphia</td>
<td>14,000</td>
<td>12,200</td>
<td>94,200</td>
</tr>
<tr>
<td>37 El Paso Natural Gas3</td>
<td>El Paso, Tex.</td>
<td>13,000</td>
<td>8,000</td>
<td>287,000</td>
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<tr>
<td>38 Eastman Kodak*</td>
<td>Rochester, N. Y.</td>
<td>12,951</td>
<td>N.A.</td>
<td>60,173</td>
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<tr>
<td>39 Consumers Power</td>
<td>Jackson, Mich.</td>
<td>12,509</td>
<td>16,563</td>
<td>105,502</td>
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<td>40 Chase Manhattan Bank</td>
<td>New York</td>
<td>12,000</td>
<td>N.A.</td>
<td>12,000</td>
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<tr>
<td>41 Food Fair Stores*</td>
<td>Philadelphia</td>
<td>12,000</td>
<td>N.A.</td>
<td>20,000</td>
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<tr>
<td>42 Weyerhaeuser Timber</td>
<td>Tacoma, Wash.</td>
<td>11,918</td>
<td>2,500</td>
<td>41,876</td>
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<tr>
<td>43 Jones &amp; Laughlin Steel</td>
<td>Pittsburgh</td>
<td>11,800</td>
<td>2,200</td>
<td>100,700</td>
</tr>
<tr>
<td>44 Public Service Electric &amp; Gas</td>
<td>Newark, N. J.</td>
<td>11,526</td>
<td>12,000</td>
<td>136,199</td>
</tr>
<tr>
<td>45 American Cyanamid</td>
<td>New York</td>
<td>11,200</td>
<td>N.A.</td>
<td>84,000</td>
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<tr>
<td>46 New York Life</td>
<td>New York</td>
<td>10,475</td>
<td>N.A.</td>
<td>12,611</td>
</tr>
<tr>
<td>47 Johns-Manville</td>
<td>New York</td>
<td>10,357</td>
<td>N.A.</td>
<td>45,704</td>
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<tr>
<td>48 Carrier</td>
<td>Syracuse, N. Y.</td>
<td>10,270</td>
<td>1,755</td>
<td>19,755</td>
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<tr>
<td>49 General Telephone</td>
<td>New York</td>
<td>10,200</td>
<td>17,000</td>
<td>186,400</td>
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<tr>
<td>50 Ohio Edison</td>
<td>Akron, Ohio</td>
<td>10,122</td>
<td>10,931</td>
<td>63,993</td>
</tr>
</tbody>
</table>

* Includes industrial, commercial, utility, and transportation companies, and commercial banks.
N.A.: Data not available.
1. Excludes foreign subsidiaries.
2. 1957 building figure is estimated.
3. All figures estimated.
## The 100 largest building clients

<table>
<thead>
<tr>
<th>Company</th>
<th>Home office</th>
<th>1957 (000)</th>
<th>1958 (est.) (000)</th>
<th>Total capital outlays 1957 (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allied Chemical</td>
<td>New York</td>
<td>10,000</td>
<td>N.A.</td>
<td>69,800</td>
</tr>
<tr>
<td>Container Corp.</td>
<td>Chicago</td>
<td>10,000</td>
<td>N.A.</td>
<td>47,000</td>
</tr>
<tr>
<td>Grace (W. R.)</td>
<td>New York</td>
<td>10,000</td>
<td>5,000</td>
<td>64,000</td>
</tr>
<tr>
<td>Lilly (Eli)</td>
<td>Indianapolis</td>
<td>9,834</td>
<td>9,011</td>
<td>15,118</td>
</tr>
<tr>
<td>Am. Radiator &amp; Std. Sanitary</td>
<td>New York</td>
<td>9,599</td>
<td>436</td>
<td>25,387</td>
</tr>
<tr>
<td>Niagara Mohawk Power</td>
<td>Syracuse, N. Y.</td>
<td>9,398</td>
<td>8,032</td>
<td>104,744</td>
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<tr>
<td>Goodyear Tire &amp; Rubber</td>
<td>Akron, Ohio</td>
<td>9,285</td>
<td>N.A.</td>
<td>82,947</td>
</tr>
<tr>
<td>Swift</td>
<td>Chicago</td>
<td>9,272</td>
<td>9,030</td>
<td>22,000</td>
</tr>
<tr>
<td>Reynolds (R. J.) Tobacco</td>
<td>Winston-Salem, N. C.</td>
<td>9,255</td>
<td>6,800</td>
<td>23,982</td>
</tr>
<tr>
<td>Continental Oil</td>
<td>Houston</td>
<td>9,000</td>
<td>7,000</td>
<td>111,000</td>
</tr>
<tr>
<td>Lehigh Portland Cement</td>
<td>Allentown, Pa.</td>
<td>9,000</td>
<td>3,000</td>
<td>35,328</td>
</tr>
<tr>
<td>R. H. Macy</td>
<td>New York</td>
<td>9,000</td>
<td>6,000</td>
<td>19,418</td>
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<tr>
<td>Minneapolis-Honeywell Regulator</td>
<td>Minneapolis</td>
<td>9,000</td>
<td>1,000</td>
<td>14,000</td>
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<tr>
<td>Mutual Benefit</td>
<td>Newark, N. J.</td>
<td>8,500</td>
<td>N.A.</td>
<td>8,775</td>
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<tr>
<td>Detroit Edison</td>
<td>Detroit</td>
<td>8,300</td>
<td>8,000</td>
<td>81,700</td>
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<tr>
<td>North American Aviation</td>
<td>Los Angeles</td>
<td>8,279</td>
<td>4,000</td>
<td>19,759</td>
</tr>
<tr>
<td>Bank of America</td>
<td>San Francisco</td>
<td>8,100</td>
<td>11,000</td>
<td>20,700</td>
</tr>
<tr>
<td>Boston Edison</td>
<td>Boston</td>
<td>8,000</td>
<td>5,000</td>
<td>38,000</td>
</tr>
<tr>
<td>General Mills</td>
<td>Minneapolis</td>
<td>8,000</td>
<td>7,000</td>
<td>17,400</td>
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<tr>
<td>National Cash Register</td>
<td>Dayton, Ohio</td>
<td>7,947</td>
<td>4,841</td>
<td>13,473</td>
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<td>Outboard Marine</td>
<td>Waukegan, Ill.</td>
<td>7,923</td>
<td>1,820</td>
<td>17,183</td>
</tr>
<tr>
<td>Prudential Insurance</td>
<td>Newark, N. J.</td>
<td>7,800</td>
<td>19,800</td>
<td>22,800</td>
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<tr>
<td>Harbison-Walker Refractories</td>
<td>Pittsburgh</td>
<td>7,715</td>
<td>1,400</td>
<td>13,350</td>
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<tr>
<td>Ideal Cement</td>
<td>Denver</td>
<td>7,656</td>
<td>4,510</td>
<td>28,631</td>
</tr>
<tr>
<td>New England Mutual</td>
<td>Boston</td>
<td>7,326</td>
<td>7,965</td>
<td>13,291</td>
</tr>
<tr>
<td>Pennsylvania RR</td>
<td>Philadelphia</td>
<td>7,250</td>
<td>4,800</td>
<td>59,258</td>
</tr>
<tr>
<td>Cleveland Electric Illuminating</td>
<td>Cleveland</td>
<td>7,000</td>
<td>7,000</td>
<td>38,000</td>
</tr>
<tr>
<td>Pan American World Airways</td>
<td>New York</td>
<td>7,000</td>
<td>12,000</td>
<td>33,300</td>
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<td>Owens-Illinois Glass</td>
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<td>6,900</td>
<td>5,500</td>
<td>39,300</td>
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<td>4,700</td>
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<td>2,427</td>
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<td>1,071</td>
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<td>6,695</td>
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<td>Chicago</td>
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<td>10,230</td>
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<td>6,214</td>
<td>1,709</td>
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<td>American Stores</td>
<td>Philadelphia</td>
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<td>6,000</td>
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<td>South Milwaukee, Wis.</td>
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<td>2,250</td>
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<td>3,830</td>
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<td>Detroit</td>
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<td>5,446</td>
<td>2,215</td>
<td>32,285</td>
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</tbody>
</table>
Manufacturers dominate the 100 list . . . . . . . . and so do plant outlays.

<table>
<thead>
<tr>
<th>TOTAL OUTLAYS: $1.85 BILLION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturers</td>
</tr>
<tr>
<td>Utilities</td>
</tr>
<tr>
<td>Merchandisers</td>
</tr>
<tr>
<td>Insurance companies</td>
</tr>
<tr>
<td>Transportation companies</td>
</tr>
<tr>
<td>Banks</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TYPE OF BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factories and plants</td>
</tr>
<tr>
<td>Office buildings</td>
</tr>
<tr>
<td>Distribution facilities</td>
</tr>
<tr>
<td>Research facilities</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Total outlays, 56 companies</strong></td>
</tr>
</tbody>
</table>

one industrial firms rated spots on the list, and together they accounted for a massive $1.3 billion of building, a total which made them first in aggregate outlays among the various types of corporations. Runners-up were the 13 utility companies with construction outlays of $349 million (the average per-company outlay for utilities was $27 million, compared with $18.7 million for the industrials). Only two banks and three transportation companies made the list.

**Size is no guide**

One point that emerges clearly from the survey is that a company’s size, measured in terms of its sales volume, is not necessarily a reliable guide to its importance as a building client. Only 46 of the industrial firms on FORUM’s building list also rank among the top 100 U.S. industrial firms (in sales) in FORTUNE’s 1958 Directory of the 500 Largest U.S. Industrial Corporations. Kaiser Steel, for example, which ranked eighth in building outlays last year, was No. 202 on FORTUNE’s list; Chrysler, which was sixth in FORTUNE’s Directory in sales volume, does not even appear on FORUM’s list at all. Obviously, both industry and individual company expansion goals and estimates of future sales volume are far more important in determining building programs than the level of present sales.

The FORUM list shows that, of the total $1.3 billion spent by industrial firms for buildings, more than half, or $733 million, was accounted for by companies in just three industries — transportation equipment, electrical machinery, and primary metals. Thirteen other industries are represented on the list, but several large industries, e.g., textiles and printing, do not appear at all.

Business characteristics also influenced capital spending patterns. Insurance companies, for instance, put nearly 66 per cent of their capital outlays into construction in 1957, a larger proportion of total capital expenditures than any other group of companies. Commercial banks, which channeled 62 per cent of their capital funds into construction, were a close second, followed by merchandisers (49 per cent). These high building ratios resulted, of course, from the fact that the equipment needs of insurance companies and banks tend to be relatively modest. At the opposite end of the scale, utilities, which are the biggest per-company spenders for building, but which have heavy equipment requirements, spent only 9 per cent of their total outlays for building. Manufacturers allocated a little less than 26 per cent to buildings.

Fifty-five of the companies surveyed broke down their expenditures by building types (see chart, above). More than 50 per cent of the building outlays of these firms went into factories. Office buildings accounted for roughly 15 per cent of the total, distribution facilities 10 per cent, and research buildings 9 per cent (the remaining 17 per cent went into hangars, terminals, and shops for transportation companies, etc.). As might be expected, manufacturers were responsible for most of the factory spending (85 per cent of the total plant outlays), nearly all of the research outlays (90 per cent), and were second only to merchandisers in expenditures for distribution facilities (40 per cent of the total, compared with 44 per cent for the merchandising companies). Against this, spending for office buildings was more evenly distributed: manufacturers accounted for 48 per cent of all the outlays, utilities for 30 per cent, banks for 14 per cent, and insurance companies for 7 per cent.

Forty-nine manufacturing and utility companies also broke down, by building type, their estimated construction expenditures for 1958. The utilities expect to increase outlays for distribution facilities 12 per cent this year over 1957, but will cut their spending for plants and office buildings by 1 per cent and 13 per cent, respectively. Manufacturers’ outlays, as might be expected, will be down across the board with the biggest slash, 50 per cent, in factory construction.

**Turnover at the top**

On the whole, it appears there will be a sizable turnover from year to year among the companies on the list of the 100 biggest clients. Industrial expansion programs may show more long-range continuity today than ever before, but many of the programs are still scheduled over three- or four-year periods. Thus, while certain corporations can probably be counted on as regulars for the list—AT&T, for instance, expands so continuously that it will undoubtedly keep a place in the top 100—other companies are likely to come and go. Whatever the make-up of the list, though, the top 100 building clients are sure to dominate business building. And as such they will continue to exert a tremendous force on the prosperity of the entire construction industry.
Architecture and popular taste

There is a vitality in America’s popular building, even in its roadside honky-tonk, that is exerting a strong pull on modern architecture—and vice versa.

Is modern architecture molded by popular taste? The answer is that it has not been, but that quite assuredly it soon will be—in a grand new reciprocal interchange. This is not the answer that is given in modern critical writing about architecture. Indeed, popular taste has become the modern critic’s favorite whipping boy. The ordinary people of America have been taxed by Britain’s prestigious Architectural Review, for example, with creating a man-made environment that is “dreary,” “corrupt,” “scrofulous,” “infantile,” and “hopeless.” A free people never before had such a wealth and range of choice, these critics lament, but what the American people have chosen is ugliness. The critics bitterly envision a twenty-first century in which the whole countryside will be covered with a combination of “Usonian Idiot’s Delight and automobile graveyard.”

And yet it is well to remember that art is emotional. A favorite way of greeting any strange subject, or group, or problem, is to say, “I hate you.” Whenever such expressions get particularly vehement, as the artistic reproaches against the common people have since 1950, it is usually a sign of a prolonged engagement—that will surely end with a rapprochement. This was so 30 years ago, when the problem of architecture and the arts was “the new machine world.” Plays were written like Capek’s R.U.R., which introduced the figure of the robot; and the German horror film of the twenties, Metropolis, showed armies of dread dehumanized creatures marching up and down the ramps of a vast jail-like metallic city. The industrial revolution was catching up at last with the laggard building industry, and this was the first reception of the new problem. Those architects who ultimately gave an acceptable answer to the “machine-age” challenge, by developing modern design, were not the older leaders, but new ones. And something of the same sort appears to be happening today. Now the problem is shifting away from the adaptation of design to machine production toward the highly psychological task of adapting design to an era of popular mass consumption. Once again, the new situation is bringing forth new attitudes, new leaders.

What do people really want?

Being artists, the younger architects are not content to believe that the general public really wants a blatant kind of honky-tonk. Nor would these architects produce such structures (as many manufacturers do) even if preference questionnaires seemed to demand them. What makes art art, the young architects reason, is that it penetrates beneath the surface, and helps clumsy people to a more adequate self-expression. What makes
the artist a leader is that he discovers the aim that is struggling to express itself and then identifies himself with it. He helps it to emerge in a manner more satisfactory to its originators than would have been possible through their own unguided efforts.

Under this rationale, the newer modern trend, as it has already begun to take shape, seems to fall in with three popular desires:

The first seems to be a popular demand for more decorativeness and romance than a highly intellectual architecture has been delivering: the desire is for what architectural draftsmen gruffly call “schmaltz” and what a more sophisticated critic might christen “the new Alhambra.”

The second popular need seems to be for more drama: a “good show,” symbolism, even fairy tales: what draftsmen might term “googie” and a critic might describe as the “new baroque.”

And, finally, there are indications of a growing popular desire for an architectural counterpart to jazz—that new art form, popular in origin, which has grown into a highly demanding discipline and has greatly affected “serious” music. Its architectural analogue reflects a comparable need for free improvisation in building design, newer rhythms, freshness and readiness in adaptation. Draftsmen might call it honky-tonk; English critics have hinted at it with their own word: shari-waggi, an Indian idea.

Call it a trio of schmaltz, googie, and honky-tonk; call it the new romanticism, the new baroque, and the new improvisation; call it sweetness, symbolism, and the happy note; call it the new Alhambra, the greater googie, and the new Times Square—in any of these triads describing new trends it is possible to find evidence of the coming rappoachment between modern architecture and popular taste.

The new Alhambra

It has not been necessary for the younger architects to desert the fine modern style of the last 30 years in order to design something prettier. The recent career of one of the more elastic older masters, Architect Edward D. Stone, shows that it can be done through modification. The American pavilion at the Brussels Fair is his, and whatever controversies may have arisen around the show inside, the popular acceptance of the architecture itself has been nearly unanimous. This is an architecture that is literally “star-spangled.” Alone among the buildings of the fair, this pavilion stands behind a water pool studded with lighted fountains; its envelope is a pretty latticed plastic screen; gold mesh is draped from its bicycle-spoke roof framing, which leads to a great ring, open to the sky, and spangled with lights like jewels; undisturbed in this great pleasure-dome there still grow the king's royal willows.

What Stone achieved in this fine popular expression of American statecraft has been carried by other architects, in the same spirit, into that stronghold of functionalism, the American factory. True, the examples are not many yet, and the factories which exhibit the new ornamental treatment are select ones. And yet the impulse is unmistakable: the efficient arrangement of the machinery of production is supplemented by the provision of pleasant outdoor courts, by pools and planting and hanging pots of flowers, for a pleasant coffee break. In the citadel of “production” there are made available some of the pleasures of “consumption.” Nor is America alone in this; witness the new factories in Italy of Olivetti and his architects.

Then again some of the same sweetening, the same direct effort at a nonpatronizing popular appeal, has invaded what was once the favorite province of severe early “modernism”—minimal housing. The change is best seen in Architect Vernon DeMars’ “Easter Hill” public housing development on the east side of San Francisco Bay, at Richmond. DeMars, who once regimented the Okies of the great depression into handsome, sanitary but no-nonsense work camps, has done everything possible at Easter Hill to make the houses seem homelike, pretty, unpretentious, colorful, less like a flat of design from above and more like a growth that might spring directly from the people.

And, finally, younger architects such as Yamasaki and Rudolph have taken the new sweetness, the prettier, more popular style, onto the college campus. Appropriately, here the trend has gone deeper and possibly has become more learned. In the new academic buildings the decorative quality, which Stone and his colleagues limited to surface elements, such as pierced screens, pools, and hanging flower pots, has been carried directly into the very bones of the construction. Yamasaki's completed and projected buildings for Wayne University in Detroit (see page 78) carry this trend the furthest. The concrete columns and beams that will support Wayne's forthcoming education building are to be prefabricated in the accepted “modern” manner but with a big difference: they will be cast in the form of “trees,” three stories high, that will be as decorative in their own way as the columns and spandrels of Venetian Gothic buildings. This may all be schmaltz, and its prettiness may conceal hidden architectural dangers; but if the trend prevails,
Harris Armstrong's romantic factory: "in the stronghold of functionalism, rambling walks in outdoor courts..."

Edward D. Stone's romantic factory: "... and in the citadel of production, the pleasures of the coffee break."

Minoru Yamasaki's romantic college hall: "as decorative as Venetian Gothic; more rewarding than gingerbread."

Disneyland: "between such flights of popular fantasy and some kinds of modern architecture, the cleft is not so deep."

the public will gain a popular architecture far more thoroughbred than most of its own gingerbread efforts, and, in the long run, far more rewarding.

"Modern baroque"

The problem of symbolism in architecture is old, deep, and incredibly ramifying. It stretches all the way from the Gothic cathedral builder representing the vision of Heaven to the efforts of the hot-dog stand proprietor in Hollywood who builds his stand in the literal form of a hot dog. In modern architecture, symbolism has generally been a weak force, for although the great masters of the new style struggled mightily with symbolism, modern architects as a group suspected all such poetry of being literary and pretentious. More often they sought to "stick with the facts" and to "express the construction" in the hope that the most "direct solution" of the "given program" would be so clear, the "necessary form" so self-declarative, the proportions so harmonious, and the rhythm so compelling, that the prosy facts would be transmuted with no further effort into an esthetic vision. But again and again modern functional architects were embarrassed by the question: what is it—a school, a factory, or a supermarket? It was often hard to tell. And since even this relatively simple problem of "reading" a modern building was so difficult, most modern architects rejected popular "fantasy" building as being still more confusing. Only Wright dared it—Wright and then a few others like Bruce Goff, who produced unabashed fantasies leading into a land of never-never.

Now it would require a Solomon to decide just how much of the new trend in modern architecture derives directly from the popular view of things, and how much of it has been independent. But the fact is undeniable that the lines converge. Popular building, for example, is often fairy-tale building. Obviously those who buy "Cinderella Houses" have some fantasy to indulge, as do those who build or buy "ranch houses" in the East or "Cape Cods" in the West, not to mention those of greater means who buy their own versions of English country houses or Italian palaces. The make-believe gets most intense where somebody is deliberately putting on an "act," e.g., building a "Frontier Village" (false fronts, log cabins, and hitching bars), "Storytowns" (high gables painted with daisies), or "Santa Claus Villages" (complete with Silent Night on the loudspeaker).

Between such flights of popular fancy and certain of the newer "modern" buildings the cleft is not so great
Félix Candela's baroque supermarket: "like flocks of surrealistic creatures."

Hugh Stubbins' Berlin Congress Hall: "like an Etruscan helmet."

Eero Saarinen's baroque TWA terminal: "like a big bird, but with an esthetic standard."

Le Corbusier's baroque Ronchamp church: "like a ship's prow, but with a religious mystery."

even though the official excuse of the architects has often been that they sought nothing more than "greater freedom" with the "newer more fluid methods of construction." Somehow a scheme like Candela's new supermarket for Mexico City, which is made up of a whole flock of "shell shapes," ends up in fairyland, for when seen at a distance or from above it will resemble flocks of "little creatures" not unlike those which have been painted by the surrealist Masson. Sometimes symbolism is deliberately sought in the new modern architecture; for example, in Hugh Stubbins' Congress Hall in Berlin, where the idea of "free speech" sought to escape from its abstractness into architectural expression. What was actually achieved was a kind of popularity that was quite unintentional, for the Berlin public hugged the new creation to its heart, dubbed it "the Etruscan helmet," and "the pregnant oyster."

Sometimes the symbolism is unmistakable, as in Saarinen's design for the main terminal for TWA at New York's Idlewild airport. This structure looks so much like a "big bird" that it is hard to believe it was not so tagged in the architect's drafting room. The fact that this effort rounds the circle, and that, intentionally or not, the symbolic reference to an alighting bird is just as simple and direct as it would be in popular building, does not mean that the TWA terminal will not reach a high esthetic standard. The models promise an interior not only alliterative but beautiful.

Poetic allusion can also be abstract and mysterious. Le Corbusier's church at Ronchamp, for instance, is a building that conjures up many images: is it a great hat, or a ship's prow, or the bastion of some prehistoric Mediterranean fortress? Some of its evocations are subtle. What is the significance of the great sculptured downspout? Was the jeweled cave of the interior intended in any way to recall early Christian catacombs? Where lies the magic that separates this place from "the world outside" and suits it to religious contemplation?

One new surge in modern architecture, then, is a kind of baroque—a varied architecture of drama, fairy tale, allusion, and symbol—extraordinarily different from the characteristic architecture of the previous "modern" decades. And, like all baroque architecture, the new "modernism" leaves some purist engineers bitterly complaining at the "misuse" of their technology. But the popular audience does not care. Why, it asks, should buildings concentrate upon displaying their construction? Apart from great civil works where engineering is a central element of the drama itself, "function" is nothing to get excited about. On with the show.
Jazz and honky-tonk

There remains, finally, the jazz simile. To compare any architectural effect with jazz is full of peril, for nobody is more finicky about his art than the jazz musician—and his audience. The fact is, however, that a completely popular creation, such as Times Square at night, irresistibly suggests improvised and syncopated music. As has been remarked by Paul Rudolph, that perspicacious architectural teacher of the younger generation, the trick in Times Square at night is that “the buildings are gone.” To him this is a fascinating indication of the possibilities in new and different kinds of architectural “places.” The buildings of Times Square at night are reduced to the barest suggestion of a scaffolding to support the real “show” that goes on—a show of many-colored lights, in lines, patches, and floods, flashing each in its own tempo. If the beholder will relax and surrender himself to it, the effect is quite hypnotic—as in jazz. By day the effect is very different, but once more it resembles nothing known in conventional and sophisticated architecture either traditional or “modern.” The feeling is more like standing surrounded by the pieces of a gigantic abstract painting. And, as the photos on this page show, precisely this combination of material has been used by painters such as Stuart Davis for their compositions.

What does this musical and painted world mean for the architectural future? Who can say, except that it attests the vast possibilities that still lie ahead in free and popular improvisation? And, where other lines of popular development are full of symbol and fairy tale, the effect of this architectural improvisation, like the effects of jazz, is “popular” yet wonderfully abstract.

Such, then, are a few of the possibilities, a few of the tentative maneuvers, in the rapprochement between popular taste and modern architecture. It cannot be expected that the appearance in modern architecture of decorativeness, of symbolism, and of improvisation, will change the look of America overnight. Sensitive men, for years to come, will still find their stomachs turning at many a stretch of “Idiot’s Delight and automobile graveyard,” studded by poles, decked in hideous colors, and swathed in wire. Most people will remain visually untrained and they will often prefer the inferior to the superior. And yet, just as the great threat of “the machine” was reduced in thirty years to more nearly manageable proportions by modern design, so with time and sympathetic feeling modern design may make some impact on the threat of the democratic wilderness. It will not happen any other way.

END
Richly expressive of its structure, this deeply ribbed Boston headquarters of Blue Cross–Blue Shield is a handsome new merger of function and form.

**Pattern with a purpose**

Modern architecture’s reawakening interest in shapes and shadows is beginning to catch up with the office building, an old customer that lately has been getting an overdose of sleek and shiny fronts. Some of the signs are apparent in this new $4 million headquarters for Massachusetts Hospital Service, Inc. and Massachusetts Medical Service, Inc. (Blue Cross and Blue Shield plans), now under construction in Boston’s financial district.

Seen up Federal Street from near South Station (sketch and photo, left), the new Blue Cross–Blue Shield building will be unusually sculptural, both in its treatment of mass and in its expression of structural and mechanical systems on the exterior. Architects Anderson, Beckwith & Haible and Paul Rudolph have set a 12-story tower atop two basements containing an employee cafeteria, storage and mechanical rooms. The upper basement emerges slightly from the sloping site as a functional and decorative pedestal for the building, and also provides a welcome little plaza downtown.

The four façades of the tower atop this pedestal are heavily shadowed by vertical ribs, and chamfered at the corners to heighten the building’s freestanding, rounded effect. At the ground floor a colonnade of Y-shaped concrete supports gives the building a powerful base. Reminiscent of the tree-form Gothic framing of Viollet-le-Duc and the Art Nouveau forms of Antonio
Gaudi, these pillars hold up pairs of exterior concrete columns, which also carry exterior air-conditioning ducts. The ducts join at each floor in air-mixing chambers, expressed on the exterior by thickened V-shaped spandrels set between small concrete sunshades (see details, opposite page). Between the pairs of structural columns, hollow shafts carry air back from the office spaces to fan rooms on the roof. Although these shafts start slightly higher than the line of Y-supports, they are otherwise identical in appearance with their structural neighbors. Even in this building, therefore, the differentiation between structure and nonstructure is not fully expressed. To give even more life to the deeply ribbed façades, columns and spandrels are covered with textured slabs of light precast concrete, overlapped at the joints and faceted to catch the light.

Within this highly sculptural frame, the building will provide highly usable office space. A 95 foot square plan with a compact service core placed at the back gives each floor a large net area of some 8,000 usable square feet out of a gross area of 9,000 square feet, and allows a single manager on each floor to supervise a clerical pool of 100 people (see floor plan, right). The core has load-bearing walls of reinforced concrete, supporting themselves and part of each coffered concrete floor slab; the remainder of the load is taken by two large concrete columns opposite the core, and by the smaller columns around the perimeter. Set flush with the inside of the exterior wall and spaced 5 feet apart, these perimeter columns yield an unbroken interior wall surface easily adaptable to partitioning for offices 10, 15, or 20 feet wide.

Model shows air-conditioning ducts combined with pairs of structural columns reaching octopuslike up to fan rooms in the penthouse. This strong expression of the building's actual mechanics was intended by Architect Rudolph as an "ending" to match the building's treelike "beginning." But along with the addition of separate return-air shafts on the façades, this openwork on the roof was filled in to accommodate larger mechanical spaces and to reduce building costs.
Air-conditioning system is integrated with the building's exterior design. Vertical supply air ducts are carried on the outside of two structural columns, while the return air duct forms a third "column." Supply air is mixed in a spandrel chamber between the two supply ducts and is discharged through an underwindow grille; return air flows through a window adjacent window directly into the return ducts. Note that while the exterior wall of the building is heavily textured with thin elements, the interior is smooth.
The solid science of soil behavior is a vital element in modern building design, but its principles are sometimes disregarded, leading to excessive costs and occasionally to disaster.

Today, through the science of soil mechanics, it is possible to predict how much a building will settle during its lifetime. The building may then be designed to allow for a certain amount of settlement without damage, or it may be designed to allow virtually no settlement at all, on land which only a few years ago would have been considered too unstable for any substantial building. Indeed, through further study of soils and of how to modify them with chemical additives—a development only at its beginning—it may be possible someday to prepare whole building foundations by simple injection of chemical agents, upgrading for use large tracts of now hopeless, submarginal land. And with good sites rapidly disappearing under the population explosion, the foundations of the future rest on these soil sciences.

Many architects and some structural engineers fail to take into account the present abilities of soil mechanics, even though it is one of the most advanced of the building sciences through research, and nothing would seem more fundamental to building. Soil science is only about 30 years old, and the holdover of empirical methods by which foundations were previously designed—too often taking the solid earth for granted—is still sufficient to cause one building to collapse somewhere in the world each year, and to cause other untold damage and expense. A recent horrible example is the $1 million that will be required to shore up England's historic, dowdy, three-story No. 10 Downing Street, built shallowly in 1735 on shifty soil and in need of constant repair. Problem sites are multiplying and foundation costs constantly growing, usually taking anywhere from 5 per cent to 20 per cent of the total building cost for sizable structures. Hence, the architect must now, more than ever, be familiar with the science of soil mechanics. By sensing potential foundation problems before committing himself to a building design, the architect can check costly damage.

This variable earth

The major fact that the soil scientist has brought to architectural and engineering consciousness is that soils cannot be treated like any other building material. The earth is a most complex combination of dissimilar materials, some solid, some gaseous, some liquid. Even within the solids there are wide differences between seemingly similar materials. Thus, the clays—the most prevalent soil types, and the most troublesome—come in many varieties: some more cohesive than others, some more plastic, some with greater capacity to absorb water and to swell. Moreover, the earth is never homogeneous. A typical building site may contain a great number of different soils, and their interaction is as important in determining soil characteristics and behavior as the physical properties of the soils themselves. This interaction of different soils is a key element in soil mechanics, and its close study on the molecular level—where the earth becomes a hotbed of exchange reactions—is the basis of the new chemical soil stabilizers. During the next ten years, the technological developments in this area, by soils scientists, are likely to be as significant as the design refinements

FAULTY FOUNDATION DESIGN probably caused this huge grain silo near Fargo, North Dakota, to topple over shortly after it was loaded with grain, in 1955.
of the practicing foundations engineers. It is important that the architect and structural engineer understand something of the complexity of soils and the breadth of soils mechanics, which are closely connected with the problems of building design. The link between foundation and structural design is usually recognized in schools of civil engineering, where both are in the curriculum. But the connection is less often seen in schools of architecture, where even a brief encounter with foundations would benefit the student, if only to pique his awareness of the many different soil conditions likely to prevail beneath his buildings and the direct effect of architectural design on the problems (and expense) of designing a foundation. One prominent foundations engineer says that lack of understanding often leads to excessive foundation costs. “In every building,” he explains, “including those which apply the soundest principles of foundation design, some allowance should be made for building settlement. Otherwise, foundation costs become quite high. Yet, in many instances, if the architect is asked how much settlement he has allowed for in his design, he looks shocked and says, ‘Why, none.’” And all too often, the architectural design is established before the foundation engineer is consulted, leading frequently to costly redesign.

A two-hour lecture on basic principles of foundation design would give the architectural student at least something of the principles used in designing foundations on soft ground, which, of necessity, is the ground of the future. He would learn, for example:

• That the oldest principle for limiting settlement is still the most important one. This is the principle of transferring loads by means of piles, piers, or caissons. Modern methods of constructing such foundations, e.g., the use of long steel piles, have extended substantially the usefulness of this principle.
• That buildings can “float” on weak soil, as long as the total weight of soil removed from the site is equal to the weight of the building which takes its place. This is the same principle by which a ship floats.
• That tall structures must be stiff, lest they be damaged by settlement, but that low, sprawling steel-frame structures usually need stiffness and protection against excessive differential settlement only at their outside walls.
• That periodic jacking can be an economical, simple, and effective method of keeping local settlement within tolerable limits. This is a particularly sound method for industrial buildings, but to date, it has not been extensively used.

The foundation’s founder

The man who put the foundation under all this was Karl Terzaghi, a brilliant young engineer from Austria. Bewildered over the delayed settlements of buildings he had constructed, he wrestled with the inconsistencies in the field for many years, and in 1925 wrote a book which established the link between engineering geology and foundation engineering. Terzaghi worked out methods for testing theories of soil behavior and developed ideas in soil testing. Probably his most important contribution, of the scores which have since stemmed from his early work, was formulation of the theory of soil settlement and methods for determining how much settlement to anticipate and at what rate.

The elder generation of foundation engineers were aware of many of the “laws” of soil behavior, but they understood the science only by intuition, and after many years of experience. Once Terzaghi transformed this disorganized body of information into a formalized body of fact and theory, soil mechanics became a much more usable instrument for the engineer, because he was better able to understand soil behavior and, therefore, to predict it.

Terzaghi’s science of soil mechanics has been internationally recognized since the early thirties. He has taught in the U.S. for many years, at M.I.T., Harvard, and the University of Illinois, and still carries on a thriving consulting practice, both here and abroad. By 1946, virtually every civil engineering school in the world was teaching the principles of soil mechanics which he had developed.

As it developed, the new science of foundation engineering showed a striking parallel with architecture. In both architecture and foundations, problems never quite repeat themselves and, thus, proper solutions can never be quite the same. This is not so true in such fields as structural engineering.

Huge basement of Chase Manhattan Bank building (below) had to be nested among two subway lines and nine neighboring buildings, a foundation problem which demanded painstaking precautions by Foundation Engineers Moran, Proctor, Mueser & Rutledge. Before earth could be removed from one section, chemicals had to be injected into the earth, photo right. Thus, sandy soil was held firm and made impermeable to water, enabling construction of perimeter cofferdams without troublesome compressed air techniques.
where design can be empirical and repetitious, based on the performance of structures already built. And in other engineering fields, such as mechanical and electrical engineering, there is often an even more direct transfer of applied knowledge from one building problem to the next. But at the site of a foundation, the problems are always new and, indeed, often will differ from one spot on the site to another, because, as Terzaghi says: “Unfortunately, soils are made by nature and not by man, and the products of nature are always complex.”

This complexity of nature, always besetting the foundation engineer, was really the challenge which attracted the creative scientist to the field, just as they are attracted to atomic science and solid state physics, where there are vast areas of unknown. Today, the soils scientists are working in four research areas, transforming this once callow tool of building to a valued design instrument:

1. The fundamental characteristics of soils: Still in an exploratory state, this is probably the most basic of research areas. The scientists who work in this field are interested in finding the fundamental sources of soil strength and the effects of chemical additives on soil behavior (see box, page 118).

2. The engineering characteristics of soils: Still basic research, but further ahead than the work in fundamental characteristics, the study of engineering characteristics is yielding some of the first reliable information on load-bearing capacity of soils. Basic work was done in this area by Terzaghi.

3. Theories of soil behavior: Much theoretical work has been done in this area, dating back to the eighteenth century, when the French were prolific expounders of new theories of soil behavior, e.g., strength and permeability, but less successful in proving them. Even today, there are some 100 theorists in the field, including physicists, geologists, chemists, mainly in England, Western Europe, and the U.S., with new theories of water flow, earth pressure, bearing capacity, stress distribution, etc. The field is now in a testing stage, for most of these ideas are still to be proved.

4. Field observation: Without accurate means of measuring the actual behavior of foundations—e.g., techniques for determining degree of settlement and load-bearing capacity—soil scientists could not prove the soundness of their theories and foundation engineers would not know much about the efficiency of their designs. This problem plagued the field during the early years, and it was not until the 1930’s that adequate measuring devices began to be developed. Today, this is an extremely active field and a keystone for future scientific development.

The varied foundation problems of American cities

Many cities, flouting the Biblical injunction against building on sand, could hardly have chosen worse sites for their construction. Foundation problems, however, differ widely from city to city, as the selected list below indicates. The information here was provided by two eminent foundations engineers: Dr. Ralph B. Pack, of the University of Illinois, and Dr. Philip C. Rutledge, of the New York consulting firm, Moran, Proctor, Mueser & Rutledge.

DENVER: Bedrock is encountered at fairly shallow depths downtown—from 20 to 60 feet. However, in the residential southeast, subsurface soil is a fine-grained material which sometimes decreases in volume and collapses when submerged in water; lawn irrigation has sometimes led to considerable house damage, e.g., cracked basement walls. In other sections, surface materials consist of clays which behave in quite the opposite way, swelling and heaving in water, but with the same effect: cracked walls.

DETROIT: Bedrock, a fairly sound limestone, is found at depths of 60 to 90 feet. Most of the soil above bedrock consists of soft, compressible clays. Thus piles or piers are necessary for all important structures. Many buildings can rest safely on shallow foundations, because of the presence of a stiff clay crust which is capable of supporting lighter loads. However, borings and soil tests are necessary to determine whether a particular location can support an industrial structure of moderate size, or whether it must have a deeper foundation.

NEW ORLEANS: For all practical purposes, there is no firm base or bedrock beneath New Orleans. Soft delta deposits extend to depths of several thousand feet. Long piles founded on the delta clays here, and careful subsurface exploration is required to avoid damaging settlements. A famous case of excessive settlement, before widespread knowledge of soil mechanics, was the construction of the Charity Hospital in 1939. During construction, the building required extensive strengthening, due to settlement and cracking. Since then, it has settled about 1/4 inch. This structure accelerated the acceptance of soil mechanics in the area.

SAN FRANCISCO: Depth to bedrock in San Francisco is extremely variable, due to the earth-shaping effects of the great glaciers, which cut extensive valleys in the bedrock. Today, these deep gorges are filled with sand, silts, stiff marine clays, and soft bay muds. Famous Market Street has settled about 50 inches during the past century, and continues to sink about 1/2 inch every year.

MEXICO CITY: Subsoil conditions here are among the worst in the world. The city is located on the edge of a former lake, into which silts, sands, and clays have washed from time to time. Certain of these clays are very compressible and as a consequence much of the city is subsiding rapidly. Until the development of modern soil mechanics, successful design and construction of large structures in the city was nearly impossible.

NEW YORK: This area includes virtually every kind of foundation problem. A glacial lake once covered the area, creating alternating deposits of clay and silt whose depth to bedrock varies from 25 to 175 feet, sometimes within a city block. In areas of thick clay and sand, builders for 20 years have been putting up 20-story structures on shallow foundations instead of piles; such buildings will settle, sometimes as much as 2 or 3 inches, but this is anticipated in the structural designs. In other areas, notably the Upper West Side, the Bronx, and parts of Brooklyn, there are deep salt-marsh deposits, requiring costly pile driving. Mid-Manhattan's famous hard-rock base, close to the surface, on which some of the city's tallest buildings are built, is the nearly ideal condition.

CHICAGO: Most of Chicago is built on deep strata of compressible clay, but in only three areas are there serious foundation problems. One is in the northern part of the city, near Evanston, another is in the central business district, and the third is a small zone in the southern section. Much industrial development is taking place on the west side and in the southwest; the presence of stiff soils at shallow depths in these areas has influenced the city's recent industrial pattern. Only those industries which require water transportation are forced to positions where foundation conditions are difficult.
### Five ways soil can be stabilized

<table>
<thead>
<tr>
<th>Method</th>
<th>The Reactions</th>
<th>Soil Treatment Method</th>
<th>Where Used; Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Stabilization</td>
<td>A solution of asphalt-gasoline is mixed with wet soil and droplets of asphalt are distributed among the soil particles.</td>
<td>Additives are mixed mechanically with soil, using standard field equipment. Soil remains somewhat flexible, with reduced water absorption and frost susceptibility. Dry strength is unchanged, but wet strength is improved, particularly when amines are added.</td>
<td>For coarse or moderately fine-grained soils, where excavation and mixing are practicable: e.g., highway subgrades, dam facings. Cost: between $4 and $15 per cubic yard for materials.</td>
</tr>
<tr>
<td>Cement Stabilization</td>
<td>Wet soil is mixed with cement; a gel of calcium silicate forms when the cement reacts with water, binding soil particles together. Soil minerals appear to react with additives, such as caustic soda and sodium silicate, improving cement stabilization.</td>
<td>Cement is mixed mechanically, with standard equipment. Soil’s dry strength is improved; product is hard, brittle, less permeable. Additives improve its properties further, sometimes reduce cost of stabilization.</td>
<td>For coarse and moderately fine-grained soils, where excavation and mixing are practicable: e.g., highway subgrades; ditch linings, surfacing of secondary roads. Cost: between $3 and $11 per cubic yard for materials.</td>
</tr>
<tr>
<td>Phosphoric Acid Stabilization</td>
<td>Addition of phosphoric acid to fine-grained alumina silicate soil yields phosphates of aluminum and silicon. These phosphates form cementlike gels between soil particles.</td>
<td>Acid is mixed mechanically. Soil has better dry strength and good strength retention in water. It is rigid, with reduced permeability and frost susceptibility. Mechanical mixing may be eliminated in the future, i.e., acid will be applied to surface, seeping down into soil.</td>
<td>For moderately to extremely fine-grained soils, but not applicable in arid regions (where soils are alkaline). Potentially useful for highway subgrades, dam facings, rammed earth construction, sub-surface stabilization by injection. Cost: $2.50 to $55 per cu. yd. for materials, depending on soil type.</td>
</tr>
<tr>
<td>Checking Water Flow with Dispersants</td>
<td>A chemical dispersant, e.g., tetrasodium pyrophosphate, is adsorbed on small clay particles, causing the particles to repel one another; particles then redistribute through the sand, plugging pores between sand grains.</td>
<td>In clay, mixing must be done mechanically, but in coarse-grained soils, dispersants may be applied at surface. Dispersants yield marked reduction in permeability and frost susceptibility. Soil becomes stronger.</td>
<td>For relatively coarse-grained soils containing some clay, and where water seepage is serious but soil solidification is not essential. Uses: to prevent water entry into foundations, water seepage from reservoirs. Very inexpensive: 20¢ to $1 per cubic yard for materials.</td>
</tr>
<tr>
<td>Acrylanide Stabilization</td>
<td>Two organic monomers are dissolved in water. A catalyst is added, causing the monomers to link in long, flexible cross-linked chains. This forms a stiff matrix, with water molecules and soil particles bound tightly inside it.</td>
<td>Chemicals are injected into soil, can also be mixed or sprayed on. The gel seals voids, prevents water passage. Strength of soil mass is improved some. Chemicals do not react with soil particles, only with each other.</td>
<td>Used to seal off underground water flow in basements, tunnels, mine shafts, and to solidify granular soils. Now very expensive: $40 to $70 per cubic yard for materials. Difficult to work with, because materials are toxic.</td>
</tr>
</tbody>
</table>

Source: Dr. Alan Michaels, Soil Stabilization Laboratory, Massachusetts Institute of Technology.

### Design of numerous important buildings in Boston and other cities

The best-known among these is the New England Mutual Life Insurance building, completed in Boston in 1942. It rests on a floating foundation, i.e., sufficient soil was excavated from the site to compensate for the entire weight of the building, so that the stresses in the thick stratum of underlying soft clay were essentially the same after completion of the building as they were before. The maximum differential settlement which developed in this building is only about 1 inch in contrast to the large differential settlements which have developed in other buildings in that area for which the principle of flotation was not used. It is common in the foundations field to find such men as Casagrande, a leading teacher of theory, doing an extraordinary amount of practical outside consulting work. One reason for this, of course, is that there are still few men who are well-grounded in both soil mechanics theory and its applications in design. And, moreover, it is quite impossible to separate the two—theory and practice—without crippling both. Thus, today, it is not unusual that among the top foundation engineers in the field one finds also some of the leading theorists and research men, including:

- Leo Casagrande, brother of Arthur, a well-known foundation engineering consultant, both in Europe and the U.S., is noted for his invention of the electro-osmotic technique of soil stabilization (opp. page). Since 1960, he has taught soil mechanics at Harvard.
- Philip C. Rutledge, now a senior partner in the New York consulting firm, Moran, Proctor, Mueser & Rut-
r. Ralph B. Peck, professor of foundation engineering at the University of Illinois, was in charge of soil testing and field observations for the City of Chicago from 1939 to 1942, during the construction of the city's subway system. At Illinois, Peck and his associates devote roughly half of their time to field investigation and observations. Peck, like most teachers in the field, believes fervently that soil science must be blended with field experience. He says: "One of the most dangerous men a student can be exposed to is the instructor who has learned soil mechanics and nothing beyond it. Soil mechanics alone can only define the limits of applicability of experience.

Research bores in

The problems of soils' unpredictable behavior affect areas other than building foundations. Yet, research going on in these areas often benefits building. An example is the development of chemical soil stabilization. The field had its beginning more than 30 years ago, with such compounds as sodium silicate and calcium salts, used to reduce the water permeability of subsurface soils. But this infant science was not accelerated until after World War II, when the U.S. Corps of Engineers sponsored research in hopes of finding a chemical which could be spread over a strip of land to strengthen it sufficiently so that it could be used as an airfield. Considerable research was carried on at Cornell University, at the U.S. Corps of Engineers' research station in Virginia, and at Massachusetts Institute of Technology, where the government's research activity led to the establishment of the school's Soil Stabilization Laboratory. The result was a costly chemical process which could rapidly convert certain clays to a hard-rubber consistency, though its effects were only temporary.

Since 1953, American Cyanamid Company has extended this research activity, in cooperation with M.I.T., and has developed a related process to control underground water by chemical injection (see box, opp. page). The essential chemicals, a pair of organic monomers which dissolve in water, form a flexible gel when a catalyst is added. Cyanamid is producing the chemicals in limited quantities; to date, the process has been used on more than 20 construction projects. It has limitations, to be sure: it is costly, though costs will come down with volume production; it is toxic, meaning that only experienced workmen can work with it; it will work only in those soils which are permeable to water. Still, a beginning has been made, prompting more research such as that at M.I.T., under T. William Lambe and Alan S. Michaels, which is directed toward unraveling the mysteries of soil behavior and structure as well as developing inexpensive chemical techniques for improving soil stabilization with materials such as cement, lime, asphalt, and phosphoric acid.

Likewise, in other nonarchitectural areas, such as at the U. S. Bureau of Reclamation and the U.S. Corps of Engineers' Waterways Experiment Station, at Vicksburg, Mississippi, research is going on in soil solidification and permeability, i.e., why some soil types are more penetrable than others, and in the measurement of pressures exerted within various soil particles when loads are applied to them. This work, in dams, airfields, and roads, is already broadening the knowledge of water's behavior in many types of soils, some of which are common to building sites. And at Iowa State College, in research originally set up to increase the stability of state roads and highways, much fundamental work is underway in determining the effects of chemical additives in soils and asphalt.

All this work, plus world-scattered projects at dozens of other universities, including the Imperial College in London and the Norwegian Geotechnical Institute in Oslo, is leading toward new economies in foundation design. With the developments made by Terzaghi and others who followed him, foundation engineering has unveiled many of the mysteries of building settlement, such as the long-misunderstood phenomenon of delayed settlement, where a building would stand firm for several years, then slowly begin to sink.

The research yet to be done will reveal more about the fundamentals of soil chemistry and physics, such as the nature and origin of the electrical forces which are created between soil particles when loads are applied to them, and the chemical interactions of water and various soil types. Without this fundamental knowledge, the science cannot move ahead. For example, through direct experiment the scientists have learned that certain soils react with chemical additives, becoming stable and strong when the chemicals are introduced, while other soil types are unaffected by the presence of these chemicals. In order to develop chemicals which will stabilize any kind of soil, the scientists must learn, through basic research, why some soils react while others do not. Knowing this, they may some day be able to introduce new chemicals which will cause virtually all soil types to stabilize, leading ultimately to techniques for strengthening great sections of marginal earth by means of chemical injection. This is the great future of soil mechanics.
Apartment building from the
In this new Swedish system, a concrete core is first erected, then prefab concrete sandwich panels are hoisted up around it.

In Sweden, where building-labor costs are proportionately almost as high as in the U.S. and the housing shortage is even more pronounced, there is going on an intensive and systematic development of prefabrication. The newest development is a core system of building, devised by Allan Skarne, head of Byggnadsfirman Ohlsson & Skarne AB, large Stockholm contractors, which may soon be transported to the U.S.

The Skarne system combines prefabrication with a highly organized mechanization of operations at the site. It was put to the test recently in building a $6 million apartment-house complex at Ragsved, a suburb of Stockholm, where it cut the labor force and construction time about in half against traditional methods of similar construction.

The Ragsved project, designed by Architect Ernst Groenwall, consists of seven freestanding buildings in a parklike area, ranging from nine to 13 stories high, and containing 281 apartments of three to five rooms each. The major part of the construction is prefabricated concrete slab. Altogether, excluding sitework and foundations, the bare structures went up in about five months. The total labor force was 76, divided into two teams under six foremen. (It included only one skilled worker, a mason, to help build a chimney on the central heating plant.) The force hit a construction rate of nearly one full floor per work week.

On time saved alone, there was a saving of about $170,000 in interest charges on the project through faster payoff. To achieve this speed required a coordinated construction plan, sharp preplanning, factorylike prefabrication of units on the site, and a total investment in machinery and equipment of some $200,000.

**Skarne system at work**

The central idea of the Skarne system is to construct first the building’s central core, containing elevator, stairways, and utilities. This then serves as a transport shaft and as a base for a turret crane mounted on top to raise the building floor by floor around it. To supply materials and prefabricated units rapidly to the core hoists, a production line is organized at the center of the site (see sketch, below), which includes a cement plant (150 cubic yards per day), a wall slab factory (102 wall units per day), plumbing and formwork shops, and two railway cranes mounted on tracks encircling the area. Cement moves by conveyor belt to the slab factory or to lorries. The railway cranes lift the turret cranes to the top of the cores, tote finished wall slabs, and do other jobs. The major steps and details of construction are:

1. Core shafts are poured in sections in a square slip form, a method previ-
ously developed in Sweden, in which
the form is raised hydraulically after
each section has hardened, thus allow­
ing one hollow section to be built on
top of another. Cores are raised at the
rate of one foot an hour, one core in
two to six days.

2. Turret crane is mounted on the
core’s roof, elevator and stairs are in­
stalled in the shaft.

3. Wooden forms for the first floor
are mounted on the foundation or base­
ment floor, ready for concrete pouring.

4. Through slots left in the floor
form, interior wall slabs are slipped by
 crane hoist. These slabs are the bearing
walls of the structure. They are of
uniform width, 5.5 inches thick, and
grooved on vertical edge to allow con­
crete grouting between slabs.

5. Outer wall slabs, one story high,
are placed by crane, and then grouted.
These slabs are of a lightweight, sand­
wich type of construction which con­
sists of two 3-inch-thick slabs of pow­
ered-aluminum-foamed cement, with a
3-inch insulating filler core of polysty­
rene foam. They form a nonbearing
curtain wall, resting on the floor slabs.
At the same time, prefabricated win­
dow and door units are installed.

6. All reinforcing rods, plumbing,
electrical conduits, and other service
elements are assembled in the floor
form, and the 8-inch-thick concrete
floor is cast in place, locking in the in­
terior and exterior wall slabs.

7. After two days, the concrete floor
has hardened sufficiently to permit dis­
mounting of the formwork, which is
moved to the next story and the opera­
tion started over again. Since all walls
are dry construction, they are immedi­
ately spray-coated with water-repellent
paint, and other finishing operations
are performed floor by floor. Floors are
immediately steel ground, ready for
tile or linoleum laying. Tenants can
begin moving into lower floors about
two weeks after construction starts.

The ultimate economics

Ohlsson & Skarne cannot yet say
exactly how much the new system saves
over conventional construction, due to
the difficulties of figuring in the costs
of the special equipment required. The
system was first tried on some four­
story houses, on which it did not work
out too well economically. It showed
to much better advantage in the larger
scale, higher storied Ragsved project.
Currently the firm is putting the
Skarne method is eight to nine per cent
story apartment house near Stockholm,
from which it expects to gain a clearer
picture of the economics. Preliminary
estimates show, however, that the
Skarne method is eight to nine per cent
cheaper than conventional construction.
With time, experience, and amortiza­
tion, the savings may prove greater
than this.

END
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new approaches to structural design with fir plywood

Engineering tests by Douglas Fir Plywood Association showed vault resists three-times-normal roof load. Deflection at midspan was negligible. Note how door-high roof line saves wall area.

FIR PLYWOOD

Robert C. Wing, Consulting Engineer

In this graceful stressed-skin fir plywood domical roof, Architect Price has developed a simple and precisely engineered unit that combines beams, purlins and roof sheathing.

The first application of this new semi-spherical roof system is in the four-room satellite school shown at right. In its design, Price sought to create "an exciting and stimulating space with a high degree of flexibility and substantial construction economies."

Adaptable to other types of buildings, the Price roof system is a logical design evolution in which lightweight fir plywood replaces heavier and costlier materials. It provides a long, post-free span, pleasing mass and profile, has excellent lighting, insulation and acoustical properties.

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Plastic skylight

Laminated plywood skylight curb

Shop-fabricated, glue-laminated vault is made of two thicknesses of 3/8" long-length fir plywood.

Horizontal joints staggered.

Plastic skylight

Laminated plywood skylight curb

Support at wall is by 24'-deep plywood box beam, at corners by 4 x 4 posts.

DOMICAL ROOF

This four classroom satellite school in Tacoma, Wash., is the first to use Price's fir plywood domical roof system. Model shows dome-roofed classrooms opposite a general purpose room which has a fir plywood folded plate roof. A flat fir plywood canopy unites both areas and provides shelter in bad weather.

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This month Close-ups takes a look at four notable new facilities for summer play, each with a distinctive approach to the hot-weather problems of staying cool and having fun. On this page is a state-built bathing pavilion at Scusset Beach, Massachusetts, which won this year's Boston Arts Festival award in architecture. The two L-shaped buildings, which accommodate dressing rooms and a playground on one side and a snack bar, terrace, and maintenance yard on the other, open out toward the beach on each side of a patio and sculpture pool. For coolness and easy maintenance, Architects Child, Lawrence & Shannon made their classic white colonnades of hard-finished concrete and their vent-pierced walls of rich green concrete block.
WAVY ROOF FOR BATHERS

In California, Architects Welton Becket & Associates have sought to echo the undulations of the Pacific in this new public bathhouse for Santa Monica Beach State Park. First of four such public facilities which will be dotted at intervals along the city's shore, it has a canopy of thin shell concrete that ripples beach-

A FLEXIBLE GOLF CLUB

At the Crestview Country Club in Agawam, Massachusetts, golfers and indoor sportsmen alike are discovering the convenient flexibility of new 19th hole facilities designed by Architect Percival Goodman. Above locker rooms and a golf shop built into the slope, a flaring four-way roof shelters a main room 78 feet square overlooking the 18th green, putting green and swimming pool. Normally this big space is divided into a dining room, a grill and a bar-lounge (seen in photo at far right). But for large affairs, accordion-type walls are folded back, throwing the three rooms together for cool and spacious summer celebration.
ward over dressing rooms and a snack bar walled coolly and inexpensively in ordinary concrete block. The project also includes a fenced playground with wall seats for watching mothers, a well-equipped "Junior Muscle Beach" for aspiring older children, barbecue picnic areas for families, and parking for an eventual 2,000 cars.

Getting around in club circles is no mere figure of speech at the new Isle Dauphine Club 4 miles off the Alabama coast in the Gulf of Mexico. For lot owners on the new resort island, Architects Howard Ellis and Arch Winter have tucked into the dunes a clubhouse without a single straight line in sight. Members dine in semicircular appreciation of the broad Gulf view, climb a circular stair tower to a circular ballroom, or descend to a circular bar and beach-level terrace. Across circular patio walks, the club's circular pool is surrounded by a circle of dressing rooms and flanked by a circular wading pool for younger children.
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To give latitude...even magnitude...to the scope of your lighting designs, Columbia puts infinite variety in your hands...from a 2' x 2' coffer to an acre of luminous ceiling. Beautifully engineered for unobtrusive yet decorative appearance, low-cost Columbia fixtures combine ten different styles with eight different types of shielding media to give you freedom of design unmatched in the lighting industry. Columbia's unequalled array of fixtures is stockpiled...nationally distributed...immediately available.

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Get rid of disturbing noise

Johns-Manville Sanacoustic absorbs up to 85% of room noise that strikes it.

Johns-Manville Acoustical Ceilings cost less installed than 10 years ago

Yes—the cost of a J-M Sanacoustic® Ceiling is lower than 10 years ago! And you gain these advantages: Sound-absorbing mineral wool pads within perforated metal units give best sound control. Baked enamel finish cleans easily. Units snap into tee bar for tight, firm joints; simple to unsnap for relocating. Ceiling has high light reflection and is noncombustible. Continuing J-M improvements hold down first cost and upkeep costs.

announcing! Roddis

7/16" architectural craftwall...

FACTORY-FINISHED WOOD PANELING

installs direct on studs...no underlayment!

Another Roddis “first”! New, veneered paneling of exceptional strength and rigidity... with a new “solid feel”. Gives many of the advantages of 3/4" material yet costs far less!

Now! Many of the characteristics of the finest 3/4" plywood paneling... at real cost savings... with Roddis' new 7/16" Architectural Craftwall!

Sturdy and solid-feeling, Architectural Craftwall is made from choice, hardwood veneers bonded to a 3/4" center of Timblend, Roddis' amazing man-made board.

This exclusive Timblend center makes the big difference! A unique, wood blend shavings board, Timblend gives extra strength and rigidity... assures maximum freedom from movement after installation. Architectural Craftwall stays put!

Installation is simplicity itself. Architectural Craftwall goes up fast... directly on studs or furring strips. No costly, time-consuming underlayment needed. Install with Roddis Contact Cement. Or use nails if preferred.

Sound reduction properties are impressive, too. Tests prove acoustical values of Architectural Craftwall are comparable to plaster or drywall construction.

A wide choice of woods and styles enhance your design possibilities. Select from Birch, Silver Birch, Maple, Oak, Walnut, Elm, Cherry or Mahogany. Each is completely factory-finished, ready to install. Available V-grooved at 16" intervals or V-grooved, cross scored and pegged. All panels V-grooved at veneer joints also. In regular plywood sizes... plus lengths to sixteen feet.

Architectural Craftwall is also available in standard or special size panels, without grooves, with matched flitches in the wood of your choice.

For free sample and information on how Roddis' 7/16" Architectural Craftwall can give any paneling installation new beauty, greater strength—at lower cost, just send the coupon.
ARCHITECTS AND DESIGNERS

Roddie Architectural Craftwall is a NEW kind of wood paneling. There is nothing else like it in the market. You get deep-grooved beauty and true "solid feel" at a price that will please the most cost-conscious client. And remember, this new Roddis product actually works and handles like costly 3/4" materials. Send coupon for details and sample.

RODDIS PLYWOOD CORPORATION
Marshfield, Wisconsin

Now... no underlayment required... apply direct to studs and save on material and labor. Rigid new 3/16" panels are easy to work with. Once up, they stay put... no movement on the wall! Perfect for both commercial and residential use.

Exclusive New-type Construction. Hardwood veneer bonded to 3/16" center core of extra-stable Timblend. Backed with protective veneer that is sealed to lock moisture out.

Preminished veneer facing / Sealed veneer backing

Building Paper
3/16" Craftwall
Alum.Foil Vapor Barrier
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So easy to install. Apply direct on studs with Roddis Contact Cement or nails, if preferred.

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Marshfield, Wisconsin, Dept. AF-958

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HOW TO GET MORE FOR YOUR ELECTRICAL DISTRIBUTION DOLLAR

Lightweight aluminum busway systems are one of the biggest bargains in the building industry. Here is a product that meets your electrical requirements at the lowest possible cost. The aluminum in busway saves you up to 20 per cent on material cost, up to 20 per cent on installation cost and offers you savings in weight permitting the use of less costly busway supports. In addition to savings, flexibility is another big benefit you get with busway. Future loads can be tapped off at any point to meet your new or expanded power needs without tearing down switchboards or adding feeder cable and conduit. Pound for pound, aluminum busway has greater current-carrying capacity than cable in conduit, with no increase in temperature or voltage drop. It also requires less space.

When you need a modern, flexible distribution system, specify busway made with Alcoa Aluminum...and save. Aluminum Company of America, 2295-H Alcoa Bldg., Pittsburgh 19, Pa.
Flexible floor system . . . prefabricated concrete screen . . . glare-reducing bulb . . . fireproofing paint

**PREFABRICATED FLOOR**

provides subfloor utility space

The new floor system being assembled in the photos above can be installed over an existing floor to provide subfloor space for air-conditioning ductwork, machinery power cables, telephone wiring, or other utility equipment. The system, developed by Floating Floors Inc., of New York City, requires no permanent supporting structure, no bolts or fastening devices, and no alterations in the existing floor; instead, prefabricated floor panels rest on steel pedestals which are simply set down freely on the old floor.

The assembly process is quick and easy: the pedestals are first placed so that each will support one corner of four different modular steel frames; these frames, which are 36½ inches square, are then set into the aluminum pedestal head, where, after all four corners are positioned, they self-lock; and finally, four aluminum plates 18 inches square are dropped into the frame as shown in the top left photo. As all frames and plates are interchangeable and can be raised with a suction-cup lifter, a Floating Floor can be easily rearranged or removed at any time; subfloor equipment is always accessible for maintenance or repairs; and registers, outlets, or cutouts can be picked up and reinstalled whenever machinery or other equipment is moved to a new location. In addition, the supporting pedestals are adjustable; thus the entire floor can be raised or lowered to provide more or less housing space for underfloor equipment—or to compensate for unevenness in the existing floor. Space between floors can be varied from 2⅜ inches to 13⅞ inches. Floor plate thickness: 2⅛ inches.

*Floating Floors* are designed to take loads of 1,000 pounds per square inch or 275 pounds per square foot. Finished floor weight: about 8 pounds per square foot. Installed cost per square foot: about $5.50 to $6, including a vinyl tile floor covering.

*Manufacturer:* Floating Floors Inc., 22 East 42nd St., New York 17, N.Y.

**CONCRETE SCREEN**

consists of precast blocks

The photos at left are of two pierced concrete screens designed by Austrian Sculptor Erwin Hauer. Composed of precast blocks which are assembled at the job site, the screens are intended for use as interior room dividers or as exterior sun shades. In one design (top photo) two 8 by 8 by 3 inch blocks form one 8 by 8 inch screen unit 6 inches deep. Cost: $2.50 per block—or $5 per unit. The second design shown, which is also 6 inches deep, is composed of foot-square blocks which sell for $3.50 each—or $7.50 per two-block unit.

*Manufacturer:* Murals Inc., 16 East 53rd St., New York 22, N.Y.

continued on page 136
helps skeleton don skin... in a hurry!

This skeleton was ready for its curtain wall exterior ahead of schedule. The steel flanges to which curtain walls are attached, were fastened to the beams with Ramset powder-actuated fasteners... 15 times faster than old-style methods, because Ramset eliminates pre-drilling! Says the erector, "Ramset is the most satisfactory and economical method of setting curtain wall brackets for collateral steel work."

For complete details about Ramset for your uses, ask for new catalog and AIA file, now ready.

SILICA COATED BULB eliminates glare and "hot spot"

The common light bulb has undergone its first major design change in 25 years. The result: the new Eye Saving bulb (below) which virtually eliminates the glare and "hot spot" of the standard type (shown at right, above). Developed by Westinghouse especially for reading or close-seeing tasks, the new bulb, which is almost cylindrical in shape, is electro-statistically coated inside with glare-deflecting silica. Since the bulb has greater interior surface area than standard types (though their outer dimensions are the same), more silica coating (thus less glare) is possible. Cost: about 3 cents more than standard bulbs.

Manufacturer: Westinghouse Electric Corp., MacArthur Ave., Bloomfield 7, N.J.

MULTIDOOR LOCKING SYSTEM has series of interconnected keys

A new door-locking system for offices, stores, or small factories makes it impossible to forget to lock all doors when closing up for the night—each door must be locked in a predetermined sequence, with the final lock being operable only after every other door has been fastened. The system works this way: each lock is fitted with two key cylinders as shown below; in locking up at night (or in unlocking in the morning), it is necessary to throw the bolt of the first lock with one key before the second key can be removed; this sec-
at all times—except, of course, during the unlocking or locking cycle. Designed for mounting on overhead, sliding, or standard hinged doors (as well as windows, cabinets, safes, and other storage areas), the **Sequlix Lock** has a bolt with 1 inch throw and key cylinders of the five-pin tumbler type. Cost per lock: $24.

**Manufacturer:** Safety Lock Corp., 236 North Franklin St., Hempstead, N.Y.

**OPEN PHONE BOOTH**

**has glass-fiber soundproofing**

Sixty per cent sound attenuation is claimed for the small **Hush-A-Booth** shown below. Designed as an open, wall-mounted housing for telephone or intercom equipment in offices, factories, institutions, and public places, the 65 pound unit uses 2-inch thick glass-fiber lining as its acoustical medium. The outside casing is of heavy plywood; the inside surface is perforated sheet metal. Dimensions: 27¾ inches wide, 35 inches high, 24 inches deep. Available unfinished or in green enamel, the **Hush-A-Booth** is priced at $114.50, including the sliding directory tray.

**Manufacturer:** Korfund Co., Inc., 48-15 32nd Place, Long Island City 1, N.Y.

**LATEX PAINTS**

**developed for exterior use**

Water-thinned latex paints composed of polyvinyl acetate resins have been made practicable for general use outdoors as well as indoors, thanks to new resin formulations developed by the Celanese Corporation of America and the Bakelite Company, a division of Union Carbide and Carbon Corporation. The new paints, according to these companies, will penetrate old paint, even if it is chalky or dirty, and adhere to the wood, asbestos shingle, brick, or other surface beneath.

In the Celanese test pictured on page 138, pressure-sensitive tape is used to show how the new paint adheres (left) to a heavily chalked panel, and how an old type (right) does not. Absence of yellow-

**continued on page 138**

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**Stromberg’s new Electronic Time System** is a product of the laboratories of one of the largest clock manufacturers in the world — YOUR GUARANTEE of performance, quality and dependability.

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Map shows the vast western area served by Union Pacific.

INDUSTRIAL DEVELOPMENT DEPARTMENT
UNION PACIFIC RAILROAD
Omaha 2, Nebraska

FIREPROOFING PAINT
foams into insulating coat

Pyromors-Dammenschutz is a new fireproofing paint from Germany designed for interior roof structures, walls, ceilings, or doors of wood. When exposed to fire or high temperatures, it foams into a dense, microporous coating which acts as insulating protection for the wood surface beneath, and at the same time releases carbon dioxide and other fire-retarding gases. Nontoxic and quick drying, the new paint can be tinted with special pigments. One gallon effectively protects about 165 square feet. Cost: about $5 per gallon.


WOOD PRESERVATIVE
protects against termites and fungi

Xylamon, a German product new to this country, is a chloronaphthalene solution which protects wood pilings, telephone poles, fence posts, and other subsoil structural members against all types of rot, fungi, and termites. Developed more than 30 years ago and used extensively throughout Europe, Africa, and parts of Asia, it is said to be 30 times more effective than a 5 per cent solution of pentachlorophenol. In addition, it requires no pressure impregnation; instead application is by a simple dipping process or by brushing. Tarfree, it can be painted over or varnished; neither acid nor alkaline, it will not damage metals, plaster, brick, or textiles. Treated wood after three days is completely odorless. Though 100 per cent toxic to termites and other insects, Xylamon is reportedly harmless to touch. Cost: about $4 per gallon.

NICKEL-COBALT WELDING WIRE joins dissimilar metals

Development of an unsheathed welding wire designed specifically for joining dissimilar metals has been announced by the International Nickel Company. Available on spools or in straight 36 inch lengths, Inco-Weld A, which is composed mostly of nickel and cobalt, reportedly enables arc welding of 95 per cent of all dissimilar metal combinations. The resulting joint is said to have good corrosion resistance, machinability, and impact resistance — and a strength usually greater than that of either metal being joined.

Manufacturer: International Nickel Co., Inc., 67 Wall St., New York 5, N.Y.

THREE-D WALL COVERINGS provide textures for interiors

Three new wall-covering materials have been introduced by Murals Inc. of New York City: 1) brilliantly colored, three-dimensional tiles by Gio Ponti (top photo below); 2) abstract murals by Artist Anton Refregier executed in foot-square tiles; and 3) cement-sand-marble sculpture cast in 10 pound blocks 1 foot square, 1 1/2 inches thick (shown assembled in the bottom photo). The Ponti Tiles, available in 14 different shapes (raised diamonds, sculptured rectangles, rhomboids, abstract fish, etc.), sell for $2.75 to $5.35 per square foot. The Refregier murals are priced from $8 to $10 per tile, and the sculptured blocks cost about $2.50 each.

Manufacturer: Murals Inc., 16 East 53rd St., New York 22, N.Y.

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Architectural Forum / August 1968
CASE #102—Another case where General Electric Factory-Assembled Air Conditioning Units proved more practical than a field-assembled system.

The striking modern lines of the new Surety Life Building, Salt Lake City, Utah, pay tribute to the taste and skill of the architects. And the economical, Zone-by-Zone installation of General Electric Air Conditioning pays tribute to their judgement.

GENERAL ELECTRIC ZONE-BY-ZONE AIR CONDITIONING

meets all economy and performance expectations of architects in new Salt Lake City building

Beauty and function go hand in hand—with an incomparable degree of comfort—in Salt Lake City’s new Surety Life Building. The architects chose a system of air conditioning as modern and effective as the architecture itself—General Electric Zone-by-Zone Air Conditioning. Here’s what Mr. Slack W. Winburn, architect-engineer, has to say about it...

“The General Electric Air Conditioners specified by us have proved highly satisfactory in the Surety Life Building. The points entering into our decision to specify General Electric Zone-by-Zone Air Conditioning offered the following benefits:

“1. Lower first cost, together with lower operating costs.

“2. Three zones of control per floor provide flexibility of control in the northern, central, and southern areas, thereby affording proper temperature control regardless of solar exposure, occupancy, or outside temperature.

“3. With the Zone-by-Zone conditioning approach, the large and long supply ducts normally used in a central-plant system were eliminated.

“4. The system allowed a layout of duct distribution between floors and the placing of diffusers and lights to a module between window mullions. This enables partitions to be moved without tearing into ceilings to make changes.

“5. One important consideration was the easily removable, sealed refrigeration units which can be replaced quickly if repairs are necessary.”

We can add little to Mr. Winburn’s words except, perhaps, to note that this case is typical of the results you can expect when you install General Electric Zone-by-Zone Air Conditioning.

General Electric’s complete line is flexible enough to meet every air conditioning need for all types of buildings—large or small, old or new. Ceiling-mounted units, water-cooled, up to 7½ tons—air-cooled up to 10 tons. Floor-mounted units—water-cooled—up to 30 tons—air-cooled up to 20 tons. Steam and hot water coils available for all models. Discover how General Electric Factory-Assembled Units can simplify your job. For full details write: General Electric Company, Air Conditioning Department, 5 Lawrence Street, Bloomfield, New Jersey.

Progress Is Our Most Important Product

GENERAL ELECTRIC

In Canada, Canadian General Electric Co., Ltd., Montreal
Tallest building in Texas... and the West

Built by
American Bridge

The Texas reputation for size is proved again in the Southland Life Insurance Company Home Office, in Dallas, Texas—"Southland Center." This project covers an entire city block and, as integral parts of a single structure, has: a three-story base structure (above ground); the Southland Life office tower, 42 stories high; and a 28-story luxury hotel. When finished, Southland Center will include a third tower of which the first three floors are already under construction.

American Bridge fabricated and erected all structural work, 16,100 tons. Main field connections were made with high strength steel bolts.

American Bridge is equipped—with experience, facilities and men—to handle all types of structural steel work, in all parts of the country. For more information, or specialized advice on your next project calling for structural steel work, get in touch with the nearest office of American Bridge.

The Southland Life Office Tower (rear) contains about 13,900 tons of structural steel and measures 82' 6" x 192' 6" x 650' 3" high. In this finished building the home office of Southland Life Insurance Company will occupy 14 floors. There will be parking facilities for 250 cars in three of five underground levels, a public observation lounge on the 41st floor, and a heliport on the roof. The "Sheraton-Dallas" hotel tower (front), with 600 rooms, required 2,800 tons of structural steel. It is 55' x 192' 6" x 340' 10" high.


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HAUSERMAN erection crews assure installation to specs so you can avoid time-consuming field supervision. Call your local HAUSERMAN representative for design data and specs to help you incorporate economical HAUSERMAN “HP” Movable Walls into any job... president’s office or factory shop. He’s listed under “PARTITIONS” in the Yellow Pages, or write to the address shown below.

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A REMOTE AIR COOLED CONDENSER
THAT REQUIRES ONLY 1/3 OF
THE REFRIGERANT CHARGE USED
BY COMPETITIVE MODELS

A RECENT 300 TON JOB SHOWED SAVINGS OF 1800 LBS. OF REFRIGERANT THROUGH USE OF THESE UNITS.

Yes, the Dunham-Bush 'BC' Remote Air Cooled Condensers with famous Inner-Fin construction mean savings of 67% in refrigerant charge. Additionally, they mean smaller receivers and minimum loss if the system charge is lost. In these expertly planned units, the exclusive Inner-Fin construction diminishes the internal volume of the coil while increasing the heat transfer coefficient. And higher heat transfer factors permit design of more compact units, saving valuable space in installation.

AS MUCH AS 53.5 TON
CAPACITY IN ONE UNIT

The Dunham-Bush line of 'BC' Remote Air Cooled Condensers includes models in 13 sizes with capacities ranging from 2.2 tons to 53.5 tons, making possible use of a single unit for practically any job!

AND FOR MAINTAINING SATISFACTORY HEAD PRESSURES

Plastic vinyl paint is applied to all ferrous parts of unit casing and structure in three stages:
PRIMER—a polyvinyl plastic combined with zinc chromate.
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All interior surfaces of the unit casing are given an extra finish coat of plastic vinyl.

FOR ALL 'ROUND PROTECTION

at all ambient, Dunham-Bush engineers offer the 'PS' Pressure Stabilizer.
'PS' units can be mounted indoors near the compressor, facilitating the making of necessary adjustments. They are thoroughly factory tested and assembled, and require connection only to the refrigerant liquid and discharge lines. No extra piping or special loops required. Regulating valve gives smooth pressure control and eliminates wide pressure fluctuations inherent in other head control systems.

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The name Dunham-Bush is synonymous with efficient, satisfactory service for all types of pressure and temperature conditions. For technical assistance, our engineering staff is at your service. For more information, contact us.
Ceco Research shows what you need in Curtainwalls

There's a great deal of difference between construction and creation. But the two must work together. Though curtainwall construction permits creative freedom, architects, engineers and contractors agree it must be technically and economically sound. Ceco-engineered curtainwalls permit blending artistic expression with practicality. No guesswork is involved. Within the past year—through technical research in field and laboratory—Ceco has developed basic engineering principles which can be applied to almost any architectural design. You should have all this information before you start your next curtainwall plans. So come to Ceco's "library of experience"—ask your Ceco man for his help. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 W. 26th St., Chicago.
Rose's gardens . . . Gabo's sculpture

CREATIVE GARDENS. By James C. Rose. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22. N.Y. 208 pp. 10\(\text{\textquotedbl}x\)13. $15

This big and beautifully illustrated book is primarily concerned with gardens for suburban residences, but many of the fresh ideas discussed are equally applicable to the landscaping of nonresidential properties.

The author is a pioneer in modern landscape design, one of the few who has kept his art abreast of the development of contemporary architecture and who closely relates his work to it. As might be expected, his designs make wide use of building materials (lumber, cut stone, brick, and glass) as well as plant materials. They also make use of water and a great variety of attractive, functional screens and furniture designed by the author.

GABO. Introductory essays by Herbert Read and Leslie Martin. Published by Harvard University Press, Cambridge, Mass. 193 pp. 9\(\frac{1}{2}\) x 12. $15

An elaborate volume of essays and photographs (complete with 3-D glasses) reviewing Sculptor Naum Gabo's work. Gabo is the "constructionist" of the stormy twenties and thirties, the man who did in sculpture what Kandinsky was doing on canvas and Mendelsohn in architecture: redefining space in contemporary terms.

It was very exciting then—as the pictures in this book demonstrate. But we have grown rather used to the new shapes allowed by plastic substances, we have long ago agreed that there is more to space than the formal illusion of perspective. We are no longer intrigued by experiments such as Gabo's "bas-relief" sculpture for the lobby of Rockefeller Center's U.S. Rubber Building. What we are looking for is some new synthesis.

And happily, there is some indication in the book that Gabo feels the same way himself today. Perhaps the best clue is his big, boldly sculptured "tree" built on the sidewalk outside Breuer's already famous Bijenkorf department store in Amsterdam (FORUM, 1957). It looks as if Gabo is emerging from the forest.

development space. The drawings are supplemented by a series of exquisite drawings (mostly one-point perspectives) overprinted with brilliant colors and exact replicas of natural textures, and the result is a first-rate introduction to the nature of modern space. The drawings are supplemented with full-page, black-and-white photographs of various materials and surfaces available in architecture, and with striking color photographs of various interiors designed according to the principles outlined by Professor Witzemann.

There is nothing radically new about those principles, but no one has ever made them clearer. The only missing element is a discussion of the color-systems developed by modern painters over the past 40 years or so. Such a discussion was published in the Swiss magazine, Werk, several years ago and showed that there are definite "family-affinities" between certain colors, textures, and forms which were first brought out by abstract painters, and are now part modern architecture.

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With the INVISIBLE DOR-MAN,
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dependable performance, minimum maintenance.

Beauty
Completely concealed, adapts perfectly to all modern
architecture. Carpets are now available in five decorator
colors and can be monogrammed or trade-marked for per­
sonalized identification. TOUCH-O-MATIC handle actuated
models are custom made for all types of doors.

Versatility
Single units, double units, in-and-out pairs, carpet or handle
actuated—whatever your needs, there’s an INVISIBLE
Dor-Man to fit any requirement. Installation and main­
tenance are easy, inexpensive. You’ll have the best when
you select the DOR-O-MATIC INVISIBLE DOR-MAN. Write
for detailed information.

Manually Operated Concealed in the
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Export: Consultants International, Apartado 21397, Mexico 7, D.F., Mexico

High Rent Housing and Rent Control
in New York City. Published by the New
York Temporary State Housing Rent Commis­
sion, 280 Broadway, New York 7, N. Y. 174
 pp. 5½" x 9". Free

This monograph provides a fascinating
case history of the impact of rent controls
on rental housing. Based on a 1956 Rent
Commission survey of New York apart­
m ents, it covers apartments that rented
for $200 or more a month at the start of
rent control in 1947, and the 56,240 uncon­
trolled new units erected since 1947. Of
the latter, 22,170 were public housing
units, 11,060 were units in projects grant­
ed tax exemption benefits or some other
form of direct subsidy, and only 22,410
were free-enterprise unsubsidized units.

The most revealing fact the survey disc­
closes is the complete removal from the
rental market between 1943 and 1956 of
73 per cent (9,300) of the 12,800 Manhat­
tan apartments originally priced at $200
or over a month. Some 6,200, or 48
per cent of the original supply, were con­
verted into cooperatives; another 3,100,
or 24 per cent were subdivided into
smaller units, changed to commercial use,
demolished, or otherwise decontrolled after
owners were able to obtain “possession”
of them. By 1956, 13 years after controls
started, Manhattan’s regulated $200 or
over apartments totaled only 10,000—as
compared with 12,800 in 1943—and 6,500
were units that had moved up into this
price range as a result of rent increases.

The report includes an analysis of the
various rent increases obtained from time
to time by the 10,000 units that were in
the $200 or over range in 1956. The most
striking fact revealed is that 42.3 per
cent of these apartments had qualified for at
least one officially approved “hardship” re­
li ef increase, because the owner’s income
had dropped below a statutory 6 per cent
minimum return, plus 2 per cent for de­
preciation. And, 22.4 per cent, or more
than one out of every five, had qualified
for two or more “hardship” increases.

When granted, however, such increases
only allow income to be brought up to 6
per cent, and 2 per cent for depreciation,
as a maximum. With such a large volume
—approaching a majority—of apartments
restricted indefinitely to public utility or
“hardship” level yields, city officials should
scarcely wonder that rent control has been
accompanied by a steady shrinkage in the
city’s stock of rental housing.

Aluminum in Modern Architecture.
Peter. Published by Reynolds Metals Com­
pany, Louisville, Ky. 118 pp. 9" x 9”.

A fine companion to Aluminum in Mod­
ern Architecture, Volumes I and II. The
new examples of good aluminum buildings
are attractive, particularly from abroad.

END
Vina-Lux® Floors with Micromatic Veining

Help You Achieve...

MINIMIZE LENGTH...MAXIMIZE WIDTH

The even, directional flow of Micromatic veining in Vina-Lux emphasizes length or width very effectively. Here is a flooring that has distinctive beauty plus superior performance—a modern resilient flooring that helps an architect to design better floors.

Vina-Lux is a versatile tile that solves many floor problems. It's greaseproof and durable—slip-safe and easy to maintain. Solve your floor problems with this outstanding vinyl asbestos tile. Available in 31 colors and 4 styles. Samples are yours without obligation.

Color Shown: V-312, Capistrano

AZROCK FLOOR PRODUCTS DIVISION
UVALDE ROCK ASPHALT CO. 504A FROST BANK BLDG. • SAN ANTONIO, TEXAS

MAKERS OF VINA-LUX • AZROCK • AZPHLEX • DURACO
It *had* to be glass

Everything fits. The form is right. The function is right.

And the lighting is right — because it is done with glass. In this case it's Corning's Pattern No. 70 Low-Brightness Lens Panels mounted flush in the ceiling.

The light from these fixtures is glare-free, the kind of light that makes for a pleasant work area. The glass transmits the true color of the light source—plays back the decorative colors you chose. This is the kind of light that makes the most of your skills in putting color and form to work.

Equally important, the many textures of Corning lighting glassware provide an additional design component, one that can be readily integrated into every setting and decorative scheme.

Add up the long-term values of glass, too—the fact that glass won't warp, fade, or discolor. Consider how glass is kept eternally new-looking with just a damp cloth.

Isn't it time to see how many ways glass lightingware by Corning can work for you? The basic reference on the subject is our "Commercial Lighting Application Guide." Send for a free copy, soon.

CORNING GLASS WORKS, 64-8 Crystal Street, Corning, N.Y.
new versatility

with the new

Nebbitt ROOMMATE

YEAR-ROUND CABINET AIR CONDITIONERS

In addition to versatility of arrangement, the Roommate is available in seven standard (baked enamel) colors. Bypass control is optional. Units may be installed for heating only, with cooling added later by the installation of chilled water supply. Write Nesbitt for Publication 600-1.

20 STANDARD FLOOR TYPE INSTALLATIONS

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22 STANDARD WALL AND CEILING TYPE INSTALLATIONS

equals

42 STANDARD INSTALLATION ARRANGEMENTS

multiplied by

7 STANDARD MODELS
totals

294* STANDARD MODEL INSTALLATION ARRANGEMENTS

* 5 to 5 tons cooling capacity, 25 to 180 MBH Heating Capacity.

Write for data, too, on the new Nebbitt Series A line of Cabinet Heaters.

Nebbitt

HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT

Put these "ideas in motion" to work for you

**Improve building design...**

**Increase client satisfaction**

Wherever people, materials and equipment are on the move Stanley Magic-Door controls can
STANLEY MAGIC-DOOR CONTROLS can be specified for any new or existing doors that swing, slide or fold. For complete information, see SWEET'S ARCHITECTURAL FILE and write to Magic Door Sales, Stanley Hardware, Division of The Stanley Works, Dept. H, 1005 Lake Street, New Britain, Conn., for your copy of A.I.A. FILE No. 16-D.

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This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • metal parts • coatings • steel and steel strapping—made in 24 Stanley plants in the United States, Canada, England and Germany.

PRIVATE OFFICE DOOR

AIR-LOCK APPLICATION

SHOW ROOM DOORS

PLANT DOORS BI-FOLDING

HOSPITAL DOORS

DRIVE-IN SERVICE DOORS

VISIBLE OR CONCEALED OPERATORS

HELP MOVE TRAFFIC EASIER AND FASTER

Architectural Forum / August 1958
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**Nibroc Towel Cabinets** match the strength, beauty and durability of modern skyscrapers. They are ruggedly constructed of heavy 20-gauge steel in chromium, stainless steel or heavy white enamel finish. **Also available in beautiful, new Kromotex, in soft pastel green, gray, bronze—and in prime finish.** Can be mounted on practically any wall surface without drilling or bolts. Recessed dispensers and waste receptacles also available in single or separate units.

Nibroc Towels are scientifically engineered to give you the best possible balance of strength, softness and absorbency. Their exceptional quality means greater economy, complete user satisfaction.

For more than 35 years Nibroc Cabinets and Nibroc Towels have been the choice of leading architects for many of the nation's finest buildings. Look in the Yellow Pages under Paper Towels for nearest distributor. Or write Dept. UN-3, Boston.

**BROWN COMPANY**

Mills: Berlin and Gorham, N. H.

**SEE SWEETS CATALOG** for information about Nibroc Cabinets—wall, floor model and recessed.
What other people are saying

THE MEANING OF BRUSSELS

The architecture of the Brussels Fair, according to the Architects' Journal of Britain, indicates that the modern movement has at last triumphed at the social level—and can now go on from there.

Critics seem agreed that the Brussels' Exhibition marks the beginning of a period of consolidation for modern architecture and it is difficult, though tempting, to contest this. On the whole those nations which have come off best are those which already had a stake in the movement before the war, countries like Germany, Holland, and Finland; but it is pleasant to see other countries joining their company who had no such tradition, countries like Spain, Yugoslavia, and Austria. On the debit side are France, who still finds her who had no such tradition, countries like Spain, Yugoslavia, and Austria. On the debit side are France, who still finds her...
new SHLAGRO
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SQUARE COLUMN

A unique composite of hot rolled steel sections and concrete fill, this exclusive new Shiagro "space-saver" square column carries more weight — pound for pound — than any other column!

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Yes, Bowling Alleys Too Can Get Striking Lighting with Standard Fixtures... by LITECONTROL

In these pages over the years we have been pleased to show you lighting installations in banks, offices, Supermarkets, specialty stores, schools and gymnasiums, churches, libraries and industrial plants. All of these installations have one thing in common — the superb quality of the lighting is obtained with moderate cost, standard fixtures — right out of our catalog.

The same circumstances prevail with this ultra-modern bowling alley. It is an impressive establishment — with sixty continually busy alleys, a modern restaurant and snack bar and air-conditioning. Litecontrol fixtures were chosen to illuminate this handsome interior and to blend into this very well designed structure. They were used throughout except for the area immediately over the alleys.

Whether your next installation is a bowling alley or a bank, you can get results on a sensible budget with LITECONTROL.

INSTALLATION: Thruway Lanes, Buffalo, N. Y.
AREA: Bowling Alley
ARCHITECT: Milton Mifflin
ENGINEER: Walter H. Sherry & Associates
DISTRIBUTOR: Buffalo Incandescent Light Co., Inc., Buffalo, N. Y.
ELECTRICAL CONTRACTOR: Frey Electric Construction Co.
FIXTURES: Litecontrol No. 6042TS 4-lamp approx. 2' x 2' recessed fixtures; No. 3324RS and 3428 2-lamp recessed fixtures, 2-lamp, 8-ft. strip fixtures over alleys by others.
FIXTURE SPACING: 10 feet on centers
INTENSITY: Average 45 foot-candles after 6 months operation (alley area not included)

LITECONTROL CORPORATION, 30 Pleasant Street, Watertown 72, Massachusetts

DESIGNERS, ENGINEERS AND MANUFACTURERS OF FLUORESCENT LIGHTING EQUIPMENT DISTRIBUTED ONLY THROUGH ACCREDITED WHOLESALERS
"I find the answers on FLOOR TREATMENTS... in these HILLYARD FILES!"

"What's The Best Treatment?"
Folders recommend treatments for varying floorings, floor uses and problems. Contain architect's specifications for treatment of new flooring (old flooring, too).

"What Help Can I Give My Contractor?"
Folders also contain detailed step-by-step instructions for applying each treatment specified. Includes recommendations on maintenance, which can be passed on to the client.

"Who Will Serve as My Job Captain?"
The Hillyard Maintaineer® will serve—without charge or obligation! He's your own skilled consultant, ready to help on any floor treatment problem. File carries geographical listing of the more than 175 trained "Maintaineers", from which you can select the man in your territory.

Bring Your Files Up-to-Date
Each of these Hillyard Files (AIA No. 25G) has been revised and is current for 1958. Write for new issues to complete your files, or to replace older files you now have.
A continuing series of outstanding schools, churches, office buildings, hospitals and industrial structures using NORTON DOOR CLOSERS

**TWA** EQUIPS
NEW BUILDINGS IN
KANSAS CITY WITH
NORTON DOOR CLOSERS

An engine for an airliner or a door closer for the plant which overhauls that engine, both must have one quality in common—dependability—to be acceptable to Trans World Airlines. With that thought in mind, the engineers specified Norton Surface-Mounted Door Closers for buildings at Trans World Airlines' new $18,750,000 overhaul base on Kansas City's Mid-Continent International Airport.

The door closers used here by TWA are the modern counterparts of Norton Door Closers still in daily use after serving continuously 20 to 30 years and longer. Other Norton models are available as shown at the left, to serve virtually every door closer need with equal dependability. See the new Norton catalog #57 for full descriptions of the complete line, including important new models. Write for it today.

**NORTON® DOOR CLOSERS**

BURNS & MCDONNELL ENGINEERING CO., ARCHITECTS AND ENGINEERS • AMMANN & WHITNEY, CONSULTING STRUCTURAL ENGINEERS

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**Complete Norton Line Meets Every Door Closer Need**

NORTON INADOR for Streamlined Modern Design available with (A) regular arm and (B) holder arm...4 sizes to meet all standard requirements.

NORTON 750: New corner design with concealed arms for all type doors, particularly narrow rail doors.

Norton Surface-type Closers are available for all installations where concealment is not essential.

NORTON 703E: Compact surface mounted type...first closer with extruded aluminum alloy shell.
planning and has reserved $1.3 million as the federal contribution to the write-down.

The Center and the city

One of the major difficulties faced by Lincoln Center's backers from the beginning has been the opposition of business organizations and residents in the area. Led by a lawyer named Harris Present, this group focused its opposition to the project on the allocation of land to Fordham (a Catholic university), maintaining that the federal urban renewal program was being used, in effect, to subsidize a religious organization in violation of the constitutional separation of church and state. Last month, the U.S. Supreme Court rejected this argument. From a legal standpoint, therefore, the project should have fairly clear sailing from now on.

Most of the criticism of the project now is less legalistic and more humanistic. There are those who point out that there is no sure guarantee that the Lincoln Center complex will provide the essential subsidiary facilities people need—the restaurants, the shops, the studios for private teaching, the offices for concert management. These adjuncts are now largely concentrated around Carnegie Hall on 57th Street, and unfortunately neither the Center itself nor the cramped area around it seems to provide room for these atmosphere-creating service facilities. On the other hand, the champions of Lincoln Center maintain that if a community can put together a Lincoln Center, there is hope that it can also develop a proper city environment around it.

The facts and the vision

Perhaps the biggest remaining problem is Construction Director Nelson's: how can he obtain all the facilities that the Lincoln Center board wants for the $51 million that has been allocated to building?

"Right now," reports Nelson, "we are going through a painful period of re-examination to reconcile the figures with the plans so costs don't go through the roof." There are other problems, some due simply to the plethora of ideas which would give the Center the finest facilities in the world. Others are caused by the continuing rise in the cost of construction.

The plans call for the completion of the plaza, the opera house, and the concert hall in time for fall openings in 1961. Juilliard and the repertory theater should be open by the fall of 1962, and the dance and operetta theater should be completed by mid-1963.

That may seem a long way off. But New York and the U.S. will almost surely find "a new kind of institution" facing Lincoln Square by the end of 1963. And the wait will be worthwhile; for the performing arts will then cease to be the ill-housed second cousins of a burgeoning American culture.
Another new development using
B.F. Goodrich Chemical raw materials

Rigid Geon lets you open the window in modern curtain wall

This new Chicago motor hotel presents a clean, modern face to the traveling public. It achieves the beauty of a fixed glass curtain, yet all sash slide horizontally for fast, easy window cleaning from the inside. This wasn’t practical until weatherstripping made from Geon rigid vinyl material solved a tricky problem.

Other materials that let the aluminum-framed windows slide open didn’t provide sufficient weather protection. A spring-loaded rigid Geon strip not only permits easy sliding—but provides the thermal insulation and resilience needed to seal out the Windy City’s most turbulent storms.

Geon is the remarkable plastic material that opens new markets for many products. It is being used in many applications in rigid, flexible and foam forms. For information, write Dept. LV-4, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.
Compact central power control—*with Vacu-Break protection*

**VACU-BREAK CONTROL** snuffs arcs immediately when breaking circuits under load. The enclosed head limits the oxygen available during the brief arcing period. Closeness of the head material causes the arc to cool and extinguish quickly. "Double-break" action reduces the distance the Vacu-Break head must travel before the arc is extinguished. In addition, Clampmatic action assures bolt-tight contacts, accelerates breaks.

BullDog Vacu-Break® Power Panels provide the efficient, economical way to centralize lighting and power distribution. One compact panel controls a host of lights and motors... saves space... provides real circuit flexibility.

BullDog Power Panels are pre-fabricated... switch units are standardized and interchangeable. Units are available from 30 to 600 amperes. It is simplicity itself to convert the panels when circuit requirements change.

Exclusive Vacu-Break control snuffs arcs quickly... Clampmatic® action assures quick-make, quick-break, bolt-tight switching connections—longer equipment life. Find out about BullDog Power Panels from your BullDog field engineer, or write BullDog direct.
Giant 8' x 20' Windows in St. Lawrence Power Project

Use Bridgeport Aluminum

The large dimensions of these windows require heavy, long length extrusions that are straight and true. Close, reliable tolerances are a must—to assure perfect fit, and to keep assembly and machining costs down.

Bridgeport Aluminum Extrusions are widely known for the finish and dimensional accuracy that makes fabrication of difficult assemblies easier, faster, and less expensive. That’s why you’ll find these economical, extra-quality extrusions at work doing so many important jobs in so many important places. To find out how they can serve you in your jobs, call your nearest Bridgeport Sales Office.

Send for your copy of Bridgeport’s 130-page Aluminum Extrusions Idea Book.

For the very newest in

BRIDGEPORT ALUMINUM

Aluminum Extrusions and Forging Facilities at Adrian, Michigan • Bridgeport Brass Company, Aluminum Division, Bridgeport 2, Conn.

Sales Offices in Principal Cities

harm by other neighboring buildings badly placed.

To this end, each zoning ordinance might provide a distinct "district" entitled "special sites of city design significance." This might be a discontinuous district comprising designated parcels of land. Within this discontinuous district of special sites, separate regulations would call for conformance with special use, height, bulk, and building-line limitations, appropriate in each case, and subject to special administrative review.

Several other varieties of special districts can greatly enrich the municipal plan: historic, scenic, civic, and cultural areas. Their designation, development, and preservation are important elements of the design program. Legally sound means for dealing with such districts have been developed and tested in the courts.

The esthetic survey and the municipal design plan will reveal things needing attention even in areas of outstanding excellence. They will suggest measures to reinforce the elements most influential in the overall effect. They will warn of changes that are imminent and provide for changes that are necessary. After all, any well-kept garden, however beautiful, requires weeding, pruning, and replacement as well as protection.

Making it stick

Once the planning agency has created a satisfactory community design plan and program and the local governing body has adopted regulatory legislation, the next problem is to make sure that all new structures, both public and private, are designed and placed with careful attention to their surroundings and in relation to the design plan. Architectural review procedures afford the best means for doing this.

When boards of architectural review pass judgment on façades in the absence of comprehensive design plans, the results are inherently limited. The design plan emphasizes the importance of active, design-creating measures for producing meaningful relations among structures and between structures and their settings. The review board will not establish objectives, but rather look to see if the esthetic intentions already adopted in the form of the municipal design plan are actually embodied in proposed designs. For this purpose, persons trained in judging three-dimensional forms and their interrelationships are most appropriate. Perhaps a balanced review agency might include one or more planners, architects, land developers, landscape architects, civil engineers, artists and art critics. One essential qualification is a universality of appreciation. Preferences on architectural style on the part of individual board members should not be permitted to affect decisions. The review procedure

continued on page 164

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HAWS FIBERGLASS UNIT

ONE-PIECE

with squared ends for flush mounting in continuous counters

DRINKING FOUNTAINS

For commercial, school, industrial and residential use...

HAWS Series 2800 is a one-piece fiberglass molded unit with integral receptor and deck-top. No cracks or joints for water accumulation. It's specifically designed for simple installation in continuous counters; squared ends butt snugly against adjacent counters. Decks slope to receptor for complete, unhindered drainage.

Fiberglass finish is colorful and durable! You can choose from five decorator colors at no extra cost! Choose your pantry faucet and fountain fixtures, too, from HAWS complete line of facilities for every purpose.

ARCHITECTS, BUILDERS, SCHOOL OFFICIALS... here's an idea worthy of your attention. Write for illustrated literature, today.

LABORATORY FAUCETS

HAWS DRINKING FAUCET COMPANY

1441 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

continued on page 164
Los Angeles Temple...

**textured panels and grilles of precast concrete add warmth and serene beauty**

Once again—for aesthetic and practical reasons—an important building is designed in concrete. To cover the 126,000 square feet of surface on this magnificent Los Angeles Temple, over 2,500 separate concrete panels and grilles were required. To achieve delicate color as well as textural interest the surface of each piece was etched with acid.

These panels and grilles have exceptional durability. They were made with a high quality clean quartz aggregate and white portland cement with a low water-cement ratio. Each unit is 2¾ inches thick and is reinforced with a 4-inch steel mesh.

The detail in the grille work over the windows, so easily achieved with concrete, was taken from patterns based on the beehive and the Sego Lily, Utah's state flower.

Today, architects everywhere are using concrete in its newest forms for greater freedom of expression in structures of all kinds.

**PORTLAND CEMENT ASSOCIATION**

_A national organization to improve and extend the uses of concrete_
help from taxation

A new provision in state tax law could recognize the benefit of public values created through good group planning.

Many types of desirable improvements have actually been taxed out of existence by the policy of attempting to collect local real estate taxes on the basis of the presumed full market value of individual lots, without consideration of the value to the community of particular types of improvements. It is, for example, of great value to the city to keep the structures around public parks low in height and in many cases to maintain openings as wide as possible around parks or desirable landmarks in order to spread their beneficial effect. The city might be given statutory authority, when confirmed by an impartial board of technical experts, to apportion taxes by increments and to offset total taxes by increment allowances for the preservation of historic or aesthetic monuments or for low buildings where they constitute a public advantage. If this were done, there might be more hope not only for the preservation of existing amenities but for the design of groups of buildings that provide for the balanced arrangement of bulk reasonably distributed between high and low buildings and open spaces.

planners and architects have been city designers throughout history. When today they properly address their energies to matters of municipal economics, to the social impacts of the environment, and to the programming of public activities, they must be no less concerned with the aesthetic development of their communities. It is our conviction that a positive program of design along the general lines outlined here is the best approach in our day to the creation of harmonious and inspiring communities. end
Why Ceco Specified Standard Products

DRAFTITE* for efficient weatherseal
around new window series

Two new series of aluminum windows for residential use have been introduced by Ceco Steel Products Corporation. Designed to meet the needs of varying types of architecture and wall construction, these new windows are available in double-hung and single-hung sections in modular sizes.

Standard Products DrafTite solves the problem of sealing around these, as well as all types of metal windows. Pretested DrafTite wool-pile weatherstrip reduces air infiltration to less than ½ cu ft per min. per foot of sash perimeter when subject to a wind velocity of 25 mi. per hour ... a sealing efficiency greater than that specified by the industry.

In addition, DrafTite won't leak, sweat or stick. It insures better insulation with easier window operation—keeps dust, wind, rain and snow out with an efficiency that lasts for years.

Check into DrafTite's many uses. Write for full information, and call on Standard Products engineering service to help solve your sealing problems. See Sweet's Architectural Catalogue, reference 30/ST.

*Trademark

The Standard Products Co.
Plants at Lexington, Kentucky and Fullerton, California
Building Products Division • Sales Offices: 316 Fisher Bldg., Detroit, Michigan
YAMASAKI continued from page 85

but he also developed a distinctive style that has been good news indeed for world-wide architecture.

"The two visits to Japan and the return trip around the world changed my life—maybe saved it," Yamasaki says today. "I got blinded by sunlight in Japanese courtyards after coming out of dark passages, stunned by their complete control of environment. This was the kind of experience you don't recover from—particularly when you feel a part of it. I found I liked everything there, particularly two things: skylights and water. I learned that good architecture makes you want to touch it. The Taj Mahal made me want to touch it; Corbu's Chandigarh didn't. And I learned that behind beauty there has to be a cultural concept. Now the Taj Mahal is so wonderful that it makes your hair curl, even when you know the walls have to be 12 feet thick to hold it up; there's a cultural concept supporting it. What I decided I had to do, the only thing that I would get fun out of doing, was the beautiful thing; beauty through structure and technology, because that's our culture."

The Yamasaki philosophy has already been translated into four astonishingly beautiful, immensely popular Detroit buildings. They are the $1,172,000 McGregor Conference Center shown on the preceding pages, the $250,000 headquarters of the American Concrete Institute, the new $600,000 classroom and administration building for the Detroit Arts and Crafts Society, and the Reynolds Metals sales office, whose estimated cost is $1,685,000. The first three buildings share a special set of Yamasaki features: a skylighted central hall, a stagelike podium, and a surrounding wall to control the building's environment.

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Strong in technology, rich in decoration: Yamasaki's Reynolds Metals Detroit regional sales office building (top) and American Concrete Institute office building (bottom).
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as completely as possible. The Reynolds office only lacks the wall to make it also conform (it has a gold-anodized aluminum screen instead).

The delightful, almost Grecian balance of these buildings is achieved as much by clever technology as it is by striking design. The technology is perhaps most obvious in the ACI headquarters, with its strong emphasis on concrete structure, than in the others, but it is nowhere lacking. In the Reynolds office, for instance, Yamasaki's determination to construct the handsome wrap-around screen by the latest technological methods meant that the plan of welding the screen's aluminum rings together at the site had to be scrapped, a new mechanical locking system invented. (Reynolds Metals realized, thereby, the additional beauty of saving $5,000 in construction costs.)

No more brownstones

For Yamasaki all this activity has meant considerable material success, occasional shatterings of his serenity, and a reputation that insures respectful consideration of his firm whenever a project of significance needs an architect. "I don't have to do garages or remodeled brownstones anymore," Yamasaki says pleasantly.

His disinclination to get involved in projects where his ideals of beauty cannot be expressed means, of course, that he is not as excited by the general challenge of city building, traffic problems, or slums, as another architect might be. He was by no means saddened, in fact, to lose control over the development of Detroit's Gratiot housing project. "I was delighted that Greenwald and Mies wanted to do it," he confesses. "After the airport and after my ulcer I realized there's a danger of an architect getting involved in too many things for the sake of society. He's tempted to forget his real job is beauty."

Yamasaki is interested in individual gems, perhaps even in a harmonious grouping of gems, as on the campus of Wayne, where he has evolved as a master plan a series of courtyards and integrated, controlled spaces. But to some of the men in the office of Yamasaki, Leinweber & Associates (as well as the architects, there are seven engineers and nine assistants—one of whom is Yamasaki's father) this conscious restraint is frustrating. However, as one of them remarked recently: "I'd rather be frustrated in a good outfit than in a sloppy one."

Seattle and Yamasaki's days of troubled contention are indeed a long way off. "I'm happy to be living now," he says, "in this age. It's not Baroque, it's not Victorian, it's the end of nothing. It's just the beginning and I'm comfortable for the first time." And as he muses, he relaxes into a pantherlike stretch, confident now that he can overtake whatever new opportunity for beauty may happen by.
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Looking like a winged centipede, a gaunt but handsome hall (top photo) now stands in the middle of Florence’s produce market to which truck gardeners from the surrounding area will ship their goods on Italy’s soon-to-be-completed national highway system. The bumps in the leggy hall’s backbone are actually skylights (details, left), set in five undulating rows 50 feet above the brick-paved floor. Like the hall itself, the other, less attractive buildings in the project—a bank, a bar-restaurant, two warehouses (photo above)—protect unloading trucks with overhanging roofs. They also indicate that Architect Giulio Cesare Cardini Orlandi found it easier to design a skeleton than a full-bodied building.
ITALIAN MATERNITY

Although the over-all form of Architect Ignazio Gardella's maternity pavilion for a hospital at Alessandria, Italy has an undeniably institutional look (above), the studied irregularity of its tall windows (left) gives the façade an interesting character. The windows on the second and third stories start at floor level to allow bed-patients easy views of the hospital gardens, yet are narrow and carefully positioned to give needed wall space to the small hospital rooms. Beneath each window the floor-dividing strip of concrete projects out to form a sill for the patients' flowers.

SWISS CRITICISM

At Altstetten, Switzerland, educators and architects got together last year for a most unusual experiment: the educators agreed to leave the architects alone in the planning of a new primary school. Architects Cramer, Jaray & Paillard used more of the land area than the educators had originally thought wise, but the rambling, campus-style school has succeeded in winning full academic approval. Perhaps the most delightful comment on the school was made by a fifth-grade art-class pupil who had been asked to paint his new classroom as he saw it, produced the faithful architectural rendering at right.
In contrast to many modern department stores which are totally windowless, Rotterdam’s new “Galeries Modernes” by Architects Van den Broek & Bakema openly invites customers to enjoy such downtown views as the fifteenth-century St. Laurentius church and the Delfse Vaart canal. The store appears to be even more open and airy than it is because of the horizontal glass strips that “float” the upper floors. Also, from the mezzanine, visitors can walk out onto a front porch (left) for a breath of air before plunging back into the bargain-counter jam.

The Heiligfeld apartments in the suburbs of Zurich were built on the premise that a development attractive to children would be highly rentable. Architect-planner A. H. Steiner, while seeing to it that the design of the apartment buildings themselves did not clash with the happy variety of the play areas, put his best efforts into the spirited architecture of the children’s park. The children came; the apartments were quickly let.

Architects of the Noboribetsu Hot Springs Museum on the island of Hokkaido made the best of an awkward site. The central structure of the building is a huge arch spanning a ravine. The upper part of the arch houses an art gallery. Cantilevered out from the center of the arch is a square exhibition hall of natural science. On the floor of the ravine rests a spring house, looking like a three-eyed baby bird being sheltered by its four-eyed parent.
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