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G O O D concrete—a good mix, properly placed and THOROUGHLY CURED—is watertight, of itself and by itself. But thorough curing means keeping ordinary concrete wet 6 to 8 days—next to impossible on most jobs. That is why it pays to use 'Incor' 24-Hour Cement. 'Incor' cures, that is, combines with water, so much faster that you get THOROUGH curing in 24 to 48 hours, saving 5 to 7 days on each pour. Tests summarized in graph, above, show that 'Incor' cured 1 day has less absorption than ordinary cement cured 7 days.

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October 1946
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WEATHERBOARD SIDING

.027 gauge solid aluminum sheet, crimped in simulation of clapboard—which effect can be enhanced by painting. Supplied in 6, 8, 10 and 12-foot lengths, 24" coverage, exposed "clapboard" surface 4". Easily erected in horizontal strips, 12 feet weighing 11 lbs.

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Soundly engineered shingles of .027 gauge aluminum, with firm and watertight interlocking flanges. Nails are completely covered. Coverage, 8" x 14 1/2". Shadow line, 1/4". Accessories include special Eave Starter, Ridge Cap, Gable End Cap, Hip Cap and Valley. Combining beauty with efficiency and lifetime durability, this roofing is perfect for any house.

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CORRUGATED ROOFING AND SIDING

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5-V CRIMP ROOFING AND SIDING

Distinguished by two paired "V" crimps down each side, with one crimp down the center for extra structural strength, this .027 gauge roofing and siding is superior in appearance and efficiency. Weight is less than half a pound per square foot. 6, 8, 10 and 12-foot lengths, covering width 24". Accessories include Ridge Roll, Formed Valley and Roll Flashing.

Aluminum requires no protective surface coating. However, it may be painted for decorative purposes, as in this house constructed with Reynolds Lifetime Aluminum Building Products.
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This is the beginning of a new era in building. Those who now sponsor Reynolds Lifetime Aluminum Building Products will reap the rewards of enterprise. For as these materials now rise on city lots and farms and the sites of industry, they mean far more than a solution to today's problem. They stand as models for the building industry of tomorrow!

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OCTOBER 1946
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welfare might be affected by any
failure of the heating or the utili­
ties.

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boiler house at the Veterans Ad­
ministration Hospital, Chillicothe,
Ohio. The feed water lines be­
tween feed water heater and suc­
tion pumps and between tank and
heater; the boiler feed piping; the
blow-off lines; the returns; the vents;
and the cold water lines, were
specified "wrought iron." Byers
Wrought Iron Pipe was installed;
some of the services are shown in
the illustration.

Corrosion can always be antici­
pated in these applications; the
only question is the degree of
severity. Byers Wrought Iron has
been used in all these services, and
its superior corrosion-resistance is
a matter of engineering record.
Even when current corrosive con­
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specifiers use wrought iron as in­
surance against possible changes
in the character of the water in
the future.

The excellent record of Byers
Wrought Iron in corrosive services
like these is due to its unusual
structure and composition. Tiny
fibers of glass-like silicate slag ar
threaded through a body of high­
purity iron. These fibers act like
baffles, halting and dispersing cor­
rrosive attack, and so discouraging
the pitting and penetration that
causes ordinary materials to fail.
They also anchor the initial pro­
tective film, which shields the un­
derlying metal.

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Piping Services" will give you
some helpful information about cor­
rrosion and how to combat it. May
we send you a copy?

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Atlanta, Chicago, St. Louis, Hous­
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cuts weight to a third or fourth of ordinary concrete. NHA points to the possibility of bringing roadbuilders — since the road program is being curtailed — into concrete house construction.

**More Prefabs Insured**

The Federal Housing Authority reports that many more manufacturers of factory-built houses have been seeking FHA mortgage insurance since the veterans’ program began. Before approving a product, FHA sends engineers to the factory to inspect it and to observe assembly methods. Before a ruling is issued the manufacturer must build one demonstration house without FHA insurance.

NHA reported in September that 11 factory-built home manufacturers had applied for market guarantees. Other developments in the veterans’ program include extension of priority assistance to trailer manufacturers to speed up moderately-priced models for former servicemen; requirement for 60 rather than 30 days as the time to hold houses built under the program for sale to veterans; assignment of U. S. Public Health engineers to aid NHA as consultants on health and environmental sanitation; and arrangements for seeking draft deferments for skilled construction workers.

**More Ceilings Lifted**

Building materials, along with other items, came in for price ceiling boosts as OPA got back into operation during late summer and early fall. Boosts went to hardwood flooring, stock millwork, pine stock millwork, Douglas fir doors, stock screen goods, warm air furnaces, and standard wire nails.

Reseller mark-ups — reflecting increases of 1-3 per cent — went into effect for a list of items, including, among others, asphalt and tarred roofing products, vitrified clay sewer pipe, Portland cement in southern California, asbestos cement roofing and siding shingles, metal lath, New Jersey clay building brick, and clay drain tile in Ohio and Michigan.

**Lumber Output Pushed**

As lumber production elbowed toward record heights, federal agencies pulled additional strings to stimulate it. The Housing Expediter, under the premium payments regulation, made an agreement with the State of Washington whereby timber for sale on state-owned land will be upped from an estimated 1½ billion board feet to three billion during the next year or more. Uncle Sam will compensate the state for extra “timber cruiser teams.” A bi-monthly sale in October was expected to make more timber available to builders and subsequent sales are expected to show increased momentum.

Funds totaling $1,234,000 were allocated to Interior Secretary Krug to build more than 200 miles of access roads to timber lands on Indian reservations with a view to boosting production by 17,000,000 board feet this year and 15,000,000 in 1947. The Forest Service speeded its access road program, which is expected to up timber output by nearly one billion board feet next year and by more than a billion in 1948.

The Department of Commerce warns again that 1946 and 1947 are critical to the lumber industry. “If users of lumber can be substantially satisfied quantitatively, qualitatively, and economically during these two years, and at least token export markets can be maintained,” it says, “the future stability of the industry should be assured for many years.” Excessive prices, inadequate supplies or inferior quality, or failure or inability to protect its distribution system will encourage substitute materials and may cause permanent injury to the lumber industry.”

**Housing Costs Watched**

In carrying out a policy to keep veterans’ housing costs down, Raymond M. Foley, FHA Commissioner, advises that FHA field offices are instructed “to apply only costs found existent for the most efficient builders, rather than for the typical or median builder. They are required to break down lump-sum figures and sub-contract bids into material costs and labor costs calculated on current hourly wages and normal equipment practices, plus the normal profit write-up. This scrutiny is designed to uncover unnecessary charges which the general contractor is being required to pay under present conditions, as well as unnecessary items which may exist in his own estimates.”

Mr. Foley says home owners are financing property repairs and improvements under FHA at an accelerated rate this year. More than 311,500 loans were reported in the first six months compared to 115,200 in the first half of 1945. The monthly total exceeded 85,000 in June.

**Constitutional Mounts**

The Bureau of Labor Statistics comes up with interesting facts on building. To cite a few:

1. Expenditures for new private construction in the first half of 1946 reached the highest half-year mark for more than a decade — $83 1/2 billion. This was 35 1/2 times as large as in 1945 and 50 per cent greater than in 1940.

2. In June, for the first month since the 1942 war peak, construction expendi-
The trend in contemporary store front design has made new structural demands on glazing mouldings, metal trim, and entrances. The K-47 Line has been engineered to meet these demands.

Pictured at the left are a few of the new features in construction of the K-47 Line. These features—and many others—enable you to create outstanding architectural effects through the free use of floor-to-ceiling lights of glass, full-vision doors, flush glazing and many other elements of modern design.

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For construction details of the K-47 Line and the Kawneer Standard Line, fill out and mail the coupon below.

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Get complete information about AW Super-Diamond Floor Plate by writing for your free copy of booklet L-33 Alan Wood Steel Company, Conshohocken, Pa.

THE RECORD REPORTS

(Continued from page 13)

War Relocation Authority, succeeds Mr. Krooth at FPHA. Allen Coe follows Gordon Rieley as Director of OPA’s Building and Construction Division.

Wages Codified

Following the revival of OPA, the Wage Adjustment Board issued new codified regulations to govern wage payments in building construction. Included in the rules was one allowing a contractor, without advance approval, to increase his wage rates to any higher rates already sanctioned by the Board for the area in which the contractor operates.

With A.F. of L. and C.I.O. advisory councils on housing ready to act, NHA announced that work stoppages affecting the housing program hit a low point in July.

MATERIALS ROUNDUP

Production of most key construction materials registered substantial increases in the first half of this year, compared with the first six months of 1945, the Construction Division, Department of Commerce, reports. Some of the highlights of the report are:

Steel. The high rate of increase in steel output evident in recent months is expected to taper off because of continued shortages of pig iron and scrap. Producers are far behind on commitments. Issuance of priorities for steel for building materials will be continued into the fourth quarter.

Lumber and Lumber Products. Total output of lumber is expected to pass the 32-billion-foot goal set for 1946, but supplies of several important lumber products—particularly millwork, hardwood flooring and softwood plywood—continue inadequate to meet requirements.

Clay Products. Although output of clay products increased substantially during the first half of 1946, supplies will continue tight in spots owing to heavy order backlogs and increasing demand.

Cement. Output for the first half of the year—69,600,000 barrels—showed a gain of 64 per cent over that for the corresponding period of 1945, and of 14 per cent over that for the last six months of 1945. June shipments exceeded production by less than 1 per cent. This was the first month in 1946 in which stocks were not heavily depleted.

Gypsum Board and Lath. Average current output is about equal to new orders.

(Continued on page 16)
a new service to architects

Brunswick OFFERS SPECIALIZED DESIGN ASSISTANCE FOR COMMERCIAL RECREATIONAL PROJECTS . . .

Today more and more business and investment capital is flowing into commercial recreation. Aware of the important profit opportunities in year 'round, indoor participant sports, many alert business men are planning to establish bowling and billiard recreational centers. Such planning creates the need for competent architectural assistance—offers rich opportunity for every qualified member of the architectural profession.

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Photograph by Fabian Bachrach

Edgar Lynch, Architect, directs activities of the new Brunswick Architectural Research Department. In practice since 1929, he interrupted a noteworthy career as architect and consultant to outstanding Chicago and New York business and realty firms, to collaborate with Donald Deskey Associates on the original concept of this Brunswick service.

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**THE RECORD REPORTS**

(Continued from page 14)

estimated June rate.

Concrete Building Block. Output continues inadequate to meet demand.

Nails. Third-quarter output expected to be at a near-normal rate.

Plumbing and Heating. Production of plumbing fixtures remains inadequate to fill requirements.

**BUILDING NOTES**

**Veterans' Villages**

Plans have been announced by McCloskey Homes, Inc., for two small-house developments in the Philadelphia area, the first in a series of large-scale home building projects for veterans planned by the company.

The first of the two developments, to be known as Whitemarsh Village, will occupy a 265-acre tract in the Chestnut Hill area just outside Philadelphia. Plans call for the erection of 1,000 all-masonry homes of six and seven rooms, each on its own quarter-acre plot. The price range will be from $8,800 to $9,800.

The other development already announced is Academy Gardens in northeast Philadelphia. To cover a 223-acre site, it will provide 1,500 all-masonry homes expected to sell at from $7,500 to $8,500. All houses in both groups are for sale to veterans only.

**VA Hospitals**

Army Engineers have let architect-engineer contracts for three more Veterans Administration hospitals, located at Wilmington, Del., Omaha, Neb., and Fresno, Calif.

Massena and DuPont of Wilmington have the contract for the hospital at Wilmington, a 300-bed general medical and surgical institution estimated to cost $4,950,000. The Omaha contract was let to Ellerbe and Co. of St. Paul, Minn., and the Leo A. Daly Co. of Omaha. This is a 500-bed general medical and surgical hospital with an original estimated cost of $6,825,000. The Fresno contract was awarded to Masten, Hurd, Huber and Knapik of San Francisco, for a 250-bed general medical and surgical hospital, the original cost of which is estimated at $4,445,000.

**P.I. CONSTRUCTION**

The U. S. Engineers have awarded a large C.P.F.F. contract for all their construction in the Philippine Islands to Johnson, Drake and Piper, Inc., of Minneapolis, Minn., New York City and Oakland, Calif.; the Utah Construction Company of Ogden and Salt Lake City, Utah, and San Francisco, Calif.; and Grove, Shepherd, Wilson and Krueg, (Continued on page 18)
Let your church tower pour out the ever glorious songs of The Saviour's birth through the rich, golden voice of Schulmerich Carillonic Bells. Here is the instrument best fitted to translate the songs of the ages into songs in the air, with tones of purest beauty.

You may have the joyous voice of Carillonic Bells in your church this Christmas. No season could be more appropriate than this, to dedicate a memorial that proclaims joy and peace to heart and home. Early inquiry is necessary if installation by Christmas is desired.

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OCTOBER 1946
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For further information, write the Atlas White Bureau, Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

ARCHITECTS ORGANIZE

Meeting in Cheyenne in June, the qualified architects in Wyoming organized the Wyoming Society of Architects. The following officers were elected: president, Fredric Hutchinson Porter, A.I.A., of Cheyenne; vice president, Leon C. Goodrich, A.I.A., of Casper; secretary, G. C. Hollo, A.I.A., of Cheyenne; treasurer, C. W. Shaver, Jr., of Sheridan, R. Walter Bradley, Cheyenne, Armund Kellogg, Rock Springs, and F. L. Byerly, Thermopolis, were elected to the board of directors. The current membership of the group is 17.

AT THE COLLEGES

New School

The first school of architecture in seven states in the Colorado and Rocky Mountain region was established at the Civic Center campus of the University of Denver with the opening of the fall quarter. Director is Carl Feiss, formerly director of the planning commission of the City of Denver, and now planning director of the department of development at the University of Denver. The new school is offering five-year degree programs in architecture and planning in the College of Arts and Sciences.

Expanded Program

Cooperating for a second year with the Los Angeles chapter of the A.I.A., University of California Extension this fall is launching an expanded program of engineering and architectural courses, a majority of which will be designed as refresher work for professional men and women.

The courses offered will include engineering drawing, materials of engineering construction, analytical mechanics, building codes, construction supervision, and landscape architecture. For the full schedule, address University of California Extension, Los Angeles 24.

Heating Research

Soon to begin at the University of Illinois, in cooperation with Bituminous Coal Research, Inc., representing the soft coal industry, is a three-year study of planning and design of homes to be
By use of a few standardized parts and fittings, M/P Metlwals meet every wall paneling and partitioning requirement . . . eliminate the need for plaster in new construction . . . and permit fast, clean, simple installation in dividing space. They combine rich beauty, quiet and fire resistance with low initial cost and permanent economy.

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This new Sanctuary, with complete decoration, the ecclesiastical beauty of which is apparent in the above reproduction of the artist's preliminary rendition, was designed by Professor Lelio de Ranieri in collaboration with J. M. Mosher, Architect, for St. Cecilia's Church of Pawtucket, R. I., Rev. Mathias A. Hebert. The Altar is finished in a combination of fine imported marbles with Stations of the Cross and Altar appointments executed in bronze with repoussé enrichments. A Pulpit of marble, wrought iron and hand-carved oak rounds out an installation which, in every liturgical detail, reflects the high standards of Bernardini craftsmanship.

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THE RECORD REPORTS

(Continued from page 18)

heated by coal. The project will consider such subjects as coal storage and handling, ash handling, furnace location and the arrangement of heating facilities for most convenient use of coal. It will involve study of equipment and house plans, and development of suggestions for builders and home owners. The University's Department of Architecture will be in charge of the project and will appoint a research professor to conduct the investigation. Findings will be published by the Small Homes Council at the University, which arranged the project.

New Bulletins

Four new technical bulletins have been issued by the Engineering Experiment Station of the University of Illinois:

1. Investigation of the Strength of Riveted Joints in Copper Sheets (No. 360), by W. M. Wilson and A. M. Ozelsel. Results of a series of tests planned to determine the strength of riveted joints against failure, the relation between the load and the slip of the rivets and between the load and the separation of the sheets at the edge of the joint, and the shearing strength of undriven rivets of all diameters.

2. Residual Stresses in Welded Structures (No. 361), by Wilbur M. Wilson and Chao-Chien Hao. Includes an analysis of various theories of residual stress, and complete reports on tests to determine the behavior of welded seams under loads, tests to determine the behavior under static loads of plates with circular welded seams, and fatigue tests of plates with longitudinal butt welds.

3. The Bonding Action of Clays — Part II, Clays in Dry Molding Sands (No. 362), by Ralph E. Grim and F. Leicester Cuthbert. Includes data showing the relation of dry compression strength to amount of tempering water for various amounts of each type of clay; presents a theory of dry strength based on the wedge-block concept of holding grains in place.


For copies of the four new bulletins, address the Engineering Experiment Station, University of Illinois, Urbana.

Building Started

Construction of the University of Chicago's new $920,000 administration building, the first step in the University's
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OCTOBER 1946
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SMALL-HOMES TELEPHONE PROBLEMS
THE CASE OF THE ONE-STORY HOUSE WITHOUT A BASEMENT

It is simple and inexpensive to install raceways for telephone wires in the low-cost homes you plan. And homebuyers will appreciate this mark of careful planning.

Telephone raceways are especially important for homes without basements. In these homes the telephone installer generally cannot run wires up through the floor to the telephone location. A simple wiring channel leading to a convenient telephone outlet should be installed before the floor is laid. This will avoid attaching telephone wires in plain sight on baseboards and around windows and door frames.

Your Bell Telephone Company will be glad to help you plan telephone wiring facilities. Just call your Telephone Business Office and ask for "Architects and Builders Service."
You'll find plenty of places where aluminum tubing can be used to excellent advantage. For example, conduit as shown in this illustration.

Extruded aluminum has many more uses than just for decoration. Here it is saving weight on both skylights and trusses.

Here is aluminum in multiple form—plate, extrusions, castings and sheet.

Aluminum can be extruded in many shapes to meet individual requirements. This ornamental railing is a typical use for aluminum in this form.

SHAPE OR FORM MAKES NO DIFFERENCE WITH

This is another outstanding advantage of Alcoa Aluminum. No matter where you decide to use it, you will never be handicapped by form or shape. Alcoa Aluminum can be rolled, drawn, spun, forged, cast, extruded, machined and welded. Aluminum will be ready to go to work for you in any form or shape you need on your future buildings. ALUMINUM COMPANY OF AMERICA, 1867 Gulf Building, Pittsburgh 19, Pennsylvania.

THE MOST VERSATILE OF ALL BUILDING MATERIALS

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

OCTOBER 1946
A TURN OF THE LEVER GIVES . . .
Needle spray for stimulation!

Normal spray for relaxation!

Flood spray for no-splash rinse.

Never this!—The Anystream is self-cleaning.

SPEAKMAN ANYSTREAM SHOWER HEADS

save hot water

...ALWAYS PROVIDE FULL-PATTERN SHOWER

In hotels, clubs, schools, institutions, and in homes and apartments—wherever hot water is a supply problem or a major cost item, the Anystream Shower Head is a real money saver. The figures below show how the Anystream saves up to 58% on hot water consumption.

<table>
<thead>
<tr>
<th>Water Pressure Pounds</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary 4&quot; shower head Gallons per minute</td>
<td>9 1/4</td>
<td>11 1/4</td>
<td>13 1/4</td>
<td>15</td>
</tr>
<tr>
<td>Anystream Self-Cleaning Shower Head</td>
<td>G.p.m. Normal spray</td>
<td>6 1/4</td>
<td>7 1/4</td>
<td>8</td>
</tr>
<tr>
<td>G.p.m. Needle spray</td>
<td>3 1/2</td>
<td>5</td>
<td>6 1/4</td>
<td>6 1/4</td>
</tr>
</tbody>
</table>

MAINTENANCE SAVINGS, TOO

Anystream Shower Heads are heavily constructed for long wear with low maintenance. Even in areas where alkali and other impurities in the water cause clogging in ordinary showers, the Anystream’s self-cleaning feature keeps this head in perfect working condition. All that is required is an occasional turn of the adjustment lever to flood position to flush out foreign matter.

Distributed nationally through plumbing supply dealers and plumbing contractors.

AVAILABLE FOR IMMEDIATE SHIPMENT

SPEAKMAN SHOWERS AND FIXTURES

"The best in brass since 1869"

SPEAKMAN COMPANY, WILMINGTON 99, DELAWARE
You're looking at one in this picture of a large Mid-West hydroelectric plant. Located where rocks, boulders and dirt rain down on it from the adjoining cut, this giant plant is safely protected because it has a Ruberoid concrete-surfaced industrial roof.

Obviously, roofs like this will stand the roughest treatment. That's why Ruberoid heavy-duty roofs are opening new architectural possibilities in the use of valuable roof areas for the storage of oil drums, heavy equipment—and even as roof parking areas!

Proved-in-performance specifications—worked out by Ruberoid engineers—are available now for these recent roof developments. Ruberoid Approved Roofing Contractors, located in principal cities and towns are ready to give you assistance in planning and executing them. No matter what type of roof you may have in mind—Asbestos Felt and Asphalt, Coal Tar Pitch and Tarred Felt, or Asphalt Felt and Asphalt—call a Ruberoid Approved roofer. His assistance, based on long experience and backed by a complete line of materials—all from the same source—assures you of the right roof for any job.

HANDY ROOF INCLINE FINDER
Free On Request!
This useful pendulum device instantly gives the roof incline in inches per foot. Helps determine proper type of roof. Made of transparent plastic, it can also be used as a protractor.

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The RUBEROID Co., Executive Offices: 500 Fifth Avenue, New York 18, N. Y.
ASPHALT AND ASBESTOS BUILDING MATERIALS • THERMAL INSULATIONS
REQU ESTED READING

FP HA LOOKS AT HOUSING


Keynoting this review of the FPHA's 10 years of experience in the low-rent housing field is an awareness that each project must be considered as an individual unit and developed carefully in terms of its own specific environment and the families for whom it is intended. "Canned" plans just will not do the trick, the FPHA has found out.

Nor is this the only lesson the housing agency has learned. Slum clearance, says the FPHA, is not the major goal of public housing: "People must be given first consideration; slum clearance though more spectacular, is merely a by-product of housing underprivileged people." The site plan can make or break a project: it is "a complex thing... shaped by climate, by local housing customs, economic conditions and laws; by the location of the site with respect to employment, transportation, utilities, and social institutions; by the cost of the land, the relative cost of various forms of construction and the cost of utilities and maintenance; by the habits, incomes and composition of the families to be housed." Minimum standards not only must be met, they must be met with "intimate and sympathetic understanding of the families to be housed."

The FPHA deserves credit for this volume. In the first place it has not shied away from admitting the errors it has made in the past, but actually stresses them for the benefit of future planners. Secondly, it has assembled chapter after chapter of really helpful material, and illustrated it liberally with photographs and plans.

MORE CITY PLANNING


Numerous diagrams, maps and photos, concise thinking and clarity of expression combine to give this latest book on city planning a reader-interest value rather above the average. The material itself, however, follows the usual pattern: an analysis of what is wrong with present-day cities, what to do about it, and how.

Like most able city planners of the day, Messrs. Sanders and Rabuck, both of whom are connected with federal agencies, stress the importance of planning metropolitan regions in their entirety. All levels of government concerned with the planning of a metropolitan area, they say, must be represented in the agency assigned to the job. Powers and duties of such an agency should be specific, and fully covered by proper legislation. Interstate compacts should be entered into whenever a metropolitan region extends into more than a single state. A master plan should be developed and properly administered. And above all, planning objectives must be sound, and broad enough to stretch well into the years and generations ahead.

Familiar as these planning concepts are, they have been presented here with a new freshness and a new urgency. So, too, with the stress the authors place on rent control, decentralization and facilities of transportation. These authors know their subject; their readers should profit by that knowledge.

SOLVENT METROPOLIS


Written in answer to a letter about the cause of city deficits, published in the New York Herald Tribune, this small volume offers a plan for making cities self-supporting. The plan is simply this: gradual lightening of the tax on improvements and corresponding increasing of the tax on land until the improvements are entirely tax-free.

This program, Mr. Tucker relates, has been partially tried out in Pennsylvania where, in 1913, the so-called "graded tax law" was passed, providing for a progressive shift of municipal taxes from improvement values to land values in Pittsburgh and Scranton. Results in Pittsburgh are considered good by representative groups of citizens: the Taxpayers' League, for example, "reports that 95 per cent of all home owners now pay lower taxes ...", and in a typical residential ward, Mr. Tucker reports, "out of a total of 3,272 owners of improved property, only 22 fail to show a saving ...".

Periodical Literature

APPRAISAL OF NEUTRA


Probably no greater tribute can be paid to an architect than the devotion of an entire issue of an architectural magazine to a presentation of his work. Particularly when it is a presentation as lavish and as detailed as this of Neutra in L'Architecture D'Aujourd'hui. The reason for it, M. Persitz explains as follows: "Following a program that we have set for ourselves, we have recently treated in our pages the problems of modern techniques of building. Now it seems necessary to us, in conclusion, to illustrate the real possibilities of these techniques by realizations which have passed the purely experimental stage. The work of Richard J. Neutra is an admirable example for this demonstration... This architect has, in effect, devoted himself for more than 20 years to the systematic study of methods of rational construction."

BRITISH STANDARDS


The thorough-going study of building methods undertaken in Great Britain during the past few years under the Ministry of Works is bearing fruit, this article makes clear, in the development of methods of standardization and mass production which the Ministry is now seeking to apply to housing. "Bricks, doors, and windows," Mr. Deacy reports, "are being made in fewer regulated types; the shells of entire houses are being cast in foam slag and aluminum; kitchens, bathrooms, and heating systems are highly standardized."

British experience with standardization indicates that it is of benefit not only to architects, manufacturers of building materials and equipment, and contractors, but to the general public as well. Production has been stepped up, costs have been reduced. It is with reason that Mr. Deacy asks whether a similar program in this country might not have similar good results.

LOBBY COMFORT


The familiar and frequently knotty problem of lobby heating is considerably uninked in this article by Mr. Reynolds. With the aid of diagrams, he explains various solutions that have proved effective. Included is a description of a method involving the use of overhead circular air diffusers connected to ducts run in the hung ceiling from a unit air heater. Another solution is a forced flow convector, which may be concealed or exposed, with top or front supply grille. Such a unit, Mr. Reynolds says, eliminates the difficulty usually experienced in obtaining the necessary and unrestricted flow of return air.
Electricity at every square foot holds

advantages for both Client and Architect

An enormous amount of revision in architectural plans is avoided by the use of Q-Floors. Consider this—electrical outlets and partitions can be located after the tenants move in. And this—new outlets for last-minute equipment can be added in a matter of minutes, without digging trenches. Floor layouts are permanently flexible. This saves a lot of drafting room expense. Furthermore—Q-Floors require no preset inserts. Underfloor, mechanical equipment can be suspended from any point of the steel Q-Floor.

The quick-in feature of Q-Floor reduces building time 20 to 30%. The Q-Floor becomes an immediate platform for other trades, dry, clean, noncombustible, free from forms and shoring. Work moves ahead fast, even during freezing weather. The time saved is money saved to your client. The quick-change feature protects your client’s investment against electrical obsolescence.

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- Q-Floor is made of steel, comes to the job cut to fit, ready to weld to structural frame.
- Quick-in—two men can lay 32 sq. ft. in 30 seconds.
- Light weight is desirable for tall buildings.
- Shallow floor construction leaves ample room for mechanical equipment between floor and suspended ceiling.
- Q-Floor requires no preset inserts.
- Total dead weight is less than 40 pounds per square foot, including concrete floor fill and plastered ceiling.
- Yet it has Four-hour Fire Construction, rated by Underwriters.
- The steel cells of Q-Floor are interrelated by crossover raceways so that every six-inch area of the floor can be tapped for electricity.
- An electrician merely drills a small hole for an outlet—the whole job taking only a few minutes.
- Quick-change avoids fuss, muss and trenches, even years later.

You can see Q-Floor electrical fittings at any General Electric construction materials distributor. Write for the latest, complete literature on Q-Floor.

THE EASIEST THING FOR A BUILDER TO FORGET: FLOORS ARE WHAT A BUILDING IS FOR

H. H. ROBERTSON COMPANY

2404 Farmers Bank Building, Pittsburgh 22, Pennsylvania

Offices in 50 Principal Cities, World-Wide Building Service

OCTOBER 1946
Washrooms are one of the four most important factors in good working conditions—according to a survey in 400 plants.

"A sloppy washroom sure gets my goat!"

**TOM:** "This one's always so shipshape it's a pleasure to clean up in."

**BOB:** "You said it! The boss must know we appreciate a good washroom as much as he does."

**EMployees** judge a company a great deal by its washrooms. In a survey of men and women workers at more than 400 plants, they named these factors as the ones they considered most important in good working conditions: good washrooms, adequate lighting, proper ventilation and safety devices.

Besides helping morale, sanitary well-equipped washrooms, with plenty of soap, hot water and good quality individual paper towels, help reduce the number of absences due to colds and their complications. For, they encourage frequent and thorough washing that helps prevent germs from spreading.

Haven't you yourself been irritated by a poorly planned, badly equipped washroom? Then make sure your washrooms are designed to be "Health Zones," not "Germ Exchanges"—"morale-boosters," not "temper-testers."

**Good Washrooms begin at the Drawing Board**—Good washrooms are a result of careful thinking and planning in the blueprint stage. For practical suggestions on modern washroom layout, turn to our four pages in Sweet's catalog—or call on the Scott Washroom Advisory Service, Scott Paper Company, Chester, Pa.

**SCOTTISSUE TOWELS**

STAY TOUGH WHEN WET

Build with Stran Steel

Easy to Design with ... Easy to Build with

Architects find Stran-Steel practical and economical to use. It provides durable, rigid, fire-safe framing of lightweight steel, yet permits wide flexibility in working out designs.

Builders like to work with Stran-Steel. Pre-cut to required lengths, the framing members are assembled with self-threading screws. Other building materials are simply nailed to the frame by means of the nailing groove, a patented feature of all Stran-Steel studs and joists, which grips nails as in a vise, holds them permanently and securely. The frame goes up quickly, without the use of special tools or equipment.

Prospective buyers are quick to appreciate the advantages of Stran-Steel. It gives homes, apartments, stores and industrial buildings a greater investment value, since sag-, rot- and termite-proof framing means lower maintenance costs.

For full details, see Sweet's File, Architectural, Sweet's File for Builders, or the January issue of Building Supply News.

Great Lakes Steel Corporation
Stran-Steel Division • Penobscot Building • Detroit 26, Michigan
Unit of National Steel Corporation
EFFECTIVE USES OF Glass

America has produced no better material for toilet room walls, sides and partitions than Carrara Structural Glass. Its practical qualities of permanence, easy cleaning and strength are as noteworthy as its polished beauty. Carrara is available in 10 attractive colors. Here is a dormitory toilet room, done in Carrara Glass, at Allegheny College, Meadville, Pa. Architect: Jens Frederick Larson.
IN PUBLIC BUILDINGS

A new method of setting Plate Glass was applied in this recently completed Air Lines office. To minimize reflections, the glass was set in a protruding V-shape, protected against light from above by a dark, non-reflecting canopy and from below by plants and a black sidewalk. For such applications as this, Twindow, the window with built-in insulation, is excellent. It allows clear vision, virtually prevents condensation on the glass, cuts heating and cooling costs substantially. Architect: H. Roy Kelley.

Windows in office buildings, both from the design and functional standpoint, merit unusually careful attention from the architect. To be sure of good-looking, clear-vision windows, many architects specify Pennvernon Window Glass, a quality glass which possesses a degree of clarity, freedom from distortion and beauty exceptional in a sheet glass. Twindow, Pittsburgh's new window with built-in insulation, is well suited for use in modern office buildings like this. The Rankers Insurance Building, Macon, Ga. Architect: W. Elliott Dunwody, Jr.

Stair rails can be beautiful ... when they're made of Herculite Tempered Plate Glass. Herculite is four to five times stronger than ordinary Plate Glass of the same thickness, much more resistant to impact. This glass—with its combination of strength, transparency and good taste offers the architect new design possibilities both in public building and residential interiors. Architects: Holabird & Root—A. R. Clas, Associate.

* Design it better with Pittsburgh Glass

We believe you will find much to interest you in our illustrated booklet of ideas concerning the use of Pittsburgh Glass in building design. Send the coupon for your free copy.

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Address
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State

"PITTSBURGH" stands for Quality Glass and Paint

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"O.K.—we all agree on Lumite screens. What I want to know is—how many of you are going to live here?"

• Grandpa and Uncle Jasper and Cousin Minnie have plenty of advice to give about the new house. Seems as if they never would agree. But one thing was settled from the first—Lumite plastic screens for windows, doors and porches. Your clients have heard about Lumite. Architects know that in recommending Lumite they are helping their clients, as well as themselves, to attain the ideal of "the perfect house."

No window eyesores on the Lumite-screened house! Lumite won't stain or rust... keeps its fresh beauty for a lifetime. No screens for Father to paint—Lumite never needs painting because the color is in the cloth. No screens for Junior to kick out—Lumite will not dent or bulge. And easy for anyone to clean! A wipe with a damp cloth keeps Lumite sparkling like new.

Recommend Lumite for a house that you and your clients will be proud of!

We'll be glad to send you our A. I. A. 35P folder, with sample.

LUMITE DIVISION, Chicopee Manufacturing Corporation
47 Worth St., New York 13, N. Y.

HERE'S WHY LEADING ARCHITECTS SPECIFY LUMITE:

• Cannot stain
• Won't rust or rot
• Never dents or bulges
• Needs no painting
• Color cannot fade
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• Lighter in weight
• Sensibly priced
• Lasts years longer
• Woven of Dow's Saran
• Strong! (Lumite is woven of heavy gauge plastic filament—0.015")

ARCHITECTURAL RECORD
KENTILE can be laid so that you have traffic lanes right in your floor—directing customers to counters—to special displays—to whatever spot you want. That's because Kentile comes in squares, to be laid in any pattern you want, and the tiles can also be cut to fit any special pattern.

QUIET, TOO! Kentile "cushions" sounds—is soothing to nerves usually irritated by hard, clicking heels. Moreover, super-durable Kentile shrugs off heel jabs, scuffs and scars. And because colors run through to the back, Kentile colors can't "wear off" and come clean with simple soap-and-water mopping. Thus, when day is done, your Kentile floor looks good as new and is ready for more!

KEEP IT FOR YEARS! Foot for foot, Kentile is the lowest cost floor covering you can use. Furthermore, it lasts for years! (Some fresh-as-new Kentile floors are in their 15th year of service.) And when alterations or replacements are necessary, all you do is replace the squares affected—you don't rip up the whole floor. And because Kentile is speedily laid, and never buckles, even the initial cost represents a savings.

Altogether, Kentile offers 15 different advantages. They're all told in the new, richly illustrated full-color catalogue that shows all the Kentile colors and some of the countless patterns possible—plus full-color pictures of Kentile in actual use. Send for your copy today—no obligation.
90 EVAPORATIVE CONDENSER. One of Carrier's full line of condensers. It's designed for installations requiring five tons or more. Suitable for "Freon 12" or ammonia. Though self-contained, it's built in sections for easy handling and erection. Centrifugal fans permit the use of intake and discharge ducts. Unit is hot-dipped galvanized after fabrication, making it weather-proof.

CARRIER UNITS FIT THEM ALL

Whatever the air conditioning or refrigeration needs of the building you're planning, you can find exactly the right compressor or condensing unit in Carrier's complete line. Carrier products range from 1/4-hp, units for small display cases to the famous Carrier centrifugal machine with a capacity up to 12,000 tons; from the Room Air Conditioners for individual rooms and offices to Conduit Weathermaster systems for hotels, apartments, hospitals, and other multiple-floor buildings.

The wide choice of Carrier air conditioning and refrigeration means economy. These units provide the best balance of initial investment costs and operating costs. They make it unnecessary for your client to pay for more capacity than actually needed for efficient air conditioning and refrigeration. They keep his operating costs at a minimum.

Carrier apparatus has been proved by actual tests in the field. It is precision built of quality material. The design is the result of Carrier's unrivaled experience. Carrier's engineers have worked successfully with architects and consulting engineers on all types of installations. When you specify Carrier equipment, your client can count on years of trouble-free, economical operation. Carrier Corporation, Syracuse, New York.
The Master Library uses the Master Decorative Material

STARTED with $5,000 and 1,000 volumes in 1802 the library of Congress now spends $2,000,000 annually, owns 8,000,000 books and major documents, and in 1938 completed a beautifully functional nine million dollar annex designed by Pierson and Wilson.

The Library of Congress is truly a master library for it set the catalogue system style for all libraries in the United States, it records all copyrights, and has set the pace in library science and, now, in library architecture and decoration.

The Formica laminated plastic used in catalog and reading rooms, and as table tops is the material which is setting the pace for all functional buildings. It meets the difficult requirement of being the most beautiful and the most practical and the most flexible and adaptable.
There are written and unwritten specifications. The ones by which size and shape and breadth and depth are regulated are the written specifications. The ones upon which prestige is built are the unwritten specifications.

Speed, load, car size, controls, such terms as these are familiar in the written specifications for an elevator.

Safety, satisfactory service, economy of operation, long life, these are associated with the unwritten specifications of an elevator or escalator manufactured by Otis. They are the end results of the skills perfected by experience and the determination to provide the finest vertical transportation possible.

OTIS ELEVATOR COMPANY
Offices in all principal cities
long, pleasing horizontal lines for smart, distinctive modern design

TRUSCON Residential DOUBLE-HUNG WINDOWS

For absolute harmony in the most streamlined modern design, or for adding new zest to the most conventional structures, utilize the bright, sparkling, newness of Truscon Double-Hung Steel Windows.

Their smooth, sweeping lines permit single or group arrangements that achieve exterior distinction and interior smartness.

This window is also furnished in colonial muntin designs.

Truscon Residential Double-Hung Windows offer many features not found in other windows of similar type or function.

Of major importance is the fact that the sash members are of tubular construction.

This adds greatly to the strength, insulating value, durability and finished appearance of the window. Weights and pulleys are absent. Operation is controlled by spring balances located on the head and equipped with tapes of Enduro stainless steel.

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OCTOBER 1946
Lupton Steel Casements accent the modern design of this residence of Oscar Stonorov, A.I.A., in Chester County, Pennsylvania.

Built on the foundations of a 150-year-old farmhouse, this large country home uses Lupton Steel Casements to make every room a "room with a view". And that's mighty important in this rolling Pennsylvania farm country. In the finest residential construction or in the new low cost houses, Lupton Casements afford positive assurance of abundant daylighting, draft-free ventilation, fire-proof construction. Lupton Casements are complete units, ready for quick, low cost installation. Trouble-free operation and simple, effective screening mean lower maintenance costs. Write for the new 1946 Catalog or see our Catalog in Sweet's.

MICHAEL FLYNN MANUFACTURING CO.
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You Can Make Bowling Profitable Every Month

Remember when bowling was a Winter sport only? Operators who have installed air conditioning will tell you that it's a year-round activity today, with great money-making possibilities. Extra Spring, Summer and Fall business quickly pays for air conditioning.

Architects will find that it is easy—and more economical—to air condition bowling alleys with the famous "Packaged" Air Conditioners pioneered by Chrysler Airtemp. "Packaged" Air Conditioners fit readily into any plan, are easily and quickly installed.

Each "Packaged" Air Conditioner is a complete and automatic air conditioner in itself. It cools its own zone, operates independently as the load requires.

Heating coils can be added to "packages" to provide simplified year-round air conditioning. Airtemp Division of Chrysler Corporation, Dayton 1, Ohio. In Canada: Therm-O-Rite, Ltd., Toronto, Ontario.

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HEATING • COOLING • REFRIGERATION

OCTOBER 1946
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LAVATORY

Patented


- So attractive to the eye as well as the budget, so generous in usable area, so skillfully designed to fit limited bathroom space...this is the Cosmette of 1946! Produced by Case and distributed nationally—see your Classified Telephone Directory or write W. A. Case & Son Mfg. Co., Buffalo 3, New York. Founded 1853.

- Dry shelf space for toilet articles.
- Built-in soap dish.
- Concealed front overflow.
- Towel bars, if required, free from the wall.
- Wall hung or with legs.
- All exposed parts chromium-plated brass.
- 20"x13½" and (for production soon) 24"x16½".

Case
PLUMBING FIXTURES

- NO. 90 EASY-ACTION "SLANT-BACK" FITTING. A fully chrome-plated fixture with permanent non-splash device. Design provides for easy renewal of any wearing part or the entire unit.
Red Lead "Soaps" help make Paint Film Tough...Flexible...Water-Resistant

While maintenance engineers know, by long experience, that Red Lead helps make metal last... and widely accept it as the standard metal protective paint... it remained for modern science to show exactly why Red Lead so effectively inhibits rust.

One of the important reasons is Red Lead's ability to react with the vehicle, and produce unique lead "soaps."

These soaps grow to form a tough, impervious, intermeshing matrix within the paint film, as shown in the photomicrograph at right.

The soap formations increase Red Lead's protective power in several ways. For one thing, they mechanically reinforce and toughen the paint film.

At the same time they contribute all-important flexibility, allowing movement all along their soft, intertwining projections. This helps prevent the ruptures to which a hard unyielding film is subject.

Moreover, lead soaps slowly form primarily in the dry paint film as it ages. This is where the soap formations impart their greatest benefits. When a paint film weathers and ages, decomposition products of the vehicle are formed. Red Lead's ability to slowly combine with these decomposition products actually enhances the life of the paint film. Red Lead's slow rate of reaction means the film age-hardens at a slower rate.

And again, the very structural formation of the soaps, with their dense, impermeable matrix of interwoven fibres, helps to restrict the passage of moisture through the paint film. Metal cannot rust without the presence of moisture.

Specify RED LEAD for ALL Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint.

No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

This photomicrograph shows the distinctive lead soap formations resulting from Red Lead's reaction with the vehicle. Note how the rod-like projections, radiating from central cores, spread out and intermesh. This makes a strong, flexible, interwoven structure, just as individual fibres in a piece of cloth are woven to make the cloth strong and durable. This type of soap formation is unique with lead paint films.

Here you see the standard apparatus used for measuring the water permeability of paint films.

With this equipment a measure of the amount of water that passes through a unit of film is obtained. Experiments show that a straight tissued oil film allows three times as much water to pass through the film as when the same film is pigmented with Red Lead... illustrating once more the beneficial protective action of Red Lead and Red Lead "soaps."

Write for New Booklet—"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 2; Chicago 9; Cincinnati 2; Cleveland 13; St. Louis 1; San Francisco 19; Boston 6; (National Lead Co. of Mass.); Philadelphia 7; (John T. Lewis & Bros. Co.); Pittsburgh 36; (National Lead Co. of Pa.); Charleston 11; W. Va.; (Krens Lead Division).

Dutch Boy
Red Lead
Floors in Hospital Addition

Built with 
Open-Web Joists

This eight-story, 52 room steel-and-brick addition to the New Rochelle, N. Y., Hospital was built with Bethlehem Open-Web Steel Joists in the floors—not only to provide stiffness, but for protection against fire hazards.

Bethlehem Open-Web Joists are ideal for use in light occupancy structures because they never shrink or sag. Hence there's no cause for concern about squeaky floors, open baseboards or cracks in plaster. They are immune to termites. When used with concrete floor-slab and plaster ceiling in fire-safe construction they safely withstand fire for over two hours.

Bethlehem Open-Web Joists speed the installation and concealment of pipes, conduits and ducts. They're easy to install, too, for they arrive at the job completely fabricated, ready to erect without falsework. Two men can handle standard Open-Web Joists. And the Longspan type of joist (making possible column-free floor spaces up to 64 ft. in width) can be installed by means of a light gin pole.

Ask for a copy of Folder 522. You'll find it helpful in designing with Bethlehem Open-Web Joists. Write to the nearest Bethlehem district office, or to Bethlehem, Pa.

Bethlehem Steel Company
Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

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Office Buildings...
Dormitories...
Hospitals... Schools...
Homes

Bethlehem Open-Web Joists

Bethlehem Steel

Architectural Record
FOR A HILLSIDE

LESS EXCAVATION... MORE HOUSE

...AND Fully Automatic COAL HEAT!

This little house on a hill is the solution to many designers’ problems. It offers the economy of a one story home with the advantages of a two floor plan! It can be built on a steep and rocky lot with a minimum of expensive excavation, since the partial basement fits into the slope of the lot. Living and dining spaces are at the top of the house, overlooking neighboring homes and affording a grand view. If the house is placed close to the street, a maximum of secluded garden space may be provided on the lower side, close to the living room and bedroom windows.

ECONOMY is the key factor in building the 11 million new homes needed in the next few years. The heating facilities you select will play a major part in the economy and salability of houses you design or build. The heart of this livable home is an economical, fully automatic coalburning heating plant, with easy access provided to the basement from all parts of the house. Coal heating... whether fully automatic as above, or hand-fired with automatic controls... is the most satisfactory and economical in the long run.

A coal heating plant is the only installation that can be converted to all other types of heating—when you design or build, play safe, provide coal storage space and chimneys adequate for any fuel. Design for coal... "Fuel Satisfaction". It is economical, safe, clean, quiet, odorless and abundant.

Norfolk and Western RAILWAY

Unique design of this home places bedrooms on the lower floor with combination living and dining room directly above—all away from the street for quietness, privacy and maximum view. This is an ideal design for homes along rivers and lakes, or for those in any city.

- INITIAL COST ECONOMY. A hand-fired coal furnace is the least expensive of all central heating plants.
- AUTOMATIC HEATING. The cost of a stoker-fired coal furnace is no greater than the cost of a good installation using any other fuel—over a period of time... economy in cost of fuel is the saving.
- FULLY AUTOMATIC HEAT. The ultimate in cleanliness, safety, comfort, convenience and economy, is a bin-fed, ash removal, coal-burning stoker—the cost is little more than a regular stoker.
- CLEAN, SMOKELESS FUEL. Coal today is sized, cleaned, and dustproofed at the mine.
- PLENTIFUL FUEL SUPPLY. We have a three thousand year coal reserve. Other fuels may be exhausted while your building is still relatively new.
- CONVERSION POSSIBILITIES. A conversion burner can be installed economically in a coal furnace. The reverse is not possible. Be safe... provide for coal.

OCTOBER 1946
When specifying conduit for underground (or overhead) steam distribution lines insist on Ric-wil to obtain these features for the most efficient, maintenance free, permanent system.

All-welded construction means a pressure-tight conduit capable of meeting air-pressure test. Conduit casing is 16-gage corrugated iron, seam-welded and hot-dip galvanized after welding. Simplified connector is readily welded to smooth conduit ends, held in place by drive clamps. Ends of conduit are presealed at the factory with a heavy pre-cast cylinder to protect insulation during storage on the job and installation—regardless of water conditions encountered. Triple protection against the elements is insured by Ric-wil specifications for conduit covering. First, a thick coating of high melting-point asphalt is applied over casing. Second, asbestos felt is tension wrapped around conduit before asphalt is set. Third, another coating of asphalt is applied, which is finally protected by spirally wrapped heavy kraft shipping paper. Installation is greatly simplified, saving time and money on the job. Prefabricated 21 ft. sections, also prefabricated accessories—including expansion loops, elbow, tee-branch and anchor units, are furnished with ends fitted for easy coupling in the field. Because of the conduit's inherent strength, only 18" of ground cover is required, even under trucking roads, minimizing excavation and back-fill. Pipes can be turned in conduit so that all pipe welding is done on top. Installation interferes little or none with other construction. If you have not yet used the full-welded Ric-wil Prefabricated Insulated Pipe Units, specify them on your next job and be assured of the best. Descriptive Catalog on request.

RIC-WIL INSULATED PIPE CONDUIT SYSTEMS
THE RIC-WIL COMPANY, CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES
You can’t sell ‘em if they don’t come in and a distinctive Brasco Front stimulates the buying urge as nothing else can. It halts the shopper, leads her eyes right into the store and her footsteps follow almost involuntarily.

The architect plans it that way, with large expanses of plate glass to permit direct vision within and an entrance area artfully devised to seem part of the store itself.

With complete Brasco Construction, today’s unique fronts are not only practical but moderate in cost and easy to install. Brasco engineering fully provides for the mechanics of modern design with heavy-gauged members, adequately reinforced, and patented retaining sash for utmost glass protection.

These and other exclusive features give Brasco preeminence in the field of modern store front construction, as proven by our thirty-year record of outstanding installations, coast to coast.

A COMPLETE LINE FOR EVERY DESIGN

BRASCO MANUFACTURING CO.

HARVEY - (Chicago Suburb) - ILLINOIS

National Distribution Assures Effective Installation

OCTOBER 1946
QUESTION: What's the best way to install semi-circular gutter linings?

ANSWER: Detail Sheet 19, Pages 68 & 69 in “Copper and Common Sense”

A quick source of reference for busy men, Revere’s 96-page book, “Copper and Common Sense” is based entirely on authoritative new data provided by Revere’s sheet copper research. The new principles it covers show how stress failures can be avoided through engineering design.

In the few months since it was published, this book has become the standard reference for leading architects and sheet metal experts in all parts of the country. That is because the facts it covers are important to every one concerned with better sheet copper construction, and are presented in the form of large, clear charts that are easy for practical men to use.

Copies of this book are now in the hands of all holders of Sweet’s Architectural File, and of leading sheet metal contractors. We urge you to use this book, to turn to it first in all matters of sheet copper construction. It covers every phase of the subject—roofing, gutters, flashing—in full detail. For any further assistance, feel free to call on the Revere Technical Advisory Service, Architectural. Revere building products are sold only through Revere Distributors.

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At Least a Dozen Reasons
WHY YOU'LL LIKE SHUTLBRAK ENCLOSED SAFETY-TYPE SWITCHES
There are many reasons for the mounting popularity of Shutlbrak Switches. Some say, for instance, they like its easier, split-second speed of operation ... its new shuttle mechanism feature that gives quick make and break connections. Others say it is the simplicity of design that appeals to them ... ample knockouts and wiring space at top, bottom and back. Still others say it is its trouble-free service and many practical safety features ... its long lasting economical operation.

Shutlbrak Switches are available in a full range of capacities ... from 30 to 1200 amperes, for 250 volts AC or DC and 575 volts AC in 2, 3 and 4 poles. Encased in attractive pearl gray cabinets for flush or surface mounting, Shutlbrak Switches can be used as single operating switches or assembled into panelboards and switchboards.

Whatever the reason, the fact remains that Shutlbrak Switches embody the latest in design and construction, making them the popular choice for high quality, heavy duty switching. So the next time you need a good operating switch, ask your dealer to show you an Shutlbrak or send for our 20-page Bulletin No. 70.

If it's FA it's "OK"
"Don’t tell us it can’t be

Masontown, Pa., site of 110 homes being built under the direction of the George C. Brown Co. of Pittsburgh. Architect, William C. Young, Contractor, Mellon-Stuart. This is the first in a series of the George C. Brown Company developments.

*New owners are enthusiastic* about better living, electrically. Mrs. E. C. Detisch, of 18 Cumberland Ave., Masontown, Pa., is especially proud of her G-E Dishwasher and Disposall. But, like other Masontown homemakers, she has found that all her G-E appliances—Range, Refrigerator, Steel Cabinets, Washer, and Water Heater—help make housework easier, living pleasanter, in her new all-electric home.
"We're Selling G-E Equipped Homes
For As Little As $51 to $53 a month," Says the
George C. Brown Company of Pittsburgh.

Here's what George C. Brown, president, has to say about his company's postwar homes at Masontown, Pa.

"These homes are the first fulfillment in this region of the ease and convenience which housewives have been promised since before the war.

"Standard equipment in every home includes the all-electric kitchen with G-E Range, Refrigerator, Steel Cabinets, Dishwasher, and Disposall,* as well as a G-E Washer and Water Heater.

"But most important is the fact that these homes with G-E equipment cost the owner only about $3.00 a month more than the same homes would cost without any equipment.

"So don't tell us it's impossible to include the best electric appliances in new homes, and still keep the cost down . . . we're doing it!"

In Pittsburgh, Denver, Kansas City, St. Louis—all across the country, architects and builders are planning new homes, designed for better living, electrically!

From a cost angle: they know it doesn't cost them a dime extra to include all the dependable G-E Appliances. And that there's only a minor increase in cost to the buyer, usually less than $3.00 a month on his mortgage payments.

From a sales angle: they know that today's homeowner wants, and expects, a completely equipped, up-to-date home; that a home with no extras to buy is always a fast seller.

From a quality angle: they know that selling complete, all-electric homes will bring them a reputation as good builders—and a good reputation is going to be mighty important as competition gets stiffer.

Most women want G. E.

In planning your new homes, keep this in mind too: recent national surveys showed that 53 per cent of all women prefer G.E. to any other appliances!

This preference, and the record of G-E appliances for dependable performance, are good reasons why so many builders and architects are specifying G-E appliances as standard equipment.

Let us help you plan your 1947 program. For complete information on all-electric homes, with special emphasis on the kitchen and laundry, write to G-E Home Bureau, General Electric Company, Bridgeport 2, Conn.

THE APPLIANCES MOST WOMEN WANT MOST

GENERAL ELECTRIC

Two lines of PITTCO METAL with the same rich finish

PITTCO DeLuxe Store Front Metal has a satin-smooth finish, rich in tone and gloss, which has delighted both architects and store owners. They like it because it harmonizes perfectly with any material or color combination. And the Pittco De Luxe line also has rugged, sturdy strength and clear, sharp profiles assured by its extruded method of manufacture. Imaginative styling and the wide variety of bars, mouldings and sash in the De Luxe line permit the architect many effective combinations. For symmetry, strength and perfect finish, Pittco De Luxe is the ideal choice for impressive, distinctive store fronts of high quality.

Pitco Premier, although lighter in weight and more moderately priced than Pittco De Luxe, has the same rich, smooth finish. And into the Premier line, too, has gone the same careful planning which has made the De Luxe line so popular. All Premier members were styled at one time so that perfect harmony would be inherent in the line... each Premier unit complementing the beauty of other pieces used with it. Pittco Premier construction can be set quickly and easily... a simple outside procedure that effects a substantial savings in setting time. In Pittco Premier architects will find a lightweight, economical metal with which to create pleasing, appealing store fronts.

PITTCO STORE FRONT METAL

"PITTSBURGH" stands for Quality Glass and Paint

PITTSBURGH PLATE GLASS COMPANY

ARCHITECTURAL RECORD
To compare the durability of two mortars, make a cylinder or block of each, let them “cure” for a month or so, then freeze and thaw them forty or fifty times, with a little water in the pan (the freezing unit of your electric refrigerator will do). Try this with Brixment mortar!

—AND DURABILITY MEANS

PERMANENT STRENGTH AND BEAUTY

For permanent strength and beauty, mortar must be durable—must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

Brixment mortar is more durable. This greater durability is due partly to the strength and soundness of Brixment mortar, and partly to the fact that Brixment is waterproofed during manufacture. This waterproofing helps prevent the mortar from becoming saturated —therefore protects it from the destructive action of freezing and thawing.

Walls built with Brixment mortar therefore retain their original strength and appearance. . . . Even in parapet walls and chimneys, where exposure is particularly severe, Brixment mortar will almost never require repointing.
About those NEW carpets . . .

"I've decided on Hartford Saxony for this lobby...and I'll sure wait for that!"

"These Bigelow carpets gave me real service. I'll stick to the same patterns"

"For years I've wanted rich, new textures like these...so I won't mind a little wait now"

"I can save both installation and maintenance waste with Bigelow Lokweave. That's what I want"

...It's worthwhile waiting

Bigelow carpet production is getting back to normal ... and orders will be filled. Now's the time to plan redecorations. Ask your dealer about Bigelow's Carpet Counsel. It's an old, free service to save you time and money.

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Easy to set up, strip and move. Light weight, averaging only 35 lbs. per unit. Inserts easily and accurately accommodated. Strong—No studs or joists required as with wood forms. Durable—can be used over and over indefinitely. Leave a smooth uniform finish—No Grain Marks—Nothing to Remove.

A HOUSE FOUNDATION a day at a tremendous saving in cost is easy with Atlas SPEED Forms—the new process for concrete construction which makes it simple to strip, move and set up form work accurately to suit any building condition.

In heavy construction, too, contractors are amazed at the savings they make and order again and again. Savings of 25% and more are not unusual in apartment house, department store, factory and water work construction. Ask any of the users and find out first-hand.

Economical to Rent or Buy—Available for Early Delivery.

Write for Illustrated Folder No. 6

 Irvington Form & Tank Corporation
 Irvington 16, New York

Atlas Steel Forms for every Purpose
then he said to himself:

"OK spelled backward is KO"

THE hero of Yugoslav resistance, the late Draja Mihailovich, at the end of a three-day questioning, finally said:

"I wish you wouldn't torture me with rhetoric. When I am too tired, I say yes."

Far too many people are prone to dismiss a moot subject with a tired "Yes"... meaning they haven't the energy to explore for facts on which to base a gainful YES or NO... when it is so simple to do it this way...
Apply Draja’s reasoning to the choice between two methods of joining metal members...plates for example:

Which would you OK?

THE RIVETED JOINT
- Develops 7500 lbs./in.
- Requires ½ inch plates
- Requires 15% additional splice weight
- Requires accurate detailing of 4 plates
- Requires accurate punching of 4 plates
- Requires 2 to 4 men to buck up and rivet

THE WELDED JOINT
- Develops 7500 lbs./in.
- Requires ⅜ inch plates
- Requires no additional splice weight
- Requires no detailing
- Requires no plate preparation
- Requires 1 man to arc weld

The Lincoln Engineer nearby will gladly help you explore further facts on the two methods as applied to your specific problems.

Studies in Structural Arc Welding free to architects and engineers.

THE LINCOLN ELECTRIC COMPANY • DEPT. 323 • CLEVELAND 1, OHIO

America's greatest natural recourse

ARC WELDING
What keeps the rhino feeling right

can keep your clients happy, too!

Over 90 years of successful roofing experience has demonstrated the sound value of the gravel or slag wearing surface of a Barrett Specification Roof:

1. It holds in place the heavy poured (not mopped) top coat of coal-tar pitch—providing a doubly thick waterproof covering.

2. It provides protection against the sun’s actinic rays which otherwise dry out the valuable oils in roofing bitumens.

3. It protects the roof against mechanical damage, hail and wind, wear and tear.

4. It interposes a surface of fireproof rock between the building and flying embers—makes a roof that carries Fire Underwriters’ Class A Rating.

Life is rugged for the Rhino, but he never seems to mind. Why should he worry? He knows his armored wearing surface will protect him from his natural enemies.

The Barrett Specification® Roof, with its armored wearing surface of gravel or slag, provides equally sturdy protection for buildings. It’s so long-wearing it can be bonded against repair and maintenance expense for as long as 20 years.

Built up of alternate layers of coal-tar pitch and felt, topped by a thick pouring of pitch to anchor the gravel or slag wearing surface, it is the toughest, longest-lasting built-up roof made. It is waterproof, fire-safe, sun resistant, and armored against mechanical damage.

As a service to your clients, recommend Barrett Specification Roofs on the buildings you design. The Atomic Bomb Plant at Oak Ridge, Tennessee, the Empire State and R.C.A. buildings in New York, and many other famous American buildings—all Barrett-roofed—will bear out the soundness of your recommendation.

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ARCHITECTURAL RECORD
When Chase Copper Tube is used in radiant heating installations, tight joints are easily made by a simple soldering operation. Both Chase Copper Tube and Chase Solder-type Fittings are made to close tolerances that help assure proper filling of the joint with solder.

Even these easily made joints are needed in only small numbers. Chase Copper Tube comes in lengths up to 100 feet—fewer joints needed between coils. It's easily bent to shape right on the job—no fittings needed at bends. No special tools required for bending, either.

With these and other advantages of Chase Copper Tube (note list at right) it's not surprising that we cannot always keep pace with the demand. But if you're planning radiant heating installations, the information is available for your use right now. We'll be glad to send you our radiant heating literature—simply address Dept. AR106.

7 Reasons
WHY CHASE COPPER TUBE
FOR RADIANT HEATING

1. EASY TO BEND
2. LIGHT IN WEIGHT
3. SOLDERED FITTINGS
4. SMALL DIAMETERS
5. LONG LENGTHS
6. LOW COST
7. LONG LIFE
Like Frozen Music . . .

* No beauty in Chopin 'til a Rachmaninoff or a Kilenyi pulls it from a Steinway. No beauty in tracings 'til they turn to stone in the architecture Von Schelling calls "frozen music."

Indiana Limestone is America's most frequently specified stone not only because of its incomparable beauty, moderate cost and constant availability direct from our companies, ready for positioning . . . but because it resists temperature extremes, and assures homogeneous strength regardless of natural bed plane.

If your questions are unanswered by our Sweet's File catalog, experts in our Technical Division, backed by a century's experience in every building application, will counsel with you personally.

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Complete Catalog, containing Installation Details and Clearance Dimensions, will be mailed upon request.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

One of Many Mahon Power Operated Rolling Steel Doors Installed in the New Plant of The Falls Spring & Wire Company, Detroit, Mich.

OCTOBER 1946 61
Good people to do business with." That is a statement often made about Spencer. It’s the best compliment we could ask for—and we promise to live up to it.

Spencer knows the heating business. Through the years our engineers have progressively modernized the Spencer line. Today’s modern Spencer steel boiler is not just "another package" but a time-tested, proven product... a good reason why men who "live" heating problems recommend Spencer... why many of the most reliable distributors in the industry sell Spencer.

There’s a precision-built Spencer unit for every individual heating job... every type of heat... every size of building... a premium boiler at no additional cost. Write or wire for a catalog of the complete Spencer line now.

SPENCER HEATER
Division—The Aviation Corp., Dept. A-8, Williamsport, Penn.
FIRST, we replaced the human hand with a Shading machine that moves the pencil back and forth across a sheet of paper at fixed speed, pressure and spacing, characteristic of the lead being tested.

Result: A square of paper uniformly shaded to the grey tone.

Then we replaced the human eye with the electric eye of a Reflectometer and measured the exact percentage of light reflected from the shading.

NEXT, we developed 17 different degrees of TURQUOISE leads (6B to 9H) evenly spaced by percentage of light reflection.

NOW, Ernest Eagle makes and checks a shading chart for every batch of every degree of TURQUOISE lead. When he places the electric eye on a 2H shading, the needle must point to 54, or the entire batch is rejected. No wonder TURQUOISE gives you the line you want from every pencil every time!

Prove it Yourself!

For a free sample TURQUOISE, just write to Ernest Eagle, naming this magazine, your dealer and the grade you wish.

Grading the blackness of drawing pencils by the human hand and eye is not accurate enough for TURQUOISE... see how Ernest Eagle took the guesswork out of grading.
Silently, almost stealthily, arc welding swiftly unites steel members into one-piece skeletons for today's skyscrapers. Combined with oxyacetylene cutting for various operations of fabrication, arc welding saves steel...assures full strength...and permits wider architectural latitude.

To help you solve the many perplexing problems involving this modern method of erecting buildings, Airco has just published "Manual of Design for Arc Welded Steel Structures"—a handy, useful book that brings you a wealth of information covering design, materials, inspection, estimating, and engineering control of welding and related operations...tables of standardized welded connections for all sizes of beams...AND a series of diagrams for the rapid design of special connections.

But see this invaluable new manual for yourself—just mail us your check or money order for $2, and we will send the book to you at once...look the book over for ten days; then, at the end of this period, if it does not live up to your expectations, simply return the book to us, and we will refund your money.

Write today; address: Air Reduction, Dept. AR 2-I, General Offices, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston I, Texas.
Whenever you lay floors at grade, or sub grade . . . it's particularly important to use pressure-treated wood.

The moisture that is almost always present encourages the growth of fungi that cause decay. Pressure treatment poisons the food supply of the fungi. Treated wood delivers the many years of service that you have a right to expect. You'll find, too, that pressure treatment improves the wear resistance of the wood . . . a profitable extra dividend.

Remember, decay in wood is not the natural result of old age, but of avoidable disease. In 21 modern, fully-equipped treating plants, Koppers "inoculates" all varieties of structural lumber against this threat. Special selected treatments give enduring protection against the hazards of the individual service: decay, termites or marine borers . . . acid attack . . . fire. Our Bulletin G-23 will give you full information on the various treatments, and show you some of the many places where pressure-treated wood is serving and saving. Ask for a copy. Koppers Company, Inc., Pittsburgh 19, Pa.
A NEW AUTOMATIC WATER HEATER

TO MEET 1946 BUILDING AND MODERNIZATION BUDGETS...

Eagerly awaited since its announcement several months ago, the new Bryant Model 105 Automatic Storage Water Heater is now in production. This popular-priced unit, because of its many distinctive features, will set new standards of quality and performance while serving America's new and modernized homes.

Attractive in its gleaming white finish, the Model 105 is completely automatic, thermostatically controlled. It is rigidly constructed for long life and dependable operation, super-insulated for heating efficiency. The "Bryalite" Automatic Safety Pilot, a Bryant engineering achievement, provides easy, safe lighting...shuts off the gas to burner should the pilot light go out. The specially-designed stainless steel burner operates quietly, resists corrosion and stoppage from dust or dirt. Segmental baffles inside the heating section utilize all the heat by directing it against the heating surface.

These and many other features make the Model 105 Automatic Water Heater highly desired equipment in any new or modernized home...a proudly-presented newcomer to the famous line of Bryant automatic gas-fired heating equipment.

BRYANT HEATER COMPANY
17825 St. Clair Ave., Cleveland 10, Ohio
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The most complete line of gas heating equipment in the nation!
CECO STEEL JOISTS BRING LIVINGROOM LOVELINESS TO THE BASEMENT

Now both beauty and efficiency are possible in modern homes because of steel joist construction. Yes, there's new beauty... new efficiency ahead, even for basements. That's because steel joists eliminate unsightly supports... provide unobstructed floor areas... permit neat, trim ceilings.

Bigger buildings point the way!
Ceco drew from wide experience with light occupancy buildings to bring steel joist construction to home building. For in bigger buildings where both permanence and beauty are desired, builders turn to Ceco steel joists for flexibility in design, rigid floors, greater safety.

Why builders prefer CECO Steel Joists
1. Easy to install—no special skill or equipment required.
2. Eliminate fitting electrical fixtures to chopped-up ceiling areas.
3. Provide convenient tunnel system for pipes and conduits.
4. Provide cooler floors in summer—warmer floors in winter.
5. Eliminate sagging partitions and squeaky floors.
6. Eliminate dry rot and termites.
7. Cut insurance costs by reducing fire hazards.
8. Reduces plaster cracks and shadow lines.

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Dealers, Offices, warehouses and fabricating plants in principal cities
ONE **Dial-ese UNIT**

**FITS ALL NEW CRANE FAUCETS**

Beautiful new Crane trim—both Temple and Crestmont lines—has the newly developed Dial-ese Unit. Water pressure below the seat is a boon to home owners troubled by hard-to-close, dripping faucets.

To the user, Dial-ese offers another advantage: a single unit fits all new Crane trim in bathroom, laundry and kitchen.

**CRANE**

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PLUMBING • HEATING • PUMPS

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ARCHITECTURAL RECORD
Linked closely to the precision jobs coming off the boards are the tools that assure accuracy of detail. One of these is the seemingly small pencil which looms large in the mind of a craftsman, as an important instrument of accuracy.

VENUS Drawing Pencils are engineered to give you drafting perfection without failure: accurately graded to assure uniformity in all 17 degrees...strong in performance...smooth and clean in action.

VENUS DRAWING PENCILS
AMERICAN LEAD PENCIL COMPANY, HOBOKEN, NEW JERSEY
One of the country's ultra-modern postwar community projects has been designed by Ames Aksila, Worcester, Mass., Developer and Builder. Unusual features include ceiling panel heating of all first floor rooms. And each of the 400 homes will be equipped with a Moduflow control system, which is Minneapolis-Honeywell's latest contribution to heating comfort and efficiency.

Here is concrete evidence of the way Moduflow has "taken hold." It demonstrates how in modern housing developments, Moduflow is being used as a distinguishing sales feature—a feature that commands a premium in the better homes and provides a powerful advantage whenever competitive selling is a factor.

But, regardless of any project's size, whether a single home, or 400, when Moduflow is specified your clients are assured of a new high standard of house heating comfort. Moduflow control systems are now available and their performance record has already been established in thousands of homes throughout the nation. Minneapolis-Honeywell Regulator Company, 2600 Fourth Avenue South, Minneapolis 8, Minnesota.

MODUFLOW means modulated heat with continuous flow. Since heat losses are continuous, heat supply should also be continuous but modulated to whatever temperature is required to offset the heat loss. Moduflow automatically maintains continuous balance between heat loss and heat supply.
MORE INSPIRED CHURCHES

WE SHOULD have no illusions about the difficulties of designing a soul-satisfying church. True, it may not be too hard to please a dominie, or his flock, or even the building committee. The pastor may be satisfied if his pulpit is well placed and the acoustics are good; the congregation will probably like the edifice because it is bright-and-shiny new and less draughty than the old; the building committee will like it because they can show that here or there they saved a dollar or two. But to create a church design that is really inspiring, expressive of spiritual aspiration, that lifts one's mind and soul, that creates a worshipful mood — as well as being physically efficient and enduring — is no mean task.

It is a task worthy of the best efforts of the most sensitive and talented members of the profession, one that should be welcomed rather than shunned because of its difficulty. For it does take the highest form of creative imagination — inspiration, if you please. And it takes the utmost of the designers' powers of persuasion, diplomacy, and applied psychology as well. The intrinsic difficulty of the esthetic problem is complicated by the problem of human relationships, the necessity of dealing convincingly with church building committees.

What makes the architect's task the harder is that the church building committee is usually sincere, devoted, well-intentioned and hardworking, however dogmatic, opinionated, parsimonious and "practical" they may turn out to be. Fortunate indeed is the architect who finds a church building committee open-minded, sympathetic, sensitive to the nuances of good design, appreciative of scale, proportion, form, color, texture.

A building committee pre-informed of architectural practice and progress, and predisposed to give the architect the fullest scope for his creative imagination would be a boon conducive to inspired churches. An architectural handbook for the churchman would serve a mighty useful purpose, save many a frustration.

But I do believe that an architect, if he has the will and the inspiration, the patience and the tact, can create, even with a modest budget, a church worthy of its function. However, it seems too few of our most talented designers have devoted their efforts to this most difficult of all forms of architectural expression. Their minds and hands have been otherwise engaged in serving society in more exciting, more lucrative and less circumscribed fields. If our major architectural achievements are in the realm of commerce or industry, recreation or health it is because society's interests, emphasis and emoluments are centered there. For architecture is inevitably an expression of the civilization of the time and place of its creation.

Here and now we find church attendance and church prosperity at new high levels. Hundreds of churches are thus encouraged to wish and to work for new edifices. Architects' plans and sketches are being used as major tools in the fund-raising drives. Today architects are confronted with a greater opportunity for their talents than ever before — the opportunity to design inspired churches, churches as distinguished in the quality of their design as in the quality of their materials and equipment, churches worthy of their functions, spiritual as well as physical.
A PLAN FOR ROTTERDAM

By Earle Draper, Jr.

Rotterdam has been working for six years on its new city plan. One of the earlier cities to be largely leveled by bombs, Rotterdam immediately started to replan its future, and, in five years of working behind its conquerors' backs, threshed out the innumerable discussions that must attend drastic replanning. Early in 1946 the new plan was ready and accepted, and new construction was going forward according to its dictates.

Standing in the shadow of the modern Bourse, one of the few buildings spared in the destructive German air raid in May, 1940, one can see the reinforced concrete skeleton of the new Rotterdam Bank Building, and not far west on Coolsingel Street there is a large theater more than half completed. But perhaps the most impressive sight is the large open areas overgrown with grass and weeds. In the past these areas were densely built up and represented the heart of the city. The raid resulted in the loss of 25,000 houses, 2300 shops, 1450 offices, 700 warehouses, 4 railway stations, 24 churches, 60 schools, 500 public houses, 30 factories, and 26 hotels.

But there are no ruins left standing to testify to this catastrophe. The industrious Rotterdammers have...
cleared away all of the debris, and have even gone so far as to remove all of the foundation piles.

Reconstruction work will not be confined to the destroyed area; construction projects are going forward in various sections of the city. A large 1900-family housing project is well under way across the Maas River in the southern section of the city; construction of buildings for light industry is in progress northeast of the exchange; canal bridges which will be an integral part of the new street system are in evidence.

All of these new projects conform with Rotterdam's new plan. This plan represents five years of underground work. It supersedes the first plan for the rebuilding of Rotterdam, which was the official plan for the rebuilding of the city until 1946. This first plan was completed three weeks after the air raid to prevent German interference. As Mr. van Emden put it, "We knew Hitler dabbled in city planning, and we wanted to have a plan ready before he or his technicians arrived." Fortunately the war prevented work on this plan, for had it been
carried out there would have been only a slight improve-
ment on the old city plan.
The new plan of Rotterdam, however, represents a real achievement in city planning. The three men largely responsible for the new plan, Cornelius van Tass, director of planning; Samuel van Emden, deputy director of planning; Rein. H. Fledderus, the chief architect, are to be commended not only for their scheme, but also for the manner in which they arrived at this plan. During the occupation all of the work had to be carried on under-
ground, but in spite of this handicap, the people of Rotterdam were not excluded from the work. Representa-
tives from all walks of life were constantly consulted in the preparation of the plan.
The new plan seeks to achieve an orderly grouping of related functions. Public buildings will be grouped in the vicinity of the city hall, another building spared in the bombing attack; banks will be located near the ex-
change; a recreation quarter with cafés, restaurants, hotels, and theaters is planned close to the proposed

Replanning for Rotterdam began with the dikes and wharfs of the harbor, for shipping is the life blood of the city's commerce. Besides the maritime center and seamen's quarters, there will be other groups segregated by functions — public buildings near the city hall, which was spared in the bombing, a financial group near the Bourse, a recrea-
tion center near the central station, housing groups in greenbelt locations, small-
industry groups in the city, larger indus-
ties outside of the area shown.
central station; a cultural group with concert halls, museums and public meeting halls is projected close to the existing park; a maritime center and seamen's quarters will be constructed in an area close to the waterfront; large industries will be excluded from Rotterdam proper, but small industries will be accommodated in designated areas; and housing, for the most part, will be located in outlying greenbelts.

For traffic circulation, the planners have worked out wide, tree-lined thoroughfares in the heart of the city and a parkway along the waterfront constructed on a new dyke. All trains will arrive at the proposed central station, and the land now occupied by the Maas station will be available for housing. Trains from the south will cross the Maas River over a large suspension bridge and will proceed to the central station over a concrete viaduct. Foot passengers and vehicular traffic will cross the Maas on a suspension bridge also, and this traffic will be received in the new section of the city at a traffic circle located in one of the three large squares projected for the new heart of Rotterdam. Plenty of space is allowed for in planning the circulation scheme, except for

View 1: the Maritime Center, long piers at the left, wharfs and shippers' buildings at the right

View 2: motor and rail traffic will cross the harbor and the island on two suspension bridges
the streets in the shopping areas. These streets have been planned for pedestrian traffic only, and, consequently, will be narrow.

The execution of the new plan of Rotterdam is dependent upon the rejuvenation of the city’s principal economic support, shipping. Everyone remembers the bombing attack, but few people outside of Holland are aware of the further damage the Germans were guilty of when they destroyed almost two miles of docks. The Rotterdammers have concentrated their main efforts in reconstruction on the repair of this damage, for they realize the desperate need of the city for a revival of the trade and shipping which flourished before the war. The city planners have made certain that everyone will be conscious of the importance of shipping to the city’s economy and will appreciate the importance of the city as a shipping center. In the future one will be able to look down Coolsingel Street and see large ships at dock, and the entire waterfront will be open to view from the parkway along the dyke. Thus have they confidently prepared a welcome for the ships which they hope will once more tie up at Rotterdam.
"The present program (10,500 victims) involves four living units and the garden cities radiating about the center of the city. However, the plan reproduced below envisages also several other living units; with these, this part of the city could one day count 20,000 inhabitants. To look for such a growth is nothing but wise foresight in what one calls a master plan.

A master plan preserves the terrain and must permit execution in steps. At St. Dié the realization of the first can be immediate. It is the beginning of two vertical living units which can be industrially manufactured without delay anywhere in the country, then brought in and erected in place with record speed. And with one stroke the first three thousand residents of St. Dié will be sheltered.

In the meantime all the other dispositions can be made for the construction of the horizontal garden cities. The factories, also, can be constructed industrially as soon as the program starts.

It is understood that the buildings that were spared will remain among the new constructions, notably among the manufacturing buildings (to the south of the Meurthe) whose plan here is purely schematic." (Shaded area near highway shows older part of city.)
When I was called by the municipality and one of the associations of victims of the city to collaborate as counsellor in the reconstruction of St. Dié, I accepted for diverse reasons, notably the presence in that city of devoted friends of public well-being who are keenly aware of the need for an architecture which takes into consideration the conditions of modern life. Furthermore, St. Dié constitutes in its reurbanization, a living unit made up of a majority of workers in manufacturing industries (printshops, hat factories and spinning mills, etc.). The almost complete destruction of the ancient city had the result of clearing and bringing back into value the surrounding countryside, which is agreeable and charming. It is a revelation for the visitor and still more for the resident. This is a treasure regained, which it would be criminal to allow a lazy and inattentive urbanization to bury again at the bottom of courtyards or behind the walls of corridor streets.

The master plan must bring a solace to the labor of the workers, and especially to that of the women, housewives, who in modern life are crushed under the burden of domestic duties. Architecture and modern urbanism have the possibility of giving to domestic labor a greater efficacy with less effort. And the dispositions which may be made will lead to ways of life beneficial to the future. I am thinking here of a method of existence, a method of daily life which will free it from the lethargy which betrayed it and continue to betray it if we are not careful. I am thinking also of the evils resulting from the industrial evolution — tentaculate cities and deserted fields — which we must try to remedy.

This was the problem for St. Dié:

Destroyed zone: A rectangle cleared by shell and fire, which was the very cradle of the city, the place where it was born and started to raise itself. Approximately 10,500 victims who are tenants and small property owners.

The project envisages the possible distribution of: 6,000 residents in buildings furnished with "communal services" and with "extensions of the dwelling"; that is the type of vertical garden city (four living units). 4,000 residents in individual family houses, of the horizontal garden city type. The proportion may be equally well 5,000 and 5,000 or 4,000 and 6,000.

We belong to a civilization characterized by a considerable development of large-scale industrial production. Work is an essential part of our daily life. The plan reintroduces it into the city as the integrating part of an urban life to which one tries to give dignity, a reason for being and strength.

The factories are grouped and combine all the technical facilities for a modern operation. They will constitute one of the aspects of the city scene, one of the essential parts of the urban activity.

This group of factories, on the left bank of the Meurthe, occupies a territory covered with ruins. Naturally, the few buildings which escaped the disaster will be respected. The present master plan, in the form in which it is here published, is purely schematic.

The homes, provided with their "communal services" and their "prolongations," occupy the same terrain as the ancient city. Four living units accommodate about 6,000 persons. Fifty meters high, at the most, they mark themselves off against an immense space today liberated of all barriers. From each residence the view will be magnificent, on the higher floors even more than on the lower. (The plan is arranged for an eventual extension to eight living units.)

The living units offer the advantage over every other method of construction in that they permit an immediate commencement and take advantage of all the re-
Before it was razed by bombs, St. Die was a typical French town, with rows of buildings packed together on streets laid out for an age of carts and pedestrians. But now "the misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned."

sources of manufacture in series and all the quality of standardization. Better yet, in a region ravaged as St. Die, they can be made industrial accomplishments (industry takes over construction), thus leading the world of production to eminently productive tasks.

The building industry has suffered so much since 1930 that it is not in condition to face the present tasks which are crushing. If industry takes over construction, or at least a part of the tasks, it is in effect the providential application of technique in a dramatic conjunction. But on another plan, the living unit offers the immense interest of lending itself economically and efficaciously to the installation of equipment for the preparation of food and for domestic service according to the formulas which bring to the housewife such relief as one would never suspect. We think also of the services of preventive and curative medicine; of dispensaries and emergency hospitals; of physical culture becoming then a regular function of the daily life; of heliotherapy and of hydrotherapy scientifically practiced.

Outside the buildings, and on the extensive level spaces which surround them, there are the prolongations of the home, to wit: the nurseries and the kindergartens, primary schools, the workshops or the clubs for adolescents, finally, the sports fields at the base of the home: races, tennis, basketball, football, swimming in the open air.

The surrounding free spaces may have yet other installations: In particular, well-organized vegetable gardens with common cultivation and automatic irrigation offered to those who want to cultivate their own gardens.

The second lot of homes will be made up of family dwellings having gardens, some large, some small.

Certain of these houses destined for a clientele of means may be constructed by private initiative. Others for the use of more modest occupants may be planned in groups to gain the benefits of effective and economical series production.

The vertical garden city and the horizontal garden city can co-exist perfectly in harmonious relations. The experiment may bear fruit and the users will pronounce themselves one day in favor of one or the other formula.

Finally, in the center of the presently ruined territory of the city of St. Die, there is a spot specially selected for the construction of the civic center.

The civic center is forbidden ground to automobiles; it is reserved for pedestrians. It groups in a single perspective the buildings of work, public and private administration and the cathedral. It includes as well the artisans' shops and the tourist center, the cafés with their terraces and their gardens, the amusement halls (cinemas, etc.), whatever one can call the department stores that have available space sufficient for the parking of vehicles belonging to the clientele from the country, finally the transient hotel and the hotel for tourists. The civic center is the pre-eminent place of the city, its heart and its brain. It is there that through monuments and through activities the city life develops and writes itself in history.

The primary schools form part of the living units (vertical or horizontal garden cities). The higher school could be built on the hill to the east of the cathedral, the hospital still further to the east. The fields for spectator sports would be installed on the plain to the east.

The Meurthe flows at the bottom of a cut 75 meters wide and with banks 4 or 5 meters high.

By means of a summer dam, it would be possible to obtain in season a magnificent expanse of water which would unite the cities of work, the civic center and the centers of habitation, and which would permit the healthy and attractive practice of water games.
"The bishop of St. Die said to me, 'Have you noticed that the countryside has appeared since the city was razed — an admirable and consoling landscape. What a miracle if one could preserve it in reconstructing the city!' Up to the present the remarkable landscape of hills and mountains that surround St. Die was banished from the city as from the houses. The new project permits integrating it in all its splendor in the civic life as in the life of each individual — a daily stimulant.'

"CROSSING THE THRESHOLD"

By Claudius Petit, Vice-president, Commission for Reconstruction and City Planning, L'Assemblée Nationale Constituante

For St. Die, as for other cities, the great question is posed: "Shall we recommence the past? Shall we foretell the future by being of our time?"

The war left everywhere its train of ruin and misfortune. The ravaged cities, the mutilated houses, the overturned soil of our fields are all too numerous witnesses of this. Circumstances sometimes accentuate these destructions and make them symbolic.

St. Die, where for the first time America received its name; where the Americans in the first war of liberty mounted their lines; St. Die, goddaughter of America and dear to the hearts of American legionnaires, had to undergo the sadism of the barbarians.

Pitilessly, during a succession of days, each house was dynamited and burned. Nothing was spared; methodically, calmly, without any strategic military reason, the enemy satiated his vengeance. Everything that had a distinctive character, everything that constituted the civic center and contained the historic souvenirs has been reduced to a jumbled pile of stones. Only a few arcades of rose-colored sandstone attest a prosperous epoch. But, strangely, at the corner of a street a block of wall remained upright, bearing a plaque whereon is simply related the double sponsorship of America and of St. Die. In spite of the barbarian, even the material testimony of this memory has not been effaced.

The past? Like many small cities grown up by hazard, without a master plan, in a banal diversity, St. Die spread out its houses along streets with no special character. The admirable landscape of hills was invisible behind the walls and the closely set houses. There, as elsewhere, chance had brought disorder.

The misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned.

While Athens flamed, the Greeks won the battle of Salamis, and on the ruins of Athens they constructed the eternal Athens of the Acropolis and of the Parthenon. When the great fire destroyed Rennes at the beginning of the 18th century, it was rebuilt in the style of the period, for it is always true that man is capable of making a greater good come out of what seems an irreparable misfortune.

To pass from the city as we know it; formed of houses wed to the meanders of the streets, heaped up according to caprice, the fortunes and misfortunes of successive proprietors of the ground and buildings, and often shut off from the sun; to pass from the city, wayward child of the Middle Ages and of the Renaissance, where everything is measured by the pace of man and of the horse, the city astonished by every new growth, pounded and polluted by a devouring industrialism; to pass from this to the city of our time is not easy. It requires much audacity, perseverance, patience and convincing faith.

People do not like to change their habits. Often they have their ideas completely fixed. Understanding badly
THE tasks of urbanism and architecture which present themselves to authorities and to professionals seem to suggest modifications and innovations in the customs of practice in architects’ offices. Truly the problems have become very complex.

In my opinion urbanism can exist only in three dimensions. That is the fundamental reform.

Urbanism is not really a question of road networks or of abstract regulations. It has for its mission to conceive the form, volume and size of the vessels necessary to contain the diverse functions that constitute the life of society; the dwellings, the places for work, the places for cultivation of body and spirit. These functions must be housed in “conditions of nature,” which is to say that above all they must take into account the imperative law of the sun. The sun is the foremost consideration.

The vessels to contain these three cardinal elements are in reality living organisms; place them in contact and one has the phenomenon of circulation, a complementary element. The urbanist is a sociologist, at the same time that he is a humanist, also a technician.

One man alone cannot be administrator, engineer and architect, in the detail and exactitude required. But these three sorts of individuals must work together, must form an integrated unit.

Therefore I was called upon to create the first combination of such talents, the ATBAT, Atelier of Builders. We are building socially as well as technically and artistically. Building is setting up of scaffolding, orchestrating, arranging; it is harmonizing everything. Our workshop of builders is, then, a cooperative which groups people belonging to the}

the nature of the problems, they give definitive opinions which nothing can shake. It also happens that those who could and should enlighten them guard themselves from doing so, and prefer to follow the ill-informed in their error, rather than risk the opposition of the officials or of the electorate by showing them the healthy road to follow.

And yet! Who does not see in a plan as clear as that of Le Corbusier the happy synthesis of an industrious city, spacious, airy, open to the sun and to nature, having crossed the threshold? Man has here become once more a free pedestrian, relieved of the autos which are put in their place on their ways. Here quietude returns to the heart of the woman watching her children.

The man and the woman are workers. They are workers who, when day is ended, live in quarters handsomer than any dream. Everything is harmony. The volumes compose themselves in the sky. The civic center is ordered on the scale of the little city of workers. It is the normal meeting place near the shops, the cinemas, the clubs, for the youth and the active part of the population. A judicious proportion of individual houses is planned, permitting a comparison between the two propositions: vertical garden cities and horizontal garden cities. Here, contrary to all the slogans in vogue, one does not exclude the other. Perhaps it may even be that the horizontal is only possible in combination with the vertical. But it is permitted to think that the latter gives greater comfort, and, with the prolongations of the home and the services of these buildings, more liberty, particularly to the woman, mother of a family.

Municipal officeholders, if they wish to be good administrators, must be attentive to this aspect of the problem which is too often forgotten: the price of maintenance and use of a city which is all low and of another which is all high. With equal comfort and equal rate of return, it must be possible to make some choice, and possibly a point of equilibrium can be established where everyone will pay according to the expense he imposes on the community. The roads are expensive, likewise the sidewalks, the sewers, piping of all sorts, as well as the steps of the postman!

Who does not see the solid bonds that tie this project to the great accomplishments of ancient times? It is in the tradition of the great builders — that of the Roman cities, of the cathedrals and of the chateaux, of the royal squares that have so profoundly marked the French cities. The tourists from all corners of France, from all parts of the world, after having seen the Place de la Concorde, the Place Vendome, the Place Stanislas, would go to see St.-Die—the-New, who will be proud to be the first in the world, before all her big sisters who try by patchwork to adapt themselves to the present-day necessities, to cross the threshold, to be of her time. She would be sure of herself, industrious little city, strong in the health and joy of her workers, for whom she made herself beautiful and pleasant.

It is necessary that we be able to cease to speak in the conditional. This plan, so beautiful in its simplicity, must become reality. Certainly, it can be retouched, reformed, adjusted. This is only the first draught. But if the master idea remains, St. Dié, the godmother of America, St. Dié, the goddaughter of America, St. Dié, the martyr, the useless victim of barbarity, can become the symbol of the rebirth of our country and of the coming of the new times.

What greater sign of confidence in the future of the country could one seek than that a little city entirely devoted to work, marked by destiny, should be the first to cross the threshold?

Will the timid and the fearful permit the reasonable to work? Only the bold are reasonable.
three callings mentioned above, of diverse ages and experience. Such is the organization conceived to respond to the tasks of architecture and urbanism.

ST. DIE, "GODMOTHER OF AMERICA"

Bombs and fires respect a plaque commemorating the naming of America

In 1507, there existed at St. Die a small group of humanists composed in large part of members of the Chauvinist Chapter, and whom the Duke of Lorraine, Rene II, himself imbued with the sciences and geography, patronized. This little group which called itself the Gymnasium of the Vosges, had adopted the idea of popularizing the scientific knowledge of the epoch, and the first step toward the realization of this project had been the creation of a printing establishment. The sponsor of the printing shop was the Duke's chaplain and secretary, Vautrin Lud, and the two directors were Martin Waldseemuller and Mathias Ringmann. To inaugurate their project they decided to re-edit the cosmography of Ptolemy and to publish a planisphere and a world map which would be the materialization of the work.

Now, at the moment when the work was under way, and while Ringmann was editing a little work which was to serve as preface to the book, the Duke of Lorraine received a copy of the account of the four voyages of Amerigo Vespucci in the new world. He passed the book to his chaplain, who in turn showed it to the printers. These men were ignorant of the name of Christopher Columbus, whose voyages, for mercantile reasons, had carefully been kept secret by the Spanish rulers, became excited about the accounts, and Ringmann put in his "Cosmography" the following text:

"Now, since these parts (of the world) have been thoroughly explored, and a fourth part has been discovered by Americus Vespuccius, I see nothing that could prevent, after the discovery by this Americus, a wise and ingenious man, that it be called Amerige, or land of Americus, or America, inasmuch as Europe and Asia both have been given feminine names."

Waldseemuller, for his part, engraved on his map the name America on the location of the new continent. Thus, for the first time the name of America was printed at St. Die on April 25, 1507.

It is even possible to go further back in history. In 1410, Pierre d'Ailly, Grand Prevost of St. Die, in his book entitled "The Image of the World" asserted the thesis, that unknown lands must exist, and that they would be discovered by going westward from Europe. It was reading this book that incited Christopher Columbus to undertake his voyage.

In 1911, a commemorative plaque was placed on the house that had replaced the printing shop of the Gymnasium Vosgien. Celebrations took place the 15th and 16th of July, in the presence of the American Ambassador, Mr. Robert Bacon. He was given portraits of Vautrin Lud, Ringmann and Waldseemuller to be transmitted to his government. In an eloquent speech Mr. Bacon associated with these celebrations the memory of the independence of the United States.

In 1921 the American Legion paid a visit to St. Die, and a commemorative celebration took place at that time, during which a second plaque was placed below the first.

The house to which these plaques were attached was burned during the fire of St. Die, in November 1944, but the fire respected the plaques, and the portion of the wall to which they are attached will be preserved, bearing witness to the memory attached to that spot, and to the barbarity of those who tried to destroy it.

OCTOBER 1946
Design problems for this house were largely matters of site limitations: the lot slopes steeply up from the sidewalk, and was also restricted in size. Hence the garage was dug into the bank, more than two stories below the main floor, and connected to it through a residential office then up to an intermediate level. Main entrance is reached by outside stairs, leading to a two-story entrance hall. All of the climbing involved now begins to have its compensations, for combined living room and dining room offer magnificent views of San Francisco Bay, and, in the foreground, a rear garden.
Two-story entrance hall (two views below) provides two coat closets on the lower level and storage cabinets above. On its upper level it also serves as corridor between living room and bedrooms. Concrete enclosing walls (lower right) are built on post hole foundations to prevent settling and displacement on hillside locations.
Living room doors of the Myers house open onto a high terrace overlooking San Francisco Bay, with enclosed garden at the rear of the site. Interior walls are finished in white sand finish stucco, painted in light colors. The over-mantel decoration is a colored pebble mosaic by Puccinelli. Walls and cabinets in dining room are done in D'Oro plywood in natural straw finish. In the entrance hall the walls are of combed wood in gray stain. The house is built of wood frame construction, with composition roof, gray-pink stucco exterior finish, with woodwork painted cream. In the kitchen a long tile-surfaced cabinet sink extends out as a low partition cutting off the breakfast area. Generous high windows provide plenty of daylight, also supervisory view of play patio.
TWO-LEVEL SCHEME

EVERY California house has a view, and architects are forever developing new wrinkles of levels, terraces, vista devices to capitalize on hillside plots that look down valleys or valley sites that look upward toward mountains. In this case the view is downward, and the device is new only in use. It is what is sometimes called a dropped living room, here having the extra purpose of making the dining space virtually a gallery from which to enjoy the view through living room windows. Even the patio gets a piece of the view, right through the house. Or, the guest in the entrance foyer has the same elevated viewpoint. Here is one place in which the old dropped living room idea has a purpose.

Residence in Orinda, California,
Michael Goodman, Architect

PHILIP FEIN Photos
FOR A VIEW

LIVING ROOM 9'-6" x 12'-0"
CHILDREN

STOR

LAUNDRY

KITCHEN 10'-0" x 14'-0"

DINING 11'-0" x 11'-6"

PARENTS 13'-0" x 14'-0"

GARAGE 19'-0" x 19'-6"

PATIO

FOR A VIEW

OCTOBER 1946
NON-Congressional proponents of the Wagner-Ellender-Taft Bill have proposed that the President call a special session of Congress in the later months of this year for the purpose of considering it and taking final action on it. If no special session is called, the measure dies, and must be reintroduced in both houses in 1947.

This omnibus bill (11 titles, 116 pages of printed text) seeks under Title I to establish the National Housing Agency as a permanent agency of government, under which would be consolidated the Federal Home Loan Bank Administration and its various constituent agencies, the Federal Housing Administration, and the Federal Public Housing Authority.

Concentration of Power

Such consolidation would abolish permanently the Federal Home Loan Bank Board, which was created by Congress and has not yet been abolished by that body, though temporarily suspended by the administrative order which created the National Housing Agency as a temporary war agency. This consolidation would reduce the commissioners of the three constituent agencies of the permanent NHA to the status of mere administrative deputies. It would concentrate the policy-making power for these three agencies in the hands of a single politically appointed administrator. The Home Loan Bank System's member institutions have assets totaling over $6,000,000,000. The Federal Housing Administration has mortgage insurance in force totaling more than $7,500,000,000. These two federal agencies constitute a dominant factor in the mortgage lending and private long-term investment of the people's savings. It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I. If the pattern of unification that is here proposed should be followed, the least that Congress can do to assure the people of this country that sound policies will be followed under such unification would be to put the policy-making and coordinating function under the jurisdiction of a well-selected board, rather than under an individual.

Furthermore, consolidation of the two great agencies that deal with private savings and mortgage finance, with FPHA, which deals exclusively with government grants in furtherance of a social welfare program, presents a glaring inconsistency. Sound organization of governmental functions would place FHLBA and FHA in a properly constituted Federal Loan Agency, whose authority and functions should be carefully defined by Congress.

An effort was made in the 79th Congress to rush this proposed consolidation through Congress as a reorganization plan under the Reorganization Act. This proposal was vetoed by a concurrent resolution of the two Houses. The effort was also made to sell the General Housing Act to Congress and the public on the plea of emergency. Indeed, the spurious emergency plea was largely responsible for the speedy passage of the measure by the Senate.

This emergency plea has no foundation in fact. The present housing emergency is due to shortages of materials and to confused trends in material prices and construction costs. Congress has dealt with these emergency conditions by other legislation. There is nothing in the General Housing Act having any bearing upon these emergency conditions. This is a long-term measure, to be judged solely on long-term considerations. The speciousness of the emergency plea adds weight to the contention of some critics that the veterans' emergency housing program is mainly a political subterfuge whose real purpose is to put through this planned-economy measure.

Rather than enter into a detailed discussion of the remainder of this Bill, title by title, I shall attempt to summarize the considerations that have prompted me to oppose this Bill in its present form.

"Need" Based on Imaginary Statistics

Aside from the emergency plea, which seems to me entirely specious, the supposed need for this legislation has been presented to the Congress and the public by means of a quite fanciful picture of the long-term housing needs of the country, a picture composed of imaginary statistics.

In November, 1944, the National Housing Agency published a report entitled "Housing Needs." It purported to show a need for the construction of 12,600,000 new non-farm dwelling units in the United States during the first ten years following the war. Such a program would call for new construction at an average annual rate of 1,260,000 units a year. This figure has
"It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I."

"This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past . . . In short this Bill is highly inflationary . . . Titles III and IV . . . include provisions for liberalization of private mortgage lending and government mortgage insuring practices which . . . would be positively harmful."

been quoted repeatedly by numerous proponents of this Bill.

The earlier postwar decade of the 1920's had housing production at an estimated average annual rate of 700,000 new family dwelling units a year. That earlier postwar decade had the largest numerical increase in population, the greatest peacetime prosperity, and the largest volume of construction activity of any decade in the country's history. These facts immediately raise the question as to whether the NHA estimates of needs for the coming decade may not be excessive.

New Families and Replacement Rates

According to the NHA report the supposed need for 1,260,000 new family units a year was composed of two equal parts:

1. A primary need of 630,000 units annually to take care of actual increase in families plus migration from farms, servicemen's households to be established or reestablished, undoubling of married couples living with another head of family and a 5 per cent vacancy allowance.

2. An additional secondary need of 630,000 units a year in order to replace each year one-twentieth of the country's substandard structures; that is to say, structures supposed to be substandard according to certain statistical data reported in the housing census of 1940.

It is this projected replacement rate of 630,000 units a year that is subject to question.

The same NHA report stated that the replacement rate during the twenty years 1920-1939 averaged 40,000 units a year. Each year some 20,000 units were destroyed by fire or other calamity, and another 20,000 were demolished to make way for some non-housing type of development or improvement.

Questionable Economics

Few people, if any, would question the desirability of increasing the country's previous rate of replacement of old and substandard housing accommodations. As to whether it is practical or economical to step up the replacement rate from 40,000 units a year to 630,000 units a year there is a serious question. A careful estimate of the cost to the national economy of scrapping old buildings at the recommended rate gives a minimum figure of a billion dollars a year for the loss to be absorbed by owners, mortgagees or government. Furthermore, there is no evidence to show that either the 1940 census enumerators who reported data as to structures needing major repairs and structures either having or lacking running water and plumbing and heating facilities, or the economists in the office of NHA, had any knowledge as to how many of the supposedly substandard units were actually susceptible of improvement.

Census Bureau Reports Improved Housing Facts

As a matter of fact, a great deal of improvement in the country's housing standards actually took place between 1940 and 1945, without benefit of this proposed legislation and in spite of the handicaps of a war economy.

I make this statement on the basis of the spot survey of housing conditions made by the Census Bureau in November, 1945. That survey showed, as between April, 1940 and November, 1945, the following improvements in housing conditions:

1. Home ownership increased from 44 per cent to 53 per cent.

2. Units needing no major repairs increased from 82 per cent to 89 per cent.

3. Units having private bath and private toilet increased from 52 per cent to 62 per cent.

4. Units with central heating increased from 58 per cent to 61 per cent.

5. Units with electric lighting increased from 79 per cent to 89 per cent.

6. Evidence of improved occupancy conditions was also shown. The number of units occupied by more than four persons declined from 27 per cent to less than 22 per cent; the number with more than one person per room declined from more than 20 per cent to less than 15 per cent.

This survey report was not published until last May 16, thirty-one days after the Senate passed the General Housing Bill in the form given to the House of Representatives. It was previously argued before the Senate and the public that housing conditions had deteriorated during the war. On March 16, 1946, Mr. Chester Bowles said over the radio: "Naturally, the condition of our homes got a lot worse during the war — the 7,000,000 substandard city homes of 1940 grew to 10,500,000." Mr. Wilson Wyatt made a similar state-
ment before a public housing group in New York. While these two gentlemen may not have had, at the time these statements were made, personal knowledge of the Census facts that belied their statements, there is strong suspicion of attempted suppression of the Census report by obstructionist tactics of people in OPA and NHA.

These statistical matters have been cited in some detail to support the following propositions which I hold to be true:

1. Improved housing conditions can be effected by the people of this country in a period of reasonable prosperity without excessive liberalization of housing finance or lavish government subsidies.

2. The NHA estimates of postwar housing needs of the country are fantastic; they are figures blown up for use as sales arguments to Congress and the public, without sound economic validity.

It is my strong belief, on the basis of careful study of all the available facts, that a program for construction of 12,600,000 new non-farm dwelling units in ten years, if actually carried out by means of this legislation or by any other means, would so far outstrip the actual housing needs of the country as to create an economic crisis of the first order. I do not believe that, even under the most prosperous conditions possible, the market can possibly absorb new housing accommodations at the rate of production proponents of this Bill promise to accomplish. This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past, or any boom at all likely to be stimulated in the future by private builders, real estate men or speculators. In short this Bill is highly inflationary.

**Inflationary Features of the Bill**

Inflationary features of this proposed Bill are of two kinds:

1. Over-liberalization of housing finance, as provided in Titles III, IV and possibly VIII.

2. Long-term commitments for government spending, in the form of grants for public housing and for urban redevelopment, as provided in Titles VI and VII.

Titles III and IV, which would amend the Federal Home Loan Bank Act, the Home Owners Loan Act of 1933, the National Housing Act, and the United States Housing Act of 1937, include provisions for liberalization of private mortgage lending and government mortgage insuring practices which I consider excessive. Under the legislation of the past 14 years the Federal Home Loan Bank System and the mortgage-insurance system of the Federal Housing Administration have functioned with gratifying success. These agencies are well established and well prepared to meet all presently foreseeable needs for home-financing. In addition, the Congress has provided extremely liberal home-financing facilities for veterans under the G.I. Bill of Rights. With private mortgage money amply available at this time and with tested financing machinery in full operation, such liberalization as is proposed in the General Housing Bill would be positively harmful. It is not only inflationary, in view of present conditions, but is contrary to sound principles of mortgage finance.

**Unneeded Federal Subsidies**

Long-term commitments for federal grants in aid under Titles VI, VII and VIII total $133,000,000 a year for 45 years, an aggregate of $6,000,000,000. It is proposed that Congress make these long-term commitments at a time when the need for them cannot possibly be proved and when the primary fiscal problem of the nation is to balance its budget.

At a time when we have approximately full employment with wages the highest in history and with many important industries and trades suffering from labor shortages it is absurd to make large commitments for subsidized housing. If there should be later a demonstrated need for grants-in-aid to public housing, Congress can then make suitable provision for them.

Grants-in-aid for urban rehabilitation, as proposed in Title VI, are unnecessary and are potentially demoralizing. Federal subsidies to local governments and the agencies thereof are generally unsound in principle and should be used only as temporary expedients in drastic emergency situations. Financial dependence of local governments upon the federal treasury tends to by-pass the authority of the states, to further centralization of power and to encourage political abuses. Furthermore, federal subsidies in aid of purely local governmental functions, including public works and improvement programs, tend toward extravagance and waste.

The problem of urban redevelopment, which Title VI aims to solve, has long engaged the attention of business and civic groups throughout the nation. Twenty-two states have adopted laws offering specific encouragement for urban redevelopment; most of them seek to encourage private enterprise and private capital to undertake the job; powers of condemnation and tax-incentives are the inducements offered.

Since the first of these laws was enacted as late as April, 1941, they have all been thus far precluded from functioning effectively by war conditions and war and postwar restrictions. Their actual functioning (as written or as they may be later amended) will depend very largely on the postwar relationships of rents and development costs, relationships which must reach a more stable condition than at present before investment will be forthcoming. These state laws should be given an opportunity to perform under peacetime conditions before the highly dubious expedient of Federal subsidy is resorted to.

While opposed to federal grants-in-aid to local governments, I consider it entirely possible that sound pro-
vision could be made for extending credit or insuring mortgages in ways that would facilitate local redevelopment programs without injecting the federal government improperly into local government affairs.

In spite of my opposition to this Bill as a whole, I find merit in some of the provisions of the General Housing Act. However, such meritorious activities as are proposed do not require the unification of housing agencies that is called for under Title I. Those which are needed can be more soundly provided by separate legislation than by enactment of this omnibus Bill.

I refer specifically to technological and economic research in housing, the subject of Title II, and the annual housing inventory, which is the subject of Title X. These functions, under proper enactment, could be assigned either to the Federal Home Loan Bank Administration or the Federal Housing Administration, or to some appropriately constituted coordinating agency. They might even be properly assigned to the Department of Commerce. The annual housing inventory should be conceived as a matter of providing public information, not as a basis of government programming of all the public and private housing activity of the country.

There may be some possible merit in Title V, which provides for yield insurance to be administered by FHA. The insurance provisions are conservatively safeguarded; I do not consider them inflationary, though some people do. I do not know whether as a practical matter the proposed yield insurance would encourage a substantial volume of rental housing. An experiment with this idea, as projected, can do no harm and might prove beneficial. There is a question whether investment incentives for rental housing have kept pace with the enlarged incentives to home ownership that have been developed in recent years.

Any desirable features of Title IX, covering disposal of surplus war housing, can be enacted separately. There can be no objection raised to provisions for preference to veterans; provisions for sale to public housing authorities go beyond the previous intent of Congress as expressed in the Lanham Act.

In summation, I would say that many of the features of this omnibus Bill are highly objectionable for reasons that I have outlined. If long-term measures as comprehensive in character as those proposed in this Bill were needed, it would be quite impossible to draft sound legislation to cover all of them at this present moment, when the economic picture is so confused. The future housing needs and the future housing activity of the country will be determined by our future levels of prosperity and family incomes, and by future levels of rents and construction costs in a free market, factors which are quite unpredictable in the present stage of transition. If we did not already have ample facilities for financing residential building recovery, the situation would be different.

Consolidation of federal housing agencies should be considered by Congress in terms of the whole policy of the federal government respecting banking functions of the Federal Home Loan Bank Administration, the mortgage-insuring functions of the Federal Housing Administration, the capital-credit functions of the Reconstruction Finance Corporation and the functions of other federal lending agencies.

Specific proposals for amending existing housing laws or for initiating new governmental housing activities should be made in the form of separate bills rather than in an omnibus bill like S. 1592, which is extremely difficult for Congress to appraise adequately and critically in all its voluminous details.

The Wagner-Ellender-Taft Bill — "General Housing Act of 1946" (S.1592) — was passed by the Senate on April 15, 1946. Hearings were started before the House Committee on Banking and Currency, but discontinued when Congress adjourned.

This Bill is an omnibus measure of 11 titles, 116 pages, 27,000 words.

Title I: would perpetuate wartime NHA over FHA, FHLBA, and FPDA; would thus concentrate policy making power for three divergent agencies in a single politically appointed administrator.

Title II: would appropriate funds for technical and economic research in housing, also for local surveys and planning.

Title III: would expand lending powers of federal S & L associations, liberalize FHA Title I and II programs; would provide for lapsing of principal and interest payments on FHA loans up to three years; would ask builder's warranty of construction for one year.

Title IV: would drastically liberalize FHA insurance with "special systems of mortgage insurance for families of lower income," contemplating "all proper incentives to cost reduction through . . . new materials, techniques and methods . . . and elimination of unnecessary restrictive practices . . . ."

Title V: would provide for yield insurance by Government, administered by FHA, guaranteeing amortization and limited return to investors in multi-family housing.

Title VI: would offer grants-in-aid for land acquisition for urban redevelopment, the federal government to stand two-thirds of the loss in land costs.

Title VII: would authorize contributions for construction of public housing, involving $4,000,000,000 of federal funds over the next 45 years.

Title VIII: would expand public housing in rural areas, through the Department of Agriculture, involving $1,125,000,000 of federal funds over the next 45 years. It would also authorize the Secretary of Agriculture to furnish "without charge or at such charges as the Secretary may determine, technical services such as building plans, specifications, construction supervision and inspection . . . ."

Title IX: would give preference to veterans in the disposition of war housing.

Title X: would provide for an annual inventory of housing, with recommendations as to future programs.

Title XI: legal miscellany.
"WE WILL BUILD MODERN CHURCHES"

By John W. Ragsdale, Associate Editor

ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY NUMBER 118

When we build again, the war being ended, we will build modern churches. We will take advantage here, as in every other field of . . . new materials . . . new methods of construction . . . new planning techniques. We will deny to the Church no serviceable instrument, whether it be a machine or a new form of shelter which we are able to give Her; nor will we think that the imagination and invention, the surprise and daring of a new architecture are uncongenial to the Christian spirit.

So wrote Joseph Hudnut* in Architectural Record, September, 1944. Human building, at the time, in every enlightened field was much in eclipse to the stupendous pervasion of total war. But the right side was winning. "Imagination and invention" would soon be free to build, as well as new churches, an entire new world, unified by a new spirit; or, perhaps, to reshape a new and better international form out of the old pieces, in which a strong binding element would be the reaffirmation of an ancient ideal — a new moral and political "architecture" of nations, "not uncongenial to the Christian spirit."

"When we build again, the war being ended . . ." In September, 1945, the war being ended, Walter A. Taylor† writes in the Record: "Whereas 15 years ago 'shop talk' among ministers was about Sunday School methods, and a decade ago the emphasis was upon weekday programs of social, recreational and community service activities, today . . . ministers . . . are reading, writing and talking about what they can do to 'vitalize' their services of worship." (For all the worthy effort between wars to make the Church a more vital and influential factor in Christian living, through increased social and recreational activities and intensified religious education, something still was lacking — acutely realized during and at the conclusion of the greatest war, we hope, in human history.) Mr. Taylor goes on to say: "It is now realized that neither the social hall nor the Sunday School, but rather the Sanctuary, is the power house which activates the whole institution."

Shortly before undertaking this Building Types Study on Churches, in August, 1946 — the war being ended one year — Record editors received from Jean Labatutt, a critical estimate of a particular building (not a church) which concluded with the following general statement: "Perhaps all this indicates that architectural expression corresponding to the needs, demands and means of today is not yet 'around the corner,' and that the chaotic architectural expression in which we live is due to an abundance of physical means and a paucity of intellectual, spiritual and moral qualities." We wondered if, in his regard, churches — being planned and built today with the war being ended one year — were a part of "all this" indicating "chaotic architectural expression . . . abundance of physical means and a paucity of intellectual, spiritual and moral qualities." Unhappily, he declared, in many cases churches are, indeed, a part — a great and tragically significant part. Much too frequently they express the essence of the confusion, the fumbling, the double talk, the misunderstanding, the mistaken aims, causing the abundant fragments of old orders and new visions to be booted and scattered further, or else jumbled together in heart-rending flummery, not only on earthly plots but at peace conferences — and the war being ended one year!

In 1900 Ralph Adams Cram looked upon American ecclesiastical architecture and was unhappy.§ For the most part all that he saw was regrettable, from the proliferation of country churches — "wholly bad in shape and composition . . . doubly hideous through the arched windows, the silly wooden buttresses, the futile belfries and pinnacles" — to the variegated ugliness and paltriness of the village (or parish) and city churches, and the three or four American cathedrals. He called for a triennial conference of church architects and clerical and lay members for a thorough discussion of the whole question of art in relation to the Church. He was convinced that in such a conference "one decision would be reached unanimously . . . to take up the architectural life of the Church where it was severed in the sixteenth century and carry to its logical and glorious development the work begun by William of Wykeham, Bishop of Winchester. Our present chaotic methods, Romanesque and Colonial, Italian and French Renaissance, the early Gothic of France and Germany, Spain and England would be abandoned. "Build American cathedrals, he besought, in the "one style, and one only, that is for us . . . the English Perpendicular" and from these splendid examples all the lesser edifices — in town and village and country — must inevitably take their inspiration and in their lesser character truly reflect and eloquently communicate the Christian spirit.

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‡ Professor, Chief Critic of Architectural Composition, Princeton University.
§ "Church Buildings." A study of the Principles of Architecture in their Relation to the Church.
Most readers undoubtedly are familiar with Cram's words, and perhaps his feelings. Perhaps many have also contemplated the majesty of Winchester Cathedral and have likewise been moved before the West Façade "to strive to get something of that into my own work in my own day." But most readers also know that there was a Reformation, that the Roundheads did march into Winchester Cathedral during service, "with colors and drums, doing irreparable damage," that we are, inescapably, the inheritors as well of the dissident tradition expressed in England by Wren and Inigo Jones and Gibbs, who "could not build churches, though they did." Cram in 1900 might deplore our colonial examples as "only crude imitations, without any artistic value whatever, and precious only from an historical standpoint." But they were History! He might also, in 1900, set himself further against history by proclaiming that the Church of St. Mary the Virgin in New York City, though it had "the height and the simplicity of mass that were necessary," was yet "erected after an evil fashion, falsely and unpardonably, with a frame of steel like an office building, supporting the sheathing stone that was worked into the forms of honest construction ... an example of all that should be avoided."

In 1923, the war being ended, Ralph Adams Cram added to his manifesto a postscript, stating "There is nothing in the earlier editions the author would retract ... unless perhaps it were the rather narrow enthusiasm for the latest phase of English Gothic as the sole basis for the new fabric of religious architecture. ... Perhaps religion seems less national, less racial than once it did, and so essentially more Catholic as well as Catholic. ... The more one studies these arts, the more at one they seem in all their underlying principles, and all touched with some divine beauty ... " And further: "If the craze for high buildings continues, city churches must be content no longer to dominate their surroundings, but rather to call men through their contrast ... ."

And in final summary and conclusion: "It is not that the church building today (the best of it) is so much inferior in point of design to ... Bourges, Lincoln, Seville. Where it fails is in what the architect cannot give and that is life. ... I am not arguing for a 'new style' in the sense of ... something ... anarchical in its impudent defiance of law and precedent, cut off from all continuity of succession and answering to nothing in the real life of society, like ... cubist sculpture ... cacophonous music and vers libre. ... Each new thing is fathered by its antecedent, if it is legitimate. It may be, in its maturity, far different in personality to its progenitor, but the inheritance is there. Chartres is the triumphal son of Caen, the father. ... When religion regains its past vitality and marks this by a restored unity, then it will be content neither with the anarchic and amorphous monstrosities ... nor yet with the thoughtful and scholarly restorations ... ."

And so in October, 1946, how do things stand with the Church? What evidence is there of life, of "vitalization"; what prospects of new and better forms issuing from the legitimate parenthood of the past? In the first six months of the year, more than 900 church construction projects, to cost $37,160,000, were reported by Dodge services. And in just one recent month, 331 new projects were reported in the actual planning stage, valued at $27,170,000! Certainly this is heartening testimony to the presence of strongly pulsing life blood, at any rate.

But how is this life blood to be incorporated? Two years ago Dean Hudnut prophesied: "Progress will be first evident in the interior. There the ceremonial is unchanged and yet is reclothed by each generation according to its spirit. The ancient symbols will remain—altar, choir and central aisle — but not the heavy pillars, the complicated vaults, the dim religious light. A simple room, Greek in its clarity, with quiet walls and clear light." And by a legitimate transitional process, not anarchical or impudent in defiance of tradition and precedent, "the simplicity and quietude of the interior volumes will be reaffirmed in the exterior shapes."
Charles D. Maginnis, F.A.I.A., writing in the same issue of the RECORD with Dean Hudnut, believes that: "In a world of disconcerting and dramatic change old ideas are expected to make submission. Nevertheless, the Church is an institution that may in complete propriety choose its own accommodations. No interest is more removed from the hysterical importunity of novel principles. It will come to its rightful authority in American art by holding in a spirit of moderation to a sense of its independent mission, rather than by a deflecting course which involves the violent disqualification of history."

And again in the same issue, Brother Cajetan Baumann, O.F.M. says: "A certain change of attitude is taking place, a marked influence toward greater simplicity. . . . All else must be subordinated to the altar. The eye and the mind must be led immediately towards it. . . . There is a current tendency to bring the church closer to the public; to erect smaller churches but a greater number of them. . . . A proper setting gives the church both repose and dignity. . . . To attain respectable quiet, sound-deadening insulation and air conditioning are essential in planning the modern city church. Every means for making it clean and quiet, healthful and tranquil should be specified."

Walter A. Taylor concludes his remarks in last year's study by saying: "The designer who has a decent sense of the inherent dignity of the church can work over the basic patterns with the greatest of freedom, with completely non-traditional detail. . . . If it fulfills the relatively simple functional requirements, and is also the kind of place which, even when empty and silent, causes the man on the street to take off his hat upon entering, it will be a Church."

Professor Labatut supports Mr. Taylor's argument for primacy of the Sanctuary, and achievement of the sense of spiritual immediacy as foremost in objective, with an account of the 1937 Exposition Internationale at Paris. To him the experience of stepping out of the galaxial concentration of technology on parade, into the Pavillon Pontifical, with its exhibit of autels and religious objects was as immense and inspiring as anything in his memory. So effectively were modern principles of shelter and exposition adapted to the highlighting of altars and sacred art that reverent awareness was as manifest in visitors to the Pavillon as in pilgrims to Chartres Cathedral. (This writer, too, has felt the tremendous spiritual impact of Chartres; and recollects suddenly that equaling — perhaps even surpassing the experience — were a few moments in a pine woods, before a portable altar covered with a white table cloth and the simplest of sacred objects, set up by an army chaplain in the presence of several hundred frightened men.)

Professor Labatut gives counsel to many architectural students who come to him desirous of "doing" a church. He guides them, first, in simply the practical considerations imposed by chosen locality, site and denomination, number of congregation to be seated, services and activities to be included. Some return after protest thrashes on their own with questions of Style and Tradition and Precedent and avow, as indeed did one, that in their final determination the best church "was a good radio in a man's own living room." For all the superficial warrant of such a statement, there must somehow be induced in these students an awareness of the true and indispensable meaning of "Church." If such cannot be done, it is only by extraordinary happenstance, he believes, that they will ever design a successful one.

Other students want to do a "modern" church immediately, forthrightly and fearlessly. One such, for a small Catholic chapel in Ireland, adapted the concrete parabolic arch to an interior that, through sensitive and intelligent handling of the Sanctuary, was quite successful. A satisfactory resolution of the exterior, however, persistently eluded the student, dissatisfied with its starkness yet determined not to compromise his over-all principles in any egregious way.

It happened, relates Professor Labatut, at that time...
Above: design for a city church; W. H. Thomas, Architect; H. E. Wagoner, Associate Architect. "An attempt . . . to maintain dignity and importance in surroundings with which the Church cannot hope to compete in size." Right: a use of similar window technique in the Church of St. Michael the Archangel, Foggia, Italy; C. Petrucci, Architect.

a Gothic doorway belonging to a bishop's house of the ancien régime was much in the news, being energetically sought after by the Rockefeller Foundation. It was not, finally, to be removed from its original French location, but "suppose," he asked the student, "that you had this doorway to dispose of—would you put it in a museum?" It was inserted in the plan for the parabolic chapel, the area between it and the concrete arch filled with glass; and the result—in the opinion of both student and mentor—was a striking acknowledgment of the modern form's genuine and undeniable connection with the tradition and spirit of the past.

Valid new "styles" that modern church building may eventually achieve are only conjecturable to Professor Labatut. There are discernible, he believes, numerous hopeful evidences and indications. For example, he is able to show as graphic supplement to his lectures, lantern slides favorably comparing the interiors of Sainte Chapelle and Notre Dame du Rainey, by the Perret brothers. (Says Charles D. Maginnis: "After twenty years of weathering, the exterior of Le Rainey, however, confirms the idea that the virtues of concrete are best concealed.") Le Rainey is further significant to Professor Labatut in that it was achieved as the result of a competition—the winner in a final selection against three or four "traditional" entries, each to cost in the vicinity of four or five million francs. To a devout group of parishioners, Le Rainey was not only a thoroughly successful and manifest Church, but had further appeal to essential Gallic nature: its cost in estimate and in final figuration was near one million francs!

In general Labatut believes with Hudnut that new methods, materials and planning techniques will continue along the lines of successful indication, with "imagination and invention, surprise and daring" based on rediscovered concepts of Church "vitalization" and spiritual immediacy, toward a "new" architecture clothing and sanctifying and proclaiming both Christian ideal and new international order. And it will be done in "transitional" concatenation with essential precedent and tradition of the past, not in a way to trammel and restrain, but respecting and revealing, rather, the unseverable continuity of historical spirit and faith and aspiration from Gethsemane to Lake Success.

He hopes to see certain tendencies relegated to other more appropriate media than churches—such tendencies as: "cubistic architecture based on abstract equilibrium of matter, as is possible in painting or sculpture and even building of very small size; functionalism expressing the physical aspects of man's nature to the subordination and even exclusion of his intellectual and spiritual qualities."

He hopes to see more successful integration with nature—more effective usage of site and natural surroundings, in the case of rural and suburban churches. In town and city, leave mere "gigantism" to factory and office buildings where great and unobstructed working spaces are functional dictates. Let the Church try rather for its effect through considerations of contrast, sanctuary, and spiritual awareness and compulsion.

Let illumination also prevail again as a strong and pervasive ingredient in architecture—natural illumination, the plastic interplay of light and shade on the outside, in the air and sunshine. "Do you recall," he asked, "how the New York Fair—the 'World of Tomorrow'—really only came alive and splendid after nightfall?"

Architects, for they are notably men of good will—and in this he is confident—will indubitably achieve new and true forms for sheltering and expressing the Church, the Church of a religion which must, indeed, seem "less national, less racial than once it did," in a world which has started building again—the war to be ended forever.
MINNESOTA CHURCHES

Hills, Gilbertson and Hayes
Architects

These two examples in Minneapolis are the latest results in this firm's program to "create churches rather than replicas" through "simplicity of design, without sacrifice of appropriate dignity, permanent materials or smooth functioning of plan." The Church of the Holy Childhood (above) is planned for the rim of a plot 11 ft. below level of the street serving both church and present adjoining school. Plan permits functioning of social hall beneath church in connection with lower-level parking and recreational areas. Other features are: choir at rear of Sanctuary; combined baptistry and mothers' room in tower; an altar permitting celebration of Mass from either side.

The Lake Harriet Lutheran Church (below) will also be built on a plot much lower than street level permitting similar function of a fellowship hall beneath the nave. "In the interests of economy, the chapel will double as a parlor. The rather low lines of the nave will be relieved by termination in a lofty, well-lighted chancel."
IN TIMES of general stricture and shortage, the architects, in this building group for the First Methodist Church of Petaluma, have made the most of contemporary methods and materials available to them for housing an extensive parish program.

The plan provides not only for a wide range of social and recreational activities, but also permits considerable divisional and departmental concentration in the conduct of religious education. In this connection, the future chapel may serve as a "worship center" in the educational program, as well as for the usual special services. A distinctive feature of the plan is the provision adjacent to the Chancel of a room equipped with sink and other facilities for keeping and processing flowers.

Construction is frame and stucco; lightweight tile roof; cement sub floors, with asphalt tile covering. Walls and ceiling of nave are acoustically treated.
CONFINED by an extremely modest budget, the architect has yet contrived to meet all requirements of committee and pastor with a compact and distinctive plan for this small Catholic church on a Wisconsin hilltop. Tightly planned features are: narthex serving both nave (seating 130) and parish hall beneath; altar framed simply in east wall; confessional in sacristy vestibule. Further economy will be achieved with common brick on the exterior, stock size wood sash, wood shingles. Roof framing is wood truss; main floor, steel joist. Sub floors are concrete, asphalt tile covering. Interior walls, plaster; ceilings, wood paneling.
Effort toward "vitalization" and a new approach to the sense of sanctuary and spiritual immediacy are evident in this remodeling of the Community Church at Carmel, Calif., to be called in its transformed character, "The Church of the Wayfarer." Moreover, the architect says, "It would have cost the congregation $25,000 to remove the old building (right) and erect a new one. We were able to remodel it for $17,000. New paneling and pulpit are of antique walnut purchased from an estate in southern California, having come originally from a Bourbon castle in Italy." The old pews were retained and treated to harmonize.
IN GENERAL appearance, Temple Israel of Hollywood indicates extension of previous tendencies into post-war stages. In the past, American synagogues have tended to conform with prevailing regional patterns of religious architecture. In this case, however, conformity with mission influence has stopped well short of a bell tower extraneous to essential tradition of this faith.

The plan provides generously for social and recreational activities, always paramount functional considerations in synagogue planning. Curvilinear seating is in line with standard practice for bringing congregations into close relationship with Ark and Alemar.
Paul Thiry describes the general design of this proposed group of parochial structures, for a rural community near Seattle, as "contemporary, using as inspiration certain applicable techniques of the early missions of the Southwest." The first unit of the group will be church and rectory shown above in elevation and below in plan. Special features of the church are: extra wide side aisles for shrines, Stations of the Cross, etc.; large sacristies behind Sanctuary, with space above them for male choir; balcony over entry for mixed choir. Future units of the group will be an eight classroom school, social hall and teachers' residence.
MODERN CONCEPTIONS OF THE SCOPE OF RELIGIOUS ACTIVITIES FORCE A NEW ANALYSIS OF THE STRUCTURES EXPECTED TO HOUSE THE EXTENSIVE PROGRAM, IN NEW TERMS RECOGNIZING PRESENT-DAY CONDITIONS.

So great is the movement to provide religious leaders with adequate facilities that the aggregate of planned construction was, even in 1944-45, estimated to exceed $3,000,000,000, based on labor and material costs at the wartime level. But this tremendous construction program is in grave danger of being shelved because of the precipitous rise in building costs. Pastors and directors of religious education, together with the architect, must re-examine requirements and analyze the building program with a view toward consolidating the plant into as compact a space as possible. This does not mean that the desirable minimum areas per person should be lessened, but it does mean a more intensive use of the enclosed spaces to be built. To achieve maximum efficiency, proposed activities must be so scheduled that rooms may be used over and over by different groups.

Church planners must more than ever before recognize the folly of specifying a nave sized for Easter and Christmas. Two services per year must not impose a 50 per cent increase in seating capacity over normal attendance. It is recognized that many pastors are desirous of large naves, for other reasons. Granting that their preaching is dynamic enough to fill the proposed structure, there is no assurance that such force will be perpetual or that the pastor may not be called to another charge. A far wiser plan is to have multiple services which, although increasing the preaching load, does not place the burden of an expensive and lightly used plant on the congregation.

The first step, undoubtedly, toward economical building is reappraisal of architectural styles. "Architectural" types certainly are not economical to build. In order to have substance to their being, stylistic exercises in Gothic or Colonial depend on antiquated materials and methods of workmanship.

The new church should favor the use of architectural concrete or precast concrete units. Roofs, instead of expensive slate or tile, may well be built-up gravel surfaces. Trusses may be factory laminated units, or plywood rigid frames or girders. By borrowing liberally from industrial construction, many economies will result without sacrifice in beauty or dignity.

Visual education, sound distribution, cheerful lighting, acoustical correction and physical comfort are but a few additional advantages to be gained at the expense of unproductive "period designs."

Intensive use of space is the next principle in modern church building economy. Accepted practice has organized the church school into three general divisions:

**Children’s Division** — Nursery, Beginner-Kindergarten, Primary, Junior; **Young People’s Division** — Intermediate, Senior, Young People’s Department; **Adult Division** — Young Adults, Adult Bible Classes. These general divisions are usually sub-divided into departments as indicated, the over-all plan requiring divisional assembly rooms for worship and fellowship, and departmental classrooms for study and discussion.

Plans described above have generally heretofore been predicated on the various activities in the divisions or departments being carried on simultaneously; i.e., worship, study and fellowship activities of each group taking place in the same sequence in their respective rooms.

By increasing the length of the Church School period slightly, it can readily be divided into three sections. These sections will be arranged among the various groups so that the opening of the session of one group starts with a fellowship program, another with study and class work and the third with worship or junior church in the chapel. (A vital part of the program is a chapel suitable for worship services. In the Children's Division the assembly or department room can have a "worship center" readily convertible to secular purposes. In the Young People's and Adult Divisions, however, a real chapel is essential.) Allowing twenty minutes for each section and five minutes for change, the usual hour program is merely lengthened by ten or fifteen minutes. At the end of twenty minutes there is a rotation of the group to the next phase of the program, and twenty-five minutes later another rotation. This permits triple use of the same room with only one-third the size of the plant ordinarily required.

The architect adopting such a scheme must carefully check the routing of traffic at the change period. Traffic should flow naturally in one direction without crossing, requiring two means of entrance or egress from all rooms. In determining full space requirements, weekday activities must be duly considered.

The Children's Division does not adapt itself as readily to this concentration plan. Because they feel more at home in properly scaled rooms with small furniture, etc., it is usually better to house the small children in their own quarters, without rotation. It is also better to have convertible worship centers, and plan these rooms amply on the basis of 18 to 25 sq. ft. per pupil. Children's chapels have been built and are advocated by some church leaders, but they are definitely a luxury item.

Fellowship or parish halls regularly serve a number of purposes. Further concentration by subdividing these large rooms with movable partitions or curtains is unwise and most unsatisfactory. At best they are inadequate dividers of space; they are expensive and require considerable maintenance. Only as a last resort should movable partitions be used in flexible planning.

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"POORBOYED" BAPTIST CHURCH

Arthur Fehr and Charles Granger, Architects

This congregation (Luling, Tex.) suffered a total fire loss," write the architects," on Easter Sunday, 1939. Therefore in thinking of a new building they aimed at a maximum of fireproof quality, in addition to as much building as possible for their limited funds.

"After studying their requirements, we came up with the plan as shown. It was not too difficult to convince the church group that simple basic construction methods would result in a more economical and a more progressive architecture. Luling is a town of 4437 people and every other church in it is bastard Greek, Roman or Gothic inspiration.'

"This building was not built by general contract. On the first day after layouts were checked, the postmaster, banker, merchant, etc., had excavation holes assigned. In the main this procedure was followed throughout the entire construction. Every Tuesday was donated. On other days an unskilled labor group was hired at a nominal fee.

"The entire project was 'poorboyed' to achieve the most building cubage for the least expenditure of dollars and cents. Structural steel from abandoned oil derricks nearby was cut into new use. Sucker rods were used as reinforcing bars. Commercial projected sash was used throughout in lieu of more 'ecclesiastical' and expensive fenestration. The bare simplicity of the auditorium is the outgrowth of the meager budget and the unskilled labor available for construction.

"At the present time the auditorium seating 400, with 150 additional in the balcony, and the south Sunday School wing have been erected at a total actual expenditure of approximately $30,000. The east wing is scheduled to be built at a later date."
A plot of limited depth necessitated narrowing of side aisles in the plan for St. Anne's to assist in giving an appearance of greater length to the nave, dimensions of which are 60 ft. at the transept by 112 ft. 5 in. Floor has straight incline slope toward Sanctuary of 2 inches in 10 ft.
P EACE, solace and a spirit of devotion" are objectives foremost in the mind of this architect when he sets himself to designing a church. In this case, for St. Anne's Parish (Catholic) in Santa Ana, Calif., it was necessary to try to attain them within strict budgetary limits.

Structural economy was achieved through the use of factory laminated arches, recommended by Paul C. Ruth (see page 106 of this study) as a means of cutting church building costs "without sacrifice in beauty or dignity." All members of the six three-hinge wooden arches were fabricated in the shop of Summerhell Roof Structures, Los Angeles, knocked down and delivered to the site, where each arch was assembled and erected as a complete unit. The lower truss chords are continuous glued members, using water-resistant casein glue according to standards of the Forest Products Laboratory.

In his treatment of the interior, the architect has allowed his structural principle to speak for itself, with the plastered-over trusses producing "repetitive forms usually associated with churches. The treatment of the nave was carried through to the back wall of the Sanctuary and over the choir loft above the vestibule, thus adding apparent length."
For "a gently rising triangular property bounded by three streets in a Seattle residential area," the architects have devised a plan to suit present conditions and parish means, with elastic capabilities toward future appropriations and brighter building prospects. The plans left and below show the first stage, eventually to be entirely an educational and "activities" wing, but temporarily to contain the Sanctuary as well. Plans on page opposite show how the future permanent Sanctuary will be developed and temporary worship space converted into class and recreational areas. (Note how future plans provide for extension of both Sanctuary and social hall to meet peak seating requirements.) Construction will be frame, with brick veneer outside; plaster and paint throughout interior; roof shingles of cedar.
Elevation drawings (right) show two preliminary approaches to the problem, submitted to the building committee of the Greenlake Church of United Brethren in Christ. The architects were required "to restudy the problem in a somewhat more conventional feeling."
TWO OREGON DESIGNS

Donald W. Edmundson
Architect

In these designs for suburban Portland, the architect continues to exercise a characteristic freshness of approach discernible in previously published work (see Architectural Record, September, 1945, p. 88). The plan for Mock's Crest Evangelical Church (on this page) provides seating in the sanctuary for 222. Floor of the adjoining fellowship hall is 4 ft. above that of the sanctuary, the two rooms being separated by double glassed openings normally to be curtained. Intentions are, at times of unusual attendance, to accommodate 50 to 60 additional persons, with good visibility of the chancel by opening the curtains and using microphones at the platform. When not required for overflow during services, the space will be used as a mothers' room. Elevation of the fellowship hall also permits floors of primary department and nursery below to be within 30 in. of the finished grade. Construction will be frame with veneer of split Roman brick, laid with ran-
dom vertical joints. Cross motif in gables is accomplished by recessed slots.

Sellwood Church of the Nazarene, shown on this page, is still in the process of preliminary development. The fellowship hall and related facilities (not shown in plans) will be in a separate wing to be connected by covered passageway with the main building. Space between will be landscaped as a sunken garden and used for outdoor meetings and social gatherings. Sanctuary will seat a total of 517; 374 on the main floor, 40 in the choir, 103 in the balcony. Small chapel at the rear of the building will seat 105. Floors of facilities in the basement are to be only slightly below the level of finished grades.
This First Church of Christ Scientist, at Valparaiso, Ind., is typical of the widespread work done for the organization by this particular architect. Moreover, recent similar treatments by other architects tend to confirm the general style as a growing Christian Scientist preference.

In this plan, one of the most distinctive features is the handling of the Sunday School wing. The architect declares: "If we expect young people to take a real interest and active part in church work, we must exert our utmost in providing them with up-to-date and attractive quarters." He does so himself by housing the junior facilities at ground level, in a wing completely separated from adult activities.
BY DEMAND of the parish," the architects write, the exterior of St. John's Episcopal Church, to be built in Memphis, "is similar to that of Bruton Parish Church at Williamsburg, Virginia. St. John's, however, will be much larger, with a seating capacity of 500. Also, the interior is more elaborate, in keeping with Episcopalian ritual, requiring an amount of symbolism which we have incorporated in wood carving on the chancel screen, pulpit, lecturn, and reredos."

The total project will be built at a cost of $500,000, in three stages as shown in the plot plan. Exterior walls will be brick bearing; roof rafters and trusses, steel; asbestos roof shingles. Interior walls will be plastered and painted, with frescoes in Baptistry and Chapel.
Plan for First Methodist Church at Clewiston, Fla. (right), shows solution of the peak attendance problem—a social hall that may be utilized for supplementary congregational seating at Christmas time and Easter.

THREE SOUTHERN CHURCHES

Barber & McMurry, Architects

These three latest examples from an architectural firm, famously active and successful in adapting the form of the church to the solid conservatism of small southern communities, tend to imply a formula pro-
cessively discernible in previous RECORD church studies (see work of Barber & McMurry in issues of September '44 and '45). In the Methodist churches for Bristol, Tenn. (across page) and Canton, N. C. (above), the architects' usually direct approach to interior function, and their respect for client preferences regarding the exterior, have resulted in designs that are unmistakably characteristic. In each case the treatment of the tower amounts practically to a signature. In the small church for Clewiston, Fla., below, they show themselves equally at home in expressing the influences of mission tradition.
CHURCH BIBLIOGRAPHY

The following bibliography is a part of a Building Types Service for architects re­
commended by the Library of the American Institute of Architects and the Department of Architecture of Carnegie Insti­
tute of Technology under the direction of John K. Shear. It comprises articles and publications dealing with churches, ap­
ppearing in the publications indicated, since January 1, 1940.

ARCHITECTURAL RECORD

Conventual Church of St. Mary & St. John, Cebolla, Fla. W. Gr. & Fink, Architects; Prelimi­
St. Joseph’s Church, Canoan, Conn. Oliver Reagan, Architect. Mar., 1943, p. 84.

te; Congregation Church, Glastonbury, Conn.—Horace Upchurch, Architects; SS. Peter & Paul, Pierre, S. D.—Barry Byrne, Architect; St. Mary Star of the Sea, La Jolla, Cal.—Carleton Winslow, Architect; Rosamont College, Aurora, Co.—Henry D. Dagit & Sons, Architects; St. John’s Church, Sandy Hook, Conn.—Beckwith & Wilkins, Architects; Third Presbyterian Church of Chicago—Paul Schweiker, Architect; Church of SS. Peter & Paul, Norwood, O.—Edward J. Schulte, Architect; Methodist Chancel, Red Bank, N. J.—Winner & Fink, Architects; Post­
war Church for a Suburban Church—Sutton, Whitney & Aandahl, Architects; Postwar Lutheran Church—Cherry & Matz, Architects; Postwar Presbyterian Church—J. G. Howard, Architects. Sept., 1944, pp. 85-86.

ARCHITECTURAL FORM

Inadequate God. Churches After the War, By M. Heilman. Jr., May, 1944, p. 110.
Seabees Chapel, Camp Parks, Cal. Bruce Golf, Archi­
tect. Dec. 1945, pp. 73-77.

PROGRESSIVE ARCHITECTURE

PENCIL POINTS

The Church of the Epiphany, N. Y. Weyhe & King, Eugene W. Mason, Architects, Feb., 1940.

PENCIL POINTS

Three Churches. By Talbot F. Hornblin, Feb., 1940, p. 72-79. Churches shown: church at Hattona, Finland, Third Unitarian Church of Chicago—Paul Schweiker, Architect; Holy Temple, Hollywood, Mormon—Cobb and Burns, Architects; Bryan Ward Church, Salt Lake City—Edward O. Anderson, Architect; Oulu State Tobemne, Helsinki—Harald Hamborg, Architect; Mormon Church, Salt Lake City—Cannon and Mullen, Architects; Co-Cathedral of Christ the King, Ar­
tanta, Ga.—Henry D. Dagit & Sons, Architects; Renovation and Riddles for Christ Church, Bronxville, N. Y.—Chester B. Price, Architect.

Church Fixtures. Elliott L. Chisling, Architect and Henry D. Dagit & Sons, Architects, April, 1940.

NON-ARCHITECTURAL PUBLICATIONS

Air Conditioning in Churches. By Margaret Ingels. CHURCH MANAGEMENT, May, 1941, p. 481.
Blueprinting Tomorrow’s Church. By Homer W. King. CHURCH MANAGEMENT, May, 1944.
Plan Now For Your Church Workshop. By Fuller Ross. CHURCH MANAGEMENT, April, 1945.
Kansas City Diocese Building Project. By Maurice Lohnan. LITURGICAL ARTS, Aug., 1944.

ARCHITECTURAL RECORD
ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

THE BETTER WALL IS COMING

By Robert L. Davison*

SOUNDS like 1946. But this was the introduction to an article I wrote for Architectural Record in October, 1929. The quotation is a statement by Herbert Hoover, when he was Secretary of Commerce.

It is surprising how little technical progress has been made in the intervening years. The evolutionary advance has been slow. Right now there is a considerable promise that technical practice and manufacturing enterprise may catch up with the ideas and principles that were already evident in 1929. Again there is a strong urge in the economic situation in housing; there is a shortage of normal building materials, as well as of houses and apartments. And there is the wartime technology, which has given us not only a galaxy of new materials and techniques to adapt to building, but also more favorable attitude toward scientific potentials.

The 1929 article had much to say about the possibility of a new wall material, something lighter, better insulated, less bulky than the conventional masonry wall. It outlined a concept of scientific research in materials and techniques which would visualize an ideal and work toward it, rather than the more conventional approach of starting with available materials and trying to develop them. Through all the years the latter has continued to be the typical approach, but the building industry now has so many new materials arrayed before it that it should not prove difficult to get pretty close to the ideal thing. Currently there are many attempts to be revolutionary instead of evolutionary about the whole technology of housing, and they may or may not succeed. But certainly it should be possible to go at least as far as a better wall.

And how badly we need it right now! The veterans' housing program has bogged down; it begins to look like years rather than months before even the emergency part of the housing shortage will be overcome. There are simply not enough conventional materials and equipment being produced. Costs are high. There is need for every new material and money-saving method that technical ingenuity can concoct. If a new wall system would help in rental housing, the veterans would be especially thankful.

NEW MATERIALS AND RENTAL HOUSING

The multi-family rental housing field is the logical place to introduce a radically new wall material. Assume that a wall composed of insulating material, covered with copper, stainless steel or aluminum, "papreg" or "compreg," were developed at a prewar cost of 75 cents per sq. ft., finished. It would cost 25 per cent more than the standard frame construction of single-family houses, but approximately 50 per cent less than the conventional apartment house wall. Therefore, there is no direct price incentive to use the new type wall in single-family housing, but a great price incentive in multi-family dwellings, not only because of its lower initial cost, as compared to a traditional wall, but due also to its being only 2 to 3 in. thick instead of 10 to 12 in. thick. This provides an additional rentable floor area which will give a net profit of $1.00 or $1.50 per linear foot of wall per floor per year.

And in apartment construction economics tend to lift the clay feet of traditionalism. The builder is interested in financial return, not in a cozy retreat from the machine age. To many home owners a metal-clad wall would be acceptable only if made to resemble clapboards. The apartment dweller would be less concerned with conservatism. The builder could accept the money- and space-saving advantages without worrying much about tradition.

This of course does not mean that the new materials will never be used widely in single-family houses. With their perfection and quantity in apartment use, their cost will be reduced. And in time the simplicity, ready availability and other advantages of these newer construction materials will lead to their forthright acceptance in single houses.

The drawings on p. 121, which were taken from the 1929 article, illustrate the lighter wall problem possibilities of the apartment house perfectly well for today. The weight comparisons shown can be improved upon today, for the newer insulating materials are surprisingly light. Now, how far have we progressed toward realizing this goal?

DEVELOPMENT OF NEW MATERIALS

Right now the building field is witnessing a hectic scramble to improve existing materials and methods, and to develop or adapt newer ones to building uses. It is a competitive scramble, and a de-

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THE FUNCTIONAL AND ESTHETIC DEMANDS OF THE EXTERIOR WALL WHICH MUST BE PROVIDED AT REASONABLE COST AND WITH PERMANENCE

- Structural Strength
- Low Heat Transmission
- Good Acoustic Properties

INTERIOR
- Resistance to Wear
- Avoidance of Condensation
- Ease of Cleaning
- Good Appearance

EXTERIOR
- Resistance to Deterioration by Chemical Action
- Resistance to Air Leakage
- Good Appearance
- Ease of Maintenance

a processed wall material which is not merely an imitation of masonry or frame construction but by itself is the wall. One can visualize the development of a material which might perform the functions of a nontransparent wall as well as glass performs the functions of a transparent wall, and might be as universally used.

An interesting though largely hypothetical advance toward the discovery of such a material was the scientific investigation of Professor J. D. Bernal, head of housing research for the British Government. Professor Bernal decided to discard present ideas of materials entirely and start with a new approach: the formulation of a theoretically ideal wall material. He asked himself: "What molecular structure would make the ideal exterior wall?" and decided upon a crystalline structure that would have no cleavage planes between groups of atoms (leading to fracture), and that would be "transparent" to high-temperature radiation from the sun (letting its warmth through) and "opaque" to heat from comparatively low temperature sources (holding in the heat generated inside the building). Further qualities considered desirable were light weight, high tensile strength, and elasticity. He discovered a crystalline form, closely approximating this ideal substance, in the joint of bamboo, concerning which he remarked: "The aerogels which are found in certain plant products, notably the pith of bamboo, can now be made in the laboratory as hard solids several times lighter than cork and practically perfect insulators against heat. They also have the incidental advantage of being completely fireproof. If such material could be produced on a large scale, then walls and partitions could be made from slabs weighing about one pound per square foot." Present walls weigh about 10 pounds per sq. ft. for wood-frame; up to 150 lb. or more for masonry. A substance that is relatively near to Bernal's ideal in some characteristics is Santocel, a material that was developed by Monsanto Chemical Company. This is a silica aerogel, described by the manufacturer as "a very light porous form of silica, having an apparent density of 8.0 to 8.5 lb. per cu. ft."

It also is said to be one of the best heat insulators known. "Resistance to the flow of heat through its mass is the most startling of the novel characteristics of Santocel, since its resistance is greater than that believed theoretically possible. Prior to the discovery of Santocel, the best heat insulator [aside from a vacuum] was a space containing 'still air.' This was theoretical and could not be arrived at only by calculation, since heretofore it has been impossible to prevent air within a space from moving either in a mass (convection currents) or molecularly and this movement destroys (reduces) insulating value of air space.
Interest in exterior wall sections, now receiving impetus from current lag in production of conventional materials, is not entirely new, as evidenced by these sketches (reprinted from October, 1929 RECORD) calling attention to advantages of metal-faced panels with insulating core.

Idea was to show how their use might have reduced wall cross-section and increased living space in a building such as the Beaux Arts Apartments in New York.

"All previously known insulating materials [except those combating radiant heat] make use of the fact that quiet air is a good insulator, the insulating masses entrapping air in a multitude of small spaces where convection currents are kept at a minimum. These air spaces while small enough to prevent the mass movement of air in convection currents are very large compared to the path taken by air molecules in their constant vibration. As long as air molecules can move freely they will conduct heat effectively."

At present, this material is too expensive to use as a curtain wall for enclosing dwelling space. Its commercial use will probably, for the first few years, be confined to insulating refrigerators. If it ever becomes available for housing, it should be possible to have a 1-in. thick wall which would have an insulating effect more than twice that of a 12-in. masonry wall. While this decrease in heat loss from the wall of a building would amount only to 2 to 3 cents per sq. ft. of wall per year, the increase in comfort and the rapidity with which buildings could be heated in the morning would have considerable advantage.

Celotex Corporation is reported to be improving its Cemesto board, which has been used extensively in war housing for both single-family houses and dormitories. All necessary components — exterior weather surface, insulation, and interior finished wall surface are integrated into a single structural board which is made up of an insulation board core veneered in manufacture with a ½-in. sheet of asbestos-cement on both faces. For exterior walls, a board with a 1½-in. insulation core is used; for inner partitions, the insulation core is ½ in.

Honeycomb laminated panels have been developed by United States Plywood Corporation and the Glenn L. Martin Company, in which a lightweight core material, resembling a honeycomb in appearance, is sandwiched between and firmly bonded to two facing materials or "skins." The core or "honeycomb" may be made of paper, paper cloth, fiberglass, or fabric, impregnated before the core is formed with a phenolic resin. The weight of this core may be as little as 4 lb. per cu. ft., depending upon the material used. The surface material or "skin" may be wood veneer, plywood, aluminum alloys, stainless steel, or plastic sheets of any thickness, and firmly bonded to the thin edges of the honeycomb core by a plastic thermostetting adhesive.

These honeycomb laminated panels were originally developed for plane floors and bulkheads during the war, but the manufacturers expect that it will soon be available for use as wall panels in building construction. At present they are available in flat sheets only, custom-built to specification, but manufacturing techniques are now being studied for making possible the fabrication of curved surfaces.

There are various foam plastics which excite interest and may be used extensively some day as core material for metal wall units. Their advantage lies in their high insulating value, elasticity, and light weight, which provides ease in transporting and installing, but many possess a disadvantage in lack of fire-resistance, which could be provided to a degree by metal surfaces. Price per pound is still high, but is expected to decrease. When their light weight is taken into consideration (3 to 6 lb. per cu. ft.), and also the fact that less than ½ cu. ft. is needed for a square foot of wall, a cost of 20 to 30 cents per pound is not prohibitive. A price of 10 cents per pound might permit use of these panels in single-family homes.

At this time we have not discovered any insulating core material and surface.
material which meet all requirements for a wall material 100 per cent, but nearly all combinations are superior in some respects to brick walls.

Foamglas, composed of countless glass cells containing sealed-in air, is a non-combustible material offering insulation, water-stop, and vapor-seal in a single product. For this reason it is being used as an insulating material for core wall construction in masonry. It might prove a good insulating core for metal panels or wallboard if the problem of its non-resilience could be overcome.

Several other core materials are worth considering. Calcium hydroxosilicate, previously known as Microporite and now called Kaylo, is more rugged than Foamglas, but not vaporproof. For this reason, it would be necessary to seal the panel hermetically on the inside or provide ventilation of the exterior wall surface to remove any moisture that might penetrate the insulation. A 3-in. thickness of this material would withstand at least a 2-hr. fire test.

Most synthetic materials of this kind are relatively high priced and have only a limited availability at the present time. For this reason, the early types of metal-encased insulating material for walls may well have cores made of Vermiculite in board form, lightweight gypsum, or lightweight foam-fiber concrete.

METAL PANELS

Considerable experimentation has been made on metal wall sections, particularly in the small-house field. Lincoln Houses Corporation has developed a house with lightweight walls of Bakelite resin-imregnated paper cellular core, of the honeycomb type previously mentioned, faced with aluminum sheets. The house has a concrete block foundation; and concrete poured over a grill of metal reinforcing serves as the flooring. The structural panels, 8 ft. long and 4 ft. wide, then are set into place and joined to each other by metal screws. These panels are 2 in. thick for the walls and 3 in. thick for the roof.

Harman Homes, produced by William H. Harman Corporation, features a patented steel framing and sheathing interconnected to form a monocoque shell for the entire house. Insulation of the outside steel walls is provided by a non-rigid blanket type material applied to furring strips which are attached to the steel structure between inner and outer wall sections. Interior walls and ceiling consist of 3/8-in. thick plasterboard for walls, ceilings, partitions, and closets, except in the bathroom, which is of waterproof asbestos cement board. Harman's houses may well be the first housing development to be granted a guaranteed market by the National Housing Administration, following analysis of its materials and construction method by the NHA Technical Branch.

Then, there is the Higgins house which employs wall sections made with enameled steel panels. These are sheets of low-carbon steel of various sizes upon which is baked a porcelain enamel facing. Inner and outer panels are securely fastened together 2 1/2 in. apart, and an aerated concrete poured between them.

In low-cost wartime housing, Cemesto board was used as a lightweight-panel wall section. Manufactured as a single structural board, it combines a 1 1/2-in. core of insulating material with a weather face and interior wall surface of asbestos cement, 1/8 in. thick.

OFFICIAL INTEREST IN NEW MATERIALS

Wilson W. Wyatt, Housing Expediter and Administrator of the Veterans Emergency Housing Program, has stated that, "Just as we are doing everything possible to increase the supply of existing traditional materials, such as lumber and bricks, for the conventional builder, we are at the same time going to do all we can to enable developers of new materials and construction methods to make their maximum contribution to the housing program."

"The country's housing needs are so great that all the houses that all the conventional builders can erect won't be enough. We believe that the quickest and cheapest way of supplying additional housing capacity is through industrially-made homes. We want the present prefabricating plants to build all the veterans houses they can, consistent with our low-cost program. But since most of them use lumber and plywood, their output will be restricted to the amount of both they can get. For the additional production needed, and especially to achieve low-cost housing, we are encouraging the mass production of factory-built houses to be made largely out of aluminum, steel, plastics, and concrete."

"Metal houses are very promising from several angles. They lend themselves to assembly-line production, the same as automobiles and airplanes. Mass production makes for low cost, an equally important factor in our veterans housing program."

"Concrete houses are also encouraging. Materials are in ample supply and relatively low in cost. Data on hand indicates good possibilities for low-cost homes."

Both groups, Mr. Wyatt points out, are experimenting with a number of new materials. In the metal group, for example, thin metal sheets are bonded to a core made of a variety of materials, such as plastic-impregnated paper, balsa wood, and plywood which have both insulating and structural value. In the case of one product, foamed concrete is poured between metal sheets. In the concrete group, the producers are finding ways to reduce the weight of their products. In some cases, lightweight aggregates, like wood fibers, slag, and volcanic rock are being used. [In some instances clay pellets and certain types of rock are subjected to heat, which causes contained water to be converted to steam, exploding the clay or rock and giving them a "popcorn" effect.] When used with cement, this type of aggregate gives improved insulation and reduces the weight per cu. ft. to 3/4 to 4/3 the weight of ordinary concrete.

A similar note is sounded by John R. Steelman, new Reconversion Director, demonstrating the current strong trend
toward new materials. In his report, Mr. Steelman cited materials which "have been found useful — though on a small scale, since they cannot get into high volume production for some time."

These materials include:

"Precast concrete panels, which will make it possible to build concrete houses without scarce equipment; new aggregates for use in concrete mixing, such as slag, wood chips, waste paper, and agricultural waste; pre-stressed floors and floor panels; wallboards made of plastics and chemically-treated fibrous waste; wallboards which are fireproof and have high insulating properties; wallboards reinforced with noncritical metal sheeting, and wall panels consisting of two outside 'skins' separated by a structural frame of lumber or metal or held together by an insulating core . . . to save the lumber required for inside framing."

BUILDING CODES

In order to utilize fully the advantages of these new materials and construction methods, improvements in our building codes are needed. In recent years a great deal has been written and said concerning the substitution of performance requirements for detailed specifications as used in most building codes. While this is a desirable step, there is danger in setting up performance requirements unless they are realistically related to actual functional needs. I should like to differentiate between performance requirements and functional performance requirements by giving an example. In Report B MS-88, "Recommended Building Code Requirements for New Dwelling Construction," of the National Bureau of Standards, the following definition is given (italics are mine):

"(a) Type I. Fireproof Construction. That type of construction in which the structural elements are of incombustible materials with fire-resistance ratings sufficient to withstand the fire severity resulting from complete combustion of the contents and finish involved in the intended occupancy.

"But not less than the rating specified in Table I."

The first part of this definition is a functional performance requirement and in my opinion is the type of functional performance requirement that should, in principle, be applied to all types of housing regulation. This first half of the definition was put in at the insistence of the most progressive members of the committee drafting this report; the latter part of the definition may set minimal test conditions which are much more severe than those in the first half.

APPEARANCE

The question is often raised as to whether or not people will accept radically new materials and construction materials. They will if the materials and methods are a real advance from the standpoint of quality and economy. There is an interesting commentary on the acceptability of new materials in the case of office furniture. Originally filing cabinets were of wood in which the natural grain showed through the coat of varnish. The first metal cabinets were made to resemble wood by giving the metal surface an imitation grain finish. Later on, the public accepted the idea of finishing the metal a solid color such as dark green, which in no way imitated wood. Finally, due to the metal shortage during the war it became necessary to manufacture filing cabinets again from wood, but these were made to resemble metal in design and color. Similarly, I believe that new materials will someday come to be accepted frankly for themselves, rather than forced to imitate the older materials, as is often the case today. And their acceptance may someday be so complete, that the older materials might well be forced to imitate the new, should the occasion arise.

LIGHTWEIGHT FIRE-PROTECTION FOR STEEL

Fireproofing tests indicate that vermiculite-gypsum plaster may offer a lightweight and space-saving means of protecting structural steel surfaces.

The vermiculite and gypsum industries are now offering vermiculite-gypsum plaster, already known for its sound-deadening and insulating qualities, as a space-saving and weight-saving means of fireproofing structural steel members. It should prove particularly effective for protecting steel joist floors, where 1 in. of vermiculite on metal lath will provide 4 hr. of fire-resistance, perhaps meaning the difference between a Class JI and Class I building, with reduced weight, increased space, and reduction in insurance rates.

In order to demonstrate this usefulness of vermiculite-gypsum plaster on metal lath as a fire-retardant for structural steel not otherwise fireproofed, a series of fire, hose stream, and deflection tests were recently conducted by Munn and Steele, Inc., with the cooperation of the Pittsburgh Steel Company, Steel-Joist Institute, Newark Plaster Company, and the Gypsum Association. Test engineers were provided by Protexol Laboratories, Inc.

Vermiculite is made of inorganic minerals that are hydrous silicates derived generally from alteration of some kinds of mica. The specific purpose of the tests was to determine its value in plaster form to protect structural members in Class A construction, which requires that the protected steel temperatures shall not exceed 925°F in 4 hr. with the furnace attaining a temperature of 2000°F under the conventional time-temperature curve. Members tested included floor, girder, and column assemblies, and 1 in. of vermiculite plaster on wire lath was found to give the required protection in every case except that of columns, where the limit was reached at the end of 3 hr. and 35 min. A column which received the additional protection of a fill of loose vermiculite successfully passed the 4-hr. test.

TEST STRUCTURE

For test purposes an outdoor concrete structure, 13 ft. by 20 ft. in interior dimension, was constructed. The assemblies of floor, girders, and columns were designed and erected to comply with the Administrative Building Code of the City of New York, and structural minimums were selected so that all heavier construction would be covered if the tests were successful. The test structure was erected by a recognized general contractor and his subcontractors, and received the conventional inspections that would be given by an architect's field representative.

Seven (Type 123) bar joists of six manufacturers, representing expanded, fusion, and resistance-welded types were placed on 24-in. centers with a 4-in. bearing on the furnace walls. Standard anchors and bracing were used.

A typical 15-in. I-beam, 20 ft. long, was also placed on the furnace wall, its upper flange in line with the upper chords of the bar joists. Two 10-in. H-columns, 9 ft. long, were suspended from the I-beam.

The shell above the beams was composed of steeltex self-centering floor reinforcing clipped to the beam and joists and a concrete slab composed of 1 part portland cement, 2½ parts sand, and 5
parts gravel, ready-mixed, poured in place to a thickness of 1 in. over joists and beam, with a mean thickness of approximately 2 in. To form the ceiling within the furnace, ¾-in. hy-rib 3.4-lb. metal lath was wired directly to the lower chords of the bar joists. No cross channels or furring was used. The 1-beam and columns were boxed with 3.4-lb. diamond-mesh lath over ¾-in. channel corners, spaced 1 in. apart from beam and column flanges.

For the purpose of recording temperatures during the test, batteries of thermocouples were installed in the furnace, on the lower chords of joists, on the girder, on each column, and on the slab surface.

**FIREPROOFING PLASTER**

Vermiculite-gypsum plaster of a standard premixed formula produced under factory control, and tinted for identification, was applied in two coats (scratch and brown) to ¾-in. grounds on furnace walls, columns, and ceiling. A lime putty white coat, ½ in. thick, was applied as a finish coat. The floor, column pits, and corners, spaced 1 in. apart from beam and column-beam junctions.

**TEST RESULTS**

The furnace was fired to follow the time-temperature curve prescribed in the Code, rising at the end of 4 hr. and 5 min. to 200°F. The floor was loaded with 40 lb. per sq. ft. during the test. At the end of 4 hr. 5 min. the furnace fire provided by two oil burners was extinguished. The average temperature on the joists was 763°F.; on the girder, 736°F.; on column No. 2 (the unfilled column), 1101°F.; and on column No. 1 (filled with loose vermiculite), 864°F.; and the surface slab, 263°F. Allowable slab temperature was 329°F. Average temperature of the entire steel assembly was 86°F.

Column No. 2 (the unfilled column) passed the allowable limit of 925°F. in 3 hr. 35 min., winning a 3 hr. rating by a wide margin. All other elements adequately passed the 4 hr. period.

**HOSE STREAM TEST**

At the conclusion of the fire endurance test, the ceiling was subjected to a hose stream test by the New York City Fire Department. Adherence to 20 ft. standard distance was impracticable because the ceiling of the test structure was only 6 ft. high and the access door, 4 ft. high. The nozzle pressure and nozzle diameter were reduced to keep the hose stream as close to the target as possible. The hose stream was applied for 13½ min. with a nozzle pressure of 30 lb. per sq. in., and at an angle of approximately 40° from the vertical.

The stream threatened the protection but the tester was able to cover the inside wrapping on the sides facing the door opening. Although the N. Y. Bureau of Standards and Appeals, at this writing, has not published its findings, it is believed that these conditions were brought about by the unusually close range of the hose stream. There was no failure of structural members.

**DEFLECTION TEST**

Deflection tests during the fire and after the hose stream test were passed successfully. A static load of dry sand was imposed on the floor slab before the fire test, amounting to slightly more than 40 lb. per sq. ft. The day following the test, the live load was doubled and a further weight of 35 lb. per sq. ft. imposed, representing finish floor dead weight, making a total load of 115 lb. per sq. ft. When the steel work was exposed to recover the inside thermocouples, following the test, no warping or distortion of members was observed, nor anything to indicate any difference between performance of resistance- or arc-welded joists.

Test sponsors believe as a result of this demonstration, one of the most severe tests ever attempted, that scientifically controlled and factory premixed vermiculite-gypsum plaster, having a dry weight of not over 3½ lb. per sq. ft., 1 in. thick, is entitled to a high rating for the fire protection of steel structures requiring 4-hr. fire protection. In the case of the columns, a vermiculite fill was required to qualify beyond 3 hr. 35 min. Savings in dead load, over fireproofing practices, are obvious.
Air-entraining cement is an improved portland cement. While it is the latest type, it is not new, having been used in many types of construction for seven years. Research on it goes back 11 years.

Before describing some of its outstanding characteristics and properties, a brief statement of the development of air-entraining principles may be of interest. It was research on paving concrete which led to the discovery of air-entraining portland cement. Extensive research showed that the scaling of concrete pavements caused by the use of de-icing salts could be greatly reduced, and in some cases eliminated, by the use of portland cement in which a small and precise amount of air-entraining agent was interground. As a result of further experience and in recognition of its beneficial qualities, use of air-entraining cement has been extended to all types of concrete construction.

Workability Characteristics

Air-entrained concrete is more plastic, more cohesive, and has considerably less tendency toward segregation and bleeding than does concrete made with normal cement. By segregation is meant the separation of larger aggregate particles from the mortar body during the operation of transporting and placing in the forms. These features are of particular importance in the construction of concrete walls and columns. Decreased segregation results in more uniform and homogeneous concrete particularly in a heavily reinforced wall, and the minimizing of bleeding lessens the amount of laitance (whitish scum) in the top layer of a pour, giving a formed surface virtually free of sand streaks.

Durability

Resistance to alternate freezing and thawing is considered one of the principal criteria of the durability of concrete. Extensive laboratory tests and field performance have shown that air-entraining concrete possesses much greater resistance to freezing and thawing than normal-cement concrete. When bleeding or water-gain occurs in plastic concrete, minute channels are left in the interior of the hardened concrete. These channels or capillaries appear as "sand streaks" when they occur in the contact surface between forms and concrete. The air is not in large bubbles but in millions of tiny cells uniformly distributed throughout the entire mass.

It is important to understand this distinction between the nature of the small amount of air present in normal-cement concrete and the air resulting from purposeful air-entrainment. In the latter, the millions of tiny air bubbles, because of their great surface area, immobilize the free water in the plastic concrete, thereby greatly decreasing bleeding and resulting channels. The combination of fewer channels and the disconnected air cells in the hardened concrete minimizes the opportunity for water to move into and out of the concrete. Furthermore, if some water does get into the air cells, there is space for expansion of ice crystals which lessens the danger of freezing or damaging the concrete.

Design of Concrete Mixtures

Bulking effect of the entrained air causes an increased volume of concrete so that the quantities of materials that produce one cubic yard of concrete when normal cement is used will yield more than that with air-entraining cement. It is necessary, therefore, to compensate for this increase in yield by adjusting the mix slightly so as to maintain the desired cement content. Because the entrained air greatly improves the workability characteristics and increases the slump, the adjustment of the mix should be accomplished primarily by reducing the sand and water contents.

*Engineer of Tests, Universal Atlas Cement Co. A paper by the author given before the New York Chapter, American Institute of Architects.
EFFECTS ON COMPRESSIVE STRENGTH

When the mix is adjusted in this manner, the concrete made with air-entraining cement generally has higher strength in lean concrete (4 sacks per cu. yd.) and slightly lower strength in rich concrete (7 sacks per cu. yd.) than does normal-cement concrete of the same cement content. This results from the fact that use of air-entraining cement permits greater reduction in sand and water with lean than with rich mixes.

For years it has been believed by many that the durability of concrete varies with its strength. However, this is not necessarily true, especially in concrete subject to severe exposure. In any event, durability should not be sacrificed for strength. It should also be emphasized that with present-day cement it is possible to make concrete twice as strong as with the cement of 25 years ago; that allowable working stresses have not increased in the same degree; that many building codes still call for 2,000 lb. concrete at 28 days, whereas with present-day cement, either normal or air-entraining, it is possible to secure this strength at 7 days. In the final result, the loss of strength, if any, is less important than the gain in durability and other desirable characteristics.

SPECIFICATIONS

Current specifications for air-entraining cement are those of the American Society for Testing Materials ("Tentative Specifications for Air-Entraining Portland Cement," A.S.T.M. Designation: C 175-46T). These specifications include two types of air-entraining cement—Type IA for general concrete construction, and Type IIA, moderate-heat-of-hardening cement. They contain requirements for air content of standard mortar, the purpose of which is to control the amount of air entrainment. These requirements are so set as to result in an air content in fresh concrete of approximately 3 to 6 per cent which is considered the optimum range in order to obtain the desired characteristics and best results.

It is understood that the revised federal specifications for portland cement will be issued shortly and that provisions for air-entraining cements will be included in this revised printing.

APPLICATIONS

Air-entraining portland cement is being used for general concrete work such as foundations, walls, paving, sidewalks, slip-form work, gunite, and in concrete pipe and block. It also is suitable for concrete block and other machine-made, dry-tamped products, where its use makes possible blocks having a dense, rich surface texture and greater compressive strength.

Most portland cement manufacturers produce air-entraining cement. It is sold at the same price as regular cement.

Open-air swimming pools demonstrate the durability of air-entrained concrete, since they are particularly subject to freezing and thawing effects of winter weather. Y. M. C. A. Swimming Pool, Cuyahoga County, Ohio, built of air-entrained concrete by Alger Rau, Inc.

These test slabs were subjected to 60 cycles of freezing and thawing and repeated applications of calcium chloride to melt ice during two winters. Left: The slab made with regular cement shows heavy scaling. Right: Air-entrained concrete remains relatively unaffected.
THEORETICALLY an owner proceeding to build on cost-plus-a-fee wants the best contractor obtainable. But if General Motors, duPont or Standard Oil had to select a new President or Executive Vice President. Would they be likely to invite five or six leading candidates to quote the salary for which they would undertake the job, and would they then select the man who named the lowest monthly wage? Or would their Board of Directors rather canvas the field, pick out several eligibles, and finally after interviewing each and looking up his record, decide on the man who was best qualified to serve them, and then having decided on this man take for granted that they could agree on financial terms with him? Where the position is of less importance, the practice would be to determine a salary rate in advance. The management would then interview candidates and make every effort to determine the best qualified at the price. In neither case would the employer bargain first about dollars, and second about qualifications.

FIX A FAIR FEE

The best interest of an owner would be in my judgment be served if the owner did one of two things:
(a) Fix the fee himself and let each contractor under consideration know what the fee was to be, and then discuss the contractor's qualifications. The resulting selection would then be indeed on merit and not on price.

One may ask how owners or architects are going to fix a fair fee. There is ample information available. The Defense Plant Corporation scale of fees, while probably lower than the current market warrants, is a guide. The Mason Builders Association of New York has recently adopted a scale of contractors' fees. Or the owner or architects can talk to any leading builder and see what the general market is. It wouldn't be hard to arrive at the prevailing rate of fees.

(b) Select the contractor after a searching investigation of his qualifications and then negotiate with him as to the fee. Again, the selection would be on reputation, capability, availability and experience, not on dollars.

NO REAL PARITY EXISTS

I have discussed this matter with many men and usually get but one defense of fee competitions: i.e., that only contractors of equal qualifications and ability be invited to submit proposals. But there is no parity within any group of contracting organizations. Let us analyze this theory, that only equally qualified contractors are in competition. What constitutes "equal qualifications" among builders? Among the yardsticks most generally used are the following:

1. Financial Resources and Credit.
2. Reputation in general and integrity, cooperation and fair dealing in particular.
3. Experience
   a. General — years in business or volume of work done.
   b. Specific — namely, having built similar buildings.
   c. Local — knowledge of existing conditions is often of much significance in evaluating a contractor.
4. Organization
   a. Is it one of line and staff or is it departmentalized?
   b. Is it composed of old or young men?
   c. Is it staffed by men who made the company’s reputation or is it "a name" manned by men of other names?
   d. Is it undermanned or has it reserves and replacements?
5. Job staff available and the names, experience records, salary rates of the men to be assigned full time to the specific job.
6. Project Manager or No. 1 man on a big job. Are any two men equal?
7. Plant and Equipment available and at what rentals. Is the contractor likely to overplant the job?
8. Labor Relations — of vital importance these days.
9. Relations with subcontractors and material men — Do the subs like to work with this general contractor?
11. Time of Completion.

I have never seen any group of contractors — who certainly know one another better than any owner or architect possibly could — who would be willing to agree on any parity among themselves. Studies of the results obtained by applying the foregoing yardsticks to any group of builders will inevitably show wide variation on nearly all the factors. There is just no such thing as equality among bidders, especially as applied to a specific building operation. Practice certainly disagrees with theory here.

For owners and architects on private work to put the cart before the horse, or actually to put "cartwheels" ($) ahead of capabilities, is in my judgment far from the correct way to select contractors to work on a fee basis.
Steel bars for reinforcing concrete feature reverse helical ribs for an improved bond

REINFORCING BAR

Introduced in 1943, the Hi-Bond steel reinforcing bar for concrete construction, developed by Inland Steel Company, will soon be available in greater quantities, following the licensing of Carnegie-Illinois Steel Corporation and other subsidiaries of U.S. Steel Corporation to manufacture and sell it. Designed to offer a bearing surface more than double that of usual commercial types, this reinforcing bar features an arrangement of reverse helical ribs that results in a maximum bond between steel and concrete in order to realize the full potential strength of the reinforcing steel. The bar has subsequently been subjected to independent tests conducted by the U.S. Bureau of Standards and laboratories at the Universities of Illinois and Wisconsin, which reportedly show that it contributes to sounder and more economical reinforced concrete construction through an improved bond that makes possible more efficient transfer of stress at splices, better crack control, superior resistance to slip, and an opportunity to design for higher stresses. Inland Steel Co., 38 S. Dearborn, Chicago 3, Ill.

WALL COATING

A new paint, Tite-Wall, especially designed for use on concrete and cinder block, but usable on practically any rough, porous surface, is mixed with water, and painted out like an oil. Two coats are said to waterproof exterior block walls and to considerably reduce dampness and seepage even in damp basements. Truscon Laboratories, Inc., Caniff and Grand Trunk R.R., Detroit 12, Mich.

CONSTRUCTION CORE

A new construction material called Honeycomb has a cellular core made from paper, cotton or fiberglass, fabricated into blocks resembling huge honeycombs, and then sliced to the desired thickness before assembly. Faces of metal, wood veneer or plywood are bonded to the core with a plastic thermo-setting adhesive which develops a permanent bond actually stronger than the materials it bonds together. At the present time the material is custom built to specifications, in thicknesses varying from 1/4 in. to 1 in. It was developed jointly by U.S. Plywood Corp. and the Glenn L. Martin Co.

FAST-SETTING GLUE

A new cold-run fast-setting resin wood glue, Wood-Lok, has been developed for joint assembly operations in every type of wood. This resin glue is said to be the only type that can be handled and machined after 20 to 30 minutes’ clamping time, instead of the usual six to eight hours, providing a strong, resilient bond unaffected by humidity changes. It is cold-run and therefore its bonding quality is not weakened by constant heating. Wood-lok is a liquid, ready for use, and does not harden in the pot. Other announced advantages are that its use eliminates "chilled" joints, and there is no need to heat the glue or the wood; also, that it neither embrittles nor forms a rock-hard abrasive film to dull saws and knives. Colors range from pure white for colorless drying without glue line, to darker shades for special uses. National Adhesives, 270 Madison Ave., New York 16, N. Y.

ASBESTOS PLASTER

Ready-mixed and applied in much the same manner as ordinary plaster, Clap-seal is a new self-bonding asbestos plastering material, said to provide an exceptional combination of lightweight fire-protection, thermal insulation, and noise reduction. It reportedly will adhere without mechanical binding to any non-oily surface; and finish plasters, porous papers, or water-, oil-, asphalt-, and rubber-based paints may be applied directly to it to improve appearance or furnish added protection. The manufacturer points out that it should not be used where it may be exposed to weather, since its reaction to moisture is similar to that of ordinary plaster, nor where it will be subjected to excessive abuse, since it is somewhat softer than ordinary plaster, and, while as readily patched, will dent under pressure more readily. Brooks Green Co., 673 Boynton St., Boston 16, Mass.

STEEL STAIR UNITS

Recently announced is a pressed steel sectional stair unit which combines tread and riser in one piece of formed metal, punched and slotted so that, according to the manufacturer, a full stairway can be put up in only 90 minutes. This stair unit is a modification of a steel stair originally developed for manufactured houses. The standard unit is made of 12-gauge steel with an over-all width of 36 in. Two of the units may be placed end to end to form a 72-in. wide stairway. The tread is 9 in. deep and riser, 7 1/2 in. high. A lip extending above the tread has a 1 3/4-in. slotted hole through which bolts secure the lower unit to the one above. This slot permits adjustment for the height of the rise to the extent of 1 in., from 7 to 8 in. Units are finished in standard gray and may be covered with rubber treads, with carpeting (cemented or secured by carpet rods), or may be painted. Hardware for assembly and instructions are included in each set of 13 units for the stairs and one for the top. Home Ola Corp., 9 S. Clinton St., Chicago 6, Ill.

Model of x-ray laboratory units assists architects in hospital planning and design

X-RAY LAB MODELS

Three-dimensional models, a tool commonly employed by industrial architects and planning engineers for arriving at most efficient utilization of production space, have been adopted by the Westinghouse X-Ray Division to assist in rehabilitating and expanding the nation’s war-worn x-ray facilities. Value of replacement and expansion is expected within several years to reach $35 million a year. In planning a modern x-ray laboratory, the hospital architect coordinates the desires of many individuals. This model permits duplication of existing or proposed facilities in miniatures making possible visual arrangements that are located to the satisfaction of hospital superintendents, radiologist or roentgenologist, operating technicians, and members of the hospital directing board. The model kit contains 1000 individual pieces, scaled one inch to the foot. Models of x-ray equipment, walls, floors, windows, and doors are developed in wood, metal, and plastic. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Penn.

(Continued on page 138)
MANUFACTURER’S LITERATURE

CHURCH ORGANS
A Practical Approach to the Church Organ Problem. A booklet pointing out the advantages claimed for the Wurlitzer organ in churches of all sizes, with particular stress on the space saving and economical features. Includes technical data about organ placement and selection, and typical floorplans. Also included is a series of scale plans of Wurlitzer organs. 28 pp., illus. The Rudolph Wurlitzer Co., Organ Division, North Tonawanda, N. Y.

DEAERATORS
Cochrane Atomizing Deaerators (Publication 4160). Technical details and application data for the atomizing type of deaerator developed by Cochrane to meet the demand of marine engineers. Includes diagrams and a catalog of accessories. 20 pp., illus. Cochrane Corp., 17th St. below Allegheny Ave., Philadelphia 32, Penn.

ELECTRICITY
Planning Your Home for Better Living Electrically. Home building and remodeling tips for kitchens, laundries, lighting and air conditioning. Selection and location of equipment, decoration, placing of outlets, electrical appliances and conveniences, wiring information, costs. 64 pp., illus. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.

HEATING
Automatic Cool Stoker, Residential Models RB 20, RB 35, and Floor Furnaces, Series 1500. Descriptions, specifications, features and dimension sketches of two models of the stoker, and similar information on one floor and two wall furnaces. 4 pp., ea. illus. Rheem Mfg. Co., Dept. AB, 714 W. Olympic Blvd., Los Angeles, Calif.

The Answer Book on Home Heating. Information for the home owner and prospective homeowner on heating and air conditioning; types of system available; thermostats; insulation; solar heating; heating and air conditioning equipment. 28 pp., illus. General Electric Co., Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.

Fitzgibbon’s “D” Type Steel Heating Boilers. Catalog of boilers designed and constructed according to Steel Boiler Institute Rating Code. How to select a boiler for specific requirements. Complete details on each model in the line. Engineering tables, diagrams. 12 pp., illus. Fitzgibbon’s Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.*


Panelaire: The Warm Air Panel Heating System. Design and installation manual for a system of radiant heating using ceiling panels. Calculation and design diagrams and examples, examples of procedure, Btu requirements tables, tables of duct and pipe sizes and c.f.m. capacities. Specifications and complete construction details. 36 pp., illus.

Whiting Stokers (Specification Sheet 608). Mechanical details, specifications and advantages of Whiting H-C stokers featuring horizontal-compression principle. Diagrams of front and rear ash arrangement models. 6 pp., illus. Whiting Stoker Sales Co., 11 S. La Salle St., Chicago 3, Ill.


INSECTICIDES

LALLY COLUMNS
Lally Column Concentric Safe Load Table and Formula for Computing the Safe Carrying Capacity of Light and Heavy Weight Lally Columns. Handy tables, with explanatory notes and diagrams. Lally Column Co. of N. Y., Inc., 211 Lombardy St., Brooklyn, N. Y.

OFFICE RECORDS
Diebold Tested Methods and Equipment for Better Record Management and Protection. Catalog of record files, cross files, safes, cash drawers, metal doors, and microfilming equipment. 16 pp., illus. Diebold, Inc., Canton 2, Ohio.*

PRINTERS

SHEET COPPER
Research Solves Problem of Stress Failures in Sheet Copper Construction. A detailed report on the reasons for failures of copper sheet used for gutters, flashings and roofs. Proposed solution, with charts showing effect of shape, temper and gauge on strength, determination of gauge and expansion joint locations for various sizes and shapes of copper gutter linions, and formula for safe critical load. Details of sheet copper installations, with 30 detail sheets giving installation methods for seams, flashings, high and low parapet walls, roofing, gutters, expansion joints, etc. Table of thickness and weight of sheet and strip copper. 92 pp., illus. Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N. Y.*

SILICONES
How to Use DC 996. Description of a high temperature Silicone insulating varnish which cures at ordinary baking temperatures and protects electrical equipment operating continuously at temperatures up to 350° F. Contains instructions on how to apply and cure DC 996; includes tables of properties and specifications. 4 pp., illus. Dow Corning Corp., Midland, Mich.

TEMPERATURE CONTROL
Wheelco Multronic Capactrol (Bulletin D4-2). Description of a flexible electronic pyrometer controller using two electronic control circuits and featuring instantaneous control action. Lists applications and features, describes the operation, shows typical installation diagrams. 4 pp., illus. Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

TREATED WOOD
Value of Sound Conditioning

Being architects, you already know. That's why the majority of your specifications for new building call for sound conditioning.

The problem—architecturally speaking—is to specify the right material and the right applicator. Acousti-Celotex* offers you both.

It's the right material because it's the original and genuine drilled fibre tile, most widely used of all acoustical materials. Acousti-Celotex can be easily, quickly installed—and is simple to maintain through the years. Repeated painting does not affect its sound conditioning efficiency.

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A note to us will bring the Acousti-Celotex sound conditioning expert to your desk—ready and able to assist you in any and all of your plans.

A Suggestion Based on 68 Years’ Service to Churches

Never before in our 68-year history has there been such a keen interest in carillons, or such a widespread acceptance of genuine tower bells as an integral and essential part of the modern house of worship.

Most pastors and influential laymen now recognize what forward-looking churchmen have long known—that the music of true bells is the one most effective method of projecting the message of the church to all the community, the one most logical means of giving voice to the beauty of the edifice and the principles it symbolizes. Even when not included in the original plans, a way is usually found to install a carillon later, either through group subscription or the memorial gift of an individual donor.

Too often in such cases we find that the architect has not made proper provision for tower bells. Although a Deagan Carillon is a marvel of compact design, delivering many times more volume per pound of metal than old-style bells, ideal results still call for the observance of a few simple rules as to dimensions and relative height of the tower.

With these facts in mind, we earnestly suggest that you anticipate the installation of genuine bells and make your plans accordingly. To do otherwise may necessitate later alterations or, even worse, encourage the adoption of synthetic loud-speaker music which is entirely out of keeping with the true principles of ecclesiastical architecture that you have observed in your design.

Our Architectural Service Department stands ready to assist you in making provision for tower bells by sending you detailed information on the dimensions and specifications of a proper bell tower. Please address Department 374, J. C. Deagan, Inc., 1770 Berteau Ave., Chicago 13, III.
CHECK LIST ON CHURCHES

These two pages are reprinted from the building questionnaire used by the Archdiocese of Los Angeles. The
Archbishop directs that two copies of the information be made, signed by the pastor and architect, and
submitted to building committee with plans and sketches. (The actual questionnaire carries a page ar-
arranged for noting the approval, criticisms and objections of the Archdiocesan Building Commission.)

PROPOSED CHURCH

Parish......................................................City..................................
His Excellency approves loan of $........................................
Estimated parish debt on completion $........................................
Type of architecture............................................Estimated cost........................................Sq. foot cost?
Length and width............................................Height of walls..............................................of roof line..............................................of tower
Construction material............................................of roof..............................................of floor
If concrete — width of walls?....................................Reinforced?..............................................What waterproofing?
If wood or stucco — what termite and dry rot preventatives?
Church faces which direction?....................................Main boulevard or car line by side windows?
Bell?..............................................Bell tower?
Estimated number of weeks to complete construction

NAVE

Dimensions.............................................Finish material of ceiling........................................of inside walls
Width of main aisle.............................................of side aisles..............................................Seating capacity
Floor — level or sloped?.............................................Number of rows of pews......................................Length of pews
Inches between pews — back to back.............................................Distance from top of kneeler to arm rest
Maximum for comfort 26 inches.
Number of confessionals.............................................Dimensions.............................................Lighted?
Sound proofed?.............................................Dimensions of kneelers and arm rests
Light back of confessor's name?.............................................Light to show when penitent in?
Number of windows.............................................Dimensions..............................................Distance from floor to window sills
Type of church lighting.............................................How many units.............................................Where located
Type of heating.............................................How many units
Where located.............................................Air Conditioning?
Type of stations.............................................Size.............................................Has their location been determined?
Floor plugs provided for cleaning?.............................................At space for crib?......................................At shrines?..............................................For clock?
Material of altar railing.............................................Space between altar railing and front pew
If steps at front entrance, has a side entrance at street level been provided?
Will windows open for ventilation?.............................................How controlled?
Number of pillars.............................................Has acoustical engineer been consulted?

SANCTUARY

Dimensions.............................................Height of ceiling
Floor material.............................................Height above nave floor........................................Number of exits
Type of altar.............................................Material.............................................Dimensions
Conforms to rubrics?.............................................Altar canopy?..............................................Dimensions of predella
Number of steps?.............................................Height to altar table
Inches from front to tabernacle.............................................Tabernacle wired for burglar alarm?
Tabernacle securely bolted to altar?
Side altars.............................................How many?.............................................For Mass?..............................................Dimensions
Niche beside altar for cruets?.............................................Pipes in floor for flags and banners?
Pulpit?.............................................Location.............................................Dimensions
Height above sanctuary floor.............................................Loud Speaker System?......................................Spotlighted?
Number of windows.............................................Size.............................................Type of lighting..............................................How many units
Small wall safe for holy oils?.............................................Sacrement bell?

(Continued on page 135)
DAY-LINE*

The

"ONE-MAN"

Fixture

This heavy-duty Day-Brite Industrial Fluorescent system saves time and money on every installation—every service operation:

- One man alone can quickly hang the Day-Line with chain or patented Day-Brite "Ice-Tong" hangers.
- Rugged, die-formed steel channels designed for simplified unit or continuous mounting—plenty of knockouts.
- Lifetime porcelain enameled steel reflectors fastened with two captive wing nuts can be removed and replaced in one minute for easy installation and servicing—without tools.

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo. Nationally distributed through leading electrical supply houses.

In Canada: address inquiries to Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.

* Patent Nos. 231743, D133573, D133458

IT'S EASY TO SEE WHEN IT'S

D A Y - B R I T E

Lighting
### SACRISTY

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Number of doors to Sanctuary</th>
<th>Height of doors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling height</td>
<td>Convenient entrance for priests?</td>
<td>For people?</td>
</tr>
<tr>
<td>Number of windows?</td>
<td>Number of lighting fixtures?</td>
<td>Floor plugs?</td>
</tr>
<tr>
<td>Dimensions of vestment cases?</td>
<td>Dimensions of wardrobe cases?</td>
<td>Dimensions of free floor area?</td>
</tr>
<tr>
<td>Have you planned for lavabo?</td>
<td>Sacristary?</td>
<td>Safe?</td>
</tr>
<tr>
<td>Fireproof cabinet for censer?</td>
<td>Toilet?</td>
<td></td>
</tr>
<tr>
<td>Dimensions of storage space for envelopes</td>
<td>Pamphlets</td>
<td>Funeral candlesticks</td>
</tr>
<tr>
<td>Banners</td>
<td>Laundry, etc.</td>
<td></td>
</tr>
<tr>
<td>A small squint to be able to see into the church?</td>
<td>Full length mirror?</td>
<td>Any communication system to choir?</td>
</tr>
<tr>
<td>Any communication system to choir?</td>
<td>Vestibule?</td>
<td>School?</td>
</tr>
<tr>
<td>Will panel for electric control be located so that you can easily tell if lights are working?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BOYS' SACRISTY AND FLOWER ROOM

| Total dimensions | Accessible to sanctuary? | To outside for candle and flower delivery, to incinerator, etc. |
| Dimensions of cupboards for cassocks and surplices | Dimensions of storage space for candelabra and vases, etc. |
| For candles and votive lights | Because of danger of melting, is candle storage space against wall not touched by the sun or heating unit? |
| To avoid breakage has wood or rubber drainboard been specified? Any provisions for hot water? | Where are storage facilities located for janitor's cleaning equipment and supplies? |

### VESTIBULE

| Dimensions and number of outer doors | Dimensions of doors to nave |
| Number of steps to street level | Width of treads |
| Location of poor box | Provision for its security? |
| Dimensions of announcement board | Of space for papers and pamphlets? |
| Built in holy water fonts? | What arrangement for people to get holy water? |
| Height of ceiling | Number of windows |
| Number of lighting units | Any possibility of an auto entrance under cover? |
| Floor plug? | City ordinance demands toilets connected with church building or adjacent thereto. |
| Is there any necessity for light standards or lighting fixtures outside the church? |

### BAPTISTRY

| Location | Dimensions | How lighted | Floor plug |
| Wall cabinets? | Sacristary? | Locked screen or gates? |

### CHOIR

| Location | Dimensions | Seating capacity | Height of railing |
| Ventilated? | Lighting provisions? | Wired for future pipe organ? |
| For echo organ? | Blower silenced | Floor plugs? | Music storage? |
| Floor and stairs noise-proofed? | |

### SHRINES

| How many? | Where located? | Dimensions | How lighted |
| Will altar be used for Mass? | What provisions for security of donations? |

**Dated**

**Signed**

**Licensed Architect**
Quality fixtures like these
cost no more than others
—and they’re just right for today’s small homes

When it comes to specifying plumbing fixtures for those new homes and modernization jobs, the surest way to please is to recommend American-Standard. No name is better known. No products enjoy greater public acceptance.

The recessed Master Pembroke Bath, Companion Lavatory and Compact Water Closet shown above are typical of the smart, modern styling you’ll find throughout the complete line. Like all products bearing the familiar American-Standard Mark of Merit, they are distinguished by their superb craftsmanship, quality materials and sound construction.


American-Standard
Heating & Plumbing
Serving the Nation's Health and Comfort

Look for this mark of Merit—it identifies the world’s largest line of Heating and Plumbing Products for every use... including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels... Radiators, Convector Enclosures... Gas and Oil Burners... Heating Accessories... Bathrooms, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim... and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads
Master Sound Control Console provides paging facilities to loudspeakers in 15 to 60 zones.

Whether your problem is sound distribution for a small paging installation or an elaborate plant broadcasting service—
you can do it better with an RCA unit-built Master Sound Control Console.

A series of standardized frames and panels are matched to make up distinctly styled basic units. These matched units are so designed that it is possible to assemble them into any desired combination of unit-built Master Sound Control Consoles to fit the job.

No matter what your requirements—record transcription turntable, recorder, radio, or paging—so flexible is this equipment that the right combination of basic units can be provided to give you any or all of these services. As your sound-system needs develop, basic units can be added without discarding equipment already in use.

Built of "matched" units, RCA's Master Sound Control Equipment provides custom-built consoles within the price range of regular production-made equipment. You are assured of dependable performance at lower cost, for years to come.

For full information on the various unit-built combinations, write: Dept. 10-J, Sound Equipment Section, RCA, Camden, N. J.
HIGHER LUMEN RATINGS

Increases in the light output of fluorescent lamps, ranging from the miniature 6-watt lamp to the large 100-watt lamp have recently been announced. These increases, measured by initial (100 hour) lumen ratings, average approximately 5 per cent but run as high as 14 per cent in the case of the 15-watt soft-white fluorescent. Initial lumen ratings of the widely used 40-watt lamp have been raised 6 per cent for the 4500° white color, 11 per cent for the daylight, and 4 per cent for the soft white. The 100-watt lamp, which is used extensively in industrial installations, has rating increases of 3 per cent for the daylight and soft-white colors and over 4 per cent for the standard white. Similar increases have been made for the smaller 6-, 8-, 14-, 15-, 20-, and 30-watt lamps. Sylvania Electric Products, Inc., 500 Fifth Ave., New York, N. Y.

KITCHEN PLAN NO. 37:

This plan has been designed for an "off-the-track" hospital of 125 beds, located near a small city in the West.

KEEPS FOR HANDY REFERENCE!

COOKING EQUIPMENT PROPOSED:

(a) 1 No. 982 BLODGETT GAS-FIRED BAKING OVEN.
(b) 1 20 gallon trunnion kettle
(c) 2 Stock kettles
(d) 1 Vegetable steamer
(e) 1 Solid top skeleton range
(f) 1 Open range extension
(g) 1 Open top skeleton range
(h) 1 Deep fat fryer
(i) 1 No. 959 BLODGETT GAS-FIRED ROASTING and GENERAL COOKERY OVEN.

This layout was designed with an eye toward adequate cleaning space and the elimination of employee fatigue. In addition to patients and a staff of eighty, provision has been made for supplying meals to a limited number of visitors. The No. 982 Blodgett Bake Oven is an eight-pan, two-section unit, and the No. 959 an oven with two sections, one with two 7" compartments and one with a 12" compartment.

The G. S. BLODGETT CO., Inc.
50 Lakeside Avenue Burlington, Vermont

The new Deluxe edition of Case Histories is ready—write for it now!

FLOOR FURNACE

Dual floor furnace, Model D-45000, is of shallow flat-bed construction. The fire-box is only 18 in. deep, so the furnace can be hidden below floor level and installed without the need of basement or pit. Shallow depth and welded construction are said to provide safeguard against danger of flooding in rainy season. Installation is made by cutting specified size holes in floor and wall, and slipping the furnace into place. Grills are so designed that no patching or painting is necessary afterwards. Pilot and burner valves are equipped with safety locks. This model has a 45,000 Btu input. Model D-55000, next in production, will have a 55,000 Btu input.

Furnaces have the seal of approval of the American Gas Association. Royal Heaters, Inc., Dept. AR, 1024 Westminster Ave., Alhambra, Calif.

SINGLE-SEATED VALVES

A new line of single-seated fully balanced diaphragm regulating valves is being manufactured for process industries and power plants. These diaphragm valves are made with cast iron, bronze, and steel bodies for steam, air, or gas pressures up to 1000 psi, and are designed to be actuated by standard pressure or temperature instruments or controllers using 20 psi air or clean water. Supplied as standard equipment with 800 Brinell hardened stainless steel main valves and stellited seat rings, they are said to provide equal or greater capacities than most double-seated regulating valves of the same size, and to have the additional advantage of being absolutely tight in dead-end service. For temperatures over 450° F., steel diaphragm valves are equipped with Condense-Seat cooling bonnet, designed to provide a large radiating surface and a reservoir of condensate to help keep the stuffing box temperature down. Leslie Co., 37 Delafield Ave., Lyndhurst, N. J.
STEEL HEATING BOILERS

ARE EASY-TO-CLEAN AND EASY-TO-KEEP CLEAN

For cleaning the waterlegs, four 3" x 4" handhole openings (one at each corner) make it possible to flush out all water surfaces; while the shell can be blown clean under pressure through the clean-out opening in the rear circulator. An additional handhole opening is provided at the bottom of the front head and manholes in all sizes having shell diameters more than 48". Two 2½" blow-off openings at the water line are provided in all sizes. Write for Bulletin No. 3000-A.

All tubes are readily accessible through the full width front flue doors.

The bottom of the rear smoke box slopes away from the upper tube bank so that soil accumulations can quickly be removed through the smoke box clean-out opening.

Member of

TITUSVILLE
IRON WORKS DIVISION
TITUSVILLE, PENNA.

OCTOBER 1946
WOOD-METAL LAMINATE
Sheet metal with a thin wood veneer, formerly called Decorative Armorply, will henceforth be known as Flexmetl. This is the new laminate consisting of a hardwood veneer, only 1/85th to 1/28th of an inch thick, bonded to a sheet of metal. The finished material is reported to be flexible to the limit of the sheet metal used.

PROPELLER UNIT HEATERS
A new and restyled line of propeller unit heaters has been announced featuring three distinct types of units with a total of 47 basic capacities. To the conventional horizontal and vertical delivery types, there has been added a powerful new draw-through unit which provides horizontal discharge of heated air over an extra-long range. Known as the Power-Throw, this type has specialized applications, and may be used alone or in combination with the horizontal or vertical type. All are available in standard models as well as in models designed to provide low-outlet air temperatures when used on steam pressures of 30 lb. or more. Models specifically designed for hot water application and for drying and processing jobs are also included in the new line. A wide range of heat throw patterns is available through the use of air-distribution devices, such as deflectors and louvers. All models in the new line are currently finished in beige-gray enamel with chrome trim. Modine Mfg. Co., Racine, Wis.

COLOR GUIDE
Architects, decorators, and their clients frequently encounter difficulties in making color selections. Often a client will be given some color chips furnished by the manufacturer and will narrow his selection down to two colors, following this with the request, "Now, I’d like a color in between those two." Or the homeowner selects a color from a mix in the wet state, and is disappointed with the variation shown upon drying. The Moleta Architectural Color Guide displays 150 different colors, each shown on a large page measuring 9 by 15 in. The guide is said to prove a boon to architects because the formula for obtaining each particular color is given clearly on the reverse of each color sheet. Colors are shown as they will appear in the dry state. Monroe, Lederer & Taussig, Inc., 606 North American St., Philadelphia 23, Penn.

NEW NAME
Announcement has been made of the change in name of Sanimetal Corporation to Vikon Tile Corporation, which will continue to manufacture steel wall and ceiling tile of various colors. Vikon Tile Corp., Washington, N. J.

(Continued from page 138)
Permanent contact between tubes and the entire surface of the fin collars—that's the advantage of hydraulic pressure used to create the lasting mechanical bond on McQuay Ripple Fin Coils. And this significant advantage is a typical example of how a seemingly small detail in engineering design plays an important part in making a superior product.

McQuay construction means higher flexible strength with less air friction and cleaner operation. To provide maximum flexibility, all headers are of non-ferrous tubes, thus reducing the problem of unequal expansion and contraction.

These exclusive features make McQuay performance possible and establish their preference among users. McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications.

For complete information write McQuay, Inc., 1605 Broadway Street N. E., Minneapolis 13, Minn.
extensive postwar building program, was started early last month.

The new building, six stories and basement, designed by Holabird and Root, will be 220 ft. long and 50 ft. wide, containing 1,001,600 cu. ft. with a usable floor area of about 56,500 ft. It will house the offices of the chancellor, president and vice presidents, the secretary of the board of trustees, the comptroller, bursar, business manager and purchasing office, the dean of students, registrar, admissions, student counseling and the university examiner. The university's radio office and studio also will be housed there, along with the alumni office, public relations and university postoffice.

Foundations will be pile footings. Frames and slabs will be reinforced concrete, exterior walls cutstone, and the roof tile. Interior finish will be plastered with the walls painted; ceilings will have acoustic tile; floors will be terrazzo in public and asphalt tile in office areas.

Construction Program

Construction of five new buildings for the State Agricultural and Technical Institute and the College of Ceramics at Alfred University has been approved by the New York State Postwar Public Works Planning Commission. Projected are a home economics building, gymnasium and auditorium, farm mechanics building and an industrial shop and laboratory building for the Institute, and an industrial design building for the College of Ceramics. The total program will cost an estimated $1,236,662, will be under the direction of Haskell, Consideine and Haskell of Elmira, N. Y., architects for the project.

Appointments

Oscar D. Rickly, an Ohio State University staff member for more than 25 years in the industrial engineering department, has been advanced from associate professor to a full professorship. Charles A. Miller, assistant director of the School of Architecture of International Correspondence Schools, has been appointed to serve as a member of the Civic Design Committee of the Pennsylvania Society of Architects.

Sidney Wahl Little, associate professor in The School of Architecture and Arts, Alabama Polytechnic Institute, has been named dean of the School of Architecture and Allied Arts, University of Oregon.

ON THE CALENDAR

October 7-11: National Exhibition of Gas Appliance Manufacturers and Annual Convention, American Gas Association, Atlantic City, N. J.

October 10-12: 13th Annual Meeting and 1st Annual Exhibit on Building and Maintenance Products, National Association of Housing Officials, Carter Hotel, Cleveland, Ohio.

October 29-November 1: 4th All-Industry Refrigeration and Air Conditioning Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

November 11-16: 39th Annual Convention, National Association of Real Estate Boards, Atlantic City, N. J.


November 18-22: 28th Annual National Metal Congress and Exposition, Municipal Auditorium, Atlantic City, N. J.

December 2-7: 17th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

The Josam Moderator Mixing Valve assures lasting shower bathing pleasure through simplicity of construction. A single moving part—the hydraulically operated shuttle valve—keeps hot and cold water “in balance” at the selected temperature and prevents accidental scalding. This shuttle valve is enclosed in the “heart of the valve”—a unit in which all working parts are combined. Even after years of wear or rough usage, there is no need of expensive replacement. All you do is replace the old “heart of valve” with a new one... and the valve is as good as new! The Josam Moderator Mixing Valve is ideal for residences, apartments, schools, colleges, hotels, clubs, institutions, factories, or wherever shower bathing is a regular routine. Fits readily into all standard shower installations. Send coupon below for complete details today!

JOSAM MANUFACTURING COMPANY
CLEVELAND 14, OHIO

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FIRM
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STATE

Josam MANUFACTURING COMPANY
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EMPIRE BRASS COMPANY, LTD.—Canadian Distributors

See our Catalog in Sweets’ Member of the Producer’s Council

October 1946

143
To help you Plan every ...  

AIR CONDITIONING JOB

- As in the past, engineers, architects and contractors today look to usAIRco for the right equipment for each job.
- Whether it be an economical washed-air cooling system, a cold water unit for deep well operation, or a refrigeration system for complete air cooling and dehumidification, there's a usAIRco system engineered for your job. Year-round air conditioning is also available, cooling in the summer and heating in the winter. usAIRco systems are designed for "packaged" installations, central station systems, or remote type units. Auxiliary equipment such as unit heaters, heat coils, centrifugal blowers, fans, evaporative condensers provide you with complete system responsibility. It will pay you to get in touch with your usAIRco representative ... take advantage of specialized experience and engineering leadership.

United States Air Conditioning Corporation

MINNEAPOLIS 14, MINNESOTA

Architectural Record
In this new Navy building
ANACONDA THROUGH-WALL FLASHING
Keeps water out


In the new Navy building illustrated above, the J. Edw. Linck Sheet Metal Works of Washington, D.C., installed 6,500 lb. of the flashing that drains itself dry . . . Anaconda Through-Wall Flashing.

This exceptionally effective flashing has been chosen for commercial, industrial, educational and institutional buildings throughout the country, because it offers these exclusive advantages:

1. Pre-stamped dam and corrugations which provide positive drainage.
2. Dam so designed that edge can be placed within ¼ inch of face of wall and still allow for pointing of mortar joint.
3. Flat selvage in which sharp bends can be made without distorting flashing.
4. Readily locked endwise to form thoroughly water-tight joints, by nesting one or two corrugations.
5. Corrugations provide a strong bond with mortar, and prevent lateral movement.

Write for Publication C-28, which contains complete description and specifications; or refer to Swee's Architectural Catalog.
Edwin G. Johnson and John M. Whitcomb have announced the opening of their office under the firm name of Johnson & Whitcomb, Architects, at 44 Brattle St., Cambridge, Mass.

Lt. Com. Derick B. Kipp, U.S.N.R., has announced his release from active duty and his resumption of the practice of architecture, with offices at 425 Valley Rd., Montclair, N. J.

C. William Palmer, recently released from active duty with the Navy, has reopened his office for the practice of architecture and engineering at 2675 Penobscot Bldg., Detroit 26, Mich.

James Silhanek, Architect, has opened offices at 362½ D St., San Bernardino, Calif.

**New Addresses**

The following new addresses have been announced:

Asphalt Tile Institute, 101 Park Ave., New York 17, N. Y.

---

**MACOMBER**

**STANDARDIZED SERVICE IN STEEL CONSTRUCTION**

ROOF TRUSSES

STEEL JOISTS

LONGSPANS

STEEL DECKING

AND

ROOF PURLINS

AND

STEEL SIDING

MACOMBER — Masters of the One Story Steel Building, have a real service for you. It includes:

1—Fabrication and erection of the complete building.

2—Fabrication of the roof supporting members only where masonry walls are used.

3—A wealth of engineering information as a result of specialization in this type of construction.

Here is standardization in steel building products that does not limit either you nor the occupant in the kind of building that serves his needs best. Your contractor knows Macomber products. He will expend far less equipment in their erection. If you are interested in some helpful suggestions and further information drop us a line.

---

Bodin & Lamberson, Architects (Daniel H. Bodin and Willard N. Lamberson, and Clarence A. Smith II, Associate), 827 Forsyth Bldg., Atlanta, Ga.


Kemper Nomland, A.I.A., 623 W. 5th St., Los Angeles 13, Calif.


Palace Hardware Co., Inc., 53 Stevenson St., San Francisco, Calif.

Clarence O. Peterson and Wendell R. Spackman, Architects, 593 Market St., San Francisco 5, Calif.


Herbert M. Tatum, Architect, 2812 Fairmount St., Dallas 4, Tex.

Gerald W. Wolf, Architect, 2518 Holmes St., Kansas City 8, Mo.

**Firm Changes**

The Asphalt Tile Institute has announced the appointment of Charles B. Whitelsey, Jr., as managing director.

The Clay Sewer Pipe Assn., Inc., has announced the addition to its technical staff of Edward A. Walker as district engineer representing the Association in Pennsylvania. His office is at 503 Chestnut St., Greensburg, Penn.

Baumann and Baumann, Architects, of Knoxville, Tenn., have announced the association with them of Will W. Griffin, A.I.A., formerly chief architectural designer, Robert and Co., Atlanta.


Ralph Bryan, Architect, who had returned to the practice of architecture in Dallas, Tex., following four years of service with the Seabees, has been recalled by the Navy for several months of active duty with the U. S. Naval Mission in Lima, Peru. He is serving as Captain in the Civil Engineering Corps Reserve.

Ernest J. Kump and Mark Falk have announced the return of their former partners, Lt. Col. Charles H. Franklin, A.U.S., Corps of Engineers, and the formation of the firm of Franklin, Kump & Falk, for the practice of architecture and engineering. Address, 9 Main St., San Francisco, Calif.

Wallace W. MacDonald has been appointed by John W. Maloney, Architect, of Yakima and Seattle, Wash., to head his Yakima central office, succeeding Howard E. Miney who has been transferred to manage the Seattle branch.

(Continued on page 152)
"Be it ever so humble..."

Somehow you know, without being told, that the author of "Home, Sweet Home" was an American...

For the simple beauty of his song so exactly expresses the love which Americans have for home. An attitude, both strong and reverent, born in the cabins of pioneer ancestors and guarded zealously through generations that followed. From American hearthstones the spark of independence was fanned to quenchless flame, and a succession of great men and women emerged to carry its light abroad in the land.

To people who thus cherish the ideal of home, the expression of its physical form is no less important. So American homes have become the wonder of the world! Here, the home of the Colonel's lady and Judy O'Grady differ in size, location and pretension, but seldom in facilities for necessity or convenience.

One development, perhaps more than any other, makes this possible... the invention and mass production of steel pipe.

Yes, steel pipe makes it possible! The conveyance of fresh, pure water from its source, however distant, to and through the home... for drinking, cooking, bathing, laundering, cleaning and sanitation. For providing conventional heating or the advantages of the newly developed radiant heat. For cooling in summer. For fire protection... for a hundred-and-one uses.

Durable, reliable, economical... steel pipe makes these comforts of home available to all! That's why 90% of all home piping is steel piping.

The interesting story of "Pipe in American Life" will be sent upon request.

Committee on
Steel Pipe Research
OF
AMERICAN IRON AND STEEL INSTITUTE
350 Fifth Avenue, New York 1, N. Y.

STEEL PIPE MAKES IT POSSIBLE!

...better living through pipes of steel for plumbing and heating purposes.
Here's a proved system of interior construction that offers complete flexibility to meet ever-changing educational needs

THINK OF IT! ... the entire interior of a school completely flexible, yet having all the necessary qualities of permanent and solid construction!

Think what that means in terms of economy alone ... when you want to expand or subdivide units, or convert a building from academic to vocational, or from grade school to junior high!

Three Johns-Manville materials make this revolutionary development possible ... permit Unit Construction of walls, ceilings, and floors under a single specification, a single manufacturer's responsibility:

1. **Movable Walls** ... 100% salvageable. Made of Transite sheets—difficult to mar, highly resistant to shock and abuse.
2. **Acoustical Ceilings** ... reduce noise, increase classroom efficiency. Demountable units can be taken down and relocated as desired.
3. **Colorful, Resilient Floors** ... quiet to walk on; easy to clean; stand up under heavy traffic. Small units permit easy extension of the floor to meet changing conditions.

The constituent parts of Johns-Manville Unit Construction are built to last as an integral part of the structure. And they're so much easier to keep clean that they bring maintenance expense way down. Their modern attractiveness inspires genuine pride on the part of students, teachers, and parents.

Before planning a new school or converting an old one, write for our brochure describing this important step forward in school design. Johns-Manville, P. O. Box 290, New York 16, N. Y.

Because of the unprecedented demand for Johns-Manville Building Materials, there may be times when we cannot make immediate delivery of the materials you desire. With Johns-Manville Walls, Ceilings, Floors, you can keep expanding, converting, or subdividing schoolroom units as often as conditions require.
ACOUSTICAL CEILINGS—Important factor in helping to overcome the handicap of distracting noise, Johns-Manville Acoustical Ceilings are beneficial both to teacher and student alike. They give the desired degree of quiet for effective teaching, eliminate frequent causes of nervousness, and are proved aids to concentration. An exclusive Johns-Manville patented construction system permits interchangeability of flush-type fluorescent lighting and acoustical ceiling units, which are readily demountable.

MOVABLE WALLS—The keystone of flexibility in Unit Construction is the J-M Transite Wall. It can be disassembled and relocated as educational needs require. One-unit rooms, for instance, can be speedily converted into two-unit rooms, or vice versa. Made of fireproof asbestos and cement, practically indestructible materials, the movable panels are used to form rigid, double-faced partitions, 4" thick. Can also be used to finish the interior of outside walls. Transite base is easily removable for access to wiring, etc.

COLORFUL, RESILIENT FLOORS—J-M Asphalt Tile Flooring completes the Unit Construction System. Made of asbestos and asphalt, the units withstand the kind of hard wear and abuse that must be expected in any school building. Not only durable, J-M Asphalt Tile Floors are comfortable and quiet underfoot, reducing the disturbing effects of noisy footsteps in corridors, gymnasiums, etc. Individual units permit easy alterations or extension of patterns. Made in a wide variety of plain and marbleized colors.

Incredible as it may seem, this beautiful and solidly built Vocational Room can easily be expanded, subdivided, or converted to an ordinary classroom—thanks to the flexibility of Johns-Manville Unit Construction. Note the projection-free lines of the movable, hard-to-mar Transite Walls. And note the Acoustical Ceiling (with fluorescent lighting), which cuts down noise and reverberations that would otherwise distract students and teachers in other rooms. The colorful floor is Asphalt Tile, easy to clean, highly resistant to scuffing, yet resilient underfoot.

Johns-Manville Unit Construction

ASPHALT TILE FLOORS
MOVABLE TRANSITE WALLS
ACOUSTICAL CEILINGS
Main administration building of the Douglas Long Beach plant: Taylor and Taylor, Architects; O. W. Ott, consulting mechanical engineer. Contractors were Great Western Refrigeration and Engineering Co., and W. S. Kilpatrick and Co., both of Los Angeles.

Largest “Conditioned” Plant West of the Rockies

uses “FREON” refrigerants

for added safety

When this huge windowless plant, covering approximately 3 million sq. feet, was built for the Douglas Aircraft Co. in Long Beach, Calif., air conditioning was a factor of prime importance. The extremely high internal heat load from men at work, machinery, motors and lighting, plus high sun loads on the buildings, necessitated a system designed to provide suitable working conditions at all times. So York and Westinghouse units using “Freon” safe refrigerants exclusively were installed.

There are 125 units strategically located (as a wartime precaution) throughout the many buildings of the plant. They range from 50 h.p. to 62½ h.p. and produce a total of 7500 tons of refrigeration. Units are situated in the trusses directly under the roof to allow floor clearance for operation of cranes. Ductwork from fan units handling 36,000 c.f.m., is located above the bottom chord of the trusses with air supply outlets in each bay. Return ducts are used with drops at columns and along outside walls to within 6 feet of the floor.

Today, as during the war, this plant is operating at full capacity, and with maximum air conditioning safety. Because “Freon” safe refrigerants eliminate risk of work stoppages . . . protect the health of employees and increase their efficiency.

“Freon” refrigerants are truly safe . . . non-toxic and odorless. They won’t burn or explode. They are amazingly pure and moisture-free. “Freon” circulates through valves and tubes without danger of blocking or freezing the system. It helps keep maintenance costs down to a minimum and prolongs the efficient and economical life of the machinery in which it is used.

More and more prominent architects and engineers throughout the country heartily endorse equipment designed to utilize the advantages of “Freon” safe refrigerants. So when you come to your air conditioning or refrigeration problems, be sure to keep the proven safety and dependability of “Freon” well in mind. Write for technical data for your files. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.
Men in the Building Industries have watched with interest the enthusiastic, widespread acceptance of GENERAL'S jewelry-polished Ledge-type Swing Spout Kitchen Faucet. In the Commodore, new concepts of high-strength, light weight, and maximum durability have been created through advanced brass engineering. The perfection of the Commodore's long-life heavy chrome finish, its graceful sweeping lines, and the strength of its light weight fabrication are revolutionary in plumbing fixtures.

THE COMMODORE PRESENTS THESE FEATURES:

★ Long, Nine-inch High Arch Spout — for extended radius of motion over twin sinks. ★ All Brass Parts — heavy triple plated, jewel-polished. ★ Auto-spray Attachment for rinsing. ★ Faucet-shanks eight inches on centers — quickly attaches to wood or tile ledge.

The COMMODORE... choice of Fritz B. Burns' $75,000.00 Post-War House in Los Angeles

GENERAL TIRE & RUBBER COM. S.A.

Plumbing Division Sales Office: 608 South Fair Oaks Avenue, Pasadena 2, California
ONE distinguishing mark of church murals, windows and altars created by Conrad Schmitt Studios is their complete harmony with the surrounding architecture. This is the outgrowth of over fifty years of close co-operation with architects in all parts of the country. Learn how pleasant it is to plan with Conrad Schmitt Studios. Your inquiries will receive prompt and courteous attention.

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Murals - Decorations - Stained Glass - Altars
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Expediency May Invite Premature Obsolescence in a Toilet Room Environment

Sanymetal® Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.

Sanymetal Porcena Academy Type Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.

Sanymetal Porcena Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements.

Sanymetal Porcena Academy Type Shower Stall and Dressing Room Compartments provide the utmost in sanitation for gymnasiums and dormitories.

Sanymetal® "PORCENA" (Porcelain on Steel) TOILET COMPARTMENTS possess the natural structural strength of steel, not one sheet, but two 16-gauge sheets securedly bonded on opposite sides of dense insulating core, strengthened by porcelain enamel (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.

- Toilet compartments usually dominate the toilet room, influencing the environment of the one room that is important to everyone occupying the building. Toilet compartments sometimes become outmoded quickly by changes in design and materials. Sanymetal "PORCENA" (Porcelain on Steel) Toilet Compartments provide a generous measure of protection against premature obsolescence because of their modernity and beauty, fadeless color combinations, utmost sanitation, and a correct combination of the hardness of glass with the structural strength of steel, which assures years more of unvarying service.

Fabricated of the ageless, fadeless material—"PORCENA" (Porcelain on Steel)—Sanymetal "PORCENA" Toilet Compartments are available in a wide range of beautiful, never-fade colors imbedded deep into a glass-smooth, flint-hard, non-porous surface that is moisture and rust-proof, does not absorb odors, and is impervious to ordinary acids, oils and grease. The glistening porcelain finish discourages defacement; is easily cleaned, and the brilliance of the surface renewed by wiping with a damp cloth.

Ask the Sanymetal Representative in your vicinity (see "Partitions" in phone book) for helpful suggestions on planning modern toilet room environments. Refer to Sanymetal Catalog 19-BS in Sweet's Architectural File for 1946 or write for file copy of Catalog 84.

THE SANYMETAL PRODUCTS COMPANY, INC.
1689 URBANA ROAD  •  CLEVELAND 12, OHIO

Sanymetal Catalog 84 illustrates several typical toilet room environments as well as shower stall and dressing room suggestions.
Living comfort has advanced tremendously in the last 20 years... and nowhere with greater strides than in the kitchen. It's a far cry from the coal stove and old style sink to the streamlined Hotpoint electric kitchen of 1946. Here truly are the appliances of tomorrow in use today. From the superb new Range and Dishwasher to the smallest matching cabinet, Hotpoint kitchens make good homes better!

Since homes in most income brackets are now completely equipped by the builder, your designs must make maximum use of all the improvements in equipment and materials. Hotpoint's Portfolio of Personalized Kitchen Plans provides complete information and planning guidance on the functional, all-electric kitchen. Attach the coupon below to your letterhead and mail to us today for your copy of this helpful Portfolio. Edison General Electric Appliance Co., Inc., Chicago.

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In most states, all Hotpoint kitchen equipment can be included in F.H.A. insured mortgages.
You'll say you've never seen anything like it—once you examine this new Curtis Woodwork Style Book! Never before has any book presented woodwork so effectively ... and so beautifully. For here, in big pages measuring 15 x 19 inches, are mantels—entrances, windows and doors—kitchens—china closets—stairways—and other woodwork in natural room settings and charming life-like colors.

The new Curtis Style Book contains scores of ideas for interior and exterior treatment, using Curtis Woodwork and the new Self-Fitting Silentite Windows. Outstanding decorators have contributed valuable suggestions to make this book a source of inspiration in planning and building any size home—and to make selection of woodwork easy for architect and builder as well as for the home-owner.

Have your Curtis dealer show you the big, new Curtis Woodwork Style Book which the whole building industry is talking about. And mail the coupon for literature on the new Curtis Woodwork line and the new Self-Fitting Silentite Windows.
Hillyard's Floor Seals, Finishes and Treatments properly protect and prolong the life of all types of floors. Floors stay cleaner, look better and have given and are giving entire life to all types of floors.

Abesto coating.

No small maintenance job! More than 70,000 square feet of roof on this generating plant, one of many big structures protected and maintained with Abesto.

Specify Abesto for new built-up construction...for roof maintenance.

Architects...Contractors

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See Hillyard Specifications in Sweets 1946 Catalog, Sec. 13, Pages 18G-2.

Send for Specifications Cards. FREE for the asking.

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DISTRIBUTORS
HILLYARD CHEMICAL COMPANY
ST. JOSEPH, MISSOURI
370 TURK ST. • SAN FRANCISCO, CAL.
1947 BROADWAY • NEW YORK, N.Y.

THE RECORD REPORTS

(Continued from page 146)

office. Mr. MacDonald served as a Colonel with the Western Defense Command during the war and aided in the $139,000,000 construction program in the western states and Alaska.

David Maxwell has joined Bertell, Inc., design and development organization, 40 E. 49th St., New York 17, as director of product development and company associate.

Patrick D. Hongan, Architect, 1453 Tremont Pl., Denver 2, Colo., has announced dissolution of the firm of McCarter and Hongan.

Nashaat Morsy, A.F.S. "Eng.," "Quant.," has been appointed architect to The Ghamra Bottling Company, Regal Brewery of Cairo. Address: P. O. Box 1731, Cairo, Egypt.

Mendelsohn, Dinwiddie and Hill (Eric Mendelsohn, A.I.A., John Dinwiddie, A.I.A., and Albert Henry Hall), 233 Sansome St., San Francisco 4, Calif., have announced that David B. Gideon, formerly Lt. Col. in the Corps of Engineers, U.S.A., is now associated with the office as general manager.

Guy B. Panero, engineer, has purchased the firm of Clyde R. Place, Consulting Engineers, Graybar Bldg., New York, and is now directing the organization under the name of Guy B. Panero, Successor to Clyde R. Place, Consulting Engineers.

Thorne Sherwood, A.I.A., Willis Nathaniel Mills, A.I.A., and Lester Wickham Smith, A.I.A., have announced the formation of a partnership under the firm name of Sherwood, Mills & Smith, for the practice of architecture and associated fields of design, with offices at 101 Park Ave., New York City and 4 South St., Stamford, Conn.

J. Archer Turner, president of the Turner Construction Co., has announced the return to the company, as a superintendent of construction, of Col. George M. Reaves, C.E., U.S.A. Col. Reaves was with the Turner Company for nine years prior to 1931 when he joined Wark and Co. of Philadelphia.

Donald F. White, A.I.A., Architect-Engineer, has announced his association with Francis E. Griffin, R.A., and the formation of the firm of White & Griffin, Architect-Engineer Associates, with offices at 1727 St. Antonio St., Detroit 26, Mich.

Announcement has been made of the formation of the firm of Thomas Worcester, Inc., to provide complete service including engineering, architecture and construction. Offices are at 84 State St., Boston 9, Mass. Thomas Worcester is president of the new firm, William Davies is chief architect, and Henry H. Harrison is chief of construction.
It took
ONE MINUTE
to permanently waterproof THESE WALLS

One minute did a permanent waterproofing job on this wall! Yes, it took only a minute for the architect to specify Medusa Waterproofed Portland Cement. And, that's all the time it took, for this cement is mixed and placed exactly the same as regular cement—no time wasting admixtures—no costly, doubtful waterproofing surface coatings—and no extra supervision.

HOW IT WATERPROOF

Medusa Waterproofing is ground in with the cement during manufacture—is uniformly distributed and locked in the mass—lines every pore of the concrete—repels all water—is unaffected by time, heat or cold—and guards against efflorescence and deterioration.

YOUR CHOICE OF WATERPROOFED WHITE OR GRAY

Specify Medusa Waterproofed Gray for all normal concrete construction...and Waterproofed White when a white surface coat is desired. Waterproofed White stays white, for water carrying dirt and soot cannot penetrate to stain or disfigure the surface.

SUCCESSFULLY USED

Both Medusa Waterproofed Gray and White Portland Cements meet specifications set forth under A.S.T.M. standards...they have been used successfully for 36 years all over the civilized world. An informative booklet, "How To Waterproof Concrete, Stucco and Masonry" is available to all architects. The coupon below brings your copy.

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Gentlemen: Please send me a free copy of "How To Waterproof Concrete, Stucco and Masonry"

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OCTOBER 1946

133
"Cast Iron is ALWAYS a Sound Investment"

Bankers concerned with real estate invariably recommend cast iron for new boilers or for replacement. Experience has taught them these good reasons why cast iron is a sound investment...

Cast-iron boilers resist rust and corrosion, thus last longer and may be amortized over longer periods... their sectional construction means easier installation or replacement... their high efficiency results in consistently low operating costs... they are readily adapted to all fuels.

Bankers also recognize the superiority of H. B. Smith Cast-Iron Boilers for business, industry, institutions and homes. Plan to use them for every new building, every replacement. Write for your free catalog.

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ARCHITECTURAL ENGINEERING
TECHNICAL NEWS AND RESEARCH

(Continued from page 140)

Electrically-Welded PERMANENCE Wrought Iron BEAUTY and DIGNITY

Drafting machine can be used on horizontal, sloping, or vertical drawing table

DRAFTING MACHINE

Announced as a new development in drafting machines, the Boardmaster is adaptable to all types of drawing tables — horizontal, sloping, or vertical — by the rapid assembly or "packaged" accessory units. Counter-balancing at any angle is designed to be frictionless and without drag. All operating controls are grouped within a 2-in. radius at the fingertips of the left hand. As a result, the drafting machine reportedly can be operated virtually by feel alone, without visual reference. The "over-arm" protractor permits full visibility of the dial throughout 360° and in any arm position. Featured are synthetic sapphire glides for use on new abrasive drawing papers without smudging or wear; increased ruggedness of arm and protractor; built-in key wrench anchor clamp and hinged anchor; replaceable snap-lock, enclosed steel bands; diamond turned pulleys; and glareless aluminum matte finish. Universal Drafting Machine Co., Cleveland 14, Ohio.

FLUORESCENT EFFECTS

Fluorescent lacquers, and black-light fixtures which cause them to glow in the dark, are offered as a means of enhancing the beauty of churches. Lacquers, which come in 13 different hues, may be applied directly to walls as murals, or can be painted on wallboard for mobile sections. Black Light Products, 67 East Lake St., Chicago 1, Ill.

STANDARDS

A revised list of standards has been published by the American Standards Association. The 845 standards listed in the booklet include definitions of technical terms, specifications, dimensions, safety provisions for the use of machinery, and methods of work and test for finished products. Copies can be obtained without charge from American Standards Association, 70 E. 45th St., New York 17, N. Y.

Anchor Fence
Nation-wide Sales and Erection Service

Free Specification Manuals
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No. 111 for Anchor-Weld Iron Fence, No. 110 for Anchor Chain Link Fence. Show installation photographs and sectional drawings... describe the various heights, weights, architectural features and applications of Anchor fences and gates. Anchor Fence Div., Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Md.
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BUILDERS OF THE UNITED STATES SILVER STORAGE VAULTS AT WEST POINT

OCTOBER 1946
USING THE SUN TO CUT LIGHT AND FUEL BILLS

It sounds easy — but the easy-looking results achieved by experienced architects involve some very complicated mathematics.

The "solar house" is not just a flat-roofed house with a wide overhanging eave on one side. It is a house in which lighting and heating are tied by architectural design to the position and movement of the sun. No matter what the house looks like — unless the orientation, roof pitch and amount of roof overhang are calculated on the basis of solar angles — it cannot be a solar house.

At Winnipeg, Canada, the highest point reached by the sun on December 22 is 16° 30 minutes; at Miami, Florida, it's 41° 30 minutes. Every day of the year at every latitude the sun rises at a different point on the horizon. On June 22 — at Key West — the position of the sun above the horizon (its "azimuth") undergoes a change of 174° between 11 A. M. and 1 P. M. . . . So — how shall your house be faced and built, to put the sun to work for you?

One of the feature articles in a recent issue of Architectural Record provides a set of charts whereby the architect can determine the exact sunlight and shadow — all year round — for any part of the United States.

Architectural Record is the work book of a great many architects and associated engineers. Every check shows that at least 80% of all current planning of investment building is on the boards of Record subscribers. In these offices you find the Record out in the work rooms, in use, rather than on the reception tables.

The reason is simple . . . Through exclusive circulation methods — based on Dodge Reports gathered by 750 field men — paid circulation is solicited from those who have jobs on their boards (if they are not already subscribers). From this same information background, the editorial content is accurately guided to parallel the range of subjects on which the greatest number of subscribers are currently interested.

The advertiser in Architectural Record knows that he is reaching a homogeneous audience, currently in the market for building products and services. He knows that his advertisement is of equal interest to all its readers. Here is the market place in which to keep your story told.

We have prepared a check list — "Pointers on Writing Architectural Copy" — which enforces on the three yardsticks of Appearance, Utility and Investment Value. Your copy will be mailed on request.

ARCHITECTURAL RECORD

119 WEST 40TH STREET, NEW YORK 18

OTHER DODGE SERVICES
DODGE REPORTS AND DODGE STATISTICAL RESEARCH SERVICE
SWEET'S CATALOG FILES HOME OWNERS' CATALOGS
REAL ESTATE RECORD & BUILDERS' GUIDE
Whether you're modernizing your old office or building a new one, three important considerations always pop up. They are modern lighting, air conditioning (if the budget permits), and the type of acoustical material that will provide ample noise reduction. This last is where we come in.

In selecting the right acoustical material, your local factory-appointed Gold Bond Acoustical Applicator can be of tremendous help. He is an experienced engineer—familiar with the newest types of materials, the sound absorption coefficients and the installed costs. His recommendation will be supported with detailed specifications together with samples showing colors and surface finishes.

Whatever your preference, a tile design or a monolithic treatment, there's a Gold Bond acoustical product to meet the requirements. The full line is described in Sweet's along with over 150 other Gold Bond better building materials.

Consult the phone directory under "Acoustical Materials" for the official Gold Bond Applicator in your area or write us at Buffalo for his name.

You'll build or remodel better with Gold Bond

**National Gypsum Company • Buffalo 2, N.Y.**

Over 150 Gold Bond Building Products including gypsum lath, plaster, lime, gypsum sheathing, rock wool insulation, metal lath products and partition systems, wall paint and acoustical materials.

October 1946
For America's finest post war buildings

PERMATITE ALUMINUM WINDOWS

Selected for the new buildings of the

LEHIGH VALLEY COOPERATIVE FARMERS

Now, as before the war, PERMATITE windows of aluminum or bronze are the choice of leading architects for America's finest buildings.

In the strikingly modern new buildings of the Lehigh Valley Cooperative Farmers to be located at Allentown, Pennsylvania, PERMATITE aluminum windows will be used in an interesting variety of applications. They were selected for their beauty, ease of operation and low maintenance costs.

The architectural metal work in these new buildings will also be furnished by General Bronze.

For schools, hospitals, apartments, public and commercial buildings, General Bronze can furnish specially-designed PERMATITE windows of every type in double hung, casement or projected styles.

For complete information, full size details, etc. on PERMATITE windows and other General Bronze building products, consult Sweet's or write for catalogs.

GENERAL BRONZE CORPORATION
34-15 TENTH STREET
LONG ISLAND CITY 1, N. Y.

Architectural Metal Work • Windows • Revolving Doors
Three Distinct Types — to meet the challenge of today's complex heating requirements! Never before has propeller unit heater design been so closely adapted to the expanding applications of unit heating . . . or to the critical requirements of unit heater application engineers! In this new 1947 line, Modine now gives you three separate and distinct types, developed as a matching, integrated line with 47 basic capacities . . . designed to meet the space heating needs of practically all modern industrial and commercial buildings. Modern styling and beautiful color treatment of all models opens a broad new range of installation opportunities. Advanced design features improve heating performance . . . lengthen service life . . . offer greater versatility of application. If you're planning to heat a new plant or store, investigate the Modine line. For complete information, see the "Where To Buy It" section of your phone book, or send in coupon below.

FREE!
Tear out coupon
Send for complete Catalog

MODINE MANUFACTURING CO.
1773 Racine Street, Racine, Wisconsin
Gentlemen: Yes! I want all the facts about the great, new 1947 Modine Unit Heater Line. Please send me your new catalog.

Name...........................................
Position.....................................
Company....................................
City...........................................
State.........................................
WHEN TIME STANDS STILL

When you put genuine drop-forged Von Duprins on the doors of a building . . . . time stands still. These superb exit devices will outlast the building, providing over all the years the fastest, safest, surest exit service known to man.

To the value of this remarkably long life, freedom from maintenance expense is added as an extra dividend.

See Sweets' Index, Sec. 17B/2
Eleven
COLD SPRING
Granites of Color

GIVE WIDE LATITUDE IN STRUCTURAL AND DECORATIVE PLANNING . . . AND LATEST PRODUCTION METHODS MAKE THESE COLD SPRING GRANITES MORE ADAPTABLE.

Choose the grandeur and strength of granite columns and pilasters; the exquisite beauty of granite altars, fonts and rails.

Granite steps and platforms stand the gaff of heavy traffic throughout the life of a structure.

Cold Spring granite base courses prevent discoloration of walls from soil-moisture seepage.

Architects tell us granite entrances in their buildings help to establish a desired character and individuality.

COLD SPRING GRANITE COMPANY
CHANNELED GRANITE
COLD SPRING MINNESOTA

For typical specifications and color reproductions see Sweet's 4A.

Your inquiries are invited on contemplated work.
Yes, there's four way comfort in the modern home of Arketex ceramic glazed structural tile. The entire family will delight in the comfort afforded by a home that is always cool in summer; the winter comfort of a home easy to heat; for the man of the house is the comforting realization that with Arketex tile, the first cost is the only cost! Mrs. Housewife will enjoy the comfort of beautiful walls of everlasting color, which require no more than soap and water washing to retain their luster.

A PEACETIME PROMISE

Arketex ceramic glazed structural tile is a permanent wall and finish all in one. Water, steam, ink, acids and alkalies have no effect on this ideal finish which will never scar, mar, crack or craze.

Architects favor Arketex also because of the many sizes, colors and textures available which permit them unlimited range in design.

When planning homes or offices, specify Arketex—first with the finest in ceramic glazed structural tile!
Reconversion shortages emphasize the need for building additions to existing structures in order to provide more living space. The two Balsam-Wool data sheets pictured here deal with the important matter of insulating and ventilating such additions. These sheets are part of a series—comprising more than 30—containing hard-to-get information on insulation application. The entire series is yours for the asking—without obligation—just mail the coupon!

Balsam-Wool

SEALED INSULATION

BALSAM-WOOL • Products of Weyerhaeuser • NU-WOOD

WOOD CONVERSION COMPANY
Dept. 115-10, First National Bank Building
St. Paul 1, Minnesota

Please send me set of Balsam-Wool Application Data Sheets.

NAME

ADDRESS

CITY

STATE

OCTOBER 1946
Diagram showing general dimensions and clearances required for rotation of Operay Multibeam.

Authentic Aid in
PLANNING FOR
SURGICAL LIGHTING

Provision for adequate lighting for today's surgical techniques is an important factor in the planning of the modern hospital. The wide-spread specification of Scanlan-Morris Operay Multibeam lighting fixtures is due to their exceptional efficiency—extensive flexibility of adjustment to permit angled, lateral, or direct vertical projection, and the capacity to deliver soft, white, glareless illumination into the depths of the surgical cavity.

In planning for surgical lighting as well as for other built-in facilities such as complete sterilizing equipment and custom-built recessed cabinets of metal and glass construction, the Technical Sales Service department of the Scanlan-Morris Division is well qualified to supply valuable data and assistance. This service, offered to architects without obligation, is based on 40 years of manufacturing and installation experience, and includes the benefits of knowledge that can be acquired only through extensive contacts with hospital management personnel.

Included among Scanlan-Morris surgical lighting fixtures, in addition to the Operay Multibeam, are Operay Surg-O-Ray lights of both ceiling-hung and portable types, and explosion-proof models. Complete specifications are given in the Scanlan-Morris surgical lighting catalog.

Write for this 56-Page Booklet
Included in this catalog of Scanlan-Morris surgical lighting fixtures are installation drawings and circuit diagrams of much value during the planning period. Please use your professional letterhead when requesting a free copy.

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Medical Gas Division, Cleveland; Hospital Supply and Watters Laboratories Division, New York; Feldbrink and Scanlan-Morris Divisions, Madison, Wis. Represented in Canada by Oxygen Company of Canada Limited, and internationally by Arco Export Corporation, 33 W. 42nd St., New York.

Ohio Chemical
BRANCH OFFICES IN PRINCIPAL CITIES

Manufacturers of Medical Apparatus, Gases, and Supplies for the Profession, Hospitals and Research Laboratories
Unlimited design possibilities . . . with

**Decorative Glass**

*Above:* Wall of clear Louvrex lets in abundant daylight and adds distinction to the modern design of Structon's offices in Los Angeles.

*Right:* To conceal an undesirable view of a court, and to create a sparkling background, clear Flutex was chosen for the windows in Bernhard Uhlman offices.

As a material, Decorative Glass is unique. Its design potential is enormous. Alone or in combination, it offers the architect or designer the versatility found in no other medium. Decorative Glass combines the cleanliness and sparkle of glass with distinctive beauty. It is durable, weather-resisting, utilitarian. It creates an effect of luxury even when used for purely functional purposes.

More than 20 patterns are made by the Blue Ridge Glass Corporation, Kingsport, Tennessee, and sold by L·O·F glass distributors. These patterns may be Securitized to stand great thermal and physical shock, and may be Satinol-finished or frosted to provide complete privacy yet transmit light. Blue Ridge Sales Division, Libbey-Owens-Ford Glass Company, 89106 Nicholas Building, Toledo 3, Ohio.

"Design it with one of the 5 EX's"

**LOUVREX**  **LINEX**  **FLUTEX**  **STYLEX**  **DOUBLEX**

**BLUE RIDGE Decorative GLASS**

*FOR SOFT, DIFFUSED LIGHT · SMART DECORATION · COMPLETE PRIVACY*

**OCTOBER 1946**

167
Just as modern industry turns to scientific production methods, it now turns to scientific protection for its buildings, machinery and other costly equipment. Experienced industrial engineers, architects and maintenance operators know that Plasteel Roofing and Siding is the perfect combination to provide that type of permanent protection. They know Plasteel is made of high-strength steel, hermetically sealed within a weather-tight plastic. Then for further insulation, it is finished with pure mineral mica—a combination which defies deterioration. That’s why Plasteel is corrosion-proof and maintenance-free. That’s why Plasteel is preferred above all others for factories, mines, mills, canneries and other industrial needs.

Let us send details—Write or wire today

PLASTEEL Defies—

HEAT COLD MOISTURE ACID FUMES

PROTECTED STEEL PRODUCTS

General Office and Plant  •  Washington, Pennsylvania
8 GOOD REASONS WHY!!!

...Wire insulated with GEON for manufacturing, domestic, industrial, and utilities wiring...

- Excellent electrical properties
- Thin coating of insulation
- More conductors in a given space
- Ease of handling
- Easy stripping
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- Resistance to ozone, wear, sunlight, water, chemicals, and most other normally destructive factors
- 14 colors including NEMA standards

Be sure to specify wire or cable insulated with GEON in order to get all these advantages. Or, for information regarding special applications please write Department A-10, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.
Partners who complement each other are successful. That's why Toncan Iron is able to win its fight against rust. This material is a partnership of open-hearth iron, copper and molybdenum.

In Toncan Iron, advantage is taken of the qualities offered by each of these elements. To highly refined open-hearth iron, which is remarkably free of rust-inviting impurities, is added twice as much copper as found in copper-bearing steel. Molybdenum is used to develop the maximum rust-resistance of the copper. That combination is the reason Toncan Iron has the highest rust-resistance of any ferrous material in its price class. And it's the reason Toncan Iron is completely rust-resistant throughout its entire cross-section.

But that's not the whole story. Toncan Iron has excellent workability. It's easy to cold work, cut, bend, punch, stamp, etc.

Specify performance-proven Toncan Iron to increase the life and reduce the fabricating costs of sheet metal parts. For detailed information, write for Booklet 406, "A Few Facts About Toncan Iron for Architects and Engineers."

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Graduation time for the
ADLAKE WINDOW
that was tested 1 MILLION times!

When we put an actual Adlake Window to a rigid test, it passed its one millionth opening with flying colors!

What did the test prove? Simply this:

After 1,000,000 cycles of opening and closing, the exclusive nonmetallic weather stripping used by Adlake showed little or no signs of wear!

What's more, the increase in air infiltration was practically nil, and the window moved as freely and easily as it did at the very beginning of the test!

NO WARP, ROT, SWELL, STICK OR RATTLE
An Adlake Window gives a lifetime of efficient service because it's precision-built right down to the last detail. No painting—no maintenance of the lustrous aluminum to worry about. Patented serrated guides give finger-tip control...no warp, rot, swell, stick or rattle—ever. And Adlake is designed to blend harmoniously with either modern or traditional structures.

Why not drop us a card today for complete data?

---

THE FOLLOWING TABULATION SHOWS THE RESULTS OF THE TEST, AS CONDUCTED BY AN INDEPENDENT RESEARCH FIRM:

<table>
<thead>
<tr>
<th>Number of cycles of opening and closing upper and lower sash</th>
<th>Air infiltration—cubic feet per minute per foot of inside crack perimeter at a pressure equivalent to an air velocity of 25 miles per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.237</td>
</tr>
<tr>
<td>100,000</td>
<td>0.315</td>
</tr>
<tr>
<td>200,000</td>
<td>0.320</td>
</tr>
<tr>
<td>300,000</td>
<td>0.332</td>
</tr>
<tr>
<td>416,200</td>
<td>0.437</td>
</tr>
<tr>
<td>507,800</td>
<td>0.481</td>
</tr>
<tr>
<td>750,000</td>
<td>0.557</td>
</tr>
<tr>
<td>1,000,000</td>
<td>0.579</td>
</tr>
</tbody>
</table>

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Also Window Makers to the Transportation Industry
ESTABLISHED IN 1857
ELKHART, INDIANA
NEW YORK • CHICAGO

OCTOBER 1946
Power plants, playgrounds, refineries, reservoirs, schools, airports, institutions—are but a few of many types of property which require protection against trespassing, theft and other hazards.

A sturdy chain link fence solves the problem of property protection for its initial cost is moderate—it's easy to install—and maintenance costs are amazingly low.

Only the best selected materials are used in making Wickwire, Colorado and Calwico Brands of Chain Link Fence fabric, which is further protected by hot galvanizing after weaving. Fittings are of malleable iron and pressed steel, heavily galvanized, or aluminum.

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Let us illustrate it to you briefly.

Figure 1 represents hot water falling into molten grease. Everyone knows that the two will not mix. Instead, the water is slowed down and broken up into many tiny drops spread out through the grease. This means that a vastly increased water surface area is brought into contact with the surrounding grease.

Figure 2 goes a step further to show a mixture of water and grease, resembling the waste from kitchen sinks, pouring into a layer of grease similar to that in the HydraFilter. How this layer "wipes" or filters almost all the grease from the incoming mixture is shown in detail in Figure 3.

Here a magnified single drop travels downward through the grease filter. As it does so, the tiny grease drops, being lighter, rise to the surface of the water drop. There they are "wiped off" and absorbed by the adjacent grease. The last picture shows all grease extracted from the water, as it is in all the thousands of other drops into which incoming wastes are broken up in the HydraFilter.

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![Fig. 1 and Fig. 2](image)

![Fig. 3](image)

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2 But what happens if the Aquella surface coating is scraped off? To answer that, we scraped away this portion, and there’s still no leakage. This may be slightly puzzling until you study the photograph of the third step...

3 The enlargement of a small, sawed-away section of the above block, which shows the way Aquella penetrates to fill and close each microscopic pore of the surface. It is the filling of the pores—not essentially the surface coating—which stops the penetration of water.

YOU SEE IT NOW—the principle on which Aquella works to make concrete masonry structures watertight!

The properly balanced ingredients of which Aquella is composed are so finely ground that when mixed with water, and scrubbed into the masonry, they penetrate and fill even the minutest pores of the surface.

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Moultile

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1148-B With Increaser

<table>
<thead>
<tr>
<th>With Increaser</th>
<th>Without Increaser</th>
<th>Diameter of Downspout (inches)</th>
<th>Diameter of Increaser (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of roof in horizontal projection (sq. ft.)</td>
<td>Area of roof in horizontal projection (sq. ft.)</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>2,250</td>
<td>650</td>
<td>4&quot;</td>
<td></td>
</tr>
<tr>
<td>3,800</td>
<td>1,300</td>
<td>5&quot;</td>
<td></td>
</tr>
<tr>
<td>7,750</td>
<td>2,400</td>
<td>6&quot;</td>
<td></td>
</tr>
<tr>
<td>11,500</td>
<td>3,800</td>
<td>9½&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Send us your roof drainage problems. We are sure we can be of help to you.

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ARCHITECTURAL RECORD
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This effortless action facilitates traffic flow. Since the doors swing on a shorter radius, their projection is reduced 40 to 45%. Made in bronze, aluminum and stainless steel as complete prefabricated units, ready to install, including door, frames, mullions, trim, saddles and necessary hardware. Available in a wide range of standard sizes and types or built to your specifications.

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OCTOBER 1946

187
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