Can we have better houses with 30 per cent less labor-material cost?
—A Round Table Report (p. 115)

Why the new war plants must be different (p. 83)

The new Levitt house (p. 140)

A great architect's hospital (p. 92)

A great builder's hospital (p. 100)

Florida gets a new architecture (p. 131)

Are apartment buildings economically obsolete? (p. 107)
WALLS AT WORK!

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NEWS
Building in the war economy . . . House Design Competition winners . . . NAHB Convention report.

BEHIND THE BLUEPRINTS

INDUSTRIAL BUILDING
A round-up of the latest developments in the design and construction of industrial plants—developments which make World War II plants already obsolete.

ARCHITECT’S HOSPITAL
Eric Mendelssohn’s beautiful 11-story Maimonides Hospital in downtown San Francisco provides luxurious amenities for its chronic disease patients.

BUILDER’S HOSPITAL
Andrew Eken helps build a host of economies into the Memorial Hospital at Morristown, N. J., achieves a construction cost low of $9,156 per bed. Architect: John H. & Wilson C. Ely.

CONTEMPORARY SCHOOL ARCHITECTURE
After a three year campaign in New Orleans, the architects come out on top and the city gets five new schools . . . a study of the tactics and a close-up of one of the buildings.

ARE APARTMENTS OBSOLETE?
The high cost of building service and maintenance raises an economic question whose answer is explored by James C. Downe.

ROTOLAGAR
A new invention by Rotolagar Parking Units Co. parks 400 cars on a 100 x 125 ft. lot by means of a four-car revolving elevator. Architects: Petroff & Clarkson.

ESCALATORS IN THE OFFICE BUILDING
They are working their way higher up into the building to relieve the elevators’ peak loads—An analysis of the moving stair’s increasing popularity.

SCHOOL DESIGN IN EUROPE
As presented in a new book by school Architect Alfred Roth, Europe’s recent schools hold many a lesson for U. S. designers—a review.

HOW TO CUT WASTE IN HOUSEBUILDING
A Round Table of the industry’s top technical men estimates possible savings up to 40 per cent, details how they can be achieved.

A NEW ARCHITECTURE FOR FLORIDA
A portfolio of house designs shows how contemporary architects are at last facing the challenge of wind, sun, glare, rain, rot and bugs. Architects: Marion Manley, Alfred Parker and Igor Pevsner.

LEVI'S' LANDIA
Alfred Levit’s new $13,000 house with its three bedrooms, two baths and two-car garage spotlights the trend in medium-price merchant building. And, although shelved for the duration, the new community planned by the Nation’s No. 1 home builders sets a noteworthy pattern for housing planners.

REVIEWS

PRODUCT NEWS

TECHNICAL LITERATURE

Cover: Maimonides Hospital, photo by Thomas D. Church
In these days of critical shortages—when men and money and material must be used to the very fullest, there is one method of building that truly meets the need on every count—it's Ceco's Meyer steelform construction.

For here is a building way that saves as it serves:

*Saves* men because less time and labor are required in providing open wood centering and form work.

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THE INDUSTRY'S ECONOMIC FUTURE, presaged in the President's Economic Report, includes more Government building, less luxury housing, credit controls for existing housing, tighter rent control

Significant passages in the President's Economic Report indicate that Government-built housing will be given a much larger part than housing officials have so far been willing to suggest, that the responsibility for building and managing defense housing will be given to local authorities, that housing production will be quite strictly programmed; that this may involve coordination at a higher level than HHFA; that this programming is likely to involve severe limitations on so-called "luxury" houses; that control over credit on existing houses will be sought; that a controlled-materials plan will be introduced as rapidly as preparations can be made; and that rent control will be reintroduced.

Following are pertinent excerpts from the President's report which point to such a future:

"In areas of defense expansion . . . the housing supply will need to be enlarged considerably. The emphasis should be upon rental housing serving the needs of middle and lower income families, along with necessary community facilities. While private industry should be encouraged to do as large a part of this job as it can, the experience in World War II makes it clear that publicly financed housing must serve a larger portion of this type of need than in ordinary times."

"Previous experience also demonstrates that, wherever possible, such housing should be built by local agencies, with Federal aid when needed, rather than by direct Federal construction."

"The scheduling of housing for defense workers needs to be integrated more closely with other aspects of the defense program. In addition, the general determination of what volume of total housing can be permitted in the near future, throughout the country, will be made most wisely in the framework of the complete resource programming operation which the Council has identified as a first need of the whole defense effort. Housing is so essential to our general strength, that decisions affecting housing should rest upon the general strategy of the relative emphasis being placed upon immediate military needs and long-range economic strength."

"In the case of housing, the adaptation of the program to a defense economy will require modification of the over-all approach taken in Regulation X. Terms applicable to some housing construction may have to be further tightened. In general, a more selective approach will be required. Measures will be needed to adjust the character of this housing — as to prices, rents, and size — to the needs of defense workers. Still other measures may be needed with respect to the general housing program, so that throughout the country the limited supply of new houses may be made to serve first needs first. To encourage a larger volume of rental housing, legislation should provide the FHA with a special type of insurance authority, differing in terms from the current legislation and concentrating mainly upon defense needs. A substantial volume of public housing will also be needed, with reshaping to meet defense requirements."

"One serious defect of the Defense Production Act of 1950 is that it does not contain authority to prescribe credit terms on the sales of existing homes, except on mortgages insured or guaranteed by the Federal Government. Exemption of these homes from credit regulation may result in a large rise in the price of existing homes, thus adding credit-created capital gains to the spending stream. A rise in the price of existing homes would intensify inflation also, by affecting prices on new homes."

"[Holding the line on wages] requires much tighter rent control, reinforced by adequate legislation for that purpose, because rent is so large an item in the cost of living of middle income and low income families."

Construction Industry Advisory Committee met with NPA officials early last month to discuss the impending commercial building ban (see page 13). Committee members, representing all branches of the building industry, included (l.) General Electric's A. W. Gilmour, Builder J. E. Merrion, Hercules Cement's President D. S. MacBride and Builder Thomas P. Coogan; (c) Weyerhaeuser's T. L. O'Gara, Contractor H. C. Turner, AGC President W. L. Course, and NPA's J. W. Follett; (r.) St. Louis Building Commissioner A. H. Baum and Contractor J. N. Lindsie.

LAST MONTH'S WASHINGTON DIARY

1/3 Defense Minerals Administration prohibits hoarding of 50 critical minerals, including iron ore, copper, aluminum, zinc, magnesium, asbestos, mica
1/5 HHFA extends time limit six months (to June 30) for Title I (slum clearance) grants
1/11 Defense Housing Bill (S.349) introduced in Congress
1/12 Federal Reserve Board extends housing credit curbs to multi-family structures
1/13 NPA bans commercial building until Feb. 15; after which license is required (amendment to M-4)
1/13 James W. Fallin resigns as chief of construction controls division, NPA
1/15 NPA recommended in earlier zinc order by 20 per cent reduction in use of finished zinc for various end-products: automobiles, appliances (re-defined "finished zinc")
1/22 NPA bans use of tungsten (except in small amounts) for coloring rubber, linoleum, wallpaper (i.e. pigments); (M-30)
1/22 President names five-man commission headed by William S. Foley to study national's long-range materials problems
1/23 NPA bans use of stainless steel, high-content nickel alloy and nickel silver in more than 400 items; e.g. no nickel for doorknobs, downspouts, roofing, etc. (amendment to M-14). Also restricts nickel plate.
1/26 Prices and wages frozen by Economic Stabilization Agency
1/30 NPA promises extension of deadline on end-use copper ban 2-3 months past Apr. 30 (amended to M-12)

DEFENSE HOUSING BILL, packed with everything from government building to prefab aids, faces tough going

Congress had scarcely warmed the seats in its renovated legislative chambers (prissy members thought they bore too much resemblance to a night club) before the Administration dumped a whopping new defense housing bill on its doorstep. Master-minded by HHFA Administrator Foley and his bevy of experts, it was the omnibus type of legislation—as had been expected. A liberal new FHA program patterned after wartime Title VI was combined with straight government construction for the less stable type of defense area. Thrown in for good measure were new loans for prefabricators, an expansion of Wherry Act housing for military centers and a scheme for thwarting land speculators around spec.

(Continued on page 12)
WHO wouldn't like to go to college, with a dormitory as handsome as this to live in? The Mabee Men's and Women's Halls have a lifetime of efficient service built into them, too. Gold Bond metal lath and plaster products, including famous Best Bros. Keene's Cement, were used throughout.

Whether a job is big or small, there's definitely a big advantage when Gold Bond products are used exclusively. It means that the sole responsibility for material performance rests on one reputable manufacturer, National Gypsum Company. The over 150 better Gold Bond building products are fully described in Sweet’s, and they're available at your local Gold Bond Lumber and Building Materials Dealer.
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You benefit—your clients benefit—from the great and ever-growing popularity of Permaglas Automatic Water Heaters. Popularity means mass production—mass production means economy—and the savings are passed along to you. Result? Now there's no premium price on premium-quality Permaglas!

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Tough going in Washington

Dutifully, the Senate and House Banking Committees started struggling with the bulky measure (53 pages) in a series of hearings. Oddly enough, Administrator Foley's mimeographed explanatory statement ran as long as the bill itself—one page more to be exact. By the end of last month, the legislative going was tough. Even the bill's friends admitted that the situation looked discouraging. Republican members, more cocky than ever because of their increased strength in the new Congress, were openly critical. There was also some criticism from the Democratic side. To add to the Administration's woes, jurisdictional squabbling broke out between rival executive agencies. The Federal Security Administration felt that the HHFA was encroaching on its territory in respect to federal aid for schools and hospitals in congested defense areas and made no bones about carrying its grip to Capitol Hill. Actually the bill was silent on this score but the assumption was that Administrator Foley in his over all programming of community facilities would toss the ball to FSA when the proper occasion arose.

The criticism most frequently leveled against the legislation was that it delegates an excessive amount of authority to the Administration. The most controversial section—Title II which calls for public housing in places where the executive agencies do not believe that private enterprise can meet the problem—is virtually wide open. There is no limitation on the volume of housing that the government can construct itself. Neither is there any ceiling on the amount that can be spent for community facilities.

SUMMARY OF DEFENSE HOUSING BILL

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Government Aid</th>
<th>Terms</th>
</tr>
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<tbody>
<tr>
<td>Private construction of single-family houses in defense areas under new Title IX of FHA.</td>
<td>Government-insured loans. Loan to value ratio: 90% but not to exceed $8,100 per unit with an additional $900 for the third and fourth bedroom. Appraisals to be on long-term value and not a current cost basis as under wartime Title VI.</td>
<td>Twenty-five-year maximum amortization period. Maximum interest 4 1/2% (actual rate will probably be set at 4 1/2% to conform to lower rate put into effect last spring for Title II).</td>
</tr>
<tr>
<td>Private construction of multi-family rental developments.</td>
<td>Government-insured loans. Maximum mortgage amount: $5 million; may not exceed 90% of value or $3,500 per unit of four rooms or more or $2,000 per smaller unit.</td>
<td>Probably a lending period of 32 years and 7 months with interest at 4%.</td>
</tr>
<tr>
<td>Private construction of multi-family housing at military posts (Wherry Act Housing). This portion of FHA program is extended two years from expiration date of June 30, 1951; also expanded to include rental housing at atomic energy installations.</td>
<td>Government-insured loans. Maximum mortgage amount: $5 million; may not exceed 90% of value or $3,500 per unit of four rooms or more or $2,000 per smaller unit.</td>
<td>Probably 32 years and 7 months with interest at 4%.</td>
</tr>
<tr>
<td>Public construction of housing in designated defense areas where private industry cannot meet the need. One-to-four family structures will be favored. Provision is made for mobile housing where need is obviously temporary.</td>
<td>Direct government construction and management shopped out by HHFA to local housing authorities. Cost limits: $9,000 per unit for two-bedroom apartment with extra installations of $1,000 allowed for a third and fourth bedroom.</td>
<td>Intention is to amortize cost in not more than 40 years. Rents must be based on value of property.</td>
</tr>
<tr>
<td>Construction by public and nonprofit agencies of schools, hospitals and other community facilities in defense areas. To prevention of undue land speculation in vicinity of remote federal installations, Land is to be resold to private developers. Prefabricated housing.</td>
<td>Government loans and grants. Grants may not exceed portion of cost HHFA decides is caused by defense impact.</td>
<td>Land may be sold under such conditions and terms as President may determine.</td>
</tr>
</tbody>
</table>

Tougher going in the field

While spokesmen for private enterprise groups in the building and home financing fields have not yet presented their testimony, it is an open secret that they take a dim view of the public housing section and most of its fellow travelers such as the proposed programs for helping out with community facilities and giving prefabricators a shot in the arm. Most industry men would settle for an expanded FHA program. As a matter of fact, there has already been talk of an amendment that would strike everything else from the bill except the FHA section.

Another objection is that the measure is somewhat premature; that there has been no appreciable flocking of workers to industrial centers. Administrator Foley has frankly conceded that the great defense migration has not started yet. But he believes it is none too soon to prepare standby legislation. He has advanced the not implausible argument that much of the flusterling which marked the previous war housing program was primarily due to the fact that the government did not start to move until the emergency was upon it. Other federal officials have carried this line of reasoning a step further; have warned that the private enterprise camp may well defeat its own purpose if it adopts obstructionist tactics. Their contention: If the program is delayed too long, time will become of the essence. Then the question of who builds the houses and the type of construction employed will become of secondary importance. The crying necessity will be to put roofs over the heads of workers converging on a defense hot spot through any kind of makeshift device. Under such conditions the government would have to intervene more vigorously with public housing.

Actually, the public housing section was not without redeeming features. In the first place, the policy proclaimed was to let private builders carry the ball to the greatest extent possible. Foley kept emphasizing this point in his testimony. Also it was clear that some lessons had been learned from the last fiasco. Where the government had to intrude, the bill placed stress on permanent construction. Trimmed down housing of the so-called temporary type was to be held to a minimum since experience has shown that it uses almost as much critical material as conventional building and imposes well nigh insuperable maintenance problems. Moreover structures of the two-to-four family type were to be favored to facilitate disposition. Theory is that such housing would be more readily salable later on; would be a natural for veterans banding together in a cooperative venture.
One thing that mystified Congressional critics as well as industry spokesmen was Foley's apparent lack of interest in using some of his present powers to ease the housing pinch in defense areas. By merely setting aside Regulation X in appropriate places he could obviously do a lot in providing immediate relief. In fact, Representative Clinton McKinnon (D) of San Diego had pressed him on this point during the House Committee hearings. McKinnon said that housing was already tight in his West Coast community and that airplane production being impeded as a result. Other members called attention to the growing pains being felt elsewhere such as in the vicinity of the H-bomb project site in the Savannah river area of South Carolina and Georgia.

Relaxation of Regulation X

As a matter of fact, HHFA and FHA were already grappling with the problem and expected to have a plan whipped into shape in a few weeks for exempting certain places from the credit restriction imposed by the regulation. They were not too enthusiastic about this maneuver for several reasons. For one thing, they pointed out that the regular FHA program (Title II) was at best a clumsy device for meeting the needs of defense workers. Even with FHA's counterpart of the regulation removed, the most liberal financing deal that could be arranged would be a 90 per cent mortgage on a $7,000 house and an 85 per cent loan on multifamily developments in the average cost brackets. These terms were nowhere near as attractive as those proposed for the new defense housing section of FHA—full 90 per cent loans on $9,000; $10,000; and $11,000 houses (depending on the number of bedrooms) and the same high percentage financing for multifamily rental units.

But what worried the government's housing hierarchy the most was the fact that Title II is geared to the owner-occupant type of housing market. It is virtually impossible for builders under this section to stay on the mortgage and rent their houses for a spell to designated types of tenants such as defense workers. Building men tended to sniff at such qualsms; asserted that anything that added to the store of housing in a community would ease the pressure even if defense workers were not the beneficiaries in the first instance.

Would the bill pass? Most observers were inclined to believe that something would eventually squeak through. But they were leary about predictions as to what it would look like or when it would pass. Best bet was that even a toned down version would not emerge before the end of March.

**COMMERCIAL BUILDING BAN** institutes permit system, hints at industrial building control, 
causes Follin's resignation from NPA

When it decided last month to do another amputation job on building and chop off commercial construction, National Production Authority was not pulling a real surprise. The move had long been expected. More disturbing than the order itself was what it might portend. There was anxious speculation in building circles concerning the imminence of further surgery.

There were hints, however, that within a few months some attempt might be made to trim down construction in the industrial field. True, most work of this sort is inseparably linked with rearmament. But top NPA officials strongly suspect that there is a sizable volume of plant construction under way or contemplated that could not qualify as to essentiality. Then there were rumors about a ban on luxury housing.

An amendment to the original M-4 order issued last fall, the ban on commercial construction halted in its tracks all work that was not under way at midnight of January 13. Building jobs covered by the amendment include banks, hotels, garages, service stations, stores, restaurants, office structures, and mortuary parlors. Multiple use buildings involving one of the prohibited types of construction also came under the edict. Example: An apartment house with shops or services would have to get clearance.

(Continued on page 19)

**NEW AIR FORCE BARRACKS** provide more amenities, cost less

This trim new steel and glass barracks soon to be built for the Strategic Air Command (SAC) at Offutt Air Base, Neb., is an inviting departure from the dreary old open bay building so familiar to ex-GI's of World War II. Instead of row upon endless row of dingy cots, the new structure will offer enlisted men a semi-private room, room-width windows, study desks, reading lamps, twin beds and Venetian blinds. A lavatory for each room, and a shower and toilet between each pair of rooms are two more luxuries added at the insistence of SAC's Commander, able, hard-driving Lt. Gen. Curtis Le May. Mentor of this experiment, Le May's design philosophy reads thus: "There's no reason... why the men should have to stand in line in the mornings to shave, or why they should have to stack their belongings in foot lockers and sit on bunks. They should have closets, chairs and desks for reading and study. I believe we can provide for them and I believe we can do it for less than the old barracks cost."

And he did. Construction cost of the new quarters will be $1,500 per man, or a cool $500 less than the old-type structure. The new barracks will house 216 men in a 3-story building 37 x 282 ft. Chief cost-cutting features: Three- instead of two-story construction, exterior wall sandwich panels of sheet metal and glass fiber interior walls of fireproof asbestos. Steel floor sections and window assemblies will be prefabricated—one unit for each half floor. The building was designed by the air installations office of SAC to be built for October 1 occupancy by the Korshoj Construction Company of Blair, Neb.

Could the new crop of GI's expect more privacy, comfort and storage space than their elder brothers had in World War II? Not yet, except for the lucky 216 at Offutt. But Gen. Le May thought this design might indeed become a prototype for future cantonment construction.
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Automatic Fire Doors

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A design study for The Mosaic Tile Company to illustrate uses for ceramic tile in a contemporary house

by Serge P. Petroff A.I.A. and Harvey P. Clarkson A.I.A.
132 E. 58TH STREET, NEW YORK 22, N.Y.

In the architects' search for materials which help to express the practical utility of functional design, Mosaic Ceramic Tile is finding wider and wider acceptance.

In this living-dining room study, the architects clearly illustrate how Mosaic Ceramic Tile may be used in several ways to provide an unusual combination of lasting utility and beauty—a warm and attractive background for pleasant, carefree living.

Several types of Mosaic Ceramic Tile are used in the study. Mosaic Granitex for the floor over a concrete slab in which heating pipes are placed; Mosaic Glazed Wall Tile for decorative surface on two walls; Mosaic Carlyle Quarry Tile in the construction of the fireplace, as the surface for a unique bench served by movable seats and as steps to reach the dining area on an upper level.

The complete Petroff-Clarkson Study is available at no cost. Three folders describe the study, provide tile specifications and radiant heating computations. Use the coupon on the opposite page.
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Mosaic Granitex Tile is made from a blend of native clays. Its distinctive, pleasing texture is restful and easy to live with.

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Grecian spiral floor in red Granitex, as specified in the Petroff-Clarkson study. It is made up of units 1" x 1" and 2" x 2". Pattern No. 2251A.

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This attractive office is a typical Hauserman Movable Steel Partition installation. It was pre-engineered and prefabricated in the Hauserman plant by long-experienced Hauserman experts. It was quickly erected by Hauserman men. And in a matter of a few hours, the entire room can be transformed into an entirely different layout, with no muss, fuss or delay.

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This clearance loophole gives the amendment a more liberal hue than the original order. In clamping the lid down on construction of the frivolous variety last fall NPA adopted a hard-boiled policy toward exemptions. It would only grant dispensation in hardship cases. In the commercial building amendment, however, it shifted from the negative to the positive approach. Provision was made for granting relief on a broad basis under a new permit system. Generally speaking, a project will get the go ahead signal if it: 1) furthers the defense effort, 2) is essential to public health, welfare, or safety, or 3) alleviates or prevents a hardship to a particular community. Since it had to recruit an enforcement staff and set up the administrative procedure, NPA allowed an interval of a month between the time it issued the ban and the date for submitting applications for construction permits. The applications were not to be presented until February 15. The regional offices of the Commerce Department are designated as filing places.

Behind the decision to use a permit system was more than a sudden inspiration. Affable James Follin, whom General Harrison had borrowed from the General Services Administration to organize NPA's construction section, had been a constant plugger for the idea. He was convinced at the start that it was a mistake to crack down on all commercial construction and then only let projects proceed on an individual hardship basis. In a huddle with top NPA policy makers and an advisory committee representing the building industry and labor he hammered home the point that it would be utterly unrealistic to narrow down relief in this manner; that many necessary projects would be checked off.

As Follin put it, a broad permit system would reverse the roles; make the government go on the offensive and find reasons for ruling out a proposed undertaking. Moreover, he pointed out that the waiting period before building promoters started the qualifying process would result in an accumulation of applications and thus give the administrative staff a wider basis of judgment in formulating policy. Members of the advisory committee were in substantial agreement with his proposals.

Unfortunately for the industry, Follin only scored a half-way victory. In the end, NPA accepted the permit system but rejected his proposal for a reasonably long waiting period. Since he did not believe he could do the right kind of a job under such conditions he reluctantly decided to wash his hands of the whole business. He relinquished his post, returned to GSA.

**WAGE-PRICE FREEZE contains industry exemptions. Copper controls may be eased.**

There were several gaps in the interim price-wage freeze order of last month. One of them concerned rent levels and the administration was trying to plug it. Congress had put its foot down in this respect when it passed the Defense Production Act; prohibited any tinkering with rents or real estate prices. Also exempted from controls were professional services, commissions and fees in general. This meant that, initially at least, large segments of the building industry were not affected by the order. Architects, engineers and contractors were obviously out from under. And so were builders. However, material and equipment prices were definitely covered as were the wages of building workers.

Actually the President wanted to go further than getting a toe hold on rents. In his economic message he had come out flatly for an expansion of the credit control mechanism—Regulation X—to include the price of existing houses see page 9. While it is possible under the FHA and VA programs to keep the price of existing houses in line through regulating downpayments and amortization periods, the companion controls dealing with private mortgage financing only apply to new construction. It this discrepancy that the President was trying to remove on the plea that it left too much of a chink in the dyke against inflation.

On the material control front, NPA was constantly tightening its squeeze on scarce metals. Known to be in the works was an amendment to the aluminum order that would rule out a long list of end use products such as windows frames and Venetian blinds. In its efforts to ease the impact of the controls, the Senate Small Business Committee has called the NPA regulators to task on several occasions.

Attempts of the committee to take some of the kinks out of the copper restriction program had to be abandoned temporarily. Reason: In its frenzied gyrations and shifting around of personnel, NPA could not muster a single official who could present a clear-cut statement on the copper order; much less make sense about it. Probably the worst mix-up was due to the clause prohibiting the use of copper pipes and a host of other items of a so-called non-functional nature after April 30, regardless of the supply on hand. By month's end this nonsensical gimmick had stirred up an angry chorus of protest. A relief measure in the form of an extension—perhaps through June—was promised.

**APARTMENT BUILDING CONTROLS, milder than expected, favor duplexes.**

Just at the time it was trotting out the defense housing bill to stimulate rental construction, HHFA in tandem with the Federal Reserve Board put finishing touches on its long contemplated plan for putting multi-family structures under credit controls. It was an inconsistency that did not fail to draw caustic comment from the building industry. But a re-reading of the amendment in its final form calmed most ruffled nerves. It was not as tough as had been expected. Effective as of January 12, the regulation deals mainly with apartment construction defined as structures of more than four-family units. The maximum mortgage may not exceed $3 per cent where the value per family unit is higher than $7,000; the top mortgage ratio is held to 53 per cent. Maximum mortgage per unit is $8,100.

In addition, the order brought three- and four-family residences under controls similar to those imposed previously on one- and two-family structures. Unexpectedly it gave one- and two-family units a break by shifting the approach from a structure to a unit basis. The effect is to liberalize the mortgage terms in respect to duplexes. This is because a duplex can be divided into two units in determining the amount of the maximum mortgage, whereas before the computation was on a structure basis. Thus a duplex costing say $25,000 can be split into two units of $12,500. Since the mortgage ratio is reduced as the price increases, this results in a substantially higher loan—$18,400 as against $12,500.

*(News continued on page 23)*
Micarta is the *quality* high pressure plastic laminate made by Westinghouse. It is preferred by experts because it is *always* uniform in coloring and pattern—because its finishes are superior (a beautiful high gloss or a perfect satin) — because it is practically impossible to scratch, chip or dent it—because virtually nothing will stain it.

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* available in stock from warehouses.

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20 architectural FORUM February 1951
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To help you plan your vertical transportation for peak efficiency, Westinghouse offers "The Buyers Guide for Freight Elevators," B-4402. This is the most complete source of vital information available on the proper selection and application of freight elevators. Write on your letterhead to Elevator Division, Westinghouse Electric Corp., Dept. F-1, Jersey City, N. J.

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CERTAIN-TEED'S CERTILE
the incombustible, acoustical tile that blends all the desirable features of famed Fiberglas*—incombustibility, moisture-resistance, warp-and-shrink-proofness.

In sizes 12" x 12" and 12" x 24"; perforated and plain surfaced, with painted bevels; in two thicknesses—¼" and 1"; high degree of light reflection.

CERTAIN-TEED'S INCOMBUSTIBLE CERTACOUSTIC
differs from Certile in a few minor refinements—unpainted bevels and 70 percent light reflection. It is ideal when low-cost, fire-safe acoustical tile is required.

In two thicknesses—½" and ¾" in 12" x 12" units; ¾" in 12" x 24" units; perforated and plain surfaced.

NOTE: Where decorative effects require the use of plaster, consider Kaitte—the highly efficient sound-absorbing plaster, fireproof, vermin-proof, economical.
PRIZE HOUSE DESIGN IN NAHB-FORUM COMPETITION wins $8,250
for Harvard’s Bruce Walker

During the last three months of 1950 more than 2,700 architects, designers and architectural students from coast to coast tackled the problem of designing an ideal small house for the average American family. They studied FHA and VA design and construction requirements; they learned about builder’s problems straight from the builders; then they sharpened their pencils and worked out on paper their idea of the best possible solution to the building industry’s knottiest problem—a handsome, livable, buildable three-bedroom house within the limits of 1,000 sq. ft. and a $11,000 sales price.

They were working for the biggest pot of gold ever offered in a house design competition—$57,000 in major awards, plus as yet uncounted thousands of local prize dollars. They were contestants in the NAHB-FORUM House Design Competition sponsored by the National Association of Home Builders and this magazine (which also conducted the competition) and co-sponsored by a half-dozen manufacturers and trade associations serving the building industry. (Associate sponsors: American Gas Association, General Electric Co., Kwikset Locks; Special Award sponsors: Douglas Fir Plywood Association, Libbey-Owens-Ford Glass Co., Youngstown Kitchens by Mullins Mfg. Co.)

After submitting their designs on December 15, these contestants had anxiously wondered 1) who would judge them and 2) who would win. On January 23 at the annual NAHB convention in Chicago the answers to both questions were announced before a packed ballroom session (p. 27).

The Jury who, along with its assistants, had worked 106 man days screening and evaluating the 2,730 entries, was chaired by Pietro Belluschi, noted Portland, Ore. architect and new dean of MIT’s School of Architecture. His colleagues on the National-Regional Jury were Housebuilder Fritz Burns of Los Angeles, past president of NAHB and producer (with Industrialist Henry Kaiser) of several complete communities of small houses; Housebuilder Cy Williams of Port Washington, N. Y., producer of houses by the hundreds on Long Island; Architect Charles Goodman of Washington, D. C., designer of several groups of outstanding builder houses in that area; and Architect O’Neil Ford of San Antonio, most recently in the limelight for his perfection of the Youtz-Slick system of jacking up concrete slabs from grade to roof. Their associates in the selection of special award winning designs were Architects Whitney Smith of Pasadena, Philip Will, Jr. of Chicago, and L. Morgan Yost of Kenilworth, Ill.

This Jury of recognized experts picked 63 winners for the competition’s 84 awards. Top honors and $8,250 in cash went to Bruce Walker, whose design (see cuts) placed first in the Northwest regional contest ($750) and went on to win first prize in the National judgment ($7,500). Unlike many of the other entries which were small, unworkable, unlivable condensations of big houses, Walker’s is a big little house—the kind a builder can easily put together and easily sell.

A 27-year-old, married Navy veteran with a 7 months’ old daughter, winner Walker hails from Spokane, graduated from Washington University, is now working on his masters degree at Harvard. (He hopes to earn it next June.) His office experience includes work with The Architects Collaborative, whose houses and educational buildings have frequently been presented in this magazine. He plans to use his prize money to repay educational loans and “to buy baby clothes.”

A complete list of prize winners appears on pages 54 and 60. Next month The Magazine of BUILDING will devote its entire issue to the 30 National and Regional prize houses and to the most interesting details of the 33 other special award winners.

(News continued on page 26)
In these times of scarcities it is more than ever important to remember that two or more heads are better than one. Your suppliers, for example, know a great deal about the materials they handle, how to select, specify and install them.

No matter what you buy it will pay you to draw upon this knowledge. It may help you make scarce materials go further, reduce costs of installation, perhaps even suggest a substitute.

AND of course for close collaboration regarding permitted uses of such Revere Building Products as Revere Copper Water Tube, Revere Copper Pipe, Revere Red Brass Pipe, Revere Sheet Copper for Flashing, Revere-Keystone Interlocking Thru-Wall Flashing* and Revere-Simplex Reglet Flashing*, get in touch with the Revere Technical Advisory Service through the Revere Distributor nearest you.

SEE OUR CATALOG IN SWEET'S
Mengel's hardwood Stabilized Solid Cores are deeply slotted both with and across the grain to absorb expansion and contraction internally without changing the dimensions of the door. The entire poplar core assembly is tongued-and-grooved into the dove-tailed wedge-locked hardwood frames, with enough tolerance to absorb stresses.

Designed and built to withstand severest conditions, Mengel Solid-Core Flush Doors are better. Get all the facts. Write today for new full-color A.I.A. descriptive catalog, including specifications.
NAHB CONVENTION: Housebuilders meet to define role in mobilization crisis, fail to come up with a clear-cut answer. But, they agree on one thing: the free and easy boom is over.

Last month, 7,000 builders crowded into NAHB's seventh annual convention at Chicago's Hotel Stevens to learn what mobilization meant for them.

The answers were somewhat confused, mainly because of indecision in Washington over building's defense role. But this much was clear: The industry will do well this year if it builds the 850,000 units which Washington says it can build. Most of 1951's production will be for "peace time" use, with defense housing a minor factor at least for the first nine months. Material and labor prices will be higher despite the wage price freeze. Most materials will be in short supply and some simply won't be available.

Besides listening to these sobering facts, the delegates carried out the following business:

- Elected as their new president W. P. (Bill) Atkinson of Oklahoma City (BUILDING, Jan. '50).
- Disapproved large sections of the Defense Housing Bill now before Congress.
- Awarded $55,000 to winners of NAHB-Forum small house competition (see pp. 23 and 54).
- Voted an intensive program for defeating public housing on the local level.

The biggest news was the convention's decision on the Defense Housing Bill. (For a description of the measure see p. 9). Despite the heavy dose of liberalized FHA mortgage insurance provided in the $3 billion omnibus bill the builders balked at approving the proposals for government sponsored housing to be built in areas where builders allegedly can't build. In doing this, they put themselves on record that they could handle all defense housing needs "if not hindered by unnecessary and unrealistic restrictions."

In its policy statement, NAHB suggested that this could be accomplished by amending existing legislation rather than writing new laws. Single and multi-family units for defense areas could be had by lifting Regulation X credit restrictions and by authorizing FHA to insure 90 per cent mortgages once again. For temporary housing projects, it proposed a separate FHA "defense insurance fund" to insure loans on rental projects of mobile or demountable houses.

Intra-mural differences. The convention's position on the defense bill was the end result of long and sometimes bitter discussions by top NAHB officials behind closed doors. There were two clearly defined sides. One, lead by outgoing president Tom Coogan, argued that there were enough safeguards within the bill (and in the attitude of HHFA officials who would administer it) to prevent any serious abuse by public housers. The other side, influenced by a small group of builders who are strongly allied with the National Association of Real Estate Boards, balked at approving any bill with public-housing features in it. After two days of discussion, it was clear that the opposition group was on top. One major factor was a table-thumping speech by Senator Everett Dirksen (R. Ill.) at the first general session of the convention. Said he: "The bill is nothing more than a blank check for the Administration. It would completely socialize the American housing industry and there would be no going back."

When HHF Administrator Raymond Foley arrived in Chicago on the third day of the convention to defend the bill before
Large crowd attended design panel discussion in ball room, witnessed award of NAHB-FORUM competition prizes. National first prize winner Bruce Walker and wife are shown at lower right.

NAHB's board of directors, it was already too late. (The importance he attached to NAHB's endorsement of the bill was indicated, however, by the fact that he brought with him from Washington HHFA's chief legislative strategist, General Counsel B. T. Fitzpatrick.)

Fewer houses ... If the industry's role in defense housing was still undetermined, one thing was clear: there would be nothing approaching last year's 1.4 million unit production. In his speech to the builders, Ray Foley said that the 850,000 unit estimate for 1951 made last September when Regulation X was announced still stood, despite the military setbacks in Korea, but that he could not guarantee its not being revised downward.

Although the convention went piously on record approving the 850,000 goal, the average delegate had his doubts about his own particular share of the 1951 market. Very few of them had set a firm program for the coming year. "I don't know whether to build 5 houses or 50—or go back into the insurance business," cracked one. The higher down payments required by Regulation X were the biggest immediate drawback although material shortages loomed larger every day. Builders of higher-priced houses reported little difficulty in getting the big down payments required. But in the lower brackets—the bulk of the market—the problem was different. The only salvation for most builders in this category was the backlog of FHA commitments which they had filed before Regulation X took effect. Many builders reported they had enough of these to last them through the middle of the year.

... And less materials. Getting enough materials to build these houses was another problem. The most crowded session at the convention was the panel discussion by industry leaders and government officials on materials. The general theme was the prospect of restrictions, priorities and shortages from here on in. J. L. Haynes, director of National Production Authority's building materials divisions, warned that NPA's limitation orders curtailing the use of metals will soon be felt in the building-materials field. The additional $20 billions for defense requested by the Administration in the middle of January will mean a further tightening of material controls.

There was, moreover, no assurance by Haynes and other government officials that builders would have enough substitute materials to go around. HHFA Research director Richard Ratcliffe admitted, under questioning from the floor, that there might (Continued on page 31)

At the panel on better design, Moderator Clarke Daniel of Washington, D. C. warned builders to save materials by eliminating wasteful design practices. "From now on it is going to be root hog or die; home builders are good rooters."

Exhibit of winning designs attracted thousands of builders during convention's four days.

Three members of the NAHB-FORUM competition jury took part in the convention's design panel: Long Island Builder Cy Williams, Chicago Architects Philip Will and Morgan Yost.
How important is "efficiency"?

There is a common tendency to base the selection of an acoustical material almost entirely upon its noise‐quieting efficiency. This is not always justified. Actually, small differences in acoustical efficiencies cannot be detected by the human ear. Furthermore, tests which determine these efficiencies cannot be carried out to pin-point accuracy. Therefore, unless there is a special noise problem requiring very high absorption, more emphasis should be placed on the other features of the available materials. Here are some of the reasons why.

How accurate are "efficiency ratings"?

Most materials are tested regularly by the Acoustical Materials Association. The results, which show their performance at various sound frequencies, provide a valuable standard of comparison for the whole industry. But the AMA cautions that these tests may be as much as 7% inaccurate. In addition, the resulting figures are "rounded out" to the nearest .05 after tests are completed. They serve mainly as a general guide in classifying acoustical materials into groups and in showing their relative efficiencies at various frequencies.

"Noise-reduction coefficients"

Absorption values of materials are expressed in "coefficients" at each frequency. The "noise-reduction coefficient" is an average for the middle frequencies. While it is a good general guide, it doesn't tell us how well a material absorbs sound at the higher frequencies. These higher frequencies cover the high-pitched, piercing noises. These are the sounds that are the most annoying, and therefore the most important ones to subdue.

How to specify efficiency

When only one coefficient is specified, the choice is limited and better materials may be ruled out. As an example, if a material with an approximate efficiency of .70 is desired, the specification might well read as follows:

```
Acoustical material shall have a noise-reduction coefficient in the range of .65 — .70 — .75. Tiles shall be 12" x 12" and ¾" thick.
```

Thus, it's possible to take advantage of other product features. The Armstrong Line of materials, for example, offers not only a full range of efficiencies, but also such features as low cost, fire safety, repaintability, moisture resistance, and appearance.

What about costs?

In most jobs, cost is an important factor. However, efficiency needn't be sacrificed for cost, because the lowest cost materials can usually deliver a fairly high amount of noise reduction. From the standpoint of both initial and installation costs, the most economical materials are the perforated tiles made of wood fiber. Armstrong's Cushiontone is a good example. This material is particularly suitable for ceilings in corridors, general offices, and cafeterias, where vast areas must be treated. Its noise-reduction coefficients range from .55 to .75, depending on the thickness used and the method of application. Next, in order of initial cost, in the Armstrong Line, are Travertone, Corkoustic, and Arrestone.

Building codes and fire safety

If codes demand incombustibility, a mineral wool tile like Armstrong's Travertone is called for. At higher cost, a metal pan unit like Arrestone, which contains a fireproof mineral wool pad, can be used. If codes merely specify a slow-burning material, a cork tile such as Corkoustic is suitable. Cushiontone also meets this specification when finished with a special fire-resistant paint.
Maintenance
Ease of maintenance is an important consideration. All of the Armstrong materials have washable finishes. Repaintability is also important, particularly if repainting clogs perforations or fissures and reduces absorption efficiency. While materials with fissured surfaces can be repainted by using the proper methods, those materials which are mechanically perforated are best suited for repainting. Test units of Cushiontone, for example, have been repainted 22 times without noticeable loss of efficiency.

Beauty may be important
Although most of the popular materials are neat in appearance, some jobs may call for an extra measure of beauty on the ceiling. In foyers, executive offices, display rooms, and similar interiors, the textured finish of the fissured tiles is often preferred to the more symmetrical aspect of the perforated types.

What about moisture problems?
Excessive humidity in areas like kitchens and swimming pools can be destructive to most acoustical materials. Armstrong's Corkoustic, a solid cork tile, is made primarily for this type of use. In addition to being highly moisture resistant, it is flexible enough to be applied to curved surfaces.

Light reflection, weight, insulation
Acoustical ceilings should provide at least 70% light reflection. They should be relatively light in weight so that structural reinforcement won't be needed. Most materials provide some thermal insulation. Corkoustic is an excellent insulator.

Complete details available free
For a free copy of the booklet, "How to Select an Acoustical Material," just write directly to Armstrong Cork Company, 5402 Stevens Street, Lancaster, Pennsylvania.
IS IT COST? Cooling towers or DriCoolers can have a low first cost with higher operating cost and vice versa. Or, you can get an economical combination of both. Marley application engineers have a complete line of units to select from and the “know-how” to help you make the best selection for your purpose.

IS IT SPACE? Marley equipment may be installed indoors or outdoors. Units are available with large base area and low height to give light loading per square foot or with small base area and greater height to fit in small area.

IS IT TEMPERATURE? Usually, it is not economical to cool lower than a 5F approach to the wet bulb. However, in Marley cross-flow towers a quantity of water at wet bulb temperature may be obtained without added cost. For high level cooling, the DriCooler is applicable.

IS IT LOCATION? Extreme temperatures, cold or hot, dust, wet bulb, altitude, brackish water, wind, storm conditions, or lack of proper water supply are problems that must be considered. Marley has a unit to fit any geographical condition.

IS IT APPEARANCE? Marley has a wide range of designs that will blend with any building architecture. Or even become a part of the building itself. Marley engineers can help your architect give you a good looking as well as efficient installation.

These are only a few of the problems you may face in the selection of a cooling tower or DriCooler. No matter what the problem, Marley Application Engineers have the answer to help you invest your dollars wisely and profitably.

Write, Wire or Phone The Marley Company, Inc., Kansas City 15, Kansas.
not be enough galvanized pipe available later this year to substitute for copper pipe.

**Design for selling.** One bright note at the convention was the serious attention more and more builders were giving to better house design. Now that Regulation X had brought an abrupt end to the seller's market, builders were thinking harder about "product design" than ever before. Three thousand of them crowded into the main ballroom of the Stevens Hotel to preview the winning drawings in the NAHB-Forum Small House Design Contest. For many a builder, the winning designs were an eye-opening example of how architectural imagination could be used to increase the livability and salability of a small house.

Harvard student Bruce Walker's crisp, prize-winning design so impressed two builders—Albert Balch of Seattle and Charles R. Tips of Dallas—that they announced plans to build it as soon as possible.

At the convention's panel on better design, Architect Philip Will of Chicago pointed out that the greatest obstacle to better subdivision design was no longer the builders but government and financial agencies. "Homes built today are appraised by obsolete standards which indicate that bankers and government insuring agencies expect their mortgages to mature in 1931 instead of 1971," he said.
The answer to this question is not so much a matter of the quality of materials used as it is the method of construction.

TOP PHOTO shows expensive materials installed at high labor cost. Water can seep through masonry joints into the parapet wall, and also blow up under the loosely mounted flashing and built-up roofing. Freezing weather will break open the masonry joints, and the wall will start to crumble. An installation such as this, costly to begin with, is doomed to a lifetime of joint recaulking and other maintenance and repairs.

BOTTOM PHOTO shows an entirely different coping method...a method now in its fifth year of successful service...employing aluminum, copper, stainless steel, or monel metal as the coping material...defying leakage because of its patented, interlocking, mechanical joint construction. This is the Overly-Goodwin COPING method, which eliminates the use of through-wall flashing. Note in the photo how the built-up roofing is laid up under the coping, thereby eliminating the use of cap flashing.

An Overly-Goodwin aluminum coping job, recently installed, showed a saving of 25% of the erected cost, compared with the installed cost of precast concrete coping and copper through-wall flashing. Similar savings result by comparison with stone and other coping materials. Send for new booklet, "Overly-Goodwin Coping."

Advantages:


OVERLY QUALITY ARCHITECTURAL SHEET METAL PRODUCTS ARE DESCRIBED IN SWEET'S FILE
"OUR SALES ARE UP IN SPITE OF CREDIT RESTRICTIONS
WE FEATURE Westinghouse APPLIANCES THROUGHOUT"

... says Jack Heslop, Noted Midwest Builder

"Give them top value for their money and you'll have no trouble selling houses," he states.

"We sold 180 homes in 10 days ... took commitments, and started building 221 more. Our formula is to feature recognized brand names, like Westinghouse, throughout. Sure, we could cut costs by buying off-brand or mixed-brand appliances and materials but our houses wouldn't sell as well. Then, too, as '3 Generations of Builders' we have a reputation to maintain.

"Now, with tightening credit, it makes sense to offer a complete package. Few of our prospects can afford to arrange separate financing of appliances."

Other builders, too, find that Westinghouse Appliances help sell their houses faster. Try it and see. For information, contact your Westinghouse Distributor or write us direct.

WESTINGHOUSE ELECTRIC CORPORATION
Electric Appliance Division - Mansfield, Ohio

YOU CAN BE SURE...IF IT'S Westinghouse
Rooms when and where you want them!—That's what managements like about Johns-Manville Asbestos Movable Walls.

With these asbestos-cement partitions, you can have offices enlarged, subdivided, or relocated to meet ever-changing space needs! And at the same time have rooms that are more attractive in appearance.

Today many of the most modern office buildings and schools have miles of Johns-Manville Movable Walls. Their unique appeal lies in the fact that they are made of asbestos: they have a pleasing texture and they're fire-safe, hard-to-mar, highly resistant to shock and abuse.

J-M Asbestos Wall sections are light, easy to locate. They are erected as ceiling-high or free-standing partitions and railings, either solid or with glass. Ideal as interior finish for outside walls.

"Dry" construction insures little or no interruption to normal routine. Flush asbestos walls have no dust-catching projections, are easily maintained. The complete wall, including doors and hardware, is installed by Johns-Manville construction crews; you get undivided responsibility.

An estimate will convince you that the cost of J-M Movable Walls compares favorably with that of other types of wall construction. The J-M Movable Wall line includes:

Integrally-Colored Transite® Walls—J-M Asbestos Transite® Walls eliminate the cost of periodic decorative treatment. The panels are integrally colored by blending non-fading pigments with asbestos fibre—the color goes all the way through each panel.

Transite® Walls—J-M Transite® Walls, Imperial Type, may be left in their natural gray finish or decorated as desired. J-M Transite® Walls, Universal Type, are low in cost and use no critical war materials, giving you more freedom to plan future construction with confidence.

For details, consult your Sweet's Architectural File, or write Johns-Manville, Box 158, Dept. MB, N. Y. 16, N. Y.
2 Beautiful Floors... by Johns-Manville

Save work... No scrubbing... Easily kept spick-and-span!

Johns-Manville Terraflex is an entirely new and different luxury floor tile. Made of vinyl plastic and asbestos and completely proof against greases, oils, and alkalies, it is practically indestructible. Possesses a clarity and warmth of color hitherto obtainable only in rich carpetings. Unharmed by commonly used cleaning solutions, Terraflex cannot be "washed out" and will last a lifetime. Ideal for kitchens and cafeterias.

J-M Asphalt Tile is of course the modestly priced flooring that has been a standard of quality for decades. Comes in a wide range of marbleized colors.

See the J-M Approved Flooring Contractor in your area. He is listed in the classified phone book. Or write Johns-Manville, Box 158, New York 16, N. Y.

TERRAFLEX
VINYL PLASTIC - ASBESTOS TILE
AND
J-M ASPHALT TILE

Other J-M products include Acoustical Ceilings—Movable Walls—Corrugated Transite®—Built-Up Roofs—Etc.
In a ground-to-roof remodeling program begun in 1946, the Webster Hall has modernized all of its guest bathrooms as well as the public lounges. This view of the women's rest room shows smartly styled, shell pink Crane Marcia Lavatories in a counter of black tile. Of vitreous china, the Marcia comes in white and eight Crane colors. Features: roomy, semi-oval basin, exclusive Securo waste. Dial-ese controls on convenient beveled panel. Size: 24" x 21". Consult your Crane Branch or Crane Wholesaler.

DESIGN, INC., St. Louis
Architect
WAHRHAUS & HARTNER, Pittsburgh
Plumbing Contractor
What other wall or floor covering material can take a drenching with hot water so well? Or for that matter what other material can resist knocks and scratches so stubbornly... and stay fade-proof and fire-proof for a lifetime?

Genuine Clay Tile cleans as easily as a china dish and commands respect wherever it is used. Have you considered the use of tile in the kitchen, foyer, utility room or powder room? It is worth a fresh appraisal every time you design or build any type of building. And remember—tile is one of the most versatile materials you can use in designing distinctive color schemes.

Tile Council of America, Room 3401, 10 East 40th St., New York 16, N. Y. or Room 433, 727 W. Seventh St., Los Angeles, Calif.

PARTICIPATING COMPANIES:
- American Encaustic Tiling Co.
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- General Tile Corporation
- Gladding, McBean & Co.
- Mosaic Tile Company
- Murray Tile Company, Inc.
- National Tile & Manufacturing Co.
- Olean Tile Company
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**WATERFILM**

is the fastest steaming boiler made

**Koven WATERFILM**

is the fastest steaming boiler made

In Waterfilm's exclusive zig-zag water tube only a 3/4" film of water has to boil to produce steam—thus heat starts rising long before the main body of water in the tank is even warm. This and other unique patented features mean your customer gets quick, even heat at lower cost with a Waterfilm Boiler.

Enclosed in a beautiful enamel film, KOVEN Waterfilm Boilers provide plenty of domestic hot water at all times and give years of dependable service. Recommended by leading architects and builders, Waterfilm is available in sizes and models for small homes, apartment and industrial buildings. For large installations, remember that the Sectional Boiler can be taken through a 2-foot door. 500-17,850 E.D.R. NATIONALLY ADVERTISED. Write for free literature and newspaper mats.

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Plants: Jersey City, N. J., Dover, N. J.

FOR AUTOMATIC FIRING WITH OIL, STOKER OR GAS

**BEHIND THE BLUEPRINTS**

Architect **ERIC MENDELSON** has had one of modern architecture's longest and most influential careers. One of the few architects to have worked on the construction of the Empire State Building, Mendelson became known for his modernist approach to architecture, particularly his use of steel and glass. He is best known for his work on the San Francisco's Palace of Fine Arts, which he designed in 1938. Mendelson's work has been influential in the development of modern architecture, and he is widely considered one of the most important architects of the 20th century.

**Contractor ANDREW J. EKEN** has been aptly described as the "dean of U. S. skyline builders." For 29 years under his dynamic direction, Starrett Brothers & Eken have built the tallest office buildings and the biggest housing projects in the country, including the Empire State Building and Metropolitan Life's Parkchester and Stuyvesant Town. A resident of Madison, N. J., Eken is a trustee, technical advisor and godfather to the new building of nearby Morristown Memorial Hospital.

**JAMES G. DOWNS, JR.** has a thorough background in real estate marketing and management based on 25 years of experience as author, lecturer, editor and property manager. Chicago born and educated at the University of Illinois, Downs runs a property management firm (Downs, Mohl & Co.) and a research group (Real Estate Research Corp.), can appraise, analyze or manage all types of residential and commercial real estate. Featured in this issue is his provocative study of the obsolescence of apartment buildings.

Swiss-born **ALFRED ROTH** is an architect and editor of international repute. A 1926 graduate of Zurich's Institute of Technology, he served his architectural apprenticeships in the offices of Professor Karl Moser and Le Corbusier, designed housing in Sweden for two years before establishing his own private practice in Zurich in 1932. A highly articulate exponent of contemporary architecture, he is author of several volumes on the subject. The tri-lingual Swiss magazine of art and architecture, and lecturer on modern design at Washington University in St. Louis.

**ALFRED LEVITT**, designer and co-owner (with brother William and father Abraham) of famed Levitt & Sons, can point to almost 20,000 houses built from his plans since 1929. Tall, affable and 39, Levitt was a liberal arts student at New York University, has had no formal architectural schooling, learned all about building right on the job. Of the Levitts' newest development (p. 140), he says: "The Landia house is the coming of age of mass production; its high professionalism blends simple and graceful living for the lower income levels with the most efficient techniques learned in the last decade."
HOSPITAL ZONE—QUIET is a warning that has been taken to heart in the manufacture of Corbin Hardware. In function, Corbin Hardware meets all of the specialized needs for the efficient flow of hospital traffic. In quality, Corbin Hardware is unsurpassed for its ability to provide year after year of noiseless, trouble-free service.

The fine, new Mount St. Mary Hospital in Nelsonville, Ohio is representative of hundreds of American hospitals that are equipped throughout with Corbin Hardware.

Corbin Hardware used at Mount St. Mary Hospital included, among other items:

- "900" Unit Locks
- Door Closers
- Exit Fixtures
- Flush Bolts
- Hook Door Pulls

Mount St. Mary Hospital
Nelsonville, Ohio
Architect: Louis F. Karlberger, Columbus
Contractor: Knowlton Construction Co., Bellefontaine
Hardware supplied by: Columbus Hardware Supplies, Inc., Columbus

P. & F. CORBIN
DIVISION
THE AMERICAN HARDWARE CORPORATION

New Britain, Connecticut
All look to STEEL SASH for today’s most versatile walls!
The Great UN Debate

Building:
Regarding your presentation of the UN building (Nov. '50) the plan of a building is the working mechanism and should be arranged as such. Not as a machine for living, but just simply a good working arrangement of space. To hell with all the esoteric terms of our forced modernists. The plan is the thing. As for appearance, why not echo the plan much like an airplane shows its component parts, or better still, the human form. Life is not made into perfectly uniform little shapes as our modernists force upon us. It is not the texture of her skin that makes a woman beautiful, it is her form, the irregularities rather than the regularities.

We shall see the texture of the skin of the UN Secretariat, yet the eye grows weary in the monotony of it. Call it dynamic, mutated continuity, . . . to me, monotony.

Ralph H. Syverson
Berwyn, Ill.

Building:
Turn the UN building inside out, and you will find a better engineering solution. The large expanse of outside glass, if used for luminous ceilings inside, would produce an ideal artificial lighting system. Too, the glass in the 12 in. wide, bright fluorescent fixtures could then be used as outside windows . . .

Bernard F. Greene, Consulting Engineer
New York, N. Y.

Building:
Monumentality in a building—whether the UN Secretariat or any other—seems a complete negation of the essence of architecture. If a building is to house properly the people who will use it, then this function should be the determining factor in its design and form. A monument, on the other hand, is a sculptural form designed primarily to inspire, or awe, or commemorate. Witness the great monuments of the past—the Sphinx, the Campanile, the Parthenon—these may have had functions but their primary purpose was monumentality.

It seems to me that "modern" architecture needs to overcome its perpetual search after a "new monumentality" which only leads to buildings which are neither proper architecture nor proper monuments. We need a realization that a monument has its own life and function and should be designed specifically as a monument (as was understood in Saarinen's arch for St. Louis); and that a building no matter how large is still only a building. Once we come to this realization we will be freed to design buildings which will fit the needs of their users, the problems of the site and at the same time evolve their own essential esthetic. We will then get back where we should be architecturally—not jockeying cardboard forms around like facade decorators but involving building solutions on their own merits. Then, only, will we be freed to design great monuments for their own sake, which are truly monuments and not hermaphrodites.

Lawrence Halprin, Landscape Architect
San Francisco, Calif.
(Continued on page 40)
Show any of America's top engineers a plan calling for a large window area, and his first question is usually: "Is it structurally sound? Will it resist extremes of wind pressure with a generous factor of safety?" He knows that where strength is important, steel sash are always used. And of all steel sash, as engineers know, Mesker is the strongest.
ETTERS

New Pittsburgh development set forth a point of view which we have long advocated. The role of the architect as a focal point around which the many elements of the building industry must rally cannot be overlooked; nor can it be overemphasized.

Having directed the construction of many Rockefeller Center buildings I was pleased with our citation of this development as an outstanding example of cooperative planning. I agree wholeheartedly and further believe that credit belongs largely to John D. Rockefeller Jr., who was able to bring together all the factors needed to contribute to advanced building planning.

JOHN W. HARRIS, President
John W. Harris Associates, Inc.
New York, N.Y.

BUILDING:

Your December issue was really something—and we want to add our congratulations to the good job BUILDING is doing editorially. In fact the issue looks so “hot” that we would appreciate your sending two extra copies...

R. C. OVERMYER, Advertising Manager
South Wind Div., Stewart-Warner Corp.
Indianapolis, Ind.

LARGER MAIL BOXES

BUILDING:

What is the most obsolete feature of dwelling design today? It is at the point where the mail is delivered.

The other day I sat in with a group of magazine publishers who were complaining about the damage done to their magazines when postmen try to force them through the standard-sized letter slots.

The U.S. Post Office regulations respecting apartment houses call for receptacles capable of taking a magazine measuring, when rolled, 14 1/4 in. in length by 2 1/2 in. in diameter, but one cannot roll FORTUNE, and there are months of the year when other magazines cannot be reduced, even by tight rolling, to a diameter of 2 1/2 in.

Perhaps the answer is a reform in the size and shape of letter slots as well as of the mail boxes in apartment houses. This is a job for architects to undertake. If they design and specify slots or receptacles capable of taking a standard magazine without folding, one may expect manufacturers of builders' hardware to produce them in quantity and builders to install them.

FLOYD S. CHALMERS
Executive Vice President
MacLean-Hunter Publishing Co.
Toronto, Canada

Amen.—Ed.

SHELTERS FOR PORTLAND

BUILDING:

Due to the international situation much interest has been expressed locally for the need of shelters for the public. To fill this need the mayor of Portland has asked that local buildings be analyzed to see which one would be the most (Continued on page 42)
Owners, especially, feel the pinch of today’s high costs of building. At the lowest possible cost, Mesker Steel Sash provide every owner with maximum fire-safety, abundant natural daylighting, unlimited see-through vision, permanent lifetime service and nation-wide tenant acceptance. Only economical steel sash combines all these advantages.

**LETTERS**

Desirable to use as shelters and which areas in these buildings should be designated as the shelter areas.

President J. A. Corenbaum of the Professional Engineers of Oregon asked us to form a committee for this purpose. As a result of the committee’s work a rating or check sheet was developed which is designed to provide a structural picture of a building in order that its desirability for use as a shelter may be evaluated, and a detailed analysis made of the area or areas which may be acceptable as shelter areas.

To carry out the very considerable program of looking at the structures in the city the local sections of the American Institute of Architects, the American Society of Civil Engineers, and this organization are cooperating to furnish the specialized manpower necessary. This program is being organized in cooperation with the city building department.

After the shelter areas have been selected by this method they will be further analyzed and steps outlined to be taken if and when funds are available to further improve their efficiency. To do this other engineering organizations may then be called upon, such as the mechanical engineers, the heating and ventilating engineers, and the electrical engineers, to advise on the program.

This work may be of interest to others. More information will be sent upon request.

R. EVAN KENNEDY, President Structural Engineers Association of Oregon Portland, Ore.

**ART IN ARCHITECTURE**

While you are covering the builder-architect situation admirably, you are neglecting two important adjuncts to the building and architectural professions.

Any building needs the enrichment and integrated beauty of fine three-dimensional detail and the color which comes from fine murals. . . .

There has not been enough attention devoted to the sculptor and the muralist and the contribution of each to the progress of the mother art—architecture.

Painting and sculpture are lost without a place to be; that is, to exist as a planned part of a general scheme. To plan a fine building and then purchase random bits of sculpture or a painting to enrich it is to hang table silver on a Christmas tree. Therefore, when you show us the best of modern building we would also enjoy seeing the best of modern murals and architectural sculpture.

Did I hear you say that there isn’t much to show? Well, then, maybe you might make the inclusion of painting and sculpture in the architectural scheme your next crusade!

P. G. NEMSER
Pittsburgh, Pa.

(Continued on page 48)
Here’s why all 4*

look to...

Mesker Steel Windows... Known for Their Strength

33% MORE STRENGTH!

Mesker’s Intermediate Window members are up to 33% stronger because of their greater 1 1/4” depth. These are the deepest steel window sections made!

Any way you look at it... through the eyes of the architect, engineer, contractor or owner... the extra strength of Mesker Steel Sash sets it apart from windows made of lighter weight sections. Up to 33% stronger, you’ll find it a ready answer to a multitude of building problems, especially in times like these.

Call in your Mesker Sales Engineer!
Right: Plywood forms in place preparatory to pouring porch deck which creates an overhang for terrace below. Big, versatile plywood panels were also used to form smooth surfaces for basement and foundation concrete—then re-used for sheathing and subflooring. Wall sheathing and subflooring is \( \frac{3}{4} \)" thickness. Roof sheathing is \( \frac{1}{2} \)".

Owner-designer is Charles T. Pearson of the architectural firm of Lea, Pearson and Richards, Tacoma.

"Plywood Sheathing Specified For Extra Strength",

Says Architect-Owner
Charles T. Pearson, A. I. A.

Situated on a picturesque view-bluff overlooking Puget Sound—and subject to the same strong prevailing winds which blew down the first Tacoma Narrows Bridge—this striking modern home relies on the rigidity and strength of plywood sheathing throughout. Even interior cross-walls have a membrane of PlyScord, to give added lateral bracing.

"The unusually windy location made the specification of plywood doubly important," says Mr. Pearson. "The strength and rigidity of the material definitely contributes to better construction."

Plywood sheathing is stronger—proved in government tests to be more than twice as strong and rigid as diagonal sheathing. Plywood has other advantages, too. The big panels cover quickly, require less sawing, fitting and nailing, eliminate material waste. Contractors report savings of more than 25% in applying wall and roof sheathing... up to 50% in laying subflooring.

"NON-CRITICAL"

...today's best reason for building with beautiful, permanent...

BRICK AND TILE!

You conserve vital raw materials

This nation must supply the tools of defense...the guns...the tanks...the planes...that are so urgently needed here, and elsewhere in the free world.

You conserve the vital raw materials needed for these tools—when you build essential buildings with structural clay products.

Clay is not a critical raw material. Clay deposits are unlimited.

This is today's best reason for building with brick and tile...their "non-critical" status!

But there are other reasons—good ones! Buildings erected of brick and tile are durable, remain attractive, require little repair or maintenance. By quality construction, you protect any building investment.

Yes, you can help increase the nation's productive capacity, and avoid delays due to raw material shortages. Use brick and tile for industrial buildings, military and naval facilities, warehouses, power plants, schools, hospitals and other essential buildings.

For any problem you may have on design, types of products, scheduling and other details, please contact any of our offices. We welcome your inquiry on information or service.

MAIN OFFICE

STRUCTURAL CLAY PRODUCTS INSTITUTE
1520 18th Street, N. W., Washington 6, D. C.
An Outstanding Product

G-E TEXTOLITE
PLASTIC TOPS

Manufactured by an old firm, GENERAL ELECTRIC
Distributed by an old friend, Roddiscraft

Architects have been specifying General Electric equipment and Roddiscraft products for many years. These two now team up to bring you General Electric Textolite—a quality plastics laminate surfacing material—a beauty with brawn.

Yes—General Electric Textolite wears like iron—cleans like glass. Colorful as a rainbow, too—you have a wide choice of solid colors and patterns to carry out decorative schemes, in homes, stores, restaurants, clubs, cocktail lounges—wherever a surfacing material is needed.

Call your nearest Roddiscraft warehouse for sample books—and color charts.

G-E Textolite has been awarded the 1951 Fashion Academy Award for beauty in color, design and modern decorative styling.

NATIONWIDE Roddiscraft WAREHOUSE SERVICE
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Milwaukee 8, Wis. • New York 55, N. Y. • Port Newark 5, N. J.
Philadelphia 34, Pa. • St. Louis 16, Mo. • San Francisco 24, Cal.
New Hyde Park, L. I., N. Y.
The selection of General Electric Textolite plastics tops for kitchen work surfaces in the Castle Homes development, Suffolk County, Long Island, offers two big advantages to owners. They enjoy colorful, attractive kitchens, with counter surfaces that match the overall décor. And they profit by the long-wearing, stain- and heat-resistant qualities of these sturdy tops.

G-E Textolite tops are also being used for commercial installations as well as for private kitchens. Restaurants and soda fountains find these tops both beautiful and enduring.

For more information about G-E Textolite plastics tops, see our Catalog in Sweet's File, or mail the coupon below.
Plascor is a special vinyl plastic floor tile designed particularly for those areas where the floor must combine quietness, beauty, and durability with resistance to acids, alkali, oil and greases.

Plascor comes in 8 1/2", 11", 17" and 34" square sheets, 1/8" thick and in a full color range, with matching cove base available. It is laid in the conventional manner, over wood and concrete.

CHEMICAL RESISTANCE — Plascor is made from Tygon, the vinyl plastic used to line acid tanks. It's dense, non-porous, non-absorbent. Shakes off attacks by acids, alkali, oils or grease; chemicals that quickly destroy linoleum, rubber or asphalt have no effect on this built-to-take-it vinyl floor tile.

QUIET AND COMFORTABLE — Plascor is unusually quiet, and comfortable to walk upon. Its resin-dipped cork content makes it truly resilient. Ideal for hospitals, libraries or offices where quietness is a must. Plascor stills heel clackety-clack to a whisper . . . absorbs noise, cushions shock . . . lessens foot and leg discomfort.

BEAUTIFUL APPEARANCE — Plascor is as good to look at as to walk upon. Plascor colors are clean colors . . . and Plascor's interesting mottle pattern keeps dirt and foot markings unnoticeable. It's as easy to clean as a china dish.

WEARS LIKE GRANITE — Independent laboratory tests prove Plascor's remarkable wear-resistance. And field installations confirm. Chemical laboratories and plants, hospitals, theatres, restaurants, schools, stores report a wear life far beyond expectations.

When it comes to picking a floor tile that will resist chemicals . . . be quiet and comfortable to walk on . . . looks good . . . is easy to maintain . . . and wears well . . . there's one proven answer — PLASCOR, the Tygon Plastic Vinyl Floor Tile. Made by The U. S. Stoneware Co., Akron, Ohio.

Send for free samples and technical data

Write today to: The U. S. Stoneware Co., Akron, Ohio.

LETTERS

DECORATOR VS ARCHITECT

BUILDING:

Whereas the architect's gripes against decorators are all too well known, the decorator's side of the story has received far too little publicity. The architect is as much in need of the specialized skill of the interior decorator in the planning of a home as he is of an acoustical engineer in the planning of a theater.

All too frequently in my work clients cry on my shoulder about bone-headed blunders made by leading architects in the planning of their homes. Blunders which any competent decorator could have spotted by merely glancing at the architect's preliminary drawings . . .

I quote a conversation which recently took place between one of the foremost architects on the Pacific Coast and one of our local decorators:

Architect, "I have never yet designed a house for a client that I, myself, wouldn't like to live in."

Decorator, "I have never yet planned a home for a client that I, myself, would like to live in, because I have never had a client who was just exactly like me."

KLAUS PFEFFER
Design & Color Consultants
Berkeley, Calif.

GARAGE FRONT DOOR

BUILDING:

For many months I have studied the plans of suburban houses as they appear in the Sunday real estate sections . . .

The suburban housewife's car is not a luxury nor a "pleasure car." It is as much a necessity of her daily living as a telephone or front door bell. So the placing of the garage is of great importance to her convenience . . .

Architects should consider not only a charming exterior when planning the garage. It should adjoin as nearly as possible the working unit of the house—either kitchen or utility room—and should have a direct entrance into the house proper . . .

FRANCES E. BECK
Orangeburg, N. Y.
Another New Installation of Simpson Acoustical Tile

St. Paul Fire and Marine Insurance Company's Home Office

Typical of the growing list of sound control installations using Simpson Acoustical Tile is the home office of St. Paul Fire and Marine Insurance Company. In this large modern building, 1300 employees work more efficiently . . . are less tired after a day's work . . . because of Simpson Acoustical Tile on the ceilings and walls. The management of this progressive fire and marine insurance company realizes, as do thousands of other company officials, that sound conditioning pays off in better work, fewer errors, less labor turn-over and less absenteeism.

ONLY SIMPSON HAS ALL FIVE!
1. WASHABLE FINISH
2. HIGHER SOUND ABSORPTION
3. HOLLOKORE DRILLED PERFORATIONS
4. FINISHED BEVELS
5. MORE BEAUTIFUL AND EFFICIENT

Simpson
ACOUSTICAL TILE
QUALITY SINCE 1895

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These Simpson Acoustical Contractors Offer You a Complete Acoustical Service

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  Martin & Murphy, Salt Lake City
- INDIANA
  Baldus Company, Inc., Fort Wayne
  Kelley Asbestos Products Company, Whiting, IN
- LOUISIANA
  Pioneer Contract & Supply Company, Baton Rouge
- MINNESOTA
  Data Tile Company, Minneapolis
- MISSISSIPPI
  Stokes Interiors, Inc., Jackson
- MISSOURI
  Kelley Asbestos Products Company, Kansas City
- NEBRASKA
  Kelley Asbestos Products Company, Omaha
- NEW YORK
  Robert J. Harder, Lynbrook
- OHIO
  The Mid-West Acoustical & Supply Co., Cleveland, Akron, Columbus, Dayton, Springfield and Toledo
- OREGON
  Acoustics Northwest, Portland
  R. E. Elton Co., Salem
- TENNESSEE
  D. E. Madden Co., Inc., Memphis
- TEXAS
  Blue Diamond Company, Dallas
  Otto Messey Company, Ltd., Houston
- UTAH
  Utah Pioneer Corporation, Salt Lake City
- WASHINGTON
  Elliott Bay Lumber Company, Seattle
- WISCONSIN
  Building Service, Inc., Milwaukee

the magazine of BUILDING 49
Maybe it's because we're in this business of air conditioning that we just can't get away from our work. Everywhere we go there's air. Sometimes it's too cold, sometimes it's too warm, sometimes too dry, or too moist. Usually we find ourselves figuring out ways to warm it, cool it, clean it, humidify it, dry it—move it from one place to another in the thriftiest and most efficient way.

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or remodeling, you can specify
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City... Zone State
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Much of the beauty, much of the famed efficiency of these Andersen Casement and Picture Window Units comes from their careful wood construction. Wood blends with the shingle exterior, and wood's insulating values improve the windows' performance.

See Detail Catalog in Sweet's Architectural and Builders' Files, or write us for further information. The complete WINDOWALLS Tracing Detail File will be sent on request to architects and designers at no charge. Andersen WINDOWALLS are sold by lumber and millwork dealers.

*TRADEMARK OF ANDERSEN CORPORATION
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Parkay Haddon Hall flooring is factory assembled in 12"x12" beveled edged units composed of 2"x4" and 2"x2" solid blocks ¼" thick. Each unit is then finished by proven factory methods to insure a uniform and lasting finish. Flooring is applied to any sound, smooth subsurface—solid wood, plywood, concrete, terrazzo—with Special Parkay Adhesive. Choice of five woods—light and medium finish Oak, Walnut, Avodire, Mahogany and Teak. Write for descriptive literature. Parkay, Inc., Louisville 9, Ky.

PRIZE WINNERS—NAHB-FORUM

HOUSE DESIGN COMPETITION

NATIONAL PRIZES
First ($7,500): Bruce Walker Cambridge, Mass.
Third ($2,500): Wallace S. Steele Minneapolis, Minn.
Fourth ($1,000): George Matsumoto Raleigh, N. C.
Honorable Mention ($500):

REGION A PRIZES

REGION B PRIZES
First ($750): George Matsumoto, Raleigh, N. C.
Second ($500): Sanford H. Wachtel New York, N. Y.

REGION C PRIZES
Honorable Mention ($250): Jack O. Boyte, Atlanta, Ga. • Dick Smith, Cincinnati, Ohio.

REGION D PRIZES
First ($750): Wallace S. Steele Minneapolis, Minn.
Honorable Mention ($250): Robert Diament and John Macasal, Chicago, Ill. • Vito A. Girone, South Bend, Ind. • Richard B. Pullman, Detroit, Mich. • Ambrose M. Richardson, Chicago, Ill. • Ray E. Roush, Jr., Cincinnati, Ohio.

REGION E PRIZES
First ($750): Kazumi Adachi, Dike Nagano and Robert W. Blachnik, Los Angeles, Calif.
Second ($500): Alexia Dukelski Culver City, Calif. and Harry R. Kemm, Los Angeles, Calif.
Honorable Mention ($250): Leland Evison, Pasadena, Calif.

REGION F PRIZES

(Continued on page 60)
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Recent remodeling programs in the House and Senate Chambers of the nation's Capitol took advantage of the unique properties of Stainless Steel as a construction material. Installed beneath new and stronger roofs are perforated ceilings of U.S.S. 18-8 Stainless Steel.

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An installation of this type is only one of hundreds of architectural uses of Stainless Steel. Stainless is a versatile material—its corrosion resistance, light weight, strength, attractive appearance and durability fit it to many applications.

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Fiat Precast Receptors

(Regular black & white or special colored terrazzo)

...for Built-up Tile Showers

Save money and speed up the job by eliminating the difficult lead pan and tile floor

Details of suggested construction in building up a tile shower on a Fiat precast receptor. Metal lath and foundation plaster are brought down inside the rust-proofed metal flange. The tile setter starts directly with the wall construction without the delay involved in laying a tile floor and waiting for it to harden to a working surface.

Fiat precast terrazzo receptors are made of black and white marble chips and white cement, ground and polished. A rustproof galvanized reinforcing flange and a 2" brass drain fitting are cast integral with the receptor to form a strong, leakproof, slip-proof, non-absorbent floor for the shower.

The use of a precast receptor eliminates the easily damaged lead pan and the labor consuming job of laying a tile floor. It enables the contractor to complete the shower faster and produce a better job at a lower cost.

Fiat precast receptors reduce the danger of leaky cracks developing in the tile shower walls by providing a solid, rigid foundation that is not affected by shrinkage of supporting wood framing or settling of the building.

The attractive appearance of terrazzo makes a beautiful floor that is in perfect harmony with tile walls. Various colored terrazzo is available on special order, to blend with tile colors.

Your plumbing contractor can get quick delivery of a Fiat receptor as many plumbing wholesalers have Fiat receptors in stock. Standard square type sizes—32" x 32", 36" x 36", 40" x 40". Corner type—56" x 36", 40" x 40".

Section through pre-cast receptor showing brass drain and adaptation to 2" waste pipe and "P" trap. (Trap and pipe by others).

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PRIZE WINNERS—NAHB-FORUM

HOUSE DESIGN COMPETITION

Honorable Mention ($250): W. Rowe Smith, Provo, Utah.

REGION G PRIZES

Second ($500): Donald Olsen, Berkeley, Calif.
Honorable Mention ($250): Warren B. Heid, San Jose, Calif.

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Second ($1,500): Kazumi Adachi, Dike Nagano and Robert W. Blachnik, Los Angeles, Calif.
Third ($1,000): Hugh Stubbs, Jr., Lexington, Mass.

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K&M "Century" Asbestos No. 5 Shingles. American method appearance; random width, thatched butt construction. Each unit covers over 1 sq. ft. of exposed area. Application cost is low—only 90 shingles per square; 2 nails per shingle; self-aligning. Suitable for reroofing—in the application shown, K&M Shingles were applied directly over old wood shingles. No. 5 Shingles give complete weather protection on roof pitches as low as 4" rise per foot.

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Is it any wonder that we’re proud that Day-Brite “BOXCO TYPE” Troffers* furnish the artificial lighting in the offices throughout the magnificent American Stove Company building?

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Wind-o-line Radiation

The illustrations show Wind-o-line installed as a part of The Nesbitt Package at the Thomas Williams School, Wyncote, Pa. The enlarged section below shows the grilled Wind-o-line channel and finned-tube radiation which extend from both sides of the Syncretizer unit ventilator for the full length of the window area.

See The Nesbitt Package at the A.A. of S.A. Convention, Atlantic City, February 17-22, Booths G45-7-9.

An Extra Thermal Blanket WHERE NEEDED
Answers the "WALL-OF-ICE" Problem

The trend toward larger areas of fenestration in the modern schoolroom makes greater demands of the heating and ventilating unit. The "thermal blanket" provided by the Nesbitt Syncretizer adequately shields occupants against the window "wall-of-ice" in normal situations; but under conditions of extremely long glass exposure and very low outdoor temperatures, an "extra blanket" is called for. Nesbitt WIND•O•LINE meets such needs.

When specified as an auxiliary of the free-standing Nesbitt Syncretizer, WIND•O•LINE consists of finned-tube radiation in an attractive grilled casing. It is located just below the windows and extends from both ends of the Syncretizer unit ventilator, for the full length of the sill. It is controlled in cycle with the Syncretizer to give heat—when required—where heat is needed.

WIND•O•LINE is also available (as pictured below) as a component of The Nesbitt Package, recessed in a channel at the rear of the storage units. WIND•O•LINE is yet another Nesbitt innovation which permits more of America's schools to enjoy the new standard of classroom comfort.

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In sub-freezing weather, window areas become like a "wall-of-ice".

The Nesbitt Thermal Blanket protects occupants from cold windows.

—You mean there's just enough heat here to take the chill off the windows on real cold days?

That's right, Joan, it puts an 'extra' blanket of heat between us and the cold 'wall of ice'.
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You too, can have this same peace of mind about fire by fully protecting your investment in materials, equipment and buildings with modern, approved C-O-TWO Fire Protection Equipment.

No matter what your property . . . factory, mill, warehouse, power station or research center . . . or a particular fire hazard such as spray booth, dip tank, pump room, electrical equipment enclosure or record vault . . . there is a type of C-O-TWO Fire Protection Equipment that gives you fast, positive action the instant fire strikes. Whether it's a C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguisher for an incipient fire, or a C-O-TWO Built-In High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing System for total flooding an entire fire hazardous area . . . C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

For example, at many locations a C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a “must”. The first trace of smoke in a protected area sounds an alarm . . . then fast, clean, non-damaging, non-conducting carbon dioxide blankets the fire, putting it out in seconds, before it spreads and causes extensive damage.

So, let an expert C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today for complete free information . . . our experience is at your disposal.

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Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Everything's going like clockwork...

for 5000 happy employees in the John Hancock Mutual Life Insurance Company's new 26-story, ultra-modern Boston office building

You know the importance of accurate clocks in keeping a household or office or a school well run. Just think how much more important accurate time and time-signaling are in a big business office or industrial plant where the movement and activities of large numbers of individuals must be controlled. No wonder, for example, in the new John Hancock office building where the efficiency and morale of 5000 workers are at stake— they use an Edwards Automatic Program Control System.

Operating on 48 separate systems from one central control panel, this Automatic Program Control System handles the complex scheduling of time in this huge building smoothly and efficiently. Different floors and even different departments on the same floor are automatically signalled for staggered lunch and rest periods as well as different times for starting and stopping work. The system's gentle sounding of time-reminders keep workers aware of key "time points" in their day without having them become "clock watchers" and it eliminates to a large degree the human traffic congestion which is so destructive to morale and smooth functioning.

This important Edwards System in the new John Hancock Mutual Life Insurance building is typical of the outstanding Edwards' communication and protection systems in use today all over the country in office buildings, schools, hospitals, industrial plants and government buildings.

A triumph of planning by architects and engineers

The Edwards Automatic Program Control System— like all the other marvellous modern features of this great new building—is the result of superb planning, specifying and follow-thru by the architects, Cram and Ferguson and the electrical contractor, Hixon Electric Company. Like so many other leading architects, contractors and electrical engineers throughout the nation they know there is nothing to equal Edwards equipment for dependable, adaptable and economical service.

Let Edwards help you solve your problems in electrical signaling, communication or protection. Whether you are interested in a musical sounding chime for your home—a complex hospital communication system—or fire alarm protection for a school, industry or business—tell it to Edwards. Write on your business letterhead to Dept. B-2, Edwards Company, Inc., Norwalk, Conn.

EDWARDS CO., INC., Norwalk, Conn. • In Canada: Edwards of Canada, Ltd
ARE APARTMENTS OBSOLETE?

(Continued from page 107)

the issuance and sale of mortgage bonds. The rapid rise of rents in the postwar period seemed to prove that apartment buildings erected prior to 1920 were indeed extraordinarily profitable investments. Moreover, sanguine estimates of potential earnings from new buildings encouraged speculation in the field. Competition in the new type of mortgage underwriting soon produced financing terms of unprecedented attractiveness.

During the Twenties the erection of apartment buildings steadily accounted for a higher and higher percentage of total housing units started each year until, in 1927, this type of accommodation accounted for 37.7 per cent of all dwelling units started. It appeared that apartment living was to become the standard form of urban housing, for in the major cities well over half of all housing starts were in this kind of unit.

Came the depression

Before the boom in apartment buildings came along in the Twenties there had been no real experience in the operation of apartment houses as facilities for mass housing. While it was true that a small percentage of the urban population had been able to support the capital and service charges required for such living, there was no evidence that a substantial segment of the urban families could do likewise. However, it did not take long to find out. The depression of the early Thirties found an incredibly high percentage of all postwar apartment houses in bankruptcy. Instead of being able to cut their services when lower rentals and lower occupancies drastically reduced their revenues, apartment houses were forced by competition to increase such services. In consequence this type of building almost completely lost its ability to support capital charges. Within five years after the peak of the apartment building boom in 1927 first mortgage bonds on this type of property were selling at less than 25 per cent of their face value. By 1932 the construction of multi-family dwellings had dropped to 6.7 per cent of the total housing units built in that year.

The lessons of the depression and of the experience in the years between then and now seem to justify the premises of our syllogism, for in the intervening period apartment house construction has been confined to:

1. Public housing in which virtually all of the capital charges are borne by the Federal Government and a substantial portion of the public services is contributed by the local community. As a matter of fact, the rentals in public housing projects are based almost ex-

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ARE APARTMENTS OBSOLETE?

1. Housing is almost exclusively upon purchased services which the houseowner cannot afford to buy and which he must provide for himself.

2. Institutional housing in which insurance companies, for a variety of reasons not purely investment in nature, have erected a comparatively small number of housing developments. This number has declined in the post World War II period, especially when viewed in relation to insurance company assets.

3. Government insured apartments in which the bulk, if not all, of the risk has been assumed by the underwriting agency.

The reasons for this comparative lack of activity in a field of housing so obviously well suited for urban living and so demonstrably attractive to the consuming public are cogent.

To understand them fully we must compare apartment houses with alternate housing facilities from the point of view of the governing factor in our market society, i.e., cost of consumption.

The basic housing accommodation of the American people is the single-family house, either detached or joined. The cost of occupying such a house, either as an owner or as a tenant, is the yardstick against which competitive apartment housing must be measured. This comparison must include the costs of providing the facility orginally and those incident to its occupancy.

Apartments vs house costs

In the first place a single-family house in most urban areas of the U. S. can be built for less money than an apartment unit of the same size. There are many reasons why this is so, most of which are familiar to the readers of this magazine. On a room-for-room basis the records of the Federal Housing Administration and of the Public Housing Administration prove that multi-unit buildings are more costly. Thus the prospective apartment house occupant is faced at the outset with higher capital charges.

Of greater importance is the fact that the costs of occupying an apartment are sharply higher than those in a single-family house.

The first of these costs is heat. In the single-family house all of the labor in connection with the operation of the heating plant is supplied by the occupant of the house; in an apartment this labor is purchased. In the single-family house the occupant pays only for the heat which he requires; in the apartment house the building is heated to the comfort level of the most demanding tenant.

The second element of occupancy cost is hot water. In the single-family home the occupant who is economical can conserve hot water (Continued on page 72)
To your clients

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and unquestioned quality.

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GULISTAN

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For the 31,000 feet of steam radiation, three No. 60-S-17 Smith oil-fired cast iron boilers do an eminently competent job, as does the No. 340-W-11 Mills boiler in the adjacent maintenance building.

In winter, four No. 608 Smith Manifold Indirect Heaters provide a total hot water capacity of 1680 GPH at 100°F. temperature rise, while in summer, one No. 34-W-11 Smith oil-fired unit with capacity of 1596 GPH is adequate.

ARE APARTMENTS OBSOLETE?

water and thus control his costs. In an apartment house the individual’s pro-rata cost of hot water includes the waste of the most profligate tenant. It is common practice for such tenants to use hot water to steam-press their clothes; to use continuously running streams from mixing faucets rather than to close a sink stopper. There is an equally uneconomic waste of cold water.

Now about janitor service. The apartment tenant does not shovel the snow from his walk, sweep his front or back stairs, prune his shrubs, cut his grass, water his lawns, dispose of his garbage and trash, change his fuses, wash his windows or bother with storm windows and screens. This is all done with purchased labor. If the tenant pays an economic rent (as contrasted to a bankruptcy-established rent) this cost is borne by himself and his fellow tenants. The homeowner or occupant does these chores himself in more than 90 per cent of all American homes.

The homeowner mechanic

The past 20 years have seen a complete revolution in the maintenance of the nation’s dwelling units. Years ago the homeowner acted as a general contractor for home maintenance. When he needed painting or decorating he called a neighborhood decorating contractor; when he wanted a faucet repaired he called a plumbing contractor; when he desired a shelf built he called a carpenter. Not so today. The homeowner today is a mechanic instead of a general contractor. Reason: He can’t afford to engage decorators, plumbers and carpenters. As a result the whole distribution of maintenance materials has changed. Years ago the distributors of paints, wallpaper and decorating tools dealt almost exclusively with contractors who were engaged, in turn, by homeowners. In recent years, however, these distributors have established retail stores in residential neighborhoods from which their goods are sold directly to the consumer. Large operators in this field report that more than 75 per cent of all decorating materials used in home maintenance are thus purchased. This is not only true of paint and decorating supplies but other lines as well. The typical hardware store is more and more a supply depot for the home mechanic. Lumber yards and building material dealers are increasingly directing their merchandising efforts to the home craftsman. One large building materials distributor has successfully sponsored a television program featuring instruction by a skilled mechanic in the use of tools and materials in the home.

In contrast to this upsurge of self-help on the part of the homeowner, the apartment ten-

(Continued on page 74)
AN OPEN LETTER
TO HOUSING OFFICIALS

Ten years ago, as our country mobilized for defense, the building industry was faced with the tremendous problem of providing shelter for the army of workers and fighting men. Shelter was provided—but only after long periods of acute housing shortage in critical areas.

THIS NEED NOT HAPPEN AGAIN... Enlightened building leaders see the advantages of prefabrication and are urging full use of the production facilities of this industry. These leaders advise that housing needs be surveyed and housing orders rushed to keep pace with new and expanded industrial and military construction.

To prevent delays, to insure full use of the new and expanded plants and military installations, we recommend that all Government agencies and housing officials everywhere use the SPEED, ADAPTABILITY AND ECONOMY (in man-hours, in vital materials) which prefabrication provides.

James R. Price, President
Prefabricated Home Manufacturers' Institute

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Prefabricated housing can promise:
- Speedier manufacture and erection.
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ARE APARTMENTS OBSOLETE?

The ant expects such labor to be furnished as a part of his rent. Although rent control has definitely restricted certain types of maintenance service in certain areas, the bulk of apartment house repairs and maintenance continues to be provided by purchased labor. New buildings erected in the decontrolled market are expected to offer such service.

Now for those who like to make their comparisons on the basis of cold, hard figures, let's look at a specific instance which tends to support our original syllogism. Three years ago the author became president of the Chicago Dwellings Association, a nonprofit corporation set up jointly by the City of Chicago and the State of Illinois to operate in the City of Chicago. Its objective was and is to provide rental housing for the so-called "middle income groups."

At the outset we felt that rental housing meant apartments. We certainly knew that the veterans for whom we were to build were looking for this type of accommodation as a matter of preference. So our investigations began in that field. We acquired a site suitable for apartments and undertook computations of achievable rentals. The results were astonishing. We found that the rents on apartments which we could build would be substantially more than the monthly payments on which our prospective tenants could buy and pay for houses offering the same accommodation. Although it is true that our first attempt at apartment design was an elevator-type structure, further investigations into three-story walk-up buildings failed to make the comparison much more favorable.

Advocates of apartment house construction will come to the fore with claims that on a truly comparable basis the factors of service and maintenance do not affect the monthly charges substantially and that construction costs on walk-up apartments are no greater than those for single-family houses. However, even we assume that walk-up apartments of five rooms can be built for the same price as single-family homes (insofar as monthly capital service charges are concerned) the comparative monthly costs to the occupants of a $12,000 gross cost unit would be as follows:

<table>
<thead>
<tr>
<th>Factor of cost</th>
<th>Apartment tenant</th>
<th>Homeowner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital charges</td>
<td>$ 60.50</td>
<td>$ 60.15</td>
</tr>
<tr>
<td>Property taxes</td>
<td>30.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Fire insurance</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Utility charges</td>
<td>15.60</td>
<td>15.00</td>
</tr>
<tr>
<td>Management</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Operating services</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Repairs, maintenance</td>
<td>14.50</td>
<td>4.50</td>
</tr>
<tr>
<td>and replacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrepreneurial profit</td>
<td>10.85</td>
<td></td>
</tr>
<tr>
<td>Total rent</td>
<td>$145.00</td>
<td>$105.95</td>
</tr>
</tbody>
</table>

(Continued on page 76)
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3. No sacrifice of space on narrow loading platforms with Kinnear Rolling Doors. They need no room inside or outside the building for opening and closing action.

4. Windows can be placed right next to Kinnear Rolling Doors—they are never blocked off when the doors are operated.

5. Supports or other superstructure can be placed close to sides, front and top of Kinnear Rolling Doors—inside or outside the building.

6. Light from overhead fixtures is never blocked off by Kinnear Rolling Doors, they coil compactly above the opening.

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8. Kinnear Rolling Doors open straight upward, coiling completely out of the way of traffic, safe from damage.

9. The opening is cleared from jamb to jamb and floor to lintel. No projecting edges or parts to obstruct opening.

10. A continuous curtain of strong interlocking steel slats gives you extra protection against fire, theft, intrusion, wind, weather and accidental damage.

11. Kinnear smooth, upward action is ideal for time-saving motor operation, with convenient remote control. Rugged Kinnear motor operators do the trick.

12. Kinnear’s interlocking steel slat curtain is not only more rugged and longer lasting, but permits any number of slats to be individually replaced if accidentally damaged. Lower maintenance costs!

You get many other advantages in addition to those highlighted above in Kinnear Rolling Doors. They are built any size, with motor or manual operation. Easily installed in old or new buildings. Write for complete information or recommendations.

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ARE APARTMENTS OBSOLETE?

These figures covering comparable cash outlay in apartment tenancy vs. homeowner ship do not by any means represent the net comparisons in true cost. The homeowner’s capital charges include amortization which over a period of 25 years, will result in his accumulating the sum of $12,000, whereas at the end of the same period the tenant will have nothing. Moreover, if we assume that the homeowner and the tenant both have incomes of $7,500 per year and each has one child the homeowner can save up to $12.50 per month as the result of income tax deductions.

Historically, apartments have been brought within the economic reach of a sufficiently broad market of consumers to fill their space by one of two methods: by compromise of their capital structure and a writedown of capital service charges contained in the rental or by taking advantage of a sustained rise in the general price level. We have commented upon the fact that virtually all of the apartment buildings built in the Twenties followed the first method. The relatively few privately owned multi-family structures built in the period 1933-1942 were erected in a most fortunate economic climate. Not only did the housing shortage freeze their occupancy at 100 per cent, but steadily rising costs, rent controls and building restrictions discouraged the erection of competitive buildings.

Since 1942 the existence of rent controls in all major metropolitan areas has enabled people who really cannot afford to live in apartments—at economic rentals—to continue in occupancy. In cases where rent controls have been removed the ratio of single-family residences to total housing construction has increased as consumers of housing were forced to give up the purchased services of apartments and resort to the self-help opportunities of the single-family home.

We do not conclude that apartment buildings will disappear from the urban horizon, but it is obvious to even the casual student that they will not play a dominant role in the housing of urban families. Public housing is fast approaching the time when costs of construction and service in multi-family structures will either cause its discontinuance or will force it into the area of self-help by occupants. In private housing apartment buildings will return to the role which they played before World War I—that of providing for those in the higher income groups who can afford the joint luxuries of high level service and close-in living. They will also provide housing for such of those megalopolis adults (the single, the childless married, the divorced and the aged) who can afford high density occupancy of such buildings—a declining portion of the population.
Walworth manufactures a complete line of Gate, Globe, Angle, Check, and Lubricated Plug Valves, made of Stainless Steel, Steel, Iron, Bronze, and Special Alloys in a wide range of sizes and temperature-pressure ratings.

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Distributors in principal centers throughout the world.

Architect R. Edwin Wilson, Charlotte, N.C., designed this drafting room with Daylight Walls. Thermopane was used in entire building.

Barrington (Ill.) Consolidated High School, designed by Perkins & Will, Chicago, uses Thermopane for one end of the library.
Room becomes larger when you use this simple principle

Here you see an office building, a school library, and an architect's drafting room all designed with the same simple principle that clear glass walls make rooms seem larger. These Daylight Walls make interiors delightful places to work.

No matter how a room is to be used, if you are going to put people in it, you can put more people in more happily when the room "feels big".

Clear flat glass admits more light than glass in any other form. Clear glass does not block vision. Used all the way up, it creates unity between the ceiling and sky, an uninterrupted sweep from indoors to outdoors.

All the windows shown here are glazed with Thermopane® insulating glass. This makes more of the expensive floor space actually usable, as well as making the room seem larger. The comfort-zone moves closer to the windows. In the case of the drafting room, for instance, the drawing boards can remain near the window, even in cold weather. This gives the men the advantage of top lighting and minimizes shadows. The office building and architect's offices pictured here are air conditioned. Thermopane® has the economic advantage of reducing the cost of air conditioning as well as the cost of winter heating.

When a wall is conceived of glass from the initial stages, its ultimate cost compares very favorably with walls of conventional construction. Take into account all the factors of weight, installation, interior finishing and decoration and you find clear, flat glass or Thermopane® are economical wall materials. And as a bonus you gain the benefits of maximum daylight and the psychological comfort of distant vision.

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It is good to know that our new plumbing fixtures catalogue has met with enthusiastic approval (witness the extracts of letters shown on this page). Accordingly, the same catalogue technique will be applied to the complete line of American-Standard Heating Equipment. This is just another example of the effort that goes on behind the scenes at American-Standard... making sure that architects have the latest information, in easy-to-use form, on all of the famous American-Standard products. American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pa.

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WHY NEW DEFENSE PLANTS MUST BE DIFFERENT

When Chrysler signed a contract last month for $99 million worth of heavy tanks, its first move was to call up Albert Kahn Associates and put in an order for a new plant. Speed is vital in producing these tanks. Why does Chrysler have to wait to build a new plant?

The reason is a reason which U. S. industry will frequently stumble upon as it re-gears for defense production. There is simply no available plant with a structure heavy enough to bear the loads of the cranes needed to carry the parts of these giant tanks through assembly.

The greatly increased size and weight of many new war products is only one of the reasons why plant operators of all kinds plan to build some $10.5 billion worth of new plants and equipment this year. Here are some other reasons:

1—Few existing plants have floor room or headroom enough to install the equipment for mechanized materials handling now so important in production efficiency.

2—Size and complexity of the machine tools with which almost every industry works has greatly increased. Few existing plants have spans wide enough to permit efficient installation of such massive machinery.

3—Precision operations and many new process requirements demand plant interiors equipped for complete temperature, humidity, lighting, sound and dust control.

4—Few plants provide enough flexibility in operations: when it is necessary for the manufacturer to shift from one product to another or even to make design changes in the same product, inadequate spans, inadequate load bearing capacity, inadequate wiring often handicap him in making the necessary changes in his machinery. (Lightning production changes of this kind were frequent during the last war, as armaments were tested on the field of battle or outmoded by new technological developments.)

5—Despite some $25.6 billion worth of private and government plant building during the last war, the majority of plants now in use date back to the period when the factory "just grew"—plants where lack of space prevents an efficient production flow, where boiler room, shop, storeroom, administration offices have been attached one by one in a random pattern wherever lot space permitted. Most of these preWorld War II factories lack elbow room on which to expand their present buildings—even if salvage and rationalization of these proved to be possible.

6—While materials shortage is now in the spotlight, manpower shortage may soon exceed it as a handicap to U. S. defense production. Even among the modern plants built in World War II, few went so far as industrialists now think they must go in providing conditions to get maximum output out of available labor supply. War experience showed how closely the production curve is related to labor relations. Plant design to make the most of labor includes such considerations as parking space, how to get employees quickly into the plant,
better lighting, use of color, rest room and recreation facilities, temperature and sound controls, nearby shopping centers and nurseries for working mothers. With the return of older workers, women and of green workers to the labor supply, these demands will become more urgent.

7—Many plants located in congested metropolitan areas are seeking new locations in smaller communities. There are two compelling reasons: high cost of operation in congested areas (truck delays, higher utility rates, higher workers' cost of living, etc.) and the fact that these areas are prime targets in atomic war. Many owners seeking dispersed locations are also planning to split up a manufacturing process hitherto concentrated in a single big plant into several smaller plants which they believe will be more efficient. (This whole subject is so important that it is beyond the limits of this review. It will be covered in a future BUILDING story, The Case for the Small Plant.)

The building is a production tool

Behind all these reasons for new building is perhaps the most influential factor of all: a new attitude on the part of plant owners toward building cost. As The Austin Co. puts it: "Industry itself has come to recognize that the building must be as much a tool of production as the equipment that is in it. How much good plant design contributes to cutting the cost of manufacture has been demonstrated over and over again in postwar building. Today we don't just keep structure out of the way, but handle it as an important contribution to the owner's process."

Ferguson is encountering the same attitude among more and more of its clients. Ferguson planners say: "A new light is beginning to dawn on many a manufacturer: the cost of operating in an old building may be much greater than the cost of a new one."

The government's offer of a five-year write off for tax purposes on needed plants is bringing many a delayed building plan off the shelf. There is a good chance that this accelerated amortization of the capital cost of a new plant may do a lot to change plant owners' thinking about the economic life of their plants. Under old amortization schedules (running up to 60 years or more), factory buildings never seemed to die. Because they were still carrying plant cost on the books, owners felt compelled to undertake endless reconditionings—without making a realistic analysis of the money they might save in production costs by scrapping the old plant and building anew.

There is a sensational example of this kind of saving in the revolution in building that has hit the textile industry since World War II. Dozens of new textile plants have been built incorporating completely mechanical methods of materials handling and precise temperature and humidity control; one of the astonished new owners discovered that he saved enough in the first year of operation to pay for the cost of his new plant.

Thanks to the operating records of such new plants, more and more manufacturers are recognizing that, compared to other costs of production, building cost is relatively unimportant. This attitude extends beyond the decision on whether to build a new plant: it includes the decision on how much it is reasonable to spend for a new building. Even in the case of rising building costs, owners show a new awareness that trying to shave too much off the cost of new building may hamstring their whole production process.

While rapid technological developments in practically all manufacturing processes and in the building industry itself push the owner toward new building, today there is an even stronger push. A manufacturer seeking to expand his production facilities or to start new arms production today finds it almost impossible to buy or lease existing space.

First-class industrial space is not on the market in any part of the country, according to Charles F. Noyes & Co., a leading real estate broker. Leonard Yassen of Fantus Factory Locating Service, a firm which has helped over 1,000 industries to find either existing space or a site for new building, says, "We are now in a period of peak production, and all available modern plants are fully occupied. Unless civilian production is curtailed tremendously there will be no place for industry to expand in existing plants."

Fantus records back this up. "Of 73 plants located in our organization during 1950," Yassen says, "42 originally expressed the desire for existing facilities. Of the number only 6 suitable modern structures were found after exhaustive surveys in each instance. The rest decided to build to their exact specifications."

This was not true, of course, a few years ago, when surplus war plants hit the market. But even when manufacturers found it possible to buy first-class space, they usually had to spend anywhere from $1 to $2 a sq. ft. on top of the purchase price to adapt it to their own needs. General Electric, which bought some small, modern plants right after the war, figures that there is roughly little or no difference between the cost of new, tailor-made space and the cost of second-hand space, after the used plant has been brought into condition to meet GE's exacting standards. Time—the need to get a product on the market quickly—shoved GE toward purchase rather than new building in many of these cases.

Continuous movement shapes the new plant

Today industrial architects, engineers and builders have an abundance of new techniques, materials and planning skills to offer the plant owner who wants to rationalize his operation. On the following pages, BUILDING presents a brief review of the high points in the rapid development in factory design which has taken place over the last few years. In the examples shown here and selected li
Building after consultation with the leading firms in this field, a sharply new picture of today's factory emerges. In the first place, it is a building shaped, as Austin Co. planners say, by "respect for the movement of goods as opposed to a reverence for shapes stemming from the structure itself." It will, as a commonplace, have bays of 60 x 40 ft. (and in special cases of up to 140 ft.) as compared to the 30 x 20 ft. bays of prewar days. It will have some system of positive mechanical air handling as compared to hit-or-miss ventilation. If the manufacturing process benefits thereby, it will have a complete system of interior climate control, and, because of standardization of equipment, it will have this at remarkably little cost. It will provide for all possible changes in the machinery that can be foreseen plus an extra margin of flexibility for those that cannot be foreseen. In many cases, the roof will be seen to have become an extraordinary important artery: electrical services will be distributed through the trusses and overall crane systems and conveyors will be hung from them. A look into its spacious, quiet interior will show no clutter of raw materials waiting to be conveyed to processing, no stack of processed parts waiting for assembly, and no workers waiting for parts to reach their machines. It is a factory in which the building itself has been so developed that our American specialty—the continuous flow of mass production—has finally been completely realized.

**HEAVIER STRUCTURE** will be needed in many defense plants. Both presses to form, and cranes to carry the huge parts of today's planes and tanks have outgrown the spans of World War II plants. Shown here is an early example of such massive steel structure. These all-welded 65 ft. building columns, with crane columns on either side, are in a Diesel locomotive assembly shop built by the Austin Co. for the Electro-Motive Corp., a General Motors division.

**OUR TOOLS ARE BIGGER**

The new giant size of most of the goods of war has outgrown even the giant spans of World War II plants. Chrysler's need for a new plant in which to build heavy tanks is one example. The plant Lockheed Aircraft is now building in Burbank, Calif, is another. In this plant, Lockheed first installed the giant presses it uses to stamp out jet aircraft parts on individual, giant-sized foundations—then started building the factory around them. While building goes on, this machinery is already operating, under a tarpaulin.

Lockheed calls this 33,000 sq. ft. plant "Hall of the Giants." Its welded truss structure provides two clear spans 65 ft. wide and running the 320 ft. length of the plant. This permits great freedom in placement of its enormous machines. Its 50 ft. average height will accommodate all these presses, including one 8,000 ton hydraulic press 36 ft. high, as well as overhead cranes. This steel frame is designed to bear the live loads of two 30-ton underslung cranes, and as such will be the heaviest skeleton of any plant in the aircraft industry.

A central row of steel towers (like vertical trusses) carry the weight of this building and take the weight of the giant crane loads. These towers are formed of two steel sections braced together. Towers are spaced 40 ft. on center, and each rests on a 16 ft. deep caisson. Beams carrying the crane rails span 65 ft., and are so attached that cranes can move the width of the building.

Each giant air-frame machine was installed as a separate unit, with individual foundations and shock-absorbing devices. The 12 in. concrete floor merely connects these individual installations, taking none of the machine load. Because of its extreme vibration, a 20 ton Ceco press is completely isolated from the rest of the structure. It is set on heavy steel springs mounted in a deep pit, walled by 5 ft. thick reinforced concrete. Above these shock mounts was poured an inertia block (the heavy aggregate included steel boiler punchings), on which the press is placed. The 8,000 ton press is mounted on a 12 ft. deep foundation. This heavy press forms tough aluminum alloy, \( \frac{3}{8} \) in. thick and up to 10 x 30 ft. in size, now essential in high-speed jet aircraft. (Note that this plant lacks the flexibility of the Chrysler press plant, p. 89.)

Lockheed was its own general contractor, and reports cost at less than \$9 per sq. ft.

While tanks and planes are the most spectacular examples, this greatly increased size factor is not limited to direct armament production. The size of the tools with which almost every industry works has greatly increased over the last decade. Massive presses equipped with the dies for combining several processes have replaced the lighter presses of prewar days. All kinds of series machines are now in use; a single machine with hundreds of spindles may now perform a complex operation formerly spread out among a half-dozen. Such massive and complex machine tools mean heavier foundations, wider spans and heavier frames for many kinds of plant buildings.
MECHANIZED MATERIALS HANDLING

Ever since Henry Ford built the first one-story, straight line assembly plant in 1909, the magic of U. S. mass production has been understood to lie in a continuous mechanized flow of operations. Actually in the great majority of factories, flow of materials to and from machines has been neither continuous nor mechanized. A plant might, for example, have its assembly operations synchronized to the speed of an automatic roller conveyor, but still be handling incoming raw materials by laborious manual methods or using manual methods to warehouse finished goods. The biggest single step in factory design since World War II has been the extension of mechanical handling methods to every part of the manufacturing process—from receiving raw materials at one end to shipping finished goods at the other.

The new plant which The Austin Co. is building for the Lincoln Electric Co. in Cleveland is a good example. (See BUILDING, May '50) President J. F. Lincoln points out that because his present operations are scattered among three buildings (one of them a two-story building), it has been impossible for him to employ the comprehensive mechanical handling system which the rate of his production demands. "As efficiency of production goes up," Lincoln says, "handling of materials becomes a progressively higher proportion of cost. A carefully developed scheme for uninterrupted mechanical movement of raw materials, parts and finished goods, such as we have been able to install in our new plant, is the only way to lick the cost and to keep handling in pace with the efficiency of our machines." In this plant, less than one-fourth of floor area is devoted to machines, three-fourths is allotted to movement and storage of materials and finished goods.

Another example is the continuous conveyor system being considered for the Heinz vinegar plant and warehouse designed by Skidmore, Owings & Merrill (see BUILDING, May '49). The architects designed this plant so that all receiving is on the ground level, manufacturing progresses upward through the various floors, and a conveyor system taking finished products off to the warehouse. According to the scheme now under study, six conveyors would bring packed cartons from the various manufacturing sections onto a master conveyor running across the ceiling of the vinegar building and dump them into an automatic pallet loader in the warehouse. Electric eyes would sort cartons into the proper pallet. A reciprocal lift would automatically carry the pallet down or up to the proper storage floor and come back to the loader. Pallets would be hoisted into storage by fork lifts. Not more than half the cubage of the warehouse building will be devoted to storage; the rest is allocated to wide aisles for an easy flow of mechanical handling equipment.

Mechanical handling systems have transformed the textile industry since the war. The rayon yarn plant designed and built for Enka by Ferguson (see p. 88 for layout) is one sample. In the old plant, hand trucks with racks carried yarn from one step to another. Now as the yarn is spun it is transferred from the overhead racks carried by monorail. Yarn is carried by the monorail through all processes including the ovens and is finally stored hanging from the ceiling on the monorail. The steel frame (86 x 30 ft. truss bays) was designed for an additional 5,000 lb. live load at each panel point.

Both the Lincoln and the Enka plants show complete mechanical handling from one end of a single-story plant to another. There is a further extension of such mechanical handling systems in the auto industry. In the new Ford engine plant and foundry buildings now being built outside Cleveland and designed by Albert Kahn Associates, an outdoor crane conveyor system is being considered for transporting cast parts from the foundry building to the one million sq. ft. engine manufacturing plant about half-mile away.

Sidney Reibel, Kahn consultant on materials handling, points out that the unit load system, applicable both to parts and to finished goods small enough to be assembled in a pallet, has the additional advantage of providing an easy way to count items and keep inventory.
Direct access of workers to manufacturing area is a prime necessity which designers secure in a number of ways. Ferguson emphasizes that the proper parking treatment of approaches to the plant can eliminate much wasted time. In the Ford engine plant at Cleveland, Kahn uses a T-shaped mezzanine carrying all locker rooms, dining rooms, restrooms, etc. to save main floor space. Employee entry from parking lot is at one side of this mezzanine, entry from bus at the other. A series of stairways hung from the top of the T provide direct access to the factory floor. In the Lincoln plant, Austin puts all locker rooms, restaurant etc. in an underground strip linked by a corridor the length of the plant and provides a series of stairways off this corridor giving direct access to manufacturing areas. The main plant entrance, both for administrative offices and plant proper, tunnels under so as not to interrupt the railroad spur and truck roads running the length of the plant.

Perhaps the newest development in space use are a few experiments leading away from a straight-line production flow. Ferguson tells of one plant now considering changing from a straight line flow to group all similar types of operation together (see diagram, r). Such departmental "sparring" Ferguson says, makes it possible to assemble similar operations under one supervision and, in some cases, to keep machines busy which would be idle in a straight step-by-step flow. This layout is especially useful in large job shops where a number of different items are produced in series runs and backtracking is usually necessary to keep all machines busy.

Ferguson, no doubt influenced by its pioneer design of a circular warehouse (see BUILDING, Nov '46), thinks the circle may some day replace the rectangle as a basic factory form, with materials flow in radial directions from peripheral receiving to central shipping.

**Manufacturing Space** circles around interior warehouse in Ciba drug plant at Summit, N.J., providing plenty of storage room at each assembly point. Manufacturing space is completely air conditioned, with fresh lighting and air diffusers integrated in acoustic panelled ceiling. High intensity lighting, constant temperature, elimination of dust were vital to process. Petroff & Clarkson were architects; Guy Panero and Strobel & Saltman were consulting engineers.

**SIMPLIFIED FLOW DIAGRAMS** illustrate experimental studies being made by Ferguson planners in "flow by operation type" layouts. Actually an old method used by many old-time jobbing plants, "flow by operation type" is now being examined by many plants for adaptation to high-speed production where it might replace the "straight line" production flow shown at top. Ferguson says it may provide for more intensive use of individual machines and may mean less duplication of machinery. But most production programs are more complex than indicated in these diagrams, and Ferguson reminds that only extensive study can determine feasibility of the method for a specific plant.

**Main Manufacturing Area** is in center of this Western Electric Co. electronics plant at Allentown, Pa. High central section holds main working areas with air conditioning and ventilating equipment in trusses above. Specialized functions have been isolated in 25 ft. lean-to section around perimeter. Photo shows one of these special departments where use of volatile materials required explosionproof equipment and complete isolation of air conditioning. The Austin Co.

**Bus** drives right inside Upjohn drug manufacturing plant through ground level tunnel. Austin, which designed and built the plant, says number of minutes saved for each one of 1,000 workers amounts to thousands of dollars in manufacturing costs.
Planning for flexibility means providing for 1) changes in production which require new machines or the realignment of existing machines and 2) future expansion of the building to take care of increased production. Says Austin: “We are continually at work on better basic standards for structure leading to flexibility in use. You must have a basic structural concept broad enough to satisfy the most critical conditions. You can, for example, always subdivide big space, but you can’t reverse this.” Austin’s system for unit control of interior climate (illustrated p. 90) also provides for changes to handle increased heat load as a result of new installations in various parts of the factory.

As a major designer for the auto industry, where lightning retoolings are routine, Kahn has long been accustomed to designing for such changes. Kahn usually plans for heavy foundation strips at various points to take care of future shifts in big presses, for an overall power and lighting grid with multiple take-off points, for a steam grid looped around outside the plant floor and criss-crossed through the center.

The Daniels Construction Co., which has built many of the new textile plants, employs a system of concrete lined tunnels running in a grid pattern under the plant floor and housing air conditioning ducts and electric services. These tunnels, 4 ft. wide and 10 ft. high, permit easy access to these mechanical installations both for maintenance and for future changes.

Ferguson says: “Don’t build those extra two bays for future expansion—wait until you see what kind of machines you need. It isn’t necessary to enclose a rectangle—build any shape to accommodate the exact number of machines you have now. By the time you need more machines, the kind of machines will have changed, too, and your extra bays may be inadequate. What is important is designing a basic structure that will permit easy expansion of the building shell.” For one of Ferguson’s solutions for future expansion, see below.

L-SHAPED PLAN provides for easy future expansion in Enka rayon yarn plant. Laboratories, cafeterias, locker rooms, other service facilities are concentrated in strip on inside of L, with direct access to manufacturing space. Shop and shop storage units are held separate and arranged in disconnected line for future expansion. Note how all rail tracks connect with various parts of the plant on the inside of the L. Personnel come in on the outside of L, do not have to cross the tracks. Photo shows how aluminum walls are used on side of plant earmarked for future expansion. Huge plant already has over one million sq. ft. H. K. Ferguson Co.
**OVERHEAD SYSTEM** of flexible wiring provides power for production machinery and also for building utilities (pumps, fans, unit heaters, etc.) in Clark Equipment Co. plant, Jackson, Mich. This bus-way grid system covers the entire factory area, with 40 ft. spacing between rows. To make additional machine connections or changes in layout of various departments, it is necessary only to disconnect the fused plug-in device at the bus exposed overhead. The main factory lighting is also taken from the bus-way system through small transformers mounted high on columns. Albert Kahn Associates.

**UNDERFLOOR SYSTEM** of bus duct, conduit and piping provides complete flexibility for future machine connections in Western Electric Co.'s electronics plant. A packed wood floor with maple surface gives easy access for direct connection to these distribution lines. Extensions to connect new machines to particular services are then made from below. Grid includes distribution lines for compressed air, illuminating gas, oxygen, hydrogen, nitrogen, steam and water. Piping for each of these is identified by distinctive color and is supported by hangers attached directly to the steel floor beams. The Austin Co.

**EASY TRANSFER OF GIANT PRESSES** is provided in Chrysler press plant. Before the development of this new kind of plant, such metal forming presses were designed with most of their operational parts above floor level and were set in deep pit foundations, making any future moving difficult or impossible. In this plant, an open basement is provided underneath the press area. The machines themselves are designed so that most of their moving parts are below floor level, with only the actual metal forming sections above the floor. The basement provides a clear space where repairmen can quickly get at the machinery when necessary. To move a press or add a new one, it is necessary only to remove sections of the 4 in. laminated oak floor surrounding the presses on the first floor. The plant's 50-ton overhead cranes can then move the press in sections from its original anchorage to the new location. Albert Kahn Associates.
INTERIOR CLIMATE CONTROL

Engineer Guy Panero says that mechanical equipment amounts to 40 per cent of plant cost as compared to 25 per cent before the war and that this percentage is still rising. Part of the rise is in the much wider use of mechanical systems for control of interior climate. Such systems range from low-cost plans utilizing wall louvers and roof fans for mechanical air movement to complete control installations which cool, clean and regulate the humidity of the air supply.

In the rapidly developing textile industry, new rayon and nylon fibers have been developed which require a completely air conditioned interior for finishing and weaving. The Daniel Construction Co. has built a number of such plants, all completely windowless to cut the cost of maintaining constant interior temperature. While many industrial architects feel that a windowless plant is a psychological mistake and insist on at least a vision strip, Daniel reports that these air conditioned plants have had great appeal for Southern workers and that absentee records are low. Windowless plants also provide a steady intensity of light and prevent glare.

Pharmaceutical manufacturing and many kinds of precision operations are examples of other manufacturing lines requiring complete control of interior climate. But even where the materials being processed do not require it, air cooling is often needed to counteract the increased heat load of higher-powered machines and of higher lighting intensities (General Electric researchers recommend 30 to 50 footcandles for general manufacturing areas, as compared with a typical 10 to 20 footcandles in pre-World War II plants).

PARTIAL INTERIOR CLIMATE CONTROL in Chrysler press plant. Albert Kahn Associates exploit daylighting by big window strip on four sides, use unit ventilators on roof for ten air changes per hour. Special glass cuts sun heat, glare. Curtain of unit heaters below windows counteracts wintertime heat loss.

NO NEED FOR INTERIOR CLIMATE CONTROL led to open-wall construction in Corn Products Refining Plant, Corpus Christi, Texas. Owner reports that only one of 12 buildings left open has had to be enclosed, and this because of need to maintain constant temperature in sugar curing equipment. The H. K. Ferguson Co.
AUSTIN uses figures like those in this chart to show owners how little partial and complete control of conditions actually costs. Chart estimates heat loss in a conventional monitor type building as against heat loss in a flat roofed plant with vision strip. Austin says its Norden bombsight plant, for example, requires only 1/10 the steam needed to heat a daylight building of the same size and figures that the heat saving is more than enough to cover the cost of controlled conditions. Austin also often sells owners on controlled climate by stages. Standardized control units sometimes provide only controlled ventilation, but are so arranged that cooling units can be added later on.

HEAT LOSS IN 1,000'S BTU

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<th></th>
<th>ROOF</th>
<th>WALL</th>
<th>MONITOR</th>
<th>SASH</th>
<th>INFILTRATION</th>
<th>VENTILATING AIR</th>
<th>HUMIDIFICATION</th>
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<td>5,600</td>
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<td>515</td>
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<td>350</td>
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LIGHTING is probably the most important single factor in increasing labor productivity. Lighting experts remind that the return of green workers and older workers to the labor supply will mean even better seeing conditions. Typical lighting in older factory buildings seldom amounts to more than 20 footcandles. This compares with these recommendations by General Electric experts:

Ordinary tasks: automatic machine operations, garage work, switchboards, etc. ......... 30 ft-c.
Difficult tasks: ordinary bench work and assembly, machine shop, parts finishing .... 50 ft-c.
Very difficult tasks: fine assembly, high speed work, fine finishing, etc. ............. 100 ft-c.

Money spent on adequate lighting is usually money saved elsewhere. In the Allis-Chalmers plant, Milwaukee, for example, a new lighting installation cut the accident rate by 43 per cent.

Color is one of the most important means of supplementing lighting efficiency. At General Electric's Nela Park, researchers painted the power plant in such a manner: bright yellow ceiling presents brightness contrast with high-wattage combined mercury and filament lamps; colors of wall grade from blue to brown to accustom eye to lower outdoor light level; machinery itself is painted light blue for high visibility. Researchers discovered that painting machinery had an added bonus: oil leaks indicating failures were immediately visible on the light surface.

PRECAST CONCRETE CONSTRUCTION

Metal shortages mean that concrete construction systems will be more important than ever. Not even aluminum, which substituted for steel in many building uses including walls in World War II, will now be available for building use, since much more of this metal is needed for jet aircraft production. Precast concrete systems are proving themselves as economic and time-saving.

TWO ROWS of precast concrete slabs were installed around entire exterior of Continental Can's new 17-acre plant near Pittsburgh, saving construction time and an estimated 10 per cent in cost compared with poured concrete. Lower row is below grade and supports upper row on which strip windows rest. Reinforced slabs are 20 ft. long, are poured on the site, have steel inserts and bolt attachments for fast handling and installation. Wighton-Abbott were designers, builders.

H. K. FERGUSON CO. has designed a precast system employing slabs up to 25 ft. in height. Slabs are cast on concrete floor and tilted up from the inside to form wall sections. Slab fits into a groove at bottom and is bolted to steel framing at top. No temporary bracing is needed. A glass strip slides into grooves between slabs. System makes it unnecessary to connect either slabs or glass sections to steel columns. Glass serves as a vertical window and is also a labor-saving joint between the panels.
ERIC MENDELSOHN

It was just 27 years ago when the complacent downtown architects of New York City were shocked out of their seats by a German picture book. It showed only the back sides of the big city's most honored buildings; it declared that the fire escapes, water towers, and blank walls facing the elevated had more architecture in them than the splendid Gothic or Renaissance facades out front.

Eric Mendelsohn, the itinerant visitor, had earned the right to be critical. "Two decades younger than Wright and not as wise yet," he had been one of that small handful of pioneers who started the contemporary revolution against applied styles. In school he had refused to draw the required eclectic trim, bought the Greek and Medieval sheets needed for exams from "a student still poorer than I was"; his Renaissance thesis, said the professor, had nothing in it of the Renaissance, was "crazy but good."

An admirer of the intuitive Belgian pioneer Henry van de Velde, whose buildings had flow and dynamic quality rather than intellectual functionalism, Mendelsohn had begun practice in 1908 but really hit his stride during World War I, feverishly making sketches in barracks and, says he, in trenches, showing fantastic shell-like structures. The commission for his famous Einstein tower came to him there. Einstein called it "organic." Asked later whether he would build it that way again—all curves and incidentally special formwork—Mendelsohn replied, "God forbid—but whether I could do it that well again I do not know." After the war there followed a prolific output of factories (stock forms such as the repeated sawtooth bay receiving a new plastic dignity), department stores (many will recall their dramatic curved glass stairhalls), office buildings, everything a busy architect might produce, all uncompromisingly modern.

Came March 1933 and Hitler, and Mendelsohn promptly left Germany, 45 years old, to start again. First in England (the Bexhall Pavilion, done with Chemayeff, was part of this) then Israel. In Palestine: brilliant large houses such as Professor Weizman's, banks, the University Hospital Center, the hospital at Haifa, town planning schemes extending vastly along the Mediterranean.

By now Mendelsohn had achieved world fame, but once again catastrophe struck: World War II cut off even the work in Palestine. So he circled around to America again, settling in a Howard house high on Telegraph Hill in San Francisco—the most urbane and freedom loving of America's cities.

During the succeeding ten years he painstakingly created yet another imposing group of works, no less ambitious but more mature than his earlier ones. Withheld from publication until they might make up a representative collection, they will be shown in this magazine during 1951.

A TOP ARCHITECT'S HOSPITAL

Eric Mendelsohn's unique gift to the chronic sick is the tonic effect of his airy building design

LOCATION: San Francisco, California
ERIC MENDELSOHN, Architect
ISADORE THOMPSON, Consulting Engineer
BARRETT & HILP, Contractors

In San Francisco the beautiful new building that they show to visitors is not a church or a bank but a hospital by Eric Mendelsohn.

One look at Maimonides Health Center is enough to prove that a hospital can be bracing and cheering. The building comes into view suddenly, around the corner from the new Mt. Zion General Hospital—a quick flight of long balconies, each with its fine-lined white iron balustrade, tier over tier seemingly suspended in the sky.

Good looks of the kind that architect Mendelsohn conferred on Maimonides are directly therapeutic. In every line the building was made to look light on its feet, to make the chronic sick who will be its patients feel that life can be buoyant. By dissolving his entire building front into balconies, Mendelsohn instantly subtracted four-fifths of the apparent weight. By the use of open balustrades instead of solid parapets he reduced his concrete to thin slabs. By "feathering" the slabs down to a thin leading edge (at the front edge of the corner bay it is only 2 in. thick) he obtained still further lightness and grace. By cantilevering the balconies he put the weight-supporting columns back into the shadows (although they still project from the wall reassuringly). By carrying forward the two blank end walls he not only supplied windshields for his balconies but made his whole front look as if it were carried lightly between thin
Through-passage from street to street is glazed where it passes the two patios (see opp. page) and has a cheerful entry door.

brackets. (Otherwise the balconies would have appeared to project from a heavy box.) When the two top floors are added later on, the building will end in another thin line up above—the sail-like canopy of Mendelsohn's "flying roof."

All this white, light, gaiety should take some of the lead out of a sick man's feet, give his spirit its badly needed lift. The very fact that the whole hospital front is the same balcony repeated makes the result seem effortless. And the little round turrets which punctuate the balconies, ending in the prominent round corner bay and giving the building its indelible stamp, were perhaps Mendelsohn's happiest idea. Without them, this kind of iron-railed balcony might easily have said "jail." With them there entered not only a new rhythm but also fantasy. Some people said the turrets reminded them of balustraded mountain lookouts; others recalled looking up at the pleasant white-turreted houses that flock up San Francisco's steep inclines such as Geary Street.

By the cockeyed but evocative logic of art, Mendelsohn had made a series of simple iron balustrades a bright occasion.

Vertical development on a narrow lot

Maimonides will be remembered for an expressive economy of form, especially in its front, rather than an economy of building dollars. Yet on the practical side architect Mendelsohn set a good example in making the most of a narrow "impossible" lot, such as many a "special" hospital must deal with for similar reasons. The Maimonides board wished to save money by sharing the mechanical plant and certain hospital services with allied Mt. Zion General. But the only

Only a narrow lot was available close to Mt. Zion, so the Maimonides hospital had to be developed vertically (see plans). The central position of the main building left a charming recovery court (opp. page) landscaped by Thomas Church, and the service court toward Bush Street seen in the foreground in the photo of the model. This shows the low future treatment wings and the ultimate development with a "flying roof." The north facade is bracketed between the elevator tower left and the portholed fire stair tower to the right.
In the three views on these two pages may be seen how the striking exterior of Maimonides knits in with the pleasant living arrangements inside. The exciting pattern of the balconies as seen from the court below is perhaps less important than the fact that the spindle-railings offer minimum obstruction to the view of the city itself as seen from inside the patient rooms. Floor-to-ceiling glass is well shaded by balconies themselves against noontime summer sun, while it permits the balcony to seem a part of the room. The columns which project widely forward from the main wall screen the rooms from one another and simultaneously give an impression of needed structural strength.
available near-by land was a mid-block sliver spanning 300 ft. from Sutter Street to Bush but fronting only 100 ft. on each.

On such a shape the usual economy of horizontal deployment, to get maximum reach for every nurse's station, was impossible. So Mendelsohn sought compensation in the extra amenity of vertical development. By building high, he could give every patient room a wind-sheltered, sunny, south exposure with light and air and a hilltop view across the city. So the main ward building was run up (for an ultimate height of 11 stories) athwart the middle of the narrow lot; the one-story administration building was planted on Sutter Street as a buffer and entrance unit; the low treatment buildings were grouped around the service court on Bush Street. Between the central building and the administration unit there was still space for a charming recovery court, landscaped by San Francisco's ace "Tommy" Church, in which the many ambulatory patients could walk, on whose patterns others could look down from social rooms and balconies, into which staff could look from their offices. And a long glazed walk to one side connected everything from street to street, besides becoming a pleasant social area in itself for rainy weather.

Cheery living space

Although Maimonides on its lot can put only 16 patients on a floor, so that nurses use elevators to serve two floors, this is not so serious in a chronic hospital where emergency situations are rare. Much more important is the long-term living quality of the patient rooms. So architect Mendelsohn made sure that all rooms (except a few isolation rooms) faced south, and brought the glass in bedrooms down to the floor, thus making the balcony an integral part of the room. He hung substantial figured drapes alongside that could be drawn for greater coziness when desired. And when he gave his balconies their spindle-rail, he was thinking not only about the hospital's exterior expression, but about the sightlines down to the city from beds on upper floors. Very few architects (and positively no bridge engineers) ever think just how a solid parapet or heavy balustrade may cut the view.

Colors were carefully modulated—mostly high key pinks and yellows on the walls. A special sanitary ceramic lighting fixture was designed by the architect to shine upward for indirect lighting or down for reading in bed.

Again, in a hospital which is perforce a long-term home, Mendelsohn made his social areas tall and airy (photo, page 99) and usable for movies, radio, television.

A good many visitors have asked why the social rooms are one short floor above the ground. It is partly, says Mendelsohn, because the high view of the court makes the view so much more pleasant. And this fitted in with the desire to avoid excavation (Maimonides gets its steam from Mt. Zion, needs no basement for boiler plant) so that storage areas could be kept directly behind the unloading platforms, at grade.

Maimonides is set in a very indifferent residential area verging into slums. Consequently even the landscaping is contrived to shield out what is undesirable, and provide a pleasant prospect. No matter how narrow was the lot, Church made room for a border of trees along both sides, to act as a buffer against unpleasant sights and noise. (See plan, page 95.)
A special kitchen

The planning contortions by which Mendelsohn managed to squeeze into his culinary space two complete kitchens plus a diet kitchen has special interest only for those confronted with the same problem of the Jewish orthodox dietary laws demanding completely separate treatment of all that pertains to milk or meat. More generally interesting is his invention for odorless ventilation. By dropping a corrugated glass screen from the ceiling between cooking and service area he forces the fresh air to pass from the service to the cooking area where the ceiling exhausts create a vacuum behind the glass screen. A ventilating “snorkel” (seen in photo, right) is constantly drawing out the immediate cooking fumes from the ranges, so air in the kitchen and in the hospital stays fresh.

Earthquakeproof structure results in an H

On an indifferent foundation soil of windblown sand, Mendelsohn’s engineer, Isador Thompson, poured a semi-mat concrete foundation in which integrally cast deep beams distributed loads, not only from part to part but back and forth between high buildings and low, to equalize settlement. After studying eight floor systems, Thompson settled on shallow beams and long concrete slabs, taking care to retain full continuity between slabs, beams, walls. Thompson’s shallow-beam slab system held his floor height down to 9 ft. 8 in. with a consequent reduction not only in stresses but in all costly vertical runs (pipes, ducts, elevator shafts, and stair).

For California’s earthquakes, he made his center wall (running east-west) into a bearing wall, united it with the two end walls in an H-section, got added bracing from front and back rows of columns in between. (Drawing, right.)

Maimonides’ 87 beds were housed at a cost of $1,100,000.
A TOP BUILDER'S HOSPITAL

Teamwork, tight planning and Andrew Eken's building know-how produce a masterpiece of economy

LOCATION: Morristown, N. J.
JOHN H. & WILSON C. ELY, Architects
ANDREW EKEN, Technical Adviser
WALTER KIDDE CONSTRUCTORS, INC., Contractors

GERHARD HARTMAN, Ph.D., Hospital Consultant
MEYER, STRONG & JONES, Mechanical Engineers
J. DI STASIO & CO., Consulting Engineers
CLARKE, RAPUANO & HOLLERAN, Landscape Architects

The factors that make Architect Mendelsohn's Maimonides Hospital so successful may be somewhat intangible and almost beyond definition, for beauty is an abstract concept. The factors that make Builder Andrew Eken's Morristown protege so impressive are solid and easily defined, for building economy is a concrete fact. The day when great builders like Andrew Eken get together with great architects like Eric Mendelsohn will be a great day for America. Just as Maimonides is a hospital for every builder to look at, so Morristown is something for every architect to study in order to bring that day closer.

"An extraordinary example of efficient planning and economical construction." This is the accolade given the new 236-bed general hospital in Morristown, N. J., by John G. Steinle, regional hospital program director for the U. S. Public Health Service. It may not take first prize in a hospital beauty contest, but as a yardstick of how much can be built for how little it is well worth the study of every hospital planner—be he architect, doctor, consultant, trustee or public official.

1. Direct construction cost (not counting fees, land or housekeeping accessories) will be only $9,136 per bed—20 per cent less than the current national average. This is all the more remarkable since New Jersey is a high-cost area;

2. Planning is so tight that complete facilities have been packed into only 530 sq. ft. per bed without reducing bedroom sizes;

3. More modern services, better equipment, and more privacy for patients have been combined with these dollar and space economies than can be found in most General Hospitals built at higher cost.

When the bids come in, all too many hospitals find it necessary either to make drastic cuts in their plans, or else to go out and raise more money. When the bids came in for Morristown, they were so far below expectations that the hospital could start thinking about building a $415,000 nurses' home.

A thousand savings, forty-five alternates, eight bidders

In the club car that carries Builder Andrew Eken between his New Jersey home and his Wall Street office each weekday morning, there are always a number of fellow-commuters from Morristown who know him well. One day early in 1948 a fellow commuter asked a favor: Would Eken act as an outside technical adviser to the trustees of the proposed Morristown Memorial Hospital? Eken, whose physician daughter Elizabeth had interned at Morristown, agreed to do the job, threw all his energies and enthusiasm behind the project. What started as a busman's holiday soon became for him a thoroughly absorbing and exciting contest to get the hospital more and more for its building dollars.

Today, when Eken is asked how Morristown managed to get one of the best equipped hospitals in the country for one of the lowest prices he will hesitate before he answers. What puzzles him is not so much why Morristown's bids were what they were, but why so few other hospitals can match them. He will admit quickly that the savings did not come from any radical new methods. He will say there were no big individual economies—just a thousand little ones which finally added up to one very large saving.

Eventually Eken will probably admit the building's economy was more a matter of procedure and construction know-how than a matter of revolutionary planning or techniques. For example:

1. From the very outset everyone knew that unless costs could be held down there would be no new hospital. From the very outset the object of all planning was to make sure every added foot of space served a useful purpose. Almost every week the hospital administrator, the chief of staff and several of the doctors met with Eken, the architect, and the Building Advisory Committee. The doctors explained what they needed and why and then cooperated in figuring out just how economically their needs could be met. Health Service director Steinle's office was always ready and willing to advise.

2. Before any planning decision was made final, Eken presented comparative costs from his own estimating department.

3. The hospital wanted no money spent for fancy finishes, an idea which, if not revolutionary, was certainly ahead of its time. All the facades are common brick; all interior partitions are painted plaster; all floors are asphalt tile laid on the bare floor slab. Instead of expensive bumpers to protect walls, an economical beveled cement base was run along the floor of the bedroom and corridor walls.

4. The hospital called in a top notch structural engineer and top notch mechanical engineer. Says the hospital consultant: "These engineers saved the hospital thousands and thousands of dollars. (But the mechanical engineer admits frankly that his firm would not have taken so small a job except as a favor to Eken.) The mechanical engineer's contribution included a very economical working-out of the plumbing stack (see drawing) and of the oxygen distributor. The structural engineer designed an unusually thin concrete slab floor, making it possible for his columns to be very small."

5. Wherever there was any question as to what satisfactory material or method would prove most economical, an alternate was specified. All told, 45 such alternates were included in the bid forms.

6. Eken, at the request of the architect, loaned two men from his own staff to the architect's office to help make sure that all detail work was done out for economical construction and to help write the specifications in the architect's language so clearly that bidders could know exactly what they were bidding on. (As a result, bids varied by only about 15 per cent, with the three lowest only 1 1/2 per cent apart.)

7. Not least of Eken's services was keeping the hospital planning on a fast timetable which enabled them to take bids just before the fighting in Korea began. As a result, the bids were taken when building costs were within a few points of the postwar low.

8. Only ten top flight builders were allowed to bid on the job—three New Jersey firms plus seven of the biggest New York builders...
among them Fuller, Merritt-Chapman-Scott, Thompson-Starrett, Vemlyea Brown, Irons & Reynolds, and Walter Kidde. "You can't get the best builders to spend the time and money to make a serious cost-cutting bid in a free-for-all," says Eken. Kidde was the lowest bidder, got the job.

"Full service hospital," fully equipped

Here are some of the things Morristown will get for its money:
- A hospital where every patient will have his own private or semi-private room. The rooms are all the same size, permitting complete flexibility. (An incidental saving from this no-ward policy is that very little space had to be provided for visitors' waiting rooms.)
- Every room has its own toilet, wash basin, telephone jack and its own oxygen supply specially piped in;
- There are three air-conditioned operating rooms, an air-conditioned fracture room, an air-conditioned cystoscopy room, three air-conditioned delivery rooms and two air-conditioned labor rooms.

Says U. S. Public Health Service Director Steinle: "Morristown Memorial Hospital also includes a comprehensive physical medicine unit, a contagious unit and a very complete outpatient department with facilities for the treatment of pay patients by the medical staff.

In addition to the usual outpatient facilities there are special clinics for cancer, eye and dental. The laboratory, which includes a very well planned blood bank unit, was designed to meet the needs of much more than the 236 beds of the hospital as approximately one-half the estimated laboratory load is anticipated as nonhospital patients being referred by private physicians. (Also, hospital was designed for future expansion—Ed.) Each floor has a special room for disturbed patients. There is a well-equipped treatment room on each floor. Special consideration was given to patient comfort with the inclusion of such things as coffee and gift shops and a nondenominational chapel.

"The hospital was designed as a possible teaching resource with housing for eight resident physicians and a well-planned lecture room to accommodate 150 persons for pathology conferences. The radiology department includes a photo-roentgen unit and deep, intermediate and superficial therapy facilities."

Per bed figures are frequently misleading if they do not include costly hospital equipment, just as cubic foot costs are misleading if there is no compact planning (so costly equipment is simply spread thin over a larger cubage). What makes Morristown so remarkable is that it not only includes every conceivable piece of equipment...
Concrete frame of hospital (above) shows flat slab construction. Series of pictures (right) explains how slab is finished to produce perfect, unplastered ceiling. Top view shows slab after 4 x 8 ft. plastic-coated plywood forms are removed. Next picture shows thin concrete fins formed by plywood joints being ground down to smooth finish.

After grinding, men disk the slab to remove oil and dirt, next apply a coat of cement mixed with a bonding material to fill up airholes and pockmarks.

Underside of slab is now ready to be painted.

After coat of cold water paint, monolithic concrete slab ceiling looks exactly like traditional plastered job.

Close-up of concrete frame shows shorter end bay for solarium (left). Other bays are of standard width in bedroom wings, vary slightly in north wing.
needed by its doctors, but that it is also so compact in plan. At 530 sq. ft. per bed it beats the regional average of 600 sq. ft. by more than 10 per cent. Even with all the fees, landscaping, equipment and accessories (down to spoons and pillowcases) included, Morristown's per bed cost will increase only from $9,136 to $11,607—as compared with a current national average for completely equipped hospitals of $13,089.

When completed Morristown will serve five New Jersey counties and will be the largest hospital in the north-west part of the state. It will be air-conditioned in some special areas. An additional generator set for emergencies is included in the unit cost, will come in handy during storms and in case of bombing attack. Only serious criticism by U. S. Public Health Service: Nurses will have too far (about 120 ft.) to walk from their stations at the center of the Y-shaped plan.

The Y-shape, incidentally, was chosen by the trustees before Eken entered the picture. It assures good orientation for most bedrooms, leaves the leg of the Y for services and special treatment facilities. Morristown's trustees decided against the cross shape for fear that it produced too much traffic at the intersection, rejected the H-shape for similar reasons.

**How to save 125,000 cu. ft.**

Typical of the careful cost-paring that builder Eken and his associates did on this job is the saving of an estimated 7 ft. in overall height (or 125,000 cu. ft.) they achieved by their design of a minimum concrete slab floor, and by eliminating plastered ceilings. Eken feels that plastered ceilings under a flat slab may crack and fall, that plasterer labor is harder to get each day. The reason is that many plasterers' unions are tightly knit family affairs, frequently refuse to admit men not descended from (or otherwise related to) plasterers.

Morristown is the first hospital in the country to use so economical a slab. Designed by one of the country's top concrete engineers, Di Stasio, and perfected by concrete enthusiast Eken, the Morristown slab is only 5½ in. thick in most areas, needs to be increased to 7 in., for rooms with heavy live loads. With columns spaced 15 ft. 6 in., 9 ft. 7 in. and 15 ft. 6 in. in depth, and arranged in 13 ft. 6 in. bays (a patients' room), the flat slab becomes a continuous member almost 40 ft. long, from spandrel beam to spandrel beam.

Although pipes, cables, etc. can be buried in the slab at certain points, Morristown's vertical ducts and pipe chases make most of this unnecessary, facilitate slab construction considerably. In other respects, too, the mechanical layout is a model of economical and compact planning. For every two bedrooms, Morristown has a space 3 ft. 9 in. wide and 15 ft. 9 in. deep, containing two w.c.s, two lavatories, two prefabricated closets (with storage space for bed linen so that nurses don't need to go back to a storage room for it) and the plumbing stack. This amounts to a total of 59 sq. ft. for every four beds. By comparison the tightly planned University of Illinois hospital (BUILDING, Feb. '50) devotes 105 sq. ft. to inside toilets, wastes a similar area again in 5 ft. wide entrance passages to each room (but does get the lavatory inside its private bath, and a larger closet in the bedrooms). Although Morristown's lavatories are in the bedrooms, its bedrooms are 18 in. wider than those planned for Illinois, don't have the notched-out corner produced by Illinois' interior toilets.

When all the bills are in and Morristown is ready to admit its first patient, the hospital will have spent a total of $2,739,259—$816,000 of which it got from the U. S. Government under the Hill-Burton Act. The Health Service and the hospital trustees will know that they spent those dollars well. They will be able to look back upon a fine record teamwork in the production of an efficient and useful building. And they may be sure that architects and builders all over the country will study the records of this teamwork with care; for these records hold the key to a better integration of American building—and, consequently, the key to a better architecture.
Three-year campaign swings citizens to contemporary design, forces conservative bureaucrats to adopt progressive school building program

Last November New Orleans voters went to the polls and shifted the balance of power in their school board decisively in favor of completely contemporary new schools. Behind this victory is an inspiring story of how the architects of New Orleans climbed down from their professional pedestal and pitched into a hot civic fight against entrenched school officials and conservative school board members who proposed to meet the city's crying need for new schools with hopelessly out-dated buildings. Stirred up by an energetic woman on the school board and led by a young professor of architecture, the AIA Chapter joined in an intensive public relations program which brought the advantages of good contemporary schools home to the average citizen. For other communities with a similar problem, the story of the New Orleans campaign offers heartening evidence that people will fight for modern schools when they are taught the essential, practical values of contemporary architecture by its local practitioners.

The battle of the New Orleans schools started early in 1948 when school officials belatedly announced a $40,000,000 school building program, then released a shockingly antiquated quadrangle plan for a new elementary school in the crowded suburb of Gentilly (top, right). Appalled at the thought of this plan becoming a prototype for the whole program, Charles Colbert, then assistant professor of architecture at Tulane, gave his second-year students the problem of designing a first-rate modern school for Gentilly. The university backed the project both as valuable practical experience for the students and as a public service. New Orleans newspapers gave the story a big play, and a utility company offered space and financing for a public exhibition of the best student designs (photo, below):

Delighted by this chance to tackle a practical problem, Colbert's class of mature ex-GI's thoroughly researched the Gentilly school requirements, talked to parents, teachers, school administrators, business men and civic groups to get their ideas. At the exhibit of models based on this intensive study more than 30,000 people saw such basic elements of contemporary school design as: single-floor plans laid out for maximum economy, flexibility and best sun and wind control; home-like classrooms bilaterally lighted and properly equipped for sound control and ventilation; auditoriums, gyms, cafeterias and playgrounds designed for community as well as school use; site selection based on the requirements of an increased number of outdoor activities, protection from heavy-duty streets and proximity to student's homes.
Public enthusiasm for the student designs led school superintendent Lionel J. Bourgeois to announce that revised plans for the Gentilly school would incorporate many of the new ideas supplied by the Tulane project. But nearly a year later aging school architect C. A. Christy submitted plans for a two-story, central court structure on an inadequate two-block site—a very distant cousin to a good temporary school—and the school board approved construction by a vote 4 to 1. The lone dissenting vote came from the board’s only woman member—Mrs. Jacqueline McCullough. Convinced that the board’s action blatantly defied public opinion, Mrs. McCullough teamed with Charles Colbert to build up a vigorous citizens’ drive to reverse this decision.

Architects join the fray

One of their first moves was to enlist the support of the New Orleans architects. Under the leadership of president Sol Rosenthal, the AIA chapter passed a resolution criticising the school board for proceeding with the Gentilly plans “without recognizing in any way the local practicing architects” and offered its services in “developing a modern school program of outstanding accomplishment.” Faced with mounting public pressure, the board authorized a survey of school needs by an AIA committee consisting of Colbert as chairman, August Perez, Richard Koch, William F. Bergman and Douglas Freret.

Meanwhile Colbert and Mrs. McCullough went to work on all fronts to build public backing for this professional approach to the school problem. Within two months they held more than 60 meetings with civic organizations. The Classroom Teachers Federation, PTA groups, the Young Mens’ Business Club and New Orleans newspapers bombarded the board with appeals for a modern school program. Radio stations donated time for panel discussions of the school issue. Colbert appeared before the board with 21 specific criticisms of the proposed plan for Gentilly, summed them up with a slogan which captured public imagination: The child is the monument, not the school. As a climax to the campaign Tulane architectural students prepared another exhibit of models and dramatic charts showing the advantages of contemporary design for a specific New Orleans school. Set up in a large department store in the heart of the downtown area, the exhibit drew 50,000 in two weeks.

School board yields

This whirlwind campaign forced the school board to bow at last to the aroused public support for a progressive school building program. When the AIA committee submitted recommendations for the Gentilly area based on a study of top ranking state and city school codes, the board agreed to follow them and made a precedent-shattering announcement: henceforth all New Orleans schools would be designed not by bureaucrats but by practicing AIA members.

Having won this whopping victory, the Committee was particularly anxious to prove to the sceptical board president that a good modern school could be built in Gentilly beneath the budget of $750,000, or $1,000 per child. They felt that a team of architects representing advanced, middle-ground and conservative approaches to design would be the safest bet for this first, pace-setting commission. Three firms chosen were Curtis & Davis; Goldstein, Parnum & Labousse; and Freret & Wolf. The AIA committee checked their drawings. Any disagreements were ironed out in conference with the committee, without any sign of the unpleasantness produced when an architectural committee tries to redesign submitted work. Clinching proof of the success of this collaboration was a low bid of $553,000 on the completed plans—about $200,000 under the original estimate.

With the deadlock over design broken by the decision on the Gentilly school, the school board announced an emergency $7,700,000 building program to satisfy the clamor from all quarters for desperately needed new schools. In appointing architects for the first units in this program the board decided to give priority to the hard-working members of the AIA committee. On two Negro elementary schools for the Gentilly area, involving about $1,650,000, Sol Rosenthal, chapter president, formed an association with Colbert, who quit his job at Tulane to undertake this practical test of his design ideas. A $700,000 elementary school in the suburb of Lakeview went to the firm of Favrot, Reed, Mathes & Bergman. The $500,000 Union Park school was given to Ricciuti & Benson. Nowhere in this first apportionment of jobs was there a suggestion of the entry of the “ten per centers” who sometimes infiltrate programs of this sort on the basis of political contributions rather than quality of work. All plans for these schools were reviewed by the AIA committee for conformity to basic standards set by the committee’s survey, but architects were given wide latitude within this framework.

Voters back architects at the polls

A school board election last November clearly confirmed the extent of public support for modern schools aroused by the architects and Mrs. McCullough. Prior to the election school board votes had usually been either 4 to 1 against progress or at best 3 to 2 in favor of better schools. Of the two members whose terms expired last fall one was conservative, the other progressive; but only the conservative decided to run for re-election. The McCullough candidates were C. Paul Besse, an oil company engineer, and Dr. Clarence Scheps, comptroller of Tulane University. Besse based his campaign on the need for better buildings, while Scheps hammered for sound school financing. Both pointed out the fact that no new schools had been built since the war despite the pressure of the vast number of war and postwar babies. Scheps and Besse scored a clean-cut victory; the conservative candidate was defeated by a vote of 50,000 to 32,000.

One of the new board’s first acts was to install a new president—Mrs. Jacqueline McCullough-Leonhard. Newly married herself, Mrs. Leonhard intends to cement the marriage of New Orleans citizens to contemporary school architecture. The board is now pulling through the first phase of the program and pressing the school superintendent for complete data on the city’s overall school needs. (Though the former board had obtained a report on long-range requirements, from Harland Bartholomew Associates, city planners, no effort had been made to take the pupil census recommended by the planners as a means of determining specific needs in each area of the city.) Of the first five schools awarded to members of the AIA chapter, two are under construction and bids will be taken shortly on the remainder.
Two-story finger plan trims high land costs, captures air and light for New Orleans grade-school

LOCATION: New Orleans, La.
SOL ROSENTHAL and CHARLES R. COLBERT, Architects

Here is a sample of what New Orleans is getting as a result of its architect-led campaign for better schools. This proposed Negro elementary school has a two-story "finger" plan which may prove to be more effective than the classic single-floor version as an antidote to the city's worst school building headaches. Among these are a hot, wet climate; poor foundation conditions; densely populated, costly land.

By placing classrooms in three widely spaced parallel wings with single-loaded outdoor corridors (plan, right), architects Rosenthal and Colbert have 1) opened the whole school to the all-important prevailing winds, 2) secured two-sided natural lighting for all grades, 3) provided direct access to the outdoors for the youngest pupils. To insure good cross-ventilation in frequent rainy weather, the continuous windows on both sides of classroom wings will be composed entirely of awning-type sash (detail, right). Second-floor classrooms will catch additional breezes by being up in the air—like the raised living quarters of many an old New Orleans plantation house.

Biggest advantage of the two-story plan is its economical use of high-priced land. For a comparable one-story school the space between wings could be reduced from the present 80 ft. to 50 ft. without shutting out light and air. But despite this saving, the same number of classrooms would occupy some 50,000 more sq. ft. of land than the two-story arrangement. With land at about $2 per sq. ft. this would add better than $100,000 to the school's cost. The single-floor scheme would save little on piling costs—an important factor in marshy New Orleans—and its doubled roofing area might nearly offset the cost of the fireproof construction that a 2-story plan requires in roof and floor slabs.

As far as younger pupils are concerned, this is still a one-story school, because kindergartens and lower grades occupy the ground floors and open directly on individual play areas through accordion-type doors. A library, a multi-purpose auditorium, administrative offices and upper grade classrooms are located on the top floors. Older students reach outdoor classroom areas via stairs at the end of each balcony-corridor.

Both school and community needs were considered in planning the spacious assembly-cafeteria building. Located near the street for easy public access, it provides a large clerestory-lighted room for meetings or meals, a partially roofed dining terrace, complete kitchen and a medical clinic. Estimated construction cost of the school is $950,000, or about $1,000 per pupil.
The rising cost of building service raises the question:

ARE APARTMENTS ECONOMICALLY OBSOLETE?

Because the apartment dweller must pay indirectly but dearly for lawn mowing, leaf raking, snow shoveling and for all forms of household maintenance and repair while the homeowner does most of these chores himself, a diminishing proportion of U. S. families can afford the luxuries of apartment life. This is the thesis argued below by

JAMES C. DOWNS, JR., President Real Estate Research Corporation and Chicago Dwellings Association

Pressure against luxury living has been characteristic of our expanding economy during the past 50 years. Take, for example, the case of domestic servants. Everywhere one hears the common householder's lament: "You just can't get help these days!" The inference is that maids, gardeners, housemen and chauffeurs have disappeared from the face of the earth. Of course that is not true. There are still plenty of domestic servants, even though their number has dropped from more than 27 per thousand population in 1870 to less than 13 per thousand in 1950. The wealthy continue to have servants in their homes, but in spite of our current heights of prosperity a steadily diminishing percentage of U. S. families can afford that luxury.

The prime objectives of housing design during the past half century have been to overcome the impact of higher construction costs and to eliminate wherever possible the need for purchased services. In this period we have seen a single living room substituted for the traditional front and back parlors; we have watched the dinette or dining alcove replace the dining room; we have witnessed an increasing shift from bedrooms to bed closets and studio couches. Gone almost completely are the maid's room, the sewing room and the pantry. The housing consumer has been forced to these compromises and deprivations because he just could not afford the space.

Of even greater impact upon the pattern of housing has been the need to eliminate purchased services. Broadly speaking, the economy has accommodated this need in two ways: by the use of labor-saving devices and by wider reliance upon self-help. In many instances the elimination of purchased services has been a combination of the two. For example: The home-wave kit and the portable hair dryer, combined with the labor of the consumer, have cut in on the beauty operator.

The purpose of this article is to pose and to present arguments defending the following syllogism: "An increasing percentage of U. S. people cannot afford purchased services of any kind; apartment buildings differ from other housing accommodations in that they offer a higher level of purchased services; therefore, apartment buildings must decline in relative importance as a means of housing."

Apartment: "A pretentious flat"

Although there does not seem to be any clear-cut definition of the term apartment building, it is commonly understood that the difference between an apartment and a flat or tenement is the implication of service in the former term. One of our dictionaries says that an apartment is "a pretentious flat." Certainly in the lexicon of the average realtor, builder and architect, a tenement means a unit in a multi-family building wherein no services of any kind are provided; a flat means a unit in such a building wherein a modicum of such services (perhaps only heat) is provided; but an apartment envisages a broad range of services including heat, hot water, janitor service, maintenance of furnished equipment (embracing stoves, refrigerators, plumbing and other utilities systems), cleaning of public spaces, grounds, etc., as well as maintenance of structure and the payment for all public services (taxes).

These apartment buildings came into being when central heating and utilities distribution systems made it possible to erect structures truly multi-family in character, yet offering living amenities comparable to those previously found only in single family dwellings. They originally were intended to accommodate the need for higher-density occupancy of land by persons in the upper income groups who did not wish to follow the pattern of moving farther and farther from central city areas in pursuit of such amenities. Inasmuch as these original tenants were used to a high level of service, the initial apartment houses catered to their wants.

The first residential buildings to offer a level of service high enough to qualify them under our definition as apartment buildings were luxury two-flats. Here two families could occupy no more land than was needed by one, and an owner could provide himself with service, or profit, or both, from the rental paid by his tenant. Even before the depression, however, it became obvious that the benefits of ownership of this type of building in many cases were an illusion. Mounting costs of construction and service in the period after World War I tended to make the rent of the owner more than that of his tenant. As a result, two-family structures, which aggregated 20.4 per cent of all residential units erected in 1922, began to play a less and less important role in housing construction. Since 1929 this type of building has never provided as much as 10 per cent of all residential units constructed and in 1950 it accounted for fewer than 4 per cent of the housing units built.

The apartment's role in history

Prior to the year 1920 the apartment building had never assumed a really important role in the construction of new housing for U. S. families. In fact apartment units built in any one year had never totalled as much as 10 per cent of all dwelling units. More than 80 per cent of the new residential quarters in 1920 were single family houses; something over 9 per cent were in buildings of less than four units and the balance of 8½ per cent were apartments.

Two factors in the post World War I period contributed to the dramatic increase in the number of apartment buildings erected in U. S. cities. The first of these was the sharp rise in urban population and the consequent pressure for more intense land use. The second was the technique of financing such buildings through (Continued on page 68)
One of New York City Mayor William O'Dwyer's last whimsies before he left office last year was to suggest that the traffic and parking problem in Manhattan be solved by paving over the streets and the traffic on them, and starting in clean on a new level 8 ft. higher. This was a lightly made remark but a significant one; the despairing words are illustrative of the vast and seemingly incurable automobile sickness of American cities, whose streets cannot hold both parked cars and traffic, but nevertheless are made to.

A more hardheaded approach to the intricate problem is a new design by Rotogarage Parking Units Co. of New York for multi-story parking buildings to take cars off the street for hourly storage.

Rotogarage's ingenious design for a mechanical parking tower on clamorous 34th Street between Sixth and Seventh Avenues in New York—across the street from Macy's department store—is brand new. Its parking floors are actually a stack of turntables set on a core of four elevator shafts. City motorists will drive in on a clear street floor, leave their cars before one of the four elevator doors, turn the ignition off, and get out, leaving the cars completely locked if they wish. A dolly will emerge from the elevator, lift a car a few inches off the floor, and pull it into the elevator. The elevator will carry the car upstairs to one of the rotor floors which has an empty slot on its turntable—and while the elevator is rising this rotor will be revolving to present its vacant spot before the elevator door. The elevator will stop, the dolly will run the car out of the cab and drop it on the rotor, then the elevator will either unpark another car which has been called for and take it down, or return below empty. The time elapsed from when the elevator doors open to receive one car, the car is stored upstairs, and the elevator returns to pick up another will average one and one-half minutes.

This building is designed to store 400 cars on a plot 125 x 100 ft., which is approximately seven times as many as a parking lot that size could store. Street congestion would thus be relieved to a degree. But the building is also designed to make money as a prudent investment. Its backers figure it will pay on any site which is as expensive as $15 per sq. ft. (Less expensive areas are less congested, and parking demand will not support the building investment. Real estate in the 34th Street area runs about $30 per sq. ft.) The building is cheaper to build and operate than a ramp garage. For detailed analysis of the 34th Street project compared with a parking lot and a ramp garage of equal capacity, see opposite page.

Elevator parking garages, even automatic ones, are not new. The elevator did much to create to-
day's congestion in city streets by making skyscrapers possible, and inventors have long tried to use it also to solve the situation. But elevator parking garages which are merely one storage floor above another, using attendants to drive cars into place, cannot give fast service in unparking. Other automatic parkers have been developed and are in use which handle all cars mechanically by dollies on elevators, but those designs in use have a common weakness: if any part of the mechanism goes out of order, a certain number of the parked cars cannot be imparked until it is fixed.

It is highly improbable that cars ever would be frozen in a rotogarage. This design sidesteps this weakness by making all the cars accessible to all the elevators by means of the turntables. Even if three of the four elevators should go out of commission simultaneously, the system is not immobilized. One elevator can clear the entire building. Another place of possible mechanical failure, the motors which revolve the turntables, is diminished as a danger by the design of the rotor mechanism. Only 6 h.p. are required to move a turntable fully loaded with 28 cars (gross wt. 200,000 lbs.). Actually, four 2 h.p. motors are provided in the design, but even if they go out the turntable may be turned practically in emergency by manpower at a slower speed than usual. Engine failure freezes nothing unless all elevators go out.

A basic factor in parking garage design should be the number of cars which can be discharged to the street without disrupting traffic. The rotogarage will discharge 40 per cent of its capacity in one hour—160 cars—but can hold a number of them wait street without disrupting traffic. The rotogarage will discharge 40 per cent of its capacity in one hour—160 cars—but can hold a number of them wait.

A COMPARATIVE STUDY

ANNUAL OPERATING EXPENSE of the operational costs of a parking lot, a ramp garage and a Rotogarage in the 34th Street district in New York City

<table>
<thead>
<tr>
<th></th>
<th>Parking lot</th>
<th>Ramp garage</th>
<th>Rotogarage</th>
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<tbody>
<tr>
<td>Plot required</td>
<td>$80,000</td>
<td>$25,000</td>
<td>$12,500</td>
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<tr>
<td>Land &amp; building areas, overall</td>
<td>$800,000</td>
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<tr>
<td>Assessed value of land (not for sale)</td>
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BUILDING COSTS

Demolition (incl. improvements for parking lot) | $228,000 | $12,000 | $6,000 |
Excavation & foundations | none | $130,000 | 75,000 |
Structure (incl. sprinklers) | none | 1,045,625 | 889,518 |
Elevators & parking dollies | none | none | 225,000 |
Rotors with traction drive motors, installed | none | none | 360,000 |
Costs during construction (archt. & bldrs, fees, etc.) | none | 118,763 | 119,551 |

Total building costs | $228,000 | $1,306,388 | $1,675,049 |

Mortgage, probable (60% amortized loan) | $ none | $783,000 | $1,005,000 |
Equity of owner (land not included) | $228,000 | $523,388 | $670,049 |

ANNUAL OPERATING EXPENSE (based on operation day of 24 hrs.—full 365 days a year)

<table>
<thead>
<tr>
<th></th>
<th>Parking lot</th>
<th>Ramp garage</th>
<th>Rotogarage</th>
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</thead>
<tbody>
<tr>
<td>Ground rent (land available on long term lease)</td>
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<td>none</td>
<td>12,000</td>
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<tr>
<td>Insurance</td>
<td>$6,000</td>
<td>$15,000</td>
<td>7,000</td>
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<tr>
<td>Utilities (Power, light, heat &amp; water)</td>
<td>$5,000</td>
<td>$14,500</td>
<td>11,900</td>
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<tr>
<td>Supplies, repairs &amp; misc.</td>
<td>$1,000</td>
<td>$4,000</td>
<td>10,000</td>
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<tr>
<td>Operating staff (three 8-hr. &amp; relief)</td>
<td>104,000</td>
<td>104,000</td>
<td>74,320</td>
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<tr>
<td>Gross annual expenses</td>
<td>$410,840</td>
<td>$339,798</td>
<td>$304,313</td>
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ANNUAL ESTIMATED INCOME (based on a 300 day operation year—average daytime hourly income: 50 cents)

Shopper's parking period (10 a.m.-6 p.m.) | $444,000 | $456,000 | $460,000 |
No income shown for add. parking time, etc. | $444,000 | $456,000 | $460,000 |

Gross annual income, estimated | $444,000 | $456,000 | $460,000 |

RECAPITULATION:

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<tr>
<th></th>
<th>Parking lot</th>
<th>Ramp garage</th>
<th>Rotogarage</th>
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<tr>
<td>Estimated income</td>
<td>$444,000</td>
<td>$456,000</td>
<td>$460,000</td>
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<tr>
<td>Estimated expenses</td>
<td>$410,840</td>
<td>$339,798</td>
<td>$304,313</td>
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<tr>
<td>Gross net profit (before corporate taxes)</td>
<td>$33,160</td>
<td>$116,202</td>
<td>$175,687</td>
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<td>Annual income per car stall</td>
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<td>$1,140</td>
<td>$1,200</td>
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<td>Annual operating cost per car stall</td>
<td>1,028</td>
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<tr>
<td>Annual net income per car stall (before taxes)</td>
<td>$82</td>
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RETURN ON EQUITY INVESTMENT:

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<td>14%</td>
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<td>26%</td>
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RETURN ON ANNUAL OPERATING EXPENSE:

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<tr>
<td>8%</td>
<td>14%</td>
<td>17%</td>
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MOVING STAIRWAYS
MOVE INTO OFFICE BUILDINGS

The big news in Boston and much of the rest of the office-building world is that office workers in the new John Hancock Building don't mind riding all the way up to the ninth floor on moving stairways.

This is the first big test of moving stairways versus elevators for office building transportation, and it has been watched closely for two years by smart building men who questioned the elevator engineers' old maxim on vertical transportation which had limited most such moving stairways runs to three flights. These same observers are waiting now for the next big news coming up on moving stairways—an increase in their speed.

Although they broke the old three-floor rule, the designers of the John Hancock Building were careful. They compromised by including elevators for the first eight floors as well as moving stairways (the catchy word "escalator" was invented by Otis Elevator for their own moving stairway but appropriated by the public to describe all other moving stairways too; the Hancock Building is a Westinghouse installation). The Hancock Building elevators run express to floor four, then stop at five, six, seven and eight. Hancock employees working on the second and third floors are expected to ride the escalators if they are physically able. Employees on the 4th, 5th, 6th, 7th, and 8th floors are offered their choice of moving stairways or elevators, although the management has indicated its preference for having them use the stairways.

After six months experience, the employees preferred the escalators, according to a recent informal poll for BUILDING. Said Rita Cullinane, who works on the 7th floor: "At first I didn't like it because I was afraid I would get my foot caught, but now I'd rather go on the escalator because there's no crush and you don't get somebody's cigar in your face, as you might on a crowded elevator."

Jacqui Harison, manager of the Hancock employees' store on the 8th floor, said: "I like the escalators better because they move so smoothly, and I can just relax and get my thoughts together for the day ahead or plan my evening at home."

On the basis of this kind of testimony, a number of office building projects now in the works will shortly substitute moving stairways for elevators up to eight floors. A new eight story office building for Dun & Bradstreet in New York by architects Reinhard, Hofmeister & Walquist will rely almost entirely upon moving stairways. The Chrysler plant in Highland Park, Mich. runs eight escalators up to its fifth floor in the mornings, reverses them at night. The Virginia Light & Power Building in Richmond has nothing but moving stairways for its four floors. The Metropolitan Life Insurance Co. will equip its big new 14 story, 6,545 employee office building with moving stairways up to floor eight. Skidmore, Owings & Merrill's design for the projected Ford Research Center (BUILDING, Dec. '50) swings heavily to moving stairways for vertical transportation.

Today: economy

Moving stairways can save space and money for the building owner, but only if the first eight floors of his building are big enough to require mass transportation. Escalators cost less than elevators, but obviously each escalator runs up only one floor. To serve eight floors, 14 escalators are necessary; this may be economical in a situation when they supplant a bank of eight elevators, but if the floors are small and traffic requires only three elevators, it is not economical.

A continuous 32 in. wide moving stairway operating at the rate of 125 ft. per minute can carry 580 people in a five minute interval—which is equivalent to about thirteen 2,500 lb. capacity elevators, or about ten 3,500 lb. capacity elevators. The area required for two of these moving stairway units, side by side, is 8 ft. 8 in. wide and 55 ft. 6 in. long—including 10 ft. access at each end of the units. This is about the same area required for three average size elevators with their access corridor. Operating expenses for escalators are considerably below those for elevators because they need no attendants, use less power, and have fewer expensive wearing parts.

So if the traffic is there, in an office building with large floors, moving stairways are strikingly economical, although for office buildings with small floors this may not be so. 

Even when few enough elevators are needed to keep the daily operating cost down near the level of moving stairway's daily cost, there is sometimes a fat saving on initial investment.

There is a large psychological element which for many years kept moving stairways out of office buildings. Tenants would not tolerate the moving stairways—or at least the building owners thought they would not. Even the example of the Hancock Building does not necessarily prove that general rental office buildings can succeed with moving stairways, because Hancock employees obviously do not rent their own offices; they are put in them, al-
though their favorable reactions to the situation are encouraging to moving stairway proponents.

An important factor which is switching designers from use of elevators to moving stairways is change in the relative cost of equipment. Since 1940, elevators have gone up in price. In the same period, moving stairways have come down in price about 25 per cent. One reason for this has been simplified truss design achieved through standardizing run lengths up to 20 ft. (in earlier models, runs were practically limitless) and by manufacturing stairways in two standard widths, 32 and 48 in., instead of 24, 36 and 48 in. as in older units. Width, incidentally, is measured between the tops of the balustrades rather than at the somewhat narrower treads—designed to match people who are wider at the hips than at their feet. Also, devices previously installed in their own machine room are now incorporated inside the truss. Another cost cutting factor in moving stairways has probably been the entry into the field of a new company, Peelle Motorstairs, who are now competing with the two big producers, Otis Elevator Co. and Westinghouse Electric Corp. Since the end of World War II, the use of moving stairways has taken a big upturn; 40 per cent of all those now in operation in the U.S. are new since V-J day.

Tomorrow: speed

But the biggest persuader to increase installation of moving stairways in office buildings will almost surely be an increase in their speed. The origin of the comparatively slow speed of moving stairways in the U.S. is not clear, but their use principally in department stores may have had a lot to do with it. For department store owners, who have learned from experience that a shopper taking a slow ride on moving stairway and seeing a panorama of merchandise is likely to do more impulse buying of items he sees as he rides, the slow speed of moving stairways has been a plus value rather than a hindrance. But for office buildings the slow speed of the escalators has been a major drawback, since they travel only about one-third as fast as a man would normally walk. The legal maximum speed of moving stairways in New York City is 125 ft. per minute, but, except for one in Rockefeller Center, most New York moving stairways still travel at 90 ft. per minute. This is only half as fast as moving stairways move in the London subways during rush
REVIEWS

THE NEW SCHOOL by Alfred Roth. Editions Girsberger Zurich. 224 pp. 7 x 9 1/2. Illus. $8.

Alfred Roth is a sparse, cultivated Swiss, with a sharp but kindly eye. He is one of Europe's top architects, especially on schools, and beyond that, editor of Werk which in art circles requires no further tag.

But what Roth did that was really unique, before sending his manuscript to the printer, was to spend a year in the U. S., closely observing. Consequently he is the rare kind of European whose understanding of America is genuine and free. His book, The New School, compactly written and of handy size, is to date the best handbook and guide available in the English language to the American architect and schoolman. It is well versed on social aims, clear and reliable on technical advances, and discriminating on the very best, here and abroad, in school design. It gives the serious American a broader base than our own usually parochial publications to measure himself against the best the West can do.

From Roth's technical section there emerges comforting evidence of American leadership—due however as often to opulence as to brains. The advanced American school has the most generous space standards, inside and out; the structural methods and mechanical integration here have reached the highest degree of flexibility; our climate with its sharp contrasts of light and shade, hot and cold, has forced keener thinking on daylight and climate controls than the British with all their proclamations have as yet achieved, and it is pleasing to have the evidence presented competently for a change. But in such a coolly objective compendium there is little room for chauvinistic smugness. From Roth's figures there emerges a clear minus for the U. S. in the field of programming and overall planning. When Roth sets down the size for a "large school" of primary type as 400-800, he hardly realizes how revolutionary has been the achievement of densely populated Switzerland in holding it there while sparsely populated America, in its big cities, has not hesitated to jam small children into huge plants several thousand at a time, for no other purpose than administrative convenience. But then, few American schoolmen have grasped the keenly human objective Roth sets down for school sites: "the closest possible connection between school, home, and nature, and to reduce distances to a minimum."

It is this human kind of thinking which makes the book valuable throughout, and gives edge to the rounded presentation of seven Swiss schools, five American, three British, two Dutch, and one apiece from Italy, Denmark, and France. These include the classical examples.

(Continued on page 154; see also page 114)

The Felsberg School, a Swiss school in a park

Proving that the same ideas turn up in many countries, this Swiss school-in-a-park was built at Lucerne shortly before Perkins & Will's well known Parkside School at Riverside, Illinois, saving land costs and redoubling park use. To spoil less ground, Swiss architects Jauch & Bürgi ranked their pavilions side by side rather than parallel. All classrooms are lifted into the clear above the rising slope, and the ground-floor space beneath is cleverly converted into sheltered play space. (See plan, photo below.) Here, too, are the washrooms. The play courts running out from each such shelter raise demands for respect to plants rarely obtainable in the U. S. but help protect the park itself.

Classrooms are square and well daylighted from the south—how do the Swiss maintain those exterior awnings?—but strangely the fine opportunity for bilateral daylighting has been passed over.

The carefully proportioned structures were economically built in concrete frame with brick filler-panels in the walls and granite facing for the exposed columns below. Roofs are wood-framed, and in the case of the gym carried on heavy laminated timbers (top left opposite page).

(From Alfred Roth's "The New School")
Top view, opp. page, shows landscaped approach; top views this page, the timber-roofed interior and concrete column exterior of the gym. (It is in the bottom right corner of the plan.) Typical classroom floor plan shows above the general (ground-floor) plan in upper left corner.
Pace-setting Swiss nursery school

In view of the approaching defense era, when women will be called back into industry, close attention must be paid once more to nursery schools. Swiss architect Alfred Roth's example near Bern is a fine prototype.

Under a simple cross-shaped gable roof, Roth has been able to accommodate every type and degree of needed space, all within easy supervision by the teacher. The large view shows the coatroom entrance. Since small children spend so much time there, it was an act of genius to give it a transparent glass partition so the teacher can see through at all times (it is well protected by benches against breakage). Sharing the entrance wing are toilets and the shop. To the left of this wing, in the plan, is an open covered play shed (seen also in the top photo). Its end-window with squares of colored glass gives the children endless fun looking at one another and the landscape. On the opposite side of the main classroom are two play alcoves, for boys and girls. Among author Roth's excellent details is his grooved-wood acoustical ceiling.

(From Alfred Roth's "The New School")
Once again the oft-maligned home building industry has set an example for every other industry in the national emergency—an example of constructive thinking and cooperative action. Specifically, the home building industry has:

1. Affirmed that an all-out attack on waste can cut its own costs in labor, materials, and dollars by between 20 per cent and 40 per cent.

2. Outlined a comprehensive program for government and industry cooperation to achieve these savings.

3. Proposed that every industry take similar action, in order that America's need for arms may be met, not by lowering the American standard of living, but by reducing the American standard of waste.

First step in this program was the convocation of a Round Table of home building experts called by the editors of THE MAGAZINE OF BUILDING. Assistance was given by the Research Division of the Federal Housing & Home Finance Agency and others in Government in preparing the plans and procedure for the conference.

Only top experts in every aspect of home building were invited to participate. They included the President of the American Institute of Architects and two architects selected by him for their special familiarity with home building and building code problems. They included five practical construction experts nominated by the National Association of Home Builders. They included the Chairman of the Prefabricated Home Manufacturers Institute. They included top building research men from the best technical schools. They included representatives of some of the principal material-producing industries. They included a past president of the American Standards Association.

All of these men came at their own expense to contribute their expert knowledge, some of them from as far away as California and Texas. During a two-day session they outlined a complete program for waste elimination in every aspect of home building, including site planning, foundations, structure, plumbing, heating, wiring and design.

The program drew immediate and unanimous support from the heads of every key group in the industry. The president of the AIA himself played an important part in drafting the plan. The new president of the Homebuilders approved the program almost in its entirety and went on the air from the Home Builders’ Show with a radio broadcast based on its recommendations. Similar endorsement was given by the heads of the Mortgage Bankers’ Association, the U. S. Savings & Loan League, and the National Retail Lumber Dealers. The managing director of the Producers’ Council sent congratulations. The Building Officials Conference of America named an emergency committee to cooperate in the conservation program. The AIA-NAHB committee on architect and builder cooperation called a special meeting to carry out their assignment under the plan. The program follows in full:
Home building costs can be cut up to 30% 

Without an all-out attack on waste there is no use hoping that increased production alone can meet America's tremendous, absolute and over-riding need for arms. The only alternative to a drastic reduction in the American standard of living is a still more drastic reduction in the American standard of waste.

We believe such an all-out attack on waste could achieve amazing results in almost every sector of the economy. We are certain it could achieve amazing results in our own industry. We are satisfied that these great savings and economies in home building can be effected without any real sacrifice in the quality and livability of the finished house.

Some of these economies would express themselves in dollars and thus contribute importantly to the fight against inflation. They would give the home-buying public better value, both now and after the emergency. They could make possible the erection of far more houses than might otherwise be justified at this time. And, if home peace, the more waste we take out of the house, the more quality and livability we can afford to build into it.

We are all agreed that these savings could easily run 20 per cent; if all obstructions are removed they could reach 30 per cent or even 40 per cent. Sacrificing nothing but waste, it should still be possible to build a better house with 50 per cent less cast iron pipe, 50 per cent less cement, far less lumber, far less gypsum, far less steel. It should be possible to build just as good a house with 75 per cent less copper. In other words, an all-out attack on waste could save more critical materials and more critical manpower than could be saved by a drastic further cut in housing starts.

Some of these savings and economies can be effected immediately by the home builders and their architects, but by far the greater part of these critical savings are blocked by senseless requirements imposed upon the home building industry by obsolete local building codes, union rules, mortgage requirements, and other regulations. These obstacles are all the more frustrating because they vary from state to state, from city to city, and from FHA office to FHA office.

It is unfortunately true that someone stands to make money at the home buyers’ expense out of almost every wasteful practice thus entrenched. Without the pressure of a national emergency, the home-buying public might well have to go on year after year paying billions of dollars extra as the price of these wastes. It is our hope however, that in this national emergency obvious reforms which might otherwise be delayed half a century can be put into immediate effect by the patriotic cooperation of public officials, home builders, architects, land planners, mortgage bankers, manufacturers, and building trades unions. FHA can help materially by reviewing and streamlining the widely different property standards imposed by each of its own 62 local offices—standards which are often much more wasteful than the local codes.

But the most important part of all must now be played by ODM and DPA through the firm and enlightened use of their emergency powers, including specifically their power to allocate scarce materials only to projects for which state or local codes, ordinances, union regulations and financing requirements have been brought in line with a national program for minimizing waste of materials and manpower in home building.

All of us, believing in a free economy, would far rather see Federal controls on home building applied directly to save materials and manpower while permitting as much home building as possible, rather than indirectly by reducing the volume of construction while permitting needless wastes to continue.

Late in the last war a clear precedent for such use of Federal power was set when WPB issued certain national conservation standards with which local regulations had to be conformed. What we urge is that action similar to that taken late in the last emergency should be taken early in this emergency—and on a far bolder scale.

In addition to this use of its emergency powers, the Federal Government can make a very great contribution to the attack on waste in building by setting its own standards for all housing built by the Government. Whatever standards are set for permanent private housing this year should immediately be made the maximum standards for all housing built by the Government whether for civilian or military use.

The Federal agencies charged with administering programs affecting construction should request the Building Research Advisory Board of the National Research Council, National Academy of Sciences, to set up committees from industry to work with them. Wherever needed, funds should be made available to HHFA and through HHFA to BRAB to pursue additional research on construction economies and to coordinate existing private or HHFA research. It would be most helpful if HHFA would also provide funds for the actual construction of demonstration houses and mock-ups of the various waste-eliminating proposals.
The Round Table Technical Report (cont'd)

We cannot attempt to detail all the wastes entrenched in home building or to list all the economies of material and manpower which it should be possible to put into effect. A partial list for immediate action would certainly include the following points, with particular reference to the one-story, 1,000 sq. ft. house which now accounts for the great bulk of all new family-owned homes:

ELECTRICITY
Because copper and aluminum are the most critical of all commonly used critical materials, it is particularly important to minimize waste in electrical installations. Out of 766 local codes, there are still 541 which compel home builders to install more costly and elaborate wiring systems than are prescribed by the national electrical code. In addition, there are many communities which compel home builders to waste wiring on ceiling lights in every room, although these have long since gone out of style.

Recommendation: To save critical materials and to relieve home buyers of unwarranted costs, we recommend:
1. NPA should not allocate metals for use in any wiring system in excess of the requirements of the national electrical code.
2. NPA should not allocate critical metals to houses for which local or FHA regulations compel the installation of ceiling lights in rooms other than kitchens, halls, and stairs.
3. Since non-metallic protective systems are available which are just as economical and just as satisfactory as metallic installations, NPA should not allocate steel for conduits and fuse boxes.
4. The use of low voltage wiring to light switches, which often offers substantial material-savings in wiring wall switches, should be actively encouraged by NPA, HHFA, the AIA and NAHB.
5. Since the electrical requirements of the great majority of houses are very similar, NPA should invite the collaborative AIA-NAHB committees on architect and builder cooperation to draw up standardization requirements and should ask BRAB for an immediate recommendation for the most economical use of metals in such standardized installations.
6. Copper is in shorter supply than aluminum. Aluminum is a satisfactory substitute for copper in wiring. The principal reason is that electricians are not familiar with its use and with the slightly different problems its installations involve. The NPA should take immediate steps to encourage the substitution of aluminum for copper in wiring and most particularly to familiarize electricians with these problems so that they will be ready to begin using aluminum wiring. To that end, NPA should notify all government agencies including the armed services that no allocations or priorities will be granted to governmental agencies for copper wire unless such agencies can satisfy the NPA that aluminum wire cannot meet the requirements.

DIMENSIONAL COORDINATION
The 4 in. module sponsored by the AIA and the Producers' Council and approved by the American Standards Association offers savings and economies very conservatively estimated at 5 per cent to 10 per cent of the total cost of construction—perhaps a billion dollars a year on home building alone and perhaps two billion dollars a year in the entire construction industry. There is unanimous agreement throughout the industry that dimensional coordination would save countless hours fitting materials together and save great quantities of material now cut off and wasted in fitting. It would also permit impressive quantity production and warehousing economies which are impossible without such standardization of sizes.

Unfortunately, under normal conditions it might take many, many years to bring dimensional coordination into general use. And its full benefits cannot be realized as long as some architects, some builders, some suppliers, some cities and some Federal construction agencies delay its adoption, thereby compelling producers to continue the present multiplicity of sizes.

Recommendations: 1. We recommend that NPA issue orders that all projects to be paid for by the Federal Government must be planned for dimensionally coordinated materials.
2. We recommend NPA withhold scarce materials from projects designed after April 1, 1951, which are not designed to take advantage of the savings made possible by dimensional coordination.
3. We recommend that NAHB call upon all its members to ask their architects on all projects designed after April 1, 1951, to design them to dimensional coordination.

It is our belief and hope that such a concentrated attack on the wastes inevitable without dimensional coordination can achieve, within a few months, progress towards economy in materials and manpower which might otherwise have to wait a generation.
FOUNDATIONS AND FLOOR SLABS
The foundations now required in almost every community for a one-story house are far in excess of any real need. Recent research has shown that except on soils with a high moisture retention it is not necessary to extend these foundations down below the frost line. A shallow foundation is usually quite adequate for a light building. Where it is necessary to go deeper a post and beam foundation is usually all that is needed. It is also unreasonable to require 1,600 or 2,000 lb. concrete in the floor slab, especially when that floor slab is to be protected by an asphalt tile or wood flooring. Much excellent and costly research has already been done to make possible more realistic requirements for foundations and floor slabs.

Recommendations: We urge the Government to make funds immediately available to HHFA and BRAB to coordinate this existing research and provide the basis for new foundation and floor slab standards which will be less wasteful of materials and manpower. As fast as these standards can be determined, we urge the Federal Government to use its emergency powers to bring them into general use.

PLUMBING
Within a short time a new National Plumbing Code will be announced.*

General adoption of the minimum standards approved by this new code would make possible great savings of materials by permitting hitherto impossible mass production economies due to nationwide standardization. Beyond that, it would eliminate many of the most costly wastes now imposed by a large majority of local plumbing codes. Specifically, it would save as much as $25 of the cost iron required for drainage inside a small house by reducing the required diameter of the stack from 4 in. to 3 in. and eliminating the requirement for extra heavy pipe. It would save all the cast iron usually required for drainage outside the house by accepting non-metallic pipe. It would eliminate the necessity of a house trap which now adds from $40 to $75 to the cost of many small houses, although as far back as 1925 the Hoover Plumbing Code declared it unnecessary, and many cities now forbid its use. It would reduce the height of the stack above the roof to 2 in. Its approval of stack venting and wet venting would eliminate the great cost of individual back vents.

Recommendations: With plumbing requiring many of the most critical materials, the NPA should insist that no critical plumbing materials whatsoever should

be allocated for construction in communities which impose plumbing requirements in excess of the minima set forth in the new national code.

BATHROOM STANDARDIZATION
A study of bathroom arrangement in thousands of builders' houses shows they have become almost standardized without achieving any of the advantages of full standardization. In almost every case the bathtub, wash basin and toilet are in line (usually in that order), sometimes backed up against the kitchen sink, sometimes backed up against another bath with the kitchen sink crossing the T. Although these baths are almost alike, there are still enough inch differences to make uniform plumbing assemblies impossible and to necessitate the waste of millions of hours of manpower and millions of pounds of pipe, cutting up and fitting together special assemblies.

Recommendations: We urge the collaborative AIA-NAHB committees on architect and builder cooperation to agree immediately on a dimensional standard for the spacing of tub, basin and toilet which will permit standardized, mass-produced assemblies for all houses with the bath backed up against the kitchen and for all houses with two baths back to back.

We urge the NPA to make use of these standard assemblies mandatory for the duration of the emergency. Frankly, we hope that once these standard assemblies are available, the public will continue to benefit from their economy long after this emergency is over. Standard walls could be fabricated to fit these standard assemblies.

OTHER STANDARDIZATION POSSIBILITIES
We believe there are many other aspects of the builders' house which are now approaching standardization without realizing the full benefits of standardization. Certainly great waste results from the present lack of uniformity in door and window assemblies. But we believe still greater savings might be effected if the present trend to standardization of ceiling heights around 8 ft., living room sill heights around 32 in., bath and kitchen sill heights around 52 in. and bedroom strip sill heights around 52 in. or 60 in. could be carried through to a conclusion which would permit asking lumber, wall board, and other producers to supply materials in sizes precut to fit. We recall that the builders of the industry-engineered house had to choose between sawing ends off all their lumber if the ceiling height conformed to wall board sizes or sawing ends off all their wall board if the height and width of rooms conformed to lumber lengths. We are further intrigued with the suggestion that standard joist lumber does not come cut to fit optimum room widths. We are sure there are many other similar opportunities for better standardization.

Recommendations: We urge the collaborative AIA-NAHB Committees on architect and builder coopera-
tion to make an immediate and careful study to determine where standardization could permit substantial economies without sacrificing freedom for good design. As soon as these committees can report AIA, NAHB and the Producers’ Council should ask suppliers to make materials available to fit these standards without waste. And HHFA and EPA should use their influence and power to assure quick action.

HEATING
With efficient insulation and double glazing in colder climates, there is no reason why small houses erected during this emergency cannot be heated comfortably if not luxuriously by wall or space heaters, eliminating radiators, duct work, or floor slab tubing and effecting enormous savings in both money and metals.

Recommendations: The NPA should call on HHFA and BRAB immediately for more detailed recommendations, and the use of scarce materials for heating installations in excess of the requirements proposed by BRAB should be restricted.

STRUCTURE
Practically every small house in America is structurally over-designed. This is partly because various codes require the structure to meet such unrealistic standards as a 40 lb. live load on the floors, a 20 to 30 lb. wind load and a 30 lb. snow load (5 ft. of wet snow in the places where even 2 ft. of wet snow has never been seen). It is partly because too little thought and study has been given to more economical engineering of the structure.

We can point out certain obvious structural wastes. For example: 1) 2 x 3 studs on 16 in. centers would give more than enough strength. Their use, instead of the usual 2 x 4 studs would effect an immediate saving of 25 per cent in all vertical lumber; 2) the wood or gypsum sheathing which now adds more than $100 to the cost of the average small house often serves no purpose in an otherwise well insulated house except to give a rigidity which can be achieved at a fraction of the cost by corner bracing.

The structural re-engineering of the small house for greater economy of manpower and materials requires additional study and, most particularly, the coordination of existing research to establish more realistic standards—standards which can properly vary from region to region to meet differing climatic problems. Fortunately there is time to complete this research before any acute lumber shortage is likely.

Recommendations: The Federal Government should make funds immediately available for such studies through HHFA, in consultation with BRAB, and these studies should be completed as quickly as possible. As soon as they are completed, NPA, NAHB, AIA and the National Retail Lumber Dealers’ Asso-

ication should collaborate to bring new and less wasteful structural standards into general use.

BASEMENTLESS HOUSES
In most parts of the country it is now possible to build basementless houses with the floor slab poured directly on the ground. Elsewhere basementless houses can be built economically over crawl space. Even after providing a more generous basement substitute than is now customary, these basementless houses can often be erected for about $600 less than houses with basements, with substantial savings of labor and a saving of nearly 40 per cent in cement.

Recommendations: Where practical, these savings should be encouraged by NPA, FHA, AIA, NAHB.

OPEN ROOF TRUSSES
Many builders would like to use roof trusses to save materials and manpower and to achieve complete flexibility for their room layouts (since interior walls would no longer have to be spaced to help support the ceiling). Unfortunately, most present trusses make it impossible to use the attic space for storage or future expansion.

Recommendations: HHFA and BRAB should cooperate immediately to correlate and complete the necessary research to make generally available a roof truss design which would permit maximum attic use.

SEPTIC TANKS
Savings of many millions of dollars and thousands of bags of cement on septic tanks (now adding from $200 to $500 to the cost of some 400,000 homes) can be made by immediate application of the findings of a $300,000 research jointly financed by HHFA and U.S. PHS and carried out by the latter. This research indicates that the complicated steel or concrete tanks now used can be replaced by four large sections of clay pipe arranged in series on a thin concrete base. The proposed system would actually work better. It would require much less labor and material, cost very much less.

Recommendations: HHFA, NPA, the AIA and NAHB should take prompt action to eliminate every barrier to the more economical tanks and should encourage their immediate use as soon as the Public Health Service can release its recommendations. Scarc materials should not be allocated for sewage disposal systems beyond proposed PHS requirements.

SITE PLANNING
Millions of pounds of copper wiring, millions of pounds of steel pipe, millions of bags of cement and millions of hours of labor could be saved by bringing site planning in line with the standards jointly proposed by the Urban Land Institute and NAHB. These standards provide a
26 ft, roadway from curb to curb for tertiary residential streets—enough for two lanes of parallel curb parking and one lane of moving traffic which is entirely adequate for local circulation. They permit somewhat narrower widths on cul-de-sac streets. They recommend rolled curbs and gutters, rather than vertical curbs, with the sidewalk (if any) right next to the street. They suggest that a 4 ft. sidewalk is ample; that sidewalks on both sides of the roadway are seldom necessary. They require a minimum distance from front to front of the houses of 80 ft. New developments should be planned to eliminate through traffic from residential sections thus permitting longer blocks with resultant saving in lighter pavement and fewer cross-streets. These standards are more than ample, but very much higher standards are imposed on low cost housing developments in many communities—sometimes by the local authorities, sometimes by FHA. The cost of these excessive requirements falls on the home buyer both as owner and as taxpayer, and he usually pays substantially more for these improvements than for his land. They are one reason why the lots in the average builder development are so narrow. (And wider lots would not only be more pleasant but would also permit simpler and more economical planning of homes in the “Bar” type). They contribute to the use of considerable more cement outside the house than is necessary. Most importantly in the present emergency, they necessitate longer driveways and much longer runs of pipe and wiring than are necessary.

**Recommendations:** These excessive standards should be discouraged in peacetime, and if possible, forbidden in any time of emergency.

**CONTEMPORARY DESIGN**

Architects are making a direct attack on the wastefulness of imitating structures designed primarily to fit yesterday’s materials, methods of production, and labor attitudes. This attack is developing a modern and contemporary architecture which is winning increasingly broad public acceptance. Home builders could achieve important savings by wider use of the many economies inherent in this more direct approach to better building.

A specific case is the flat roof. Architects have learned to give flat-roofed houses, properly situated, designed and grouped, the feeling of domesticity that the public desires; and builders in some locations report that the flat roof has saved up to 20 per cent of the cost of the structure. Yet many communities still forbid the erection of flat-roofed houses, many lenders refuse to finance them, and many local FHA offices will not approve them.

**Recommendations:** FHA should advise all its 62 local offices to recognize the increasing public acceptance of good contemporary design and urge them to encourage all the economies it can make possible. Similar action should be taken by the U. S. Savings Loan League and the Mortgage Bankers Association. Where local building or zoning regulations forbid these economies, FHA, NAHB and the Producers’ Council should cooperate at the local level to educate local officials and to win approval for these economies.

Some of the things they said:

Highlights from the 17 hour long discussions of the housebuilding experts who made up the two-day round-table follow. This technical testimony was selected from the stenographic record, 360 pages packed with important time, material, and money-saving suggestions:

PRENTICE: You know, there are a great many people—almost everybody—who think it is impossible for the United States to get the rearmament that we have to have without a great lowering and sacrifice of the American standard of living.

Yet the problem we face now in rearmament and standard of living is substantially different from the problem we faced in rearmament and the standard of living in 1941 and 1942. Then there was no question about it. We were at war. In all war, you can figure the need is immediate and pressing, but the duration can be short. But that is not our situation today. Sure, the need is immediate and pressing, but there is no way of knowing how much time we are talking
about. As a matter of fact, you have got to face the very real possibility that we are moving into some sort of garrison-state situation, that we are going to live with and work with for as long as you and I are living and working. The problem is not one of lowering the standard of living in order to get through with the war quickly so that we can get back to the better life. This may be a semipermanent condition.

The only possibility I can see of being able to get the rearrangement we have to have without a drastic cut in the standard of living is, perhaps, making some kind of all-out attack on wastefulness in our present production, and that is why we are here together today. It seems to me the question America has to answer now is whether we are going to get guns primarily by a sacrifice of the American standard of living, or whether we are going to see whether we can get as much as we can of that by the sacrifice of the American standard of wastefulness.

I would suspect that the American standard of wastefulness is probably costing this country very close to 40 or 50 billion dollars a year. We are not talking about small potatoes when we talk about the American standard of wastefulness.

Last year we built something like 1,300,000 homes, and building those 1,300,000 homes strained the resources of the industry, even with no competition of rearrangement. It strained the resources of the industry just about to the breaking point, and when we tried to build 1,300,000 homes, we found ourselves in a labor shortage and we found ourselves constantly involved in material shortages.

War or peace, war or garrison state, peace or garrison state, it seems to me we have reached a point where we have got to build with less use of manpower, and we have got to build with less use of materials. Although we are addressing ourselves to an emergency situation, I hope we can think somewhat in terms of the long pull and what would be sound after the emergency as well as in terms of meeting the immediate crisis. What we want to talk about here is not temporary housing. What we want to talk about is permanent housing. The record of the last war shows that all the temporary housing that went up cost almost as much as permanent housing and, moreover, the temporary housing is still there.

So much has been said about what a backward industry the building industry is that, frankly, nothing would give me greater satisfaction than to feel that some good had come out of Nazareth. The other quotation is: "Out of the carcass He brought forth honey." I would like to feel that the "chaotic and disorganized" building industry has set an example for other industries in the country in the matter of pointing out ways in which the excellence of our production can be stepped up, ways the rearrangement can be accomplished, less at the expense of the American standard of living and more by a long overdue attack on this American standard of wastefulness.

Just for two days, let us pretend that we are Utopia and figure out what kind of home building we would like to do if we weren't hampered here and restricted there and forbidden in the other place—and if we had caught up with technology.

I think perhaps the best way for us to start our talk is to let John Haynes tell you just exactly where we stand in the emergency.

HAYNES: With respect to materials, the recently created Office of Defense Mobilization, headed by Charles E. Wilson, has been empowered to do just about anything that becomes necessary for the defense of the country. There are almost no limitations on powers with respect to materials.

As to prospects for construction in 1951, in these fast-moving times, particularly in this war situation, there are not only direct military requirements for manufacturing munitions but also the need for stockpiling aluminum, copper, tin, zinc and a lot of other scarce metals. This renders our pre-Korean methods of estimating future construction volume rather poor. But there is little doubt that in the coming months it is the seller rather than the buyer who is going to determine the amount of construction volume we have.

Somewhere between 30 and 50 billion dollars has been appropriated by Congress for defense, most of which will go into hard goods. If, for example—and I can only say "if"—by next Christmas we will have spent somewhere in the neighborhood of 40 billion dollars for munitions, roughly one-seventh of what the civilian wants will be what you might call "gone". What is worse from the standpoint of construction is that it is not one-seventh of convertibles and rugs and television sets, but it is far more than one-seventh of your metals.

The total volume of construction last year was 27 billion dollars, plus 8 billion dollars of maintenance and repair. With potential military expenditures of between 30 and 50 billion dollars this year, there will not be enough materials to support any such construction volume.

One other thing worthy of observation: Our defense organization has caught us woefully behind in hospitals and schools and many other public buildings. We didn't build them during the depression because we didn't have the money, and through the war we didn't build them because we didn't have the manpower. In 1948 we had 3½ million babies. These kids are going to be ready for school very soon, and the school program is faced with shortages of materials, and it is going to be tough. So is the hospital program.

Some further curtailment of the construction volume seems inevitable. Very little construction is nonessential, but in the situation with which we are faced today you come to the inevitable conclusion that some construction is less essential than other construction, and, as your chairman suggested, something is imminent.

A lot of uses of copper in hardware, lighting fixtures and other lighting materials are already prohibited. Further prohibition is imminent, and a similar order with respect to aluminum is being discussed now. It is no secret. Several hundred manufacturers have been consulted, and aluminum prohibitions are practically with us now. The limitation orders apply to the producers and carry no prohibition on the use of quality products if you can find them. A little bit different is the case of copper pipe and tubing and wire, with respect to which the builder is treated as a manufacturer and is subject to quantitative limitations.

Of course, persons affected by the order can always appeal on the ground of personal hardship.

In the coming months, I think you will see quite a bit of emphasis on conservation, simplification and standardization. For example, I hope because of the fuel savings it will bring about we can still afford to have weatherstrip, but we ourselves and manufacturers both agree that in the present emergency a lush selection of types and sizes is not warranted.

As to my last point, priorities, so far the authority to use the "DO" symbol is only applicable to military purchases. Only five agencies are authorized to use it. As yet there are no civilian priorities. Industrial construction is making a strong bid for priorities, but it would be profitless for me to guess just when they would come about.

This is a trite statement, but I think it conforms, really, to the essence of this meeting: Architects and engineers would be well advised to spend quite a bit of time on economy of materials and design, and the advantage of using standard types and sizes cannot be overemphasized. It is not only that you save metals by standardization, but in a good many products, production doesn't increase just 2 or 3 per cent, it increases 20 or 30 per cent by use of standard sizes.

PRENTICE: May I ask you to supplement one more thing for just a minute? My understanding is that while manpower in the end is the ultimate and uninevitable shortage, because it takes 18 years to produce more manpower, the other shortages, in order of pressure, are (1) copper, (2) aluminum, (3) steel, (4) other iron products. I take it that the pressure on steel is greater than the pressure on cast iron.

HAYNES: Yes.

PRENTICE: What do we come to next?

HAYNES: After you have gone to steel, then it is greater than the pressure on cast iron.
gets a little fuzzy as to precise order. It would probably be a lot of chemicals and plastics, and then a lot of others such as cobalt, which very few people use directly, but which is one of the greatest shortages. It is very difficult to say one is more scarce than the other if you are looking toward substituting one for the other. As far as aluminum is concerned, there is relief in sight because you can make aluminum, and new plants are going up, but you can't make copper; you have to dig it. Copper and zinc are probably our worst shortages now. VOSS: I would like to ask Mr. Haynes if there is any attempt at planning for critical materials, not only from the standpoint of the volume you need for military and home uses, but from the standpoint of release of a few of those materials in such places as home building where they are absolutely necessary for maintenance and stability. Will copper be out altogether, or is copper restricted under certain conditions? HAYNES: It would seem that copper is in a very bad position. So, if you ask, "Will you have enough copper to finish houses?" I am afraid the answer is probably "no", and it is a case of scrounging around for some galvanized steel, which is also difficult.

COONLEY: I want to supplement what John Haynes said about the everyday changes in the original set-up of the production activities of Washington by indicating that I think we have today arrived at a cleaner, clearer organization chart than we have ever had, and by far, better than we ever had in World War II, and as the smoke clears, I think you will find that Charlie Wilson is in a similar position to Byrnes in World War II. Mr. Harrison is in a similar position to the team of Donald Nelson and Charlie Wilson.

Conservation is my hobby, and I agree thoroughly with Mr. Prentice that it is not a characteristic of the American people. However, we can solve so many problems by conservation I wonder why people don't give more attention to it. I have in my desk many statistics on the savings that were made through the various means of conservation, of which standardization, simplification and substitution are the most intelligent and the ones that accomplish most.

I went down to Washington last spring on a part-time basis to plan the conservation activities of the National Security Resources Board. While I have been down there, I have been in touch with many of my friends and associates during the last war who are doing intelligent planning for conservation. Some of them believe that if the building industry does a really effective and rapid job, they need not cut down the building program, because the savings that are possible through intelligent conservation methods are perfectly amazing.

In the various conservation activities—and I am going to refer for the moment to standardization and simplification—we found that we could very often increase output by 25 per cent and cut down manpower requirements by considerably more than that. Some of those things in World War II have been learned so well that they have been carried on. I think the emergency steel specifications are pretty well still intact, and they constituted a tremendous saving.

Let me say just one other thing. You may have to go to other unusual means. I think, perhaps, Mr. Price will remember that we were working on the down-grading of the electric motors. That sounds bad. But you build an electric motor for 25 years of life. During a war emergency a 10- to 15-year life in a motor would be enough. So you could downgrade your motors and use them with the knowledge that they were going to wear out more quickly.

There are many things that can be done if an intelligent group sits around the table and decides they are going to do them.

I think we have in Washington now a group that is eager for the suggestions and advice of men of knowledge and ability. I know you will receive a welcome there. I think it is very timely that you hold a meeting of this kind, because it is already too late to start metal conservation, and I am sorry to say that I find that we have far greater shortages in many more items this time than we did in the last war, whether or not we have the misfortune to get into war at present. What you do here is of tremendous importance.

SMITH: Mr. Chairman, I wonder if I might ask Mr. Coonley a question. Out in the San Francisco Bay area during the last fracas, those of us who were endeavoring to build housing frequently found ourselves without a keg of nails or a 2 x 4, but we could look over the fence and watch them burning huge piles on government projects where the splinters were getting too rough for the boys to handle. People whom we knew who were in places of reasonable responsibility were telling us of things going on in the shipyards which were appalling to us.

MR. CLARK: "We should give more consideration to the long-term use of those things which we must install from the military standpoint in order that, when the military need has ceased to exist, they will be of value for peacetime use."

because we were on the outside having a dickens of a time getting anything to build a home with under the restrictions that were imposed in the matter of construction and design. The reason advanced out there, and it was quite general in the area, was, "It is cost plus fixed fee. What the hell! This is war," and so on. We also had a deterioration in productivity of manpower. I recall when the war was ended and the men began coming out of the yards and back to work for us on the outside, it was six months to a year before we could get a day's work out of those people.

I am just wondering if anything is going to be done along that line of attempting to fix responsibility, because it seems to be indicated that something can be done. In our own business, if we let work on a cost plus fixed-fee basis, we will get a poor showing on value of return for our dollar. Is something going to be done along that line?

COONLEY: Let me say, Mr. Smith, we have put up a program of a more effective use of material in shipyards. We are planning to ask each one of the services such as the Navy and Army and Air Corps to set up a conservation department that will be in a position to investigate such situations.

SMITH: You didn't have that during the last war?

COONLEY: We did toward the end.

SLIPHER: Mr. Chairman, we were referring to some of the limitation orders during World War II, and I recall only too well a situation. At the time, there was a limitation of five board feet of lumber per square foot of house area, if I remember correctly. We happened to be in a position where we were building war housing, so we also had a contract for staff residences at three ordnance plants for Army personnel, and there was no similarity or coincidence or anything else between civilian and Army standards. It was a dramatic evidence of the lack of imposition of equal restrictions at both ends of the line.

DAWSON: The greatest waste we know of is in the armed forces themselves, and if there is anything that the Security and Resources Board can do to minimize that waste, it will simply multiply by many, many times the savings that we could make in housing and all that sort of thing. They are the greatest single wasters of material we know of.

COONLEY: And also the greatest single users. I have been promised every possible cooperation in this conservation work, in the military group.

PRENTICE: Is there any good reason why the standards which may be set up for the home building industry shouldn't automatically be extended to home building which the armed services do themselves?

COONLEY: I think they should be, and I believe they can be.

DANIEL: Is there a possibility of setting up some civilian inspection as to military waste in building?

COONLEY: I don't see any good reason why there shouldn't be.

WILLIAMS: Why restrict that to home building? We have seen a lot of funny stuff going on in defense plant building and everything else. Why should not the armed forces be examined by civilians to see that they are not indulging in wasteful practices in any construction that is not military in the sense of making tanks, or things of that kind?

PRENTICE: I wonder if we can't make the first thing on the conservation item list that we are all agreed here that it would be a very good thing for conservation in our private building and house building. If the Government would set us a good example of conservation in the Government. (Applause).
LAND USE: Sites should be selected more shrewdly and streets and sidewalks sized more sensibly

PRENTICE: Last spring, when our magazine set out to get the architects and builders working together, the very first thing that Ralph Walker said was, "Let's not think about this in small terms. One of the very first things that the architects and builders ought to get themselves together on is the perfectly ridiculous requirements for streets that are imposed on the average subdivision." I am under the impression that more than half the cement that goes into the average builder's house goes not into the house but into the streets, curbs and sidewalks that are imposed by local building and zoning codes.

CLARK: I think we can start back even further—with the fellow who goes out originally and picks out the land. Bad choice of land means money wasted improving it. I will give you an example.

Dave Slipher had the dubious pleasure of building, during the last war, Willow Run Village near Ypsilanti, Mich., and Dave knows a great deal more about it than L. He tells me that for the 2,500 units involved, the cost of structural improvements was something like a little over 5 million dollars, and that the cost of the physical improvements to the land was either a little under or a little over 3 million dollars. Now that is slightly out of proportion. We on the West Coast consider that 5 per cent of the physical improvements to the land was either a little under or a little over 3 million dollars. We on the West Coast consider that 5 per cent of the physical improvements to the land was either a little under or a little over 3 million dollars. Now that is slightly out of proportion. We on the West Coast consider that 5 per cent of the physical improvements to the land was either a little under or a little over 3 million dollars.

WILLIAMS: Let's make some distinctions here. If we consider there are different types of streets, I think we can say your main streets might under certain conditions require a certain minimum width and your dead-end streets would require vastly less. Isn't that correct?

CLARK: Absolutely right.

Getting down to basic principles, first we must have our traffic carriers. If you please, call them superhighways or freeways or limited access ways. Then we must have collectors to feed the arterials. I should like to set 76 ft. between curbs as the widest collector street. That allows for six lanes of traffic and two lanes of parking. I might even eliminate the parking if you please, between curbs as the widest collector street. That allows for six lanes of traffic and two lanes of parking. I might even eliminate the parking that is the subject of sidewalks on both sides of a local street. Of course, sidewalks are necessary in the shopping streets; I am not arguing that. I am now talking about a dead-end street. You see, we have had considerable discussion on, and Yoss: I think the general consensus, and the result of the survey made by the American Association of Highway Officials, is that in small subdivisions concrete sidewalks are not necessary. Most people walk on the street. Gravel road sidewalk with oil impregnation is good enough. Minimum paving for a subdivision is gravel surface with a good coarse sand and two coats of oil. That kind of pavement has been in front of my house for 26 years, and it hasn't cracked up yet, because it is only a tertiary street, and because the town does oil the sand during the hot days of summer.

The Urban Land Institute has published a booklet on planned planning that was very carefully prepared, and they have the regulations set out after years of study, and their minimum is 26 ft., secondary residential, and on up. I think that after the 36 years of study—and common sense study—that has gone into it that it can be recommended.

HIGHLAND: When we save on the width of these streets, we can afford broader frontages on the lots. If we can afford broader frontages, we can build properly without having to cram a ranch house into a Z shape to fit into 40 or 50 ft. If we have a wider lot, we can reduce the setback of those buildings and still keep a decent appearance. I have seen builders try to save $300 on land and then spend $800 trying to get a Z-shaped building into a lot.

L. D. PRICE: Mr. Chairman, so far the discussion of planning of streets and lengths and what-not has been largely related to cement. There is an element of copper in there. Many of the utility companies have given a great deal of consideration to increasing the voltage on the street distribution circuits. In other words, the generally accepted street distribution circuit today is 4,000 volts. Many utility companies have considered 13,000, 13,200, 13,800 volt distribution circuits, which would decrease copper used in the lines proportionately.

Many of the local zoning authorities and town authorities have refused to permit distribution of electric current at that voltage on city or town streets.

It is generally the zoning commissioners who object. It is a matter of considered hazard having that high voltage running up and down the street. Actually, personally, I don't think it makes much difference. If you get tangled up with 4,000 volts, you are just as dead as you are if you got tangled up with 13,000 volts. Many utility engineers may not agree with me on this 13,000-volt business. However, it is given as an illustration of one of the things that might be done.

PRENTICE: I want to come to one more thing we have had considerable discussion on, and that is the subject of sidewalks on both sides of a local street. Of course, sidewalks are necessary in the shopping streets; I am not arguing that. I am now talking about a dead-end street and this 26 ft. local street. How much sense does it make to require a sidewalk on both sides of the street?

VOSS: I think the general consensus, and the result of the survey made by the American Association of Highway Officials, is that in small subdivisions concrete sidewalks are not necessary. Most people walk on the street. Gravel road sidewalk with oil impregnation is good enough. Minimum paving for a subdivision is gravel surface with a good coarse sand and two coats of oil. That kind of pavement has been in front of my house for 26 years, and it hasn't cracked up yet, because it is only a tertiary street, and because the town does oil the sand during the hot days of summer.

MR. PRICE: "The big variation I see is not in the street width, but in the different kind of paving required by local FHA administrators."
THE FOUNDATION: Basementless houses should not be legislated against; trim the foundation to the terrain

PRENTICE: Let's come into the house. And unless somebody objects, I'd like to approach the house not from the top, but from below. This takes us to the subject of cement, the bottom of a house, the foundation.

HAEGER: You all know it is very difficult to estimate the cement take on a house. The cement industry has no records. But it does appear that something like 30 barrels of cement go into a typical house. That represents, in turn, about 15 to 20 per cent of the cement production in this country.

In the case of a house that might be, roughly, 24 ft. by 30 ft., with a full basement made out of concrete masonry units, and a slab down in the basement, as opposed to a foundation made of concrete masonry units, and a slab down in 24 ft. by 30 ft., with a full basement made out of something like 30 barrels of cement go into a house, the foundation.

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Another one we did work with was an asphalt floor right on the ground; about 5 per cent asphalt mixed with certain types of soil. Stabilized earth, if you can get that result, can be used. We have built several floors using asphalt, stabilized earth, and then covered it.

VOSS: I think that is generally accepted. But hardly any local building department will even accept long standing tests of the Forest Products Laboratory on strength.

DANIEL: Could we ask the question whether anyone in this field feels the code in his area is actually minimum at the present time? I think we can all feel we can go back and with an engineering approach, and prove our case in many, many points—that we can cut down and still produce a perfectly safe structure.

PRICE: We could.

VOSS: I think that is generally accepted. But hardly any local building department will even accept long standing tests of the Forest Products Laboratory on strength.

DANIEL: It is a long, hard pull. For that reason, I think the answer to that is a local advisory board of citizens, businessmen, etc., who will meet with the engineer and go to these people who are hard to get along with and appeal these cases and get some action.

HEATING: It's not the heat, it's the insulation. A space heater can create comfort in a properly designed small house

BOESTER: In heating, this comfort business really starts not with building the house and then trying to find some kind of equipment to make it comfortable but in a realistic analysis of the materials out of which you build the house to reduce the heat loss to a minimum, and more particularly to control the interior surface temperatures.

When you do that, you get comfort, and it is simple then to find inexpensive, efficient equipment to compensate for the heat losses of the building and give you uniformity of heat in the various spaces of the enclosure.

In so-called emergency housing you can get very adequate thermal comfort with the so-called space heater—the wall-type of furnace device. It is, you might say, a greatly improved space heater, where we don't have to have the forced warm air devices and motors, filters, ducts, grilles and other things, to achieve comfort.

You can take the very simplest type of space heater equipment, and the more improved types, such as the wall furnaces, and locate them correctly in the house and achieve every degree of comfort that you can with the most complex system that has yet been devised.

VOSS: I want to second everything that Mr. Boester said. There is a terrific degree of misinformation as to what the difference is between comfort and standard heating. I think the most important thing that everybody has found, after a careful study, is that you must be as close to your air temperature or exposed temperature as it is possible to get, in order to insure comfort.
LOADS: Are the design loadings now enforced by codes for small houses too high?

PRENTICE: God is good to us, and there is as yet no lumber shortage. Consequently, the problem of doing something about the frame of the house is not as pressing as, for example, the problem of doing something about copper, where, if you don't do something about that, you are not going to have any houses built. But lumber may become very scarce before we get through this situation. I should think that if it doesn't become scarce, it will become expensive, because the only way you can get more lumber is to make it worthwhile for the men to go into the woods and get it out. One of these fine days we are going to face the problem of what you can do about building a house with less lumber. So now we are talking about the frame.

SCHIECK: Certainly the experience of a man like Price in prefabrication shows that house construction is over-engineered. Much of the framing is originally hooked up so that it has something to nail to.

VOSS: A 2 ft. long 2x4 would carry 20 tons. Why use 2 x 4's? Why not 2 x 3's?

SMITH: The 2 x 3 is more than adequate to carry the load. All of us are using 2 x 4's. You would save 25 per cent by going to 2 x 3's.

PRENTICE: Let me ask you another question: Is the barrier to using 2 x 3 studs due to the codes, FHA, HHFA, or is it just because you just didn't get around to it?

SLIPHER: There are states in which FHA does not permit 2 x 3 studs in exterior walls.

BOESTER: The single barrier is a statement in the code, and I get around that with the building inspectors by saying that there is nothing to keep you from turning the 3 x 4's flat on the center, and the intent of the code is defeated anyway, and then they say, "Well, 2 x 3's are all right."

PRENTICE: There is one more question on vertical support that I would like to bring up. Three people have volunteered to say that the sheathing is practically useless if you also brace your corners against the wind loads.

HAEGER: We have argued both sides of this story. We have eliminated the corner bracing, saving as much as $27 on a house. On the other hand, there are plenty of FHA jobs that have no sheathing, but only siding. I think that in the end it is strictly an engineering problem.

KIMBELL: It is a matter of the degree of insulation that you want.

SMITH: In the southern part of California we use only the bracing, and we have paper over it and chicken mesh wire to hold the outside plaster, and those houses show less cracking than the conventional job with the sheathing underneath. It made a fine job.

VOSS: It wouldn't do up our way.

JALONACK: We have to put sheathing because of the code.

HIGHLAND: Even if houses without sheathing are theoretically strong enough, isn't there the danger of incompetent building?

PRENTICE: It seems to me that we are all watching a major change in who does the building in the United States, and a greater percentage of the building that is going on in this country is coming into the hands of the volume-builder or the speculative-builder. I don't think you like to be called that. But it is a different animal from the animal that did the building 20 years ago.

And don't let us forget our friend across the street here, Mr. Price, who is a good industrialist. The change has been made possible by FHA financing, which made it possible to finance a volume construction as it was never possible to finance before. I would agree with you that in any event the house ought to be over-designed. It is simply a case of to what extent that should be done. That is what we should determine.

THE FRAME: 2 x 3's should be substituted for 2 x 4's; sheathing might sometimes be left out

HAEGER: Over a long period of time, I have made a study of the records of movers. The possessions which we have, including our furniture and clothing, as shown in the movers' records, would indicate that the design load for that phase is actually somewhere in the neighborhood of 5 lb. per sq. ft. That has been established over the years. If we used more realistic design loads, as opposed to the 30 and 40 lb. per sq. ft. now used, considerable savings in structure could be made. Except in the case of an occasional circumstance—a cocktail party, a funeral or a wedding—there are few 30 or 40 lb. per sq. ft. load situations in homes, and the safety factor we use would more than adequately take care of the exceptions.

That is the general concept. I am not suggesting that we use rash standards, and have the floor fall down, or the walls cave in, but I simply say that a more realistic approach to these subjects of design assumptions is certainly indicated.

VOSS: The normal vertical roof load that is considered standard all over the country in the northern section is 40 lbs. You have to account for sliding snow, and so forth. The more precipitous the slope, the greater the reduction. The minute you get a thaw, or get heat from the inside, the whole thing slides off.

So, these are all factors that have to be taken

MR. DANIEL: "... a satisfactory job can be done with a space heater ..."
PLUMBING: Vast savings in the scarcest material, metals, could result from the replacement of antique plumbing codes, standardization of plumbing trees and fixtures, substitution of synthetic enamels for galvanizing, and use of new septic tank designs

DAWSON: I have estimated that there is something like a million and a half miles of piping in the plumbing systems of the U. S. A million and a half miles just in houses. I estimated that there would be something on the order of 400 million valves, faucets and similar fittings—and that's a lot, too. Now, if in the future we can save possibly 1 or 2 per cent on similar items, it would be important.

The recommended new National Plumbing Code which my committee has been working on for three years will help to do this if it is adopted in place of the 1,000-odd codes now in use throughout the country.

For example, 30 per cent of the local codes now in use require 4 in. extra heavy cast iron and soil pipe for building sewers, building drain and soil stacks, including the installation of a house trap, and a fresh inlet. Most of those are now not in our code. For another example, we are definitely not recommending the use of house traps; we are not recommending the use of 4 in. extra heavy cast iron soil pipe. We are recommending for one- or two-family houses the 3 in., and not necessarily the extra heavy; ordinary standard pipe will do, particularly in an emergency. The nonmetallic building sewer is important in the problem of saving materials. You can use clay pipe, fiber pipe, or plastic pipe in place of iron.

The new national code will permit a 3 in. building drain and a 3 in. soil stack of a weight to be known as commercial standard service weight, a nonmetallic building sewer, and no house trap or fresh air inlet.

Gentlemen, the savings on all of these items totalled for an ordinary house would probably be about a quarter of a ton of cast iron.

The question of the stack vent is one of the items that came up for long and serious discussion—the question of whether any system or fixture should be back vented or individually vented. The new code definitely permits wet venting, with limitations, of course. That will save many feet of pipe and is, in my opinion, much better than dry venting.

The national code definitely permits stack venting. That means, to those of you who are not familiar with it, that you don't need any separate vents on the top floor of any building. Or, of course, in a single-family dwelling you obviously don't need any vents if you have the proper amount of stack venting. This new code shows substantial saving—particularly in multiple-dwelling units. For example, a multiple-dwelling unit with 6 bathrooms would require, in the majority of cases, a 4 in. soil, 3 in. vent, wall fixtures back vented. The new code permits 3 in. soil stack for 6 bathrooms, or 6 stories, with a 2½ in. main vent with the bathroom on each floor stack or wet vented. An estimate of the materials requirements showed that practically one half the weight of the material may be saved.

All this, of course, is predicated on the cities and counties in these states adopting the code. We are recommending the code, but that doesn't say anybody is going to adopt it. The plea I am making here is that you do everything you possibly can to have this new code adopted by whatever community or state or municipality you may happen to live in.

Getting away from the code, I want to talk about a few things in connection with the plumbing fixtures themselves. For example, the prohibition in the use of cobalt would no doubt prevent the manufacture of formed steel fixtures, unless a practical substitute is found. Colored fixtures should not be further considered, because invariably they require very strategic materials in order to provide the proper coloring. Deluxe equipment should not be manufactured. Standard-type fixtures should be utilized.

For example, water closets of the close-coupled type require less use of critical material. If you have them close-coupled together, you will have a lesser amount of work as against ones that are 6 or 8 in. long or more. Also, lavatories with towel bars or chrome legs are another item that might easily be done away with.

Another saving is the use of ordinary chain and rubber stoppers instead of the pop-up valves on lavatories and bathtubs. A 1½ in. connected waste and overflow should be used in bathtubs in place of more elaborate mechanical wastes.

The new synthetic enamels will, if properly applied, prevent rust and deterioration of iron, and it is my honest opinion that is will be the most important saving that could be made. In other words, you don't have to galvanize these things if you can find some way of putting the synthetic enamels on there—the same type of enamel we found going on the inside of the tin cans. All trim under sinks and lavatories should be of cast iron or a ferrous material, painted or sprayed with these enamels to present a neat finish.

Another item which I would suggest your considering is the reduction from the 17 gauge brass tubing for trims. It might be reduced to a 20 gauge, eliminating something like 40 per
ing. We try to do that for him.

Now, let me touch on the thing which is closest to my heart. Savings on critical materials can be made by careful planning and design of a plumbing system. I want to emphasize that—careful design of the plumbing system. And let me say at once that in new buildings the greatest offenders in this situation are the architects who, generally speaking, design a building from its appearance standpoint and pay no attention whatsoever to how we are going to fit the plumbing or the heating into the situation. There is much more to be gained from careful planning than almost any other single thing.

Now, let me repeat: The biggest thing that we can do is to advocate the adoption of the report for a national plumbing code. The sooner it gets through the mill of the American Standards Association, the American Society of Mechanical Engineers, the American Public Health Association—all of whom are engaged in working with it—the sooner it can have the opportunity of being scrutinized by the various state organizations.

DANIEL: How long do you think that might take?

LAWRENCE: A minimum of 90 days.

DANIEL: As quick as that?

LAWRENCE: That's a minimum. Personally, I think it will take 6 to 9 months.

DAWSON: I will be happy if it got through in 120 days.

SLIPHER: Would it be possible that the request be made to the NPA it be established as an emergency plumbing code similar to the one that was established during the last war, and made the NPA basis of restrictive orders on materials going into construction? I mean it worked last time, and that came in advance of this 180 days.

JALONACK: This proposed code, or whatever you want to call it, was undertaken in the interest of standardization rather than for strict economy due to surface damage. We have done some checking on the national averages with two different manufacturers, and there is somewhere around a 3 per cent loss nationwide. You don't realize it until you see those tubs stacked up at the end of the project, totally lost—not in metal damage, but simply due to surface damage.

SLIPHER: Another matter. In Los Angeles County this year there were approximately 80,000 single-family residences completed. We completed a survey last week that showed there were somewhere between 2,000 and 2,500 bath tubs and 4,000 sinks lost due to job damage, where the porcelain enamel was knocked off. That is roughly 3 per cent.

We have done some checking on the national averages with two different manufacturers, and there is somewhere around a 3 per cent loss nationwide. You don't realize it until you see those tubs stacked up at the end of the project, totally lost—not in metal damage, but simply due to surface damage.

SLIPHER: This year we used the corrugated covers, and we had no damage. We also have someone who does repair the porcelain.

DAVISON: We have been through that mill. These tubes that I am talking about are lost as a result of FITA inspection or VA inspection; lots of other tubs are repaired. Two manufacturers have told us that they have a loss between their factory door and the job site of another 2 per cent, which means roughly 5 per cent of the bathroom fixtures and porcelain enamel that goes right down the drain. The metal is lost, and you can't use it again. That is a lot of waste!
PRENTICE: While we are recommending things to FHA and recommending things to WPB, maybe we ought to make a recommendation that the sooner the plumbing manufacturers move towards less diversified lines, the less material they are going to waste at a time when that material is important.

DANIEL: You are right. There should be more standardization.

SMITH: You are right.

VOSS: The waste in unusual types is startling.

DANIEL: And they have to have the space to keep the damned things.

JOHNSON: "In septic tanks, clay can replace steel and cement."

Mr. Johnson

JOHNSON: I would like to mention a few words about research on septic tanks. During the past several years the Public Health Service has been carrying on research in septic tanks financed jointly by the Public Health Service and the Housing & Home Finance Agency.

We are talking about an item that during the past few years applies to approximately 500,000 to 700,000 dwellings, the number of dwelling units constructed each recent year that were not connected to public sewer systems.

Perhaps the most important fact that the research has yielded to date is that new kinds of structural shapes for septic tanks—primarily round shapes—will be allowable. That means that you can use clay products, for example, instead of steel or cement. I do not know exactly how much cement is involved in an ordinary rectangular tank, but certainly over the nation it represents a substantial amount. Then too, the admission of round shapes should allow savings in construction costs.

In our studies, for example, it appears that 2 stacks of 2 lengths of 36 in. pipe each plus inlet and outlet devices, placed in series, will do a 40 to 50 per cent better job of treating the sewage (removing suspended solids) than the standard rectangular tank. Gentlemen, please realize that this research has not been completed and these results are not final, but there is a strong indication that construction time and materials, especially critical material like steel and cement, can be saved, and we can still build a septic tank that will do at least as good a job as the standard rectangular tank.

We are now working on a fairly simple device that we hope will indicate to the householder when it is necessary to clean the septic tank. This should reduce the clogging of the drainage system due to poor operation, the usual cause, to a minimum. Therefore, the capitalized cost of the septic tank installation for the life of the dwelling should be reduced.

SMITH: I have built my share of Cape Cods, and I still like them. But I think this: We are trying to get the most in the way of housing facilities with what manpower and materials we have. I think you can get the most by intelligent use of contemporary design, specifically, by building flat roofs.

The house my firm is building is not stripped down. We have good insulation, moistureproofing, steel sash and copper plumbing, as well as copper screens—all of the amenities that accrue to the intelligently designed contemporary house. We have 1,060 sq. ft. which we are building for something under $4,200 or $4,400, about $4 a ft. in round figures. That is accomplished, primarily, by the intelligent use of contemporary design, and not by any mass production techniques or mass buying.

We have a high cost area. We pay carpenters $20 a day. We pay the masons $35. It is a terrific proposition. The plumbers are now getting $3 an hour.

The important thing is that through the intelligent use of good contemporary design you do get collateral savings. You don't have to have the plumber figure the supply lines. A couple of the boys walk over and set it down. We install the rock, roll it, put our membrane down and also put the slab in. The painters can stand on a couple of saw horses and reach the whole house.

VOSS: That is interesting because I have just done a lot of figuring. Do you realize that on your house, if you put a slope roof on it, it would raise that cost up to $5 per sq. ft. ?

SMITH: Yes. And I know the question that is coming now. "What happens in snow country?" they ask. Well, as you know, in snow country they do build flat roofs, but only for people with a lot of money. But we are dealing with the little fellow. That is the fellow I am interested in. He is the fellow we are going to cater to during this next period.

In California, I am building a roof, carrying 34 lbs. As a carpenter, and not an engineer, I thought it ought to be safe. The wood is re-saved in 6 x 8's. It comes up to 6 ft. maximum centers. They tell me that will carry a 34 lb. live load. It will take a little more to bring it up to 50 for snow load. But the additional cost factor would be negligible. I think that $25 or $30 would take care of the snow in your country, wouldn't it—figuring the extra timber?

VOSS: I don't think we would have to spend that much, unless it was in a terrible area.

J. PRICE: Could you sell them on Long Island?

SMITH: That is a typical question. I get that all over the country. In California when I built the first flat roof house, I even had people in the community get up a petition to stop me from building a house without a roof on it. I said I would continue to build this as long as there was a market. I believe there is a market, due to the good work of the architectural group who have been selling the advantages of this kind of a package to the American people.

I am a carpenter, but I am also a merchant. When there is something that the people might want, I will attempt to give it to them.

I used to build 30 houses a year. I sold 1,100 last year. It is a very satisfying business, believe me, because there are growing numbers of people who will buy the house if they are given an opportunity. I have no patience at all with the guy who says it will not do in his area.

JALONACK: Would you sell 5.000 of them?

SMITH: I could sell 100,000 if I had the organization that you have.

JALONACK: You probably could. But we are not allowed to do it. The code prohibits a residential house with a flat roof out in Long Island.

PRICE: I built a flat roof house for myself, and I liked it. We tried one down in another area, but we didn't get any satisfaction. Nobody in that district liked the flat roof house. It makes a big difference what area you are in. In some areas the flat roof will go. In others, it will not.

One of the important things is climate. The question of internal condensation comes up.

VOSS: The question of condensation, rotting of timber, erosion or decay of applications and everything else is a question of ventilation. We have the same thing in the slope roof in our area, where they have been foolish enough to put insulation in the ceiling and attic, and the first thing we knew was that the whole thing went to pieces.

The answer to that is to cut a hole in two ends, and put a fan up there, and your troubles are over. So far as the roof is concerned, you can use the regular joist construction with the released ceiling for cross-ventilation and ventilate through your exterior walls by screens and so forth. Mr. Boester said that if you do that it costs just as much as a gable roof. I disagree. I think the amount of thinking that a carpenter does costs you money. That is of tremendous importance. A lot of time is consumed there.

DANIEL: We figure flat roofs in small houses, but we haven't been able to find a saving on them.

HIGHLAND: We still have banks, and the FHA figures its costs on a cubic footage basis. With a flat roof we hit diminishing returns quickly; if the poor builder goes into that, he hasn't enough cubic footage.

ROOFS: In many localities, flat roofs are a design answer to the need for economy.

Mr. Smith

Mr. Smith: "I am a carpenter, but I am also a merchant."

Mr. Highland: "We still have banks . . ."
ELECTRICAL WIRING: Eliminate restrictive regulation in local codes, educate the public and some electricians too

L. D. PRICE: You can't talk about the electrical business without thinking in terms of rather scarce materials—copper, steel, iron, rubber, coal, and at the moment, aluminum.

Now, there are factors that have to be taken into consideration in anything that we may do, or that may be done to effect the electrical work in building construction. There is the fact that almost all of the apparatus types of electrical equipment are used in armament. Whatever is due to take care of building must be coordinated with what may be done for these other uses.

Probably the principal factor that we are confronted with is that of safety. Electricity misuse can be a hazard. Consequently, there was developed some 54 years ago a national electrical code, and that has been revised every two or three years since then.

Last year we completed a study and an analysis of 376 ordinances and codes. Of those, 325 have no special rules or regulations deviating from the national electric code, and 41 have special rules—some of them minor, some major. Some require that everything may be done in uniformity; others do not. In other words, they require that the smaller operators who have very little in the way of anything to guide them to the most economical wiring systems?

L. D. PRICE: A plan for engineered wiring was started toward the end of the last war and got into operation in a few localities, but it came rather late in the war. The plan is fundamentally all put together, and work is now being done toward getting it widely used.

It involves assistance from such groups as the local electrical people and the utility companies in assisting home builders in laying out a well-engineered wiring job with a minimum of feeders and circuits.

BOESTER: Do you feel that porcelain would be equal to the other material now used, from a safety viewpoint? I refer to porcelain boxes and fixtures, and so forth.

L. D. PRICE: From my own point of view, it is probably the safest system that can be put in a house.

SMITH: I understand that you can use aluminum successfully in electrical wiring. Would it be possible that Uncle Sam could step in and start specifying aluminum wire where it seems practical and feasible, rather than taking all the copper for the work?

L. D. PRICE: There has been developed an aluminum rubber-covered wire, and other types of insulated aluminum wire in all forms. People preferred the use of copper. One reason for that is the fact that aluminum does not have the same conductivity as copper.

Generally speaking, you have to use one size of insulated wire. There is no carting away of a lot of material or rubbish—you all know that is the one big thing.

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The one thing that will answer our problem about as much as anything is to gain uniform recognition of the national electrical code.

PRENTICE: Am I right in believing that if they all did adopt the national code, it would result in substantial savings in costs and in the use of materials?

L. D. PRICE: Yes, definitely. I know of no local code that is below—I am speaking now of a floor that may be established as a minimum standard—that standard.

SCHIEK: Is there any possibility of greater standardization of the electrical field? How much waste is there in wiring on the part of the larger operators who have very little in the way of anything to guide them to the most economical wiring systems?

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L. D. PRICE: That is what I mean when I say "uniform recognition of the national code without any restrictive local regulation."

COORDINATION: There should be a smaller vocabulary of dimensions in products and on blueprints; standardization is economy

GREEN: Most people don't seem to understand that modular coordination has an unfortunate name, and really is a very simple process. The coordinating part is simply a standardization, and the modular part is simply a standard unit of measurement—4 in. in length, 4 in. in height, and 4 in. in depth.

From that point on, it is simply a question of standardizing building material so that it would work with that dimension.

The perfect size of a brick is 4 in. x 4 in. x 12 in., which lays in the wall and saves labor in handling, and saves material and "mortar. There are a lot of advantages in the standardization of brick. But you can't standardize brick without standardizing your backup.

When the mason comes to the job and lays modular brick up to a modular window, it will fit, and modular inside backup will also fit to the steel sash. There is no cutting on the job. There is no carting away of a lot of material or rubbish—you all know that is the one big place where savings can be made.

There are a great number of manufacturers who are working on the standardization of materials. The wood window manufacturers have standardized their wood units in a reasonable manner. The metal kitchen unit people are trying to develop a unit which will fit on the wall so it will not be necessary to scrape your plaster off in order to put it in place.

Now, the architect who lays out the job also has to use modular dimensions on a basis of 4 in.—or obviously the modular materials will not fit on the job. But that is not difficult.

If I told you what some of the jobs in our office have shown in the line of savings in draftsman's time, you wouldn't believe me. When a draftsman puts down a dimension, it has to be a 4 in. dimension. He doesn't argue with himself. It just has got to be a 4 in. dimension. So that saves a lot of time there in our office.

When it comes to checking materials, there are tremendous savings of time in the office, because there are no 2/4 in. dimensions, or 1 in. dimensions. They all add up to 4 in. and we get used to that. On vertical dimensions you have more difficulty, because you come into the height of the framing members that carry the story over.
I know of some operational builders in the South who have been getting their materials from the Southern Brick Manufacturers' Association, and they have reported to the Senate Committee that up to 20 per cent savings have been accomplished. With standardization you ought to have savings from 5 to 10 per cent on your overall construction job. That is a substantial saving.

PRENTICE: Is modular coordination now to a point where the Government can really put weight back of it as something which is of importance? For example, the Federal Government might set its own house in order and tell the architects on all projects to use a modular basis.

GREEN: I think that could be done. I don’t see any reason why projects couldn’t be developed on the basis of modular dimensioning without hurting anybody in the industry. You will have to invite all these fellows into a conference and get them to agree. It can be worked out.

There is only one thing that I can see which stands in the way of adopting those standards. We had this trouble in a veterans’ hospital: They said that four-bed wards had to be 15 ft., 9 in. long. We thought that was just a dimension which was approximate, so we put it on a modular dimension basis, but we found that wasn’t what they wanted. They said, “We asked for 15 ft., 9 in., and we insist upon it.”

If the Government is going to take that attitude, of course, they are going to upset the applecart, and it can’t be done, because 15 ft., 9 in. does not fit the modular dimension.

VOSS: I don’t know what right I have to talk for the manufacturers, but I am going to do so for a minute. They have a big reason for supporting modular coordination. I have had any number of manufacturers tell me on a great many occasions, “Tell us a few things you want, and we will make them, and we will reduce the price.”

I am in favor of recommending that plans be drawn on a modular basis, and when they are, I am sure that the manufacturers will feel that they can cut their specialties on those big jobs, and afford to make them at a less cost and still fit them in.

Why? Because the manufacturer is interested in selling his product in the size that the architects want it. But if every architect wants a different size, the price is going to be higher. There is a big saving there in mass production application to anything that comes from modular planning.

KIMBELL: One of the assets of the modular theory is the fact that it has not been held to an inflexible basis. One of the best arguments for the modular approach is that there are not very many valid arguments against it. In the planning, the fact that there are tolerances permitted in the matter of products proves that there are assets.

SMITH: Isn’t there a problem in connection with this? I am not a manufacturer, but I would assume that to do this at this time for all segments of industry, there might be a tremendous problem of retooling for this thing.

SCHIECK: No, Mr. Green, if you dimension your plans for a modular basis, that does not preclude the use of non-modular products, does it?

GREEN: That is true.

PRENTICE: Is there any other place in the houses where agreement on standardization could make possible major savings?

SLIPHER: Yes, the depth of a house—whether it should be 20 ft., 24 ft., or 26 ft. That makes a lot of difference. In an emergency housing program, if you establish one depth, the areas can vary in width. There are a number of factors that go into it. For instance, the last time, it was found economical to have trusses up to 22 ft., but not over that.

PRENTICE: How deep is your house, Mr. Slipher?

SLIPHER: It is 26 ft.

GOLDMAN: Mine is the same.

DANIEL: Mine is 24 inside.

SMITH: Mine is 23.

JALONACK: Mine is 25.

VOSS: I think if trusses for the ceiling of a one-story house, plus the roof support, could be limited to certain slopes—maybe two slopes—and prefabricated, purchasable by the contractor in given spans, we would get away from bearing partitions entirely.

SMITH: I think there is another thing that can be kicked around a great deal, and that is a standardization of the doors that come from the manufacturers with the jambs. Now, the big prefabricators and large developers of houses can set up a shop to take care of that, but for the bulk of the builders, who are the little fellows, the doors come in all sizes, with all sorts of jambs.

It seems to me they could just have a package—a standardized door. Why not? Then they could bring it on the job and simply nail it together. This would be for the little fellow. I do that in my shop. We build—not a lot of houses—a few hundred houses a year. But the bulk of the building is done by the fellows who build ten to one-hundred houses a year. They can’t afford to set up a shop. They have got to fit the thing the hard way. If that was standardized you could save from $1.50 to $2 per opening in manpower.

VOSS: Wouldn’t you include windows too?

SMITH: Of course. There is no reason why frames of parts can’t be precision-cut, with the doors or the sashes going into them made to fit. There is no reason at all.

VOSS: There are three cases that I know of personally where some of these package panels come in, but the unions refused to touch them.

WILLIAMS: That is another problem.

COONLEY: I found that the manufacturers in my industry—valves and fittings—were very reluctant to standardize at first. They felt they had designed certain valves that couldn’t be replaced by another manufacturer, and if they once got them into a large installation, the replacement orders would have to come back to them. We had quite a scrap to get through the idea that that was a plain bunk. Little by little the facts became evident that standardization is not only sound, but economical and profitable.

I think our major piece of education came about when six of the major oil companies issued individual specifications for 150 lb. and 300 lb. steel valves and steel fittings, with the requirement that within three years we who are making the valves for them must provide valves and fittings of those dimensions.

Of course, our engineers got busy right away, and we found there were no two dimensions in any two of those standards that were the same. I told them to find out what it would cost us to qualify for those six companies’ business. They came back with the answer that it would cost $2 million to develop the drawings, patterns, tools and fixtures, without saying anything about the inventories we would have to carry with the work in process.

That was so impossible for us that we went to the consumers—the petroleum industry—and they sat down with us to see if we couldn’t work out single standards for those two lines. Then we saw the place to lay our heads and work it out together, and we took it to the American Standards Association.

Within the next two years we developed a single standard of both those lines, and the changes necessary for my company cost us $36,000. We had to carry only one line of work in process—finished stock and parts. So we were able to deliver those valves to all the companies at about half the price we would have had to charge otherwise. Now, I hope you will take that thought home with you.

PRENTICE: The particular problem which we face today is how we can profit by this emergency situation. Use of atomic energy was expedited by something like 60 years by the last war. Can’t we profit by the present emergency by expediting modular coordination right now to the very great immediate and also long-term benefit of the building industry.

WALKER: If we could get the Government to say definitely that they would only purchase goods or products on the modular basis, we will be making an enormous step forward. The architects will follow.

We don’t ask for a lot of different elevator platforms. We take what is offered in the trade. The standardization is there. We don’t do the same thing with door closures. We take the door and door frame all together in one package, just because the demand is there. If demand is created for standardized material by the Government, who are going to be one of the largest users of material in the next several years, the building industry is going to take a great step forward.
A NEW ARCHITECTURE FOR TROPICAL FLORIDA—How to be comfortable (summer and winter) despite heat, glare, rains, rot, hurricanes and bugs

Miami architects at long last are thinking out a tropical architecture that will make living there pleasant the year round. Already their progress promises more comfort in the tropics throughout the world.

The would-be quaint ordinances of many Florida towns still require the heavy roofed, heavy walled style that Ponce de Leon brought over from sunny, mountainous, temperate Spain; but an eskimo igloo would be almost as good an answer to such Miami problems as:

Sun—Nine months of the year the No. 1 comfort rule in Miami is to keep out of the sun; and to keep the sun out (particularly in the hot afternoon) becomes the No. 1 rule for a comfortable Miami house. This means wide overhangs, smaller windows or wooden louvers on the west, reflective (instead of red tile) roofs. It means plenty of shade outdoors too.

Rain—Part of the year it rains hard almost every day—often a driving rain at a 45° angle. Miami gets four times as much rain as Southern California, about twice as much as the national average. This again calls for wide overhangs and plenty of shelter for outdoor living, too. It also calls for windows that can be kept open in the rain (a development in which Florida window makers have been leading the world).

Bugs—So many bugs and so many kinds of bugs infest Southern Florida that even outdoor living means living behind a screen.

Hot nights—Hot enough so that keeping cool is often a 24 hour problem. (Actually this makes the architect’s problem easier, for it lets him concentrate on how to keep cool.)

Rot—Dampness and termites require special attention. Wood needs preservatives. Walls must be ventilated to reduce condensation. Concrete joists and terrazo floors are desirable.

Hurricanes—Such an old problem it will not be discussed here.

Glare—Too few trees, bright sun on the water and coral roads. Miami architects are still slow to realize the anti-glare value of blue-green glass. They are apt to use wooden louvers instead.

The one thing that makes pleasant all year living possible in the face of all these problems is the never failing breeze from the ocean. But the trick is not only to catch the breeze and get it into your Florida house—it’s how you catch it that makes the difference. One idea these architects have been working on is like the Venturi principle of aero-dynamics: The window or screen opening toward the breeze is large, and the opening on the opposite wall is small. The result is a forced draft through the room and out again through the small window. Another idea is to let in the breeze low down and close to the floor, let it escape near the ceiling on the opposite wall. Result: The breezes fan your body, scoop up any warm air layers around you. Without these breezes, Miami would be almost as bad in summer as deserted Palm Springs.

For such a climate the new architecture of California is not much more help than the old architecture of Spain. Indoor-outdoor living takes on a completely different meaning—it means living outdoors night and day most of the year with all the comforts usually found only indoors—but it also requires a special kind of outdoors, protected from the sun and rain by a wide overhanging roof, protected from the insects by a screen. Above all, it means living in the breeze. And yet, because for a few weeks each year the mercury dips down into the Thirties, each house needs some provision for cold weather.

This magazine has already reported one dramatic attempt to solve all these problems—Architect Polevitzky’s bird cage house (BUILDING, May ’50). Another solution—Architect Rufus Nims’ second-story house—will be reported shortly. On the pages that follow are four more solutions—A house by Marion Manley which could almost serve as a text book on all the problems and answers; A three-unit house by Alfred Parker (also notable for its big roofed-over patio); A second house by Alfred Parker which carries some of his ideas a step further; And an all-porch house by Igor Polevitzky.
If Philip Wylie wrote textbooks instead of novels, he could use his own house by architect Marion Manley as a perfect object lesson on how to beat the Southern Florida climate; for his house does all of the following things:

- It turns the living room into a completely furnished “porch” to be used that way 11 months out of the year;
- It uses the prevailing breeze from the southeast;
- It cross-ventilates every room;
- It is sited to take advantage of its trees to cut out glare;
- It has a second story master-bedroom that catches more of the breeze than any other bedroom;
- And it is liberally endowed with overhangs, screens, and projecting windows that further control the sun and the bugs, and make it possible for the Wylies to sit in their outdoor “living porch” even when it rains.

Despite all this openness, the Wylie house is also an object lesson in splendid isolation and perfect privacy for every member of the family—a basic requirement for all families whose members want to go on liking each other.

Open for ventilation

Like the house by Alfred Parker (p. 134), the Wylie house was built in three separate units which are linked by a screened porch. These units are a study for Mr. Wylie to work in; a bedroom wing for guests and the daughter; and a living-room wing with dining area, kitchen, carport and upstairs master-bedroom.

Because these wings converge on a screened porch, each can be cross-ventilated through that porch. The living room can be opened up and merged with the porch for 11 months out of the year, an arrangement which actually gives the Wylies an outdoor living area 35 ft. long and at least 18 ft. wide, with three sides almost completely open to the breeze. To keep out the bugs all openings are screened; to keep out the rains and still let in the cooling breeze, all windows are of the awning type; and because rains in southern Florida are driven in by winds at a 45° angle, these windows are further protected by deep overhangs.

Closed for isolation

With all this openness it is astonishing that the Wylie house is also an object lesson in splendid isolation and perfect privacy for every member of the family. When Mr. Wylie is in his study, he need not be conscious of anyone else around him; the bedroom wing is similarly isolated and the master-bedroom on the second floor is the exclusive and private domain of the owners.

Equipped for climate control

In any Florida window maker’s catalogue will be found some of the screens, projecting windows, louvers and shutters that a Miamian requires to face a tropical climate. But unless these controls are all in the right place, they will do very little good. In the Wylie house, architect Manley has used blank masonry walls where they should be used, to keep...
out the hot western sun. She has built a cement asbestos board roof for added sun protection. She has used overhangs 2 ft. 6 in. deep over the porch to combat both sun and driving rains; she has provided large openings facing east and south-east to receive the breeze, and placed most sills along those sides as little as 2 ft. off the floor so as to let the breezes fan your body, (while openings on opposite walls are smaller and high—an arrangement that creates a draft in every room); and finally, she has placed her house among existing trees for protection against glare.

**Built to last**

Architect Manley has paid careful attention to the way building materials stand up to rot, termites, humidity and heat. Floors are of white terrazzo, 4 x 4 ft. square, divided with brass strips. They are cool and can easily be cleaned (which is important in an "outdoor house"). The floor of the screened porch is slightly lower than that of the other rooms, because it tends to get flooded in heavy rains. An outward pitch drains off the water in short order. To combat rot, the house is built of indestructible materials throughout: concrete joists carry the floor slab, walls are of concrete block faced with stucco, clinker brick or cypress. The sq. ft. cost was $12.

Says author Wylie: "This is the most livable, easy-to-keep, bugless house I've seen ... It does what a house should do. It's efficient." Coming from one of America's most scathing critics of his environment, this is high praise indeed.
THREE-ZONE HOUSE
LOCATION: Miami, Fla.
ALFRED B. PARKER, Architect & Contractor

spreads its wings towards the breeze.

One way of making sure that your house is well ventilated is to punch a big hole into its center. That is exactly what architect Alfred Parker has done. This Miami house is really three separate buildings: a bedroom building, a living room building and a service building. All of them open to a central screened porch which for 11 months of the year can be combined with the living room area to form one big outdoor living space 42 ft. long and about 20 ft. wide, protected by screens, louvers and 2 ft. 6 in. overhangs. To get so big a living room in a $18,600 house is little less than miraculous.

Year-round outdoor living . . .

Out of the 777 sq. ft. thus devoted to almost year-round outdoor living, some 300 sq. ft. can be sealed off from the elements to be used as a traditional living room on cold nights and in January. In the bedroom wing every room—and especially, of course, the sleeping porch—is completely cross-ventilated, with awning- and jalousie-type windows set at different heights above the floor creating a draft like that in the Wylie house shown on the previous page.

In addition to taking in the breeze from the south-east, this house also tries to keep out the hot western sun by means of louvers, overhangs, small windows or blank walls. The owners like this fine, but complete all-year round ventilation in the screened living area and the screened sleeping porch makes these rooms very cold indeed for part of the year—especially at night. Moreover, there is not much privacy from the street in the big living porch, so that crossing the porch for a breakfast snack on cold mornings can turn into a race with virus pneumonia, as well as into a frantic struggle to preserve a minimum of modesty. Still, the openness of the living area and of the sleeping porch pays big dividends in climate comfort for most of the year.

... at low cost

To get his 2,200 sq. ft. at $7.10 each, Parker built the house himself and did some fancy cost-cutting. The screen wall that gives this house such a generous outdoor living area cost only 25 per cent of the regular frame wall elsewhere; in the roof construction, the sheathing served as a ceiling for most rooms; a minimum of trim was used in the house; and all interior wood was given one coat of sprayed sealer to close the pores and simplify maintenance.

All roofing is covered with white gravel to reflect the heat, but there is no insulation. Says Parker: "In dealing with a limited budget, I've considered insulation of minor importance. Most ordinary insulation gets heated up to the point where it does more harm than good. Reflective insulation is probably best, but the aluminum foil gets dull in the salt air and loses its effectiveness."

Another money-saving device was to make one bathroom do for three bedrooms by splitting it up into three separate units that can all be used simultaneously. An old idea resurrected again and again by architects for its obvious planning advantages, the three-unit bathroom has yet to find a builder imaginative enough to grasp its importance as a major design innovation for small houses.

(Continued on page 150.)
View of west end of living room shows fireplace that comes in handy on cool days, dining area to its left on porch.

Screened sleeping porch is completely cross-ventilated, useful on hot nights.

View of south side of house shows five different roof levels that create sense of changing spaces inside, provide clerestories where they are needed. Screened porch is at center.
THREE-LEVEL HOUSE  takes in the view on the north.

LOCATION: Miami Beach, Fla.
ALFRED B. PARKER, Architect
ALBERT HALLQUIST, Contractor

Upstairs bedroom (left) has awning-type windows facing north, jalousies facing west. View of house from main approach (above) shows second-story bedroom wing shading living room roof against western sun.

Open stair connects second-story bedrooms, living room level and kitchen-dining level below. View of living room (opposite) shows spacious effect of roof-ceiling, thorough cross-ventilation and cross-lighting. Screened porch extension is at right.
the breeze on the south

his house has all the sun, rain, glare, breeze and bug control gadgets needed around Miami Beach; but in addition, it has a nice sense of spaciousness and a good feeling for direct unpretentious design. Although hamstrung by a 75 ft. lot and a tight budget, architect Parker produced one of the pleasantest and most spacious living rooms around Miami, designed it for almost year-round outdoor living in the shade and in the breeze.

Most of the points that make this a good southern Florida house have been discussed elsewhere: All rooms are cross-ventilated in a way to create cross-drafts that enter low enough to fan the body. The living room has a jalousie over wall on the south and, on the north, adjoins a second porch that overlooks the bay. It is, in effect, a large living orch, 31 ft. long and 22 ft. wide (actually it seems wider), and covered by a high gable roof that is furred down here and here to create a sense of changing levels. The living room roof is not insulated, but the second story at one end shades from the western sun. Moreover, a continuous screened ent along the soffit of the overhang allows the breeze to drive out any hot air that may collect under part of the roof.

Upstairs bedrooms have wood jalousies facing west to keep out the sun, and awning-type windows or wood jalousies on the east. Again there is an attempt to induce cross-drafts by varying the sizes of openings on opposite walls. This explains in part why architect Parker changes his window sill heights constantly; it does not explain why he uses so many different ventilating devices to do the same job.

Parker has used 2 in. thick, 2 ft. square reinforced concrete tiles for his downstairs floors. They are placed directly on top of concrete joists, which gives him a complete floor at $1.20 per sq. ft. as compared with $1.25 for wood floor construction in these parts. The porch (with its lower dining area extension), the kitchen and the carport have a 4 in. concrete slab floor poured on the ground at $.60 per sq. ft. (with an integral green color). The kitchen floor is of asphalt tile laid on the slab, which raises the cost to $.85. Any one of these floor finishes is cool and easy to clean.

The house cost about $7 per sq. ft. to build, with both architect and owner pitching in. As in his three-zone house, Parker has added some pleasant decorative touches: His supporting post at the entrance is a trunk of Australian pine; planting boxes of wood and Oolite stone emphasize the indoor-outdoor character of the house; and the cypress boards used throughout the interior give this building a warmth and an air of easy comfort that belies the hard and elaborate thinking that went into the plan.
PORCH HOUSE
is one big outdoor living room

LOCATION: Miami Beach, Fla.
IGOR B. POLEVITZKY, Architect
BRADFORD BUILDERS, Inc., Contractor
JACK CAMERON Designs, Interiors
FREDERICK STRESSAU, Landscaping

In effect this Biscayne Bay house by architect Polevitzky is one tremendous porch 85 ft. long and 26 ft. deep, with solid end walls and long sides that are as open as a sieve. Through these open sides there is a steady flow of air from the southeast; and toward the north-west, the mammoth porch is wide open to a view of the Bay.

No house could be a more unequivocal statement of modern Miami living: The living room is a porch, and the porch is the house. And no house could make this statement more simply and more directly. The result is a piece of good (and very colorful) architecture, growing out of a single good idea expressed simply, forcefully and in a unified design.

Subtropical structure

Briefly, what Polevitzky did was this: Faced with a 100 ft. waterfront lot bounded by other houses, he built two long cement brick walls parallel to his lot lines, colored the cement taupe and salmon pink to make it look rich. Where he wanted his living porch, he put up six 28 ft. stressed-skin plywood trusses on 12 columns to divide the space between walls into seven 12 ft. bays. This construction left him free to shift partitions at will.

The bay size was determined by the 4 x 12 ft. dimension of 2 in. cement asbestos board which Polevitzky used for his roof, exposed on the gray underside to form the ceiling, and finished with mopped-on roofing on top. He is completely sold on this type of roof for southern Florida. Among its many advantages: The composition sheets went up in a single day, gave other trades a chance to work under cover.

On the south-east side of his big porch, Polevitzky solved the twin problems of taking in the prevailing breeze and assuring privacy by building a curved wall of wood jalousies. These let in enough light to illuminate the entrance space and passages; but for the living room proper, Polevitzky felt he needed more south light, built a strip of fixed clerestories to
do the job. His north-west facade he protected with a con­
tinuous low overhang, 6 ft. in depth! Under it he installed
single-hung, aluminum windows: These consist of one fixed
pane reaching from the floor to a rail 2 1/2 ft. above the floor,
and a movable frame reaching from that rail to the ceiling.
The movable frame can be lowered into a deep, concre­
tioned slot along the north-west footing of the house to open
the upper portion of the window wall. The open portion is,
of course, completely screened, so that the entire living area
can be turned into a screened porch when the windows are
dropped down into the slot.

When a man builds a veritable wind-tunnel of a house, he
is bound to sacrifice some degree of privacy within his wind­
tunnel. So one might criticize the fact that there is not as
much of that between kitchen and living space, for example,
as he has a right to expect in a $42,500 house. Closing off
the kitchen would have added only a few hundred dollars to
the overall cost. But these are relatively minor details; for
the all-important fact about this house is that it demonstrated
how all the gadgets of climate control can be fully employed
without producing a crazy-quilt architecture.

Living room (above) is spanned
with plywood girders. All floors
are of cement Cuban tiles taupe
and soft purple in color. Section
(above, right) shows clerestory
arrangement and deep overhang
to the west. Pictures below show
fireplace and clerestories in liv­
ing room, entrance hall on east
side with turquoise louveres for
cross ventilation stained brown.
Site plan show Landis's neighborhoods and their relations to community facilities. Recharge basins are designed for use as ice-skating ponds in winter. Industrial area near railroad station for light manufacturing will help spread tax load.
LANDIA—Long Island’s Levitt & Sons come up with an exciting new house and a new concept of the merchant builder’s responsibility towards community planning

A continuing phenomenon in U. S. Building is how, year after year, the new house types developed by Long Island’s famed Levitt & Sons influence the industry. Their 1951 house, shown in these pages, will be no exception. In its use of economical new materials and design techniques, it sets some challenging new standards for the builder’s house. In addition, the Levitts have developed a new type of subdivision, known as Landia, where the emphasis is on neighborhood living and a complete integrated collection of community facilities.

Unfortunately, Landia and its house will not be built this year. Construction was to have started on March 15. The materials were ordered and a concrete mixing plant had already been delivered to the site when Bill Levitt announced last month that the 1,750 unit project was being postponed because of the defense emergency. (Besides canceling material orders, he had to return deposits to the 650 families who bought the houses before the model was open for inspection.)

This postponement in no way diminishes Landia’s significance. The house was designed for peacetime use but its combination of shrewd design and economical construction make it an important case-study house for the coming period of austerity. The Levitts themselves plan to adapt the house for use in any defense-housing projects they may be called upon to build. Herewith, then, a report on an exciting new house and the community it was designed for.

In planning the “village of Landia” at Jericho, Long Island, the Levitts set some challenging new standards for U. S. subdivisions. In the first place, Landia is going to be completely equipped with every community facility—from a town hall to tennis courts. Secondly, it has been land-planned so that its 1,750 houses will be grouped in small neighborhoods rather than strung out in a single monotonous pattern of curving streets.

The neighborhood idea stems from the Levitt experience in building their big Levittown development, three miles south of the Landia site. Says Alfred Levitt, designer of Landia and its house: “We learned that housebuyers want to be identified with a neighborhood, not a subdivision. As a result, we have adjusted our land planning techniques accordingly.” Landia is divided into seven neighborhoods, each containing from 90 to 350 houses. Community buildings and parks are placed between the neighborhoods so that a modified greenbelt pattern is arranged.

Each neighborhood is clearly defined by a “main street” which loops completely around it. (See plan, opposite.) Most side streets in the neighborhood go from one side of the loop to the other. This eliminates what Alfred Levitt calls “the maze”—subdivision streets which curve because FHA says they must curve but which don’t lead anywhere in particular. The Levitts think that their system has the logic of the gridiron pattern without its monotony. Each neighborhood’s loop street empties into Landia’s main street, Landia Drive, which runs on an east-west axis, ending at the village’s own railroad station on the east end. The only other through street in the village will be a north-south county road which bisects the tract.

Typical of the care with which Landia is planned is the provisions for two schools. By splitting the schools so that each is within walking distance of every house, Landia will not need an expensive school-bus system. And, the Levitts figure, the cost of the second school will be completely amortized within ten years by eliminating the busses.

Landia’s community facilities represent the largest investment of this sort which any U. S. builder has ever included in the price of his house. Included are a community center, railroad station, pre-school nursery, swimming pools, ice-skating ponds, tennis courts, baseball field and the sites for three churches and two schools. The Levitts plan to turn over all the facilities to a Landia homeowners’ association after the project is completed. They anticipate that the association will charge each family $3 a month to keep the facilities in order and also to keep the village clean.

In computing the $13,000 sales price for the Landia house, the Levitts have charged off about $1,200 for the cost of these facilities. “Theoretically we could cut the cost of the house a great deal by eliminating some of these items,” says Alfred, “but we think that they are all necessary for a good community. Again we drew upon our experience at Levittown in arriving at this conclusion.”
Three-sided fireplace and a low brick screen is all that divide living, dining and kitchen functions. Low wall separating kitchen and living room is one-brick thick, reinforced by parallel strips of steel tape in the mortar joints.

Rear view shows the two large window walls (the smaller one fixed) and also the conveniently located door to the storage room and garage.

What's new in the new Levitt house

1. The kitchen is just an alcove off the living room, creating a big (20 x 24 ft.) open-planned living-dining-kitchen area.

2. The expansion attic—a Levitt trademark—is no more. The result: a long ground-hugging house with three finished bedrooms on one floor.

3. The third bedroom can be added to the living room, if desired, by sliding back a wall.

4. A sliding window wall in the living area can be pushed back in summer to create an open-air "porch" within the house.

5. A handsome new low-cost asbestos cement exterior siding which can be applied quickly in big (96 x 32 in.) pieces.

6. Two complete bathrooms (one inside)—and an ingenious plumbing stack that cuts labor and material costs to the minimum.

7. A windowless kitchen with plenty of light borrowed from other parts of the open-planned living area.

8. Bigger closets at lower construction cost.

9. A novel use of basswood sliding curtains in the dining area to create privacy from the street, the main doorway or the kitchen as desired.

10. More appliances in the kitchen—including a frozen-food unit and a dishwasher.

11. A 3-in-12 in. roof pitch with asphalt shingles, made possible by a new stapling method.

12. A floor plan made far more workable by moving the kitchen away from the baths.
In their Landia house, the Levitts have taken another big step towards integrating contemporary design into their mass volume operation. Esthetic considerations were not the only factor in the decision, however. Like every Levitt house, Landia's design is based on merchandising analysis. If the Levitts are correct, the 1951 housebuyer wants a house with three bedrooms, two bathrooms, a two-car garage, more kitchen equipment and more storage space. More important, he wants a house that is better adapted to the requirements of modern living. In their new $13,000, 1,200 sq. ft. house (plus 400 sq. ft. garage) the Levitts have provided all these items.

The big change in the new house is three bedrooms on one floor, instead of the unfinished expansion attic which has been a standard Levitt feature for the past five years. When he first began planning the new house, Designer Alfred Levitt was reluctant to give up the expansion attic because it provides more space at less cost than any other type of construction. However, both he and his brother Bill—the family's salesman and expert on finance—agreed that a one-floor house had to be worked out. They also found out that the cost of adding a third bedroom on the slab was not significantly different from framing a high expansion-attic roof. For instance, they cut their roof-framing costs in half by adopting the lower, lighter non-expansion roof in the new house.

Besides giving the house a cleaner, low-slung look on the outside, the absence of an expansion attic permitted Alfred Levitt a wider range of design possibilities inside. No longer was his interior layout confined by the inflexible requirements of an attic staircase in the living room.

Alfred has taken full advantage of this new freedom. He has achieved the not-inconsiderable trick of opening up the whole living area as one big room without sacrificing the needs of privacy. (Floor plan, above.) Particularly noteworthy is the circulation scheme. Every part of the house is immediately available from the front door without passing through any other part. However, the living room has the gracious virtue of being protected from the front door. "There is no reason why, in the middle of the Twentieth century, we shouldn't have houses for sale that provide at least this degree of privacy," says Alfred with a Levittan air of finality.

To achieve a greater sense of spaciousness, the living area can be extended further both on the inside and the outside of the house. The large steel picture window in the living room can be slid open in the summertime so that the living room becomes, in effect, a large porch. (Photo, next page.) Slots for three large movable screens are provided to prevent mosquito invasion. Indoors, the living area can be made larger by rolling back the wall which separates it from the adjoining small bedroom. This bedroom, which Alfred describes as "the one you can do without," thus serves double duty to meet shifting family requirements. A young couple will undoubtedly keep the bedroom open to the living area. During the active child-rearing years, the wall will remain closed. (Almost all of the 650 families who ordered the Landia house from the floor plan had two or more children.) As the children leave home, the bedroom will probably be transformed into living area once more to meet the more frequent entertainment requirement of middle-aged couples. In recognizing the needs of this family-cycle pattern, the Levitts have made a significant advance in an area that deserves more attention by builders and architects alike.
Basswood sliding screens in the dining area can be arranged to serve varying degrees of privacy. In the top picture, opposite, they are used to screen the area from the street, also to create a "vestibule" at the front door and to shut off the kitchen on the other side. In second picture, the dining area is open to street view but is still screened from the front door and the kitchen.

Sliding window wall is weatherproofed in winter by fitting four sponge-tipped 2 x 4's along each side of the wall. The Levitts claim this simple system solved the sliding wall's biggest technical problem at a cost of $7.

Sliding interior wall can be opened to add 88 sq. ft. to living area when a third bedroom is not needed. Wall does not slide easily intentionally to avoid its being used by children.
GARAGE

Kitchen is well lighted though it has no windows. It borrows its light from the dining area and also from the living area over the screen and from the garage through an opaque door.

Plumbing stack, slightly abbreviated in this picture, is a typical example of the Levitt flair for cutting materials and methods down to a minimum without affecting their vital functions. This factory-fabricated stack serves two back-to-back bathrooms, also the kitchen drain. Kitchen outlet is located directly below the tub outlets on the stack.

“This is so completely a Levitt house that if a structural member is 2 in. out of line, the house will fall down.” Thus does Alfred Levitt half-humorously described the cost-conscious attention to every detail of the Landia house.

The most important saving is in the simplified design of the house itself. An open-planned living area is not only a good selling point; it is also a cost-cutter. Item: there are no doors in the living area. Item: within this large area only the fireplace runs from the floor through the ceiling. ("Every time you touch the ceiling, it costs you money.") Item: the fireplace is in the middle of the house where it creates fewer framing problems.

In their selection of materials for the new house, the Levitts have made price the controlling factor. They make no apologies for the fact that, with the exception of kitchen appliances, their houses are built and equipped with a minimum amount of the lowest-priced materials available. “It is a self-imposed restriction which we owe our customers. We have a little problem known as merchandising. It means simply that we must supply as much goodness as we can at the lowest possible price.”

When the Levitts don't like the looks or the price of the lowest-cost material, they arrange to get one they do like. In their development of the Landia house, this resulted in a new economical exterior siding panel to replace the asbestos shingles they have been using up to now. The siding is a large (32 x 96 in.) asbestos cement panel, only 1/8 in. thick, which was produced experimentally for the Levitts by a big New Jersey building materials firm. In addition to its low cost (about 8 cents per sq. ft.), each panel has 16 prepunched nail holes, can be installed in less than 10 minutes. It comes in four shades with a vertical striping made by integrating layers of pulverized white stone during the manufacturing process.

Another Levitt innovation is the use of asphalt shingles on the low (3 in.) roof. FHA and most banks have frowned upon this type of application in the past because of the waterproofing and windproofing difficulties it creates. Alfred Levitt thinks he has answered both objections by stapling the bottom of each shingle with a special machine which drives the staple through only two of the three layers of 15 lb. felt underneath the shingles. Thus the shingle is made more secure without creating another channel through which water can drip into the roof structure below.

Despite their single-mindedness about low cost construction, the Levitts are willing to spend extra money when it can be clearly justified. One example of this in the Landia house is the separation of the bathroom and the kitchen—a clear-cut violation of the dogma that all plumbing facilities should be located in one plumbing wall. Bill and Alfred batted this one around for weeks with their plumbing man Irwin Jalonack. Jalonack, who has been known to out-Levitt the Levitts on their own cost estimates, argued for a back-to-back arrangement. Finally Alfred won by arguing that the house plan would be more merchandisable by putting the kitchen on one side of the front door and the two bathrooms on the other side. The cost of the extra pipe (including another vent) was $35.
In the Landia house, the Levitts have cut closet construction to a minimum. Closets, in fact, are nothing but shallow alcoves hidden from view by flexible basswood curtains.

The Levitts gave up orthodox closet doors a long time ago but they have had a difficult time finding a satisfactory, low cost substitute. They experimented with all kinds of wooden and metal sliding doors, finally decided on the wood curtains shown in the pictures above. They eliminate the need for framing a head since they run on easily installed metal tracks. When the closet is closed, the screens are held together by two magnetic bars, one on the end of each screen. Besides giving a pleasantly textured effect, the basswood screens permit air to circulate within the closet. This is necessary with a radiant-heated house, the Levitts have found, to combat condensation in the closets.
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Air infiltration only 0.095 cfm! In terms of effective closure it is at least **TEN TIMES AS TIGHT** as the generally established standards for casement windows and projected sash!

**WHAT AUTO-LOK’S TIGHT CLOSURE MEANS:**

- reduces air infiltration to a minimum
- eliminates uncomfortable “cold-spots” around windows
- slashes fuel and air conditioning costs
- provides “sealed” protection against driving rain, snow, dust storms and hurricanes

**TIGHT CLOSURE, PLUS**

- 100% ventilation...even when it's raining
- Draft free ventilation -- air is scooped in and upward
- Cleaning entirely from the inside
- Interchangeable inside screens and storm sash...no tools...just “flip the clips”
- No painting or maintenance
- Precision-balanced finger-tip operation

**PATENTED AUTO-LOK HARDWARE**

Only patented AUTO-LOK (automatic locking) hardware pulls the vents in tight against the frame -- compressing the elastomeric vinyl weatherstripping against the entire perimeter of each vent. This positive action actually “seals” AUTO-LOK just like a refrigerator.
A NEW STANDARD FOR WINDOW PERFORMANCE

When you have available (as you do in AUTO-LOK) a window that closes ten times as tight as windows that have been considered "good" in the past, you have... a new standard of window perfection.

For comparison's sake AUTO-LOK windows are as far ahead of the field as a smartly designed and engineered 1951 automobile in a field of Model T Fords. The Model T was a "good" car in its day... one of the best, but windows, as well as cars, must keep pace with progress, too!

HERALDING A NEW ERA IN WINDOW PERFECTION

MAKE USE OF OUR ENGINEERING DEPARTMENT

Many architects are taking advantage of Ludman engineering service. Ludman's capable engineering staff is called upon daily to solve intricate window problems... they will be delighted to work with you any time!

SCHOOLS, HOSPITALS, CHURCHES, HOTELS, RESIDENCES

Yes, versatile AUTO-LOK aluminum awning windows fit readily into any architectural scheme. They are being successfully utilized in all sections of the nation. You, too, can easily benefit from this widespread, job-proven window engineering experience.

Please examine AUTO-LOK! Compare it! We believe that you'll then agree with architects everywhere that AUTO-LOK gives you performance... not claims, and that it is the first and only window to successfully combine the BEST features of ALL window types.

Consult SWEET'S and write for name of your nearest AUTO-LOK Distributor. If you have not received a copy of the informative folder

"WHAT IS IMPORTANT IN A WINDOW?"

Please address Dept. AF-2

LUDMAN CORPORATION

P. O. Box 4541 Miami, Florida
THREE-ZONE HOUSE

(Continued from page 134)

Unlike the Wylie house which uses CBS (concrete block and stucco) construction, Parker’s house sticks to frame construction; the living and master bedrooms have floors of handsome select grade oak at $0.85 per sq. ft. (with termite shield and joists, the whole floor comes to $1.25 per sq. ft.) On the screened porch, Parker has used an integrally colored concrete slab finished with green wax; the cost of this, including fill and finish, was only $0.60 per sq. ft. To get rid of rain water during hurricanes, the concrete floor has been pitched away from the living room and outward, can be drained through weepholes in the base under the screen walls. Incidentally, the three-zone house is all set to cope with hurricanes in other ways as well; like all good Florida houses, it has ample storage space for hurricane shutters right next to the carport.

At less than 1/2 the sq. ft. cost of the Wylie house, architect Parker managed to enclose a great deal of space very cheaply—and make that space seem very large indeed. His gross indoor-outdoor living area is about 100 sq. ft. larger than that of the Wylie house, although the total cost of his house is only about half the cost of architect Manley’s job. While a lot of this is due to the fact that Parker did his own building and used cheap or no finishing materials, a good deal of credit is due to him for some highly imaginative planning. Said the Miami News: “A good solution to problems of privacy, ventilation and sun control. It... can take Miami’s hot summers.” There aren’t many houses that would rate such a compliment.

South-east side of the porch is open to breezes but protected against bugs. Overhang (2 ft. 6 in.) keeps out driving rains.
No matter what type of building you’re planning—no matter what noise problems may be involved—your Sound Conditioning specifications are a trust... to your local distributor of Acousti-Celotex products!

He can perform to your specifications without tampering. For he has the broad professional training and experience—the job-proved methods—the complete line of top quality materials necessary to meet every specification, every requirement, every building code!

So when you’re planning, be sure to consult with your local distributor of Acousti-Celotex Products. He’s backed by the world’s most experienced Sound Conditioning organization, with thousands of actual installations to its credit. He can help you be sure in advance of the most attractive, most efficient Sound Conditioning installation possible!

**ACOUSTI-CELOTEX**

**CANE FIBRE TILE**
A lightweight, rigid unit, combining acoustical efficiency with a durable, smooth surface. Perforations (to within 1/4" of the back) assure repeated paintability, easy maintenance. Available in a variety of sound-absorbing ratings. Dry rot proofed by exclusive Ferox process.

**ACOUSTI-CELOTEX**
**MINERAL TILE**
Made of mineral fibre, felted with a binder to form a rigid tile with a universal rating of incombustibility. Perforated with small holes extending almost to the back, this tile provides high acoustical absorption plus unrestricted paintability by either brush or spray method.

**ACOUSTI-CELOTEX**
**FLAME-RESISTANT SURFACED TILE**
A cane fibre tile with a flame-resistant surface. This tile meets Smoke Burning rating contained in Federal Specifications SS-A-118a. It may be washed with any commonly used solution, satisfactory for good quality oil-base paint finishes, without impairing its flame-resistant surface characteristics and without loss of sound-absorbing capacity. Repainting with Duo-Tex flame-retarding paint will maintain peak efficiency. Suitable in all sizes and thicknesses of regular cane tile.

**ACOUSTI-CELOTEX**
**FISSURETONE**
A totally new mineral fibre acoustical tile. Attractively styled to simulate travertine. It beautifies any interior and effectively controls sound reverberation. Lightweight, rigid and incombustible, it is factory-finished in a soft, flat white of high light-reflection rating.

**ACOUSTEEL**
Combines a face of perforated steel with a rigid pad of sound-absorbing Rock Wool to provide excellent sound-absorption, together with attractive appearance, durability and incombustibility. The exposed surface of perforated steel is finished in baked-on enamel. Acoustical is paintable, washable, cleanable.

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Be sure to get your copy—you'll refer to it for years to come.
STRUCTURAL STEEL WORKER

says he was able to place riveters' forges close to crew on each floor without temporary platforms.

SPANDEL FIREPROOFERS

claim the work was greatly simplified by carpenter shop moved to each floor. Formwork fabricated near where used. Transporting concrete from material hoist to where it was poured was made much easier by smooth Q-Floors.

ELECTRICIAN

was able to time work to his own convenience, roughing-in anywhere in the building, without waiting for other sub-contractors to vacate floor space.

MATERIAL ELEVATOR

could work to every floor, increasing the tower height with the framework. Every floor was available for material storage. There was no double handling.

PASSenger ELEVATOR

was helped by convenient storage. Several miles of rails were stacked close to where needed but never in the way of other workers.

STONEMASON

saved time on storage. Only one handling of materials from truck on the street to within 20 feet of where used.

BRICKLAYER

unhampered by forms or shoring, worked safely and quickly with materials and equipment loaded onto floor immediately behind the men. Streets and sidewalks not needed for storage.

CARPENTER

moved his shop from floor to floor, with power equipment always nearby.

SASH CONTRACTOR

had some storage convenience as masons; only one handling of material, every floor being a warehouse.

HEATING CONTRACTORS

could work on any floor without delay. Every floor was convenient for on-the-spot fabricating.

PLUMBERS

who had complete flexibility of storage and assembly areas.

AIR CONDITIONING

was speeded by needing no preset inserts for duct hangers. When changes of layout were called for, the flexibility especially was an asset.

Steel Q-Floor is shown here with suspended ceiling and a condensed presentation of mechanical equipment needed in a modern building. No preset inserts.

LOOK BETWEEN THE LINES and you will see the evidence of how Q-Floors reduce the overall cost of a building. The subcontractors say their men were able to work faster. Materials were handled less.

Time saved is merely another way of figuring money saved. Another saving accrues from the earlier completion date you get with Q-Floor construction. Earlier occupancy brings revenue sooner. When the price of Q-Floors is quoted, these savings cannot be actually deducted from the cost of the Q-Floor, but they should be kept in mind.

The General Contractor, and others closely associated with the building found it hard to realize that there were 1,000 men distributed over the building at once. This type of construction permits all the trades to work at one time with smaller groups. This is one reason for the speed—hence the lower cost.

REVIEWS

(Continued from page 114)

As seen in the figures at the left, Roth lays heavy stress on giving the teacher clear supervision where classrooms are articulated for multiple use. The example at the left is his own masterly kindergarten, with some five different kinds of area simultaneously visible; the others are familiar American examples.

Again, Roth makes a contribution in the discussion of school height. It will annoy New York City to realize that three stories are considered the absolute top limit by the densely populated Swiss. Roth has made a fine suggestion of his own in multi-story schools: the three-story school built precisely like row apartments, with stairwells serving one classroom left, one right, on each of three floors (drawings below), so there are no corridors above ground level, and there is bilateral lighting and through ventilation in every room. It will astound Americans to note the date 1933 on this drawing. The first suggestion in the U. S. of schools more than one story high but only one room deep was made, so far as known, by this reviewer in May, '45 (Architectural Record); and the first built was Kump's Antioch School of 1948—with outdoor corridors at both levels in the mild California climate. Roth's noise-preventing stairwell scheme has been proposed by Alonzo Harriman for use in Maine but only in recent years.

So, too, the international competition is very strict in matters of design, and although it would scarcely be expected that a selection of five schools would cover all eligible U. S. architectural firms, yet it is significant that Roth has confined himself to the work of only the Saarinens, Perkins & Will, and Kump. The chief difference lies in close carefully studied attention to detail, so that each of the schools seems to have had a chance to mature.—D.H.

Like a row housing development, Roth's 3-story, one-room deep school of 1933 has frequent stairhalls but no corridors.

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(Continued from page 114)

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Like a row housing development, Roth's 3-story, one-room deep school of 1933 has frequent stairhalls but no corridors.
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"We found it to be the best heating system for our houses and it is, by far, doing a better job than the unit we previously used. . . . All our customers are very well satisfied."

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"Coleman's new Blend-Air Heating System has helped in the following ways: (1) Simple installation, (2) Trouble-free operation, (3) Economical operation, (4) Neatness in appearance, (5) Increasing the selling value of houses."

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"Our Blend-Air System has kept our home completely warm from floor to ceiling. . . . We have a little boy in the crawling stage and warm floors are a must. . . . It was installed in less than two days' time."

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Des Moines, Iowa

"We have been very pleased with the operation and comfort of this Blend-Air System . . . We especially enjoyed the even heat from ceiling to floor in every room throughout the house."

— John C. Lemke, 2002 63rd Street
The new narrower moving stairways have decreased the price, increased the market for this kind of vertical transportation. They are 32 in. wide between the handrails and narrow down to 2 ft. at the treads. They have 25 per cent more rated capacity than the old 24 in. stairway, but manufacturers sell them at a lower price.

Elevators increase speed

The best elevator service is usually planned on the basis of not more than a 30 second interval. Floor-to-floor time for a single floor ride has been reduced since the war from 8 seconds to 6, but it is still necessary to allow one second per passenger for getting on or getting off. Passing a floor without a stop takes about one second. Consequently, an elevator trip to the 5th floor, skipping one floor and letting off six passengers, would take 25 seconds, plus whatever part of the 30 seconds interval the passengers had to wait on the ground floor—a total of anywhere from 26 to 55 seconds. On an escalator traveling 90 ft. per minute, allowing 5 seconds for walking from flight to flight at three floors, the time to the 5th floor would be about 75 seconds. Unfortunately for the elevator, which does come out best in this speed comparison, there are very few buildings whose elevator service meets this standard. Most buildings are seriously under-elevated—especially buildings whose elevators have to handle inter-floor traffic for multi-floor tenants. Frequently the elevator interval runs over a minute, in which case escalator service, even at 90 ft. per minute, becomes faster in most cases than waiting for the elevator. And the scales would be tipped much more heavily in favor of escalators if they were speeded up to 160 or 180 ft. per minute, which most technical men believe is now entirely safe.

A code accelerates

Moving stairways have already begun to increase speed in the U.S. Recently the American Standards Association Code was revised upward from 90 to 125 ft. per minute, which is still considered a very sedate speed by many, but nevertheless was a notable and influential advance. A moving stairway is being designed for installation in New York's subway system which will have an emergency speed of 180 ft. per minute. By the time installation is completed, some observers think, it will be recognized legally that getting up stairs in a hurry is always an emergency.
For exits that are dependable, attractive and above all safe, leading architects and contractors specify Von Duprin exit hardware. The Von Duprin line includes latching devices and allied accessories for the complete installation on every type of exit. Consider these vital advantages in the complete Von Duprin installation shown:

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INSURES RELIABILITY AND SAFETY

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Incorporated in this new assembly is the
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the basement, each holding 28 cars, plus three cars in less transient storage on dead space on each floor plus ground floor parking. Basement space other than that used for storage in the 34th St. location will total 3,000 sq. ft., most of it under the sidewalk, and will be used for car-washing and repair facilities and additional dead storage. Only the first floor office and basement are fully heated, for minimum overhead, and the only permanent lights on the upper floors are those marking the emergency stairway. Because there are no windows in the tower (there is no ventilation problem because car engines are cut off at arrival) each elevator is equipped with a floodlight, actuated when the doors open.

Power costs are estimated to be about the same as those in a ramp garage of equal capacity.

Parking rates for the 34th St. Rotogarage are based on present rates charged by uncovered lots in the vicinity: 75 cents for the first hour, and 25 cents per hour thereafter. Eric Foundation Reports state that 33 per cent of cars parked in such locations are left less than an hour, and another 30 per cent are removed after less than two hours. Income on the statement on page 109 is figured for only an eight hour day, 10 a.m.-6 p.m., although expenses are included for 24 hour operation.

One projected application of the Rotogarage system would use the interior space in a N. Y. City office building as a parking garage (see plan below). The entrance to the garage would be by means of a ramp down from street level to a basement reservoir area where cars would be left and picked up by their drivers. Theory of the Rotogarage Co. is that the interior space on such a plot is of less value than exterior space, and might better be used for parking in congested areas. Minimum dimensions in the heart of a building needed to house a Rotogarage would be 100 x 100 ft. on all floors except the ground floor, which would be clear except for elevator shafts. Although only 9 ft. are needed vertically floor to floor for the parking unit, the office building's more generous ceiling heights would be followed to simplify framing. A 15 floor plus basement unit of the plan shown below would keep 500 cars off the street. Patents for Rotogarage are held by Albert F. Buranelle, 10 E. 40th St., New York City.

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Armstrong's No. S-104 Chemical-Set Cement resists the harmful action of alkaline moisture in grade-level concrete floors. In order to obtain a satisfactory bond, it is extremely important that the subfloor meet certain conditions. It must be clean, free of all oil, grease, and other foreign substances. No. S-104 Chemical-Set Cement will not bond satisfactorily to areas upon which paint, varnish, or flooring adhesives have been applied.

Armstrong's No. S-104 Chemical-Set Cement is a two-part adhesive—mixed on the job. It is trowelled on the subfloor in the same manner as standard resilient flooring adhesives. It covers approximately 100 square feet to the gallon. Armstrong's No. S-104 Chemical-Set Cement is also used to bond metal edging to concrete and metal stairs.

Present restrictions on certain raw materials used in its manufacture limit the production of Armstrong's No. S-104 Chemical-Set Cement. It is advisable to contact your Armstrong flooring contractor as to availability in your locality before specifying. For complete architects' specifications and other information on the installation of Armstrong's Rubber Tile over grade-level subfloors with Armstrong's No. S-104 Chemical-Set Cement, architects are invited to contact their nearest Armstrong District Office or write directly to the Armstrong Cork Company, Floor Division, 2602 State Street, Lancaster, Pennsylvania.
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Wall Thickness — ½"
Floor Lip — ½"

**KENTILE FUNCTIONAL DESIGNS:**

Colors never wear off...never need repainting. This type of treatment available for directional traffic lanes, trade marks, fraternal insignia, alphabets, basketball courts and numerals...or engineered to your specifications.
ALUMINUM...MODERN METAL

...PLAN FOR ITS USE

Aluminum troughs reflect light in lobby ceiling, harmonize with the bronze trim.

Permanent, maintenance-free aluminum louvers provide ventilation, keep hot sun away from air-conditioning equipment.

100 Park Avenue, Kahn & Jacobs, Architects.
George A. Fuller Co., General Contractors.
Alcoa Aluminum used for windows, spandrels, and mullions fabricated by General Bronze Corporation.
FOR MODERN BUILDINGS
REMEMBERING REARMAMENT NEEDS COME FIRST

The clean, efficient lines of today’s architecture are well expressed in aluminum... the modern metal. In 100 Park Avenue, aluminum has been used for windows, spandrels, mullions, copings, louvers, and lobby ceiling. In each case, one or more of aluminum’s qualities of lightness, economy, workability and freedom from corrosion have contributed to the building’s efficiency and economy of maintenance.

As in this building, Alcoa Aluminum has been used in nearly every major office building erected in America in recent years. Alcoa engineering and production men are eager to co-operate with forward-looking designers and builders. For information on any application of aluminum, call your nearby Alcoa Sales Office or write, ALUMINUM COMPANY OF AMERICA, 1887B Gulf Building, Pittsburgh 19, Pennsylvania.
Make Daylight Hours More Profitable with...

GLARE REDUCING
COOLITE GLASS

Blinding sun rays that cause eye fatigue and lead to inefficiency and production declines are turned aside or absorbed by Glare Reducing COOLITE Glass.

Of a cool, blue color with slightly greenish cast, COOLITE admits only softly diffused, comfortable daylight . . . reduces transmission of solar heat radiation and lightens load on air conditioning equipment. Temperatures inside are reduced . . . working conditions improved. Eliminated are painted windows, makeshift shields and bothersome blinds.

Used either in new construction or in modernization and sash replacement projects, the installation of Glare Reducing COOLITE Glass is an investment in greater production and decreased maintenance costs.

Installations of Coolite, Heat Absorbing and Glare Reducing Glass are stepping up output . . . reducing labor turnover in industries everywhere. For money-saving details, consult your nearby distributor of Mississippi Glass. See him today.

Rolled, Figured and Wired Glass by Mississippi is "Visioneered" for better daylight illumination. Available in a variety of patterns and surface finishes, all scientifically designed to distribute light to best advantage.

Send for new catalog, "Coolite Heat Absorbing and Glare Reducing Glass."

For further data see Sweet's Architectural Fils.

Samples on request.

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WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

DECORATIVE ARTS 1950-51

In spite of its hundred or so pages of beautifully photographed and reproduced modern interior and objects, the most interesting part of Decorative Arts is its Preface. This is a wry, readable and resigned chapter by F. A. Yerbury, entitled "Building a House in Britain Today." Here is one short chapter, he provides a volume's worth of information on contemporary building in Britain. To take on such a task, he advises, "you must first of all have immense faith, limitless tenacity, vast reserves of patience and a deep purse." Once assured of all these, he demonstrates how and where they will be needed.

First, as to land. The price of land is now fixed by the government on a "usage" scale. If the land has been unused (as is most likely) the value difference between its former "field" status and its future house use, must be paid to the government. This practice has many very cogent arguments in its favor. As it works out however, says Mr. Yerbury, one finds the owner loath to let the price difference slip through his fingers. If the site is wanted, and the purse is deep enough, the purchaser pays almost double — (1) the difference between land and field costs to the government, and (2) the full cost to the owners.

Next, the license. The difficulty here is that not only must the would-be builder prove his need for a house but his need can only be granted on a pro rata basis. Only one private house may be authorized for every five that the local housing bureau has built.

Then, materials. The basic size for a three-bedroom house is 950 sq. ft. and there are rules governing the amount of each material used to compose this structure. Softwood, for example, is rationed and may only be used for certain purposes (none may be used for ground floors) and the amount allowed for each house is very small indeed — (1) the difference between land and field costs to the government, and (2) the full cost to the owners.

The conclusion is inevitable: "Broadly speaking, it is not possible to modify the design sufficiently to allow good quality materials to be used.

(Continued on page 177)
There are good sound reasons why architects have made Church the overwhelming choice in toilet seats, whether for home, factory, school or institution.

Their styling and design is a compliment to the buyer's taste . . . their unmistakable quality a mark of good judgment—and the name "CHURCH" stamps them as the best.

Where hard use—even abuse—is anticipated, Church MOLTEX® Seats offer the architect the assurance of lasting quality, lowest cost per year of service.

With MOLTEX, first cost is last cost. They never need replacing.
There's no LIMIT
to the flexibility in use
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SECTIONAL CABINETS**

Bill-Well Nu-Style Cabinets add beauty, convenience and utility to dining areas or breakfast rooms.

Multiple-Use
— for any room
in the home.

Units to fit
any size or
shape of room.

Bill-Well Nu-Style Cabinets solve storage problems, add beauty and convenience in any and all rooms.

Just Look at These Bilt-Well Specifications:
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- Carr-dor Garage Doors
- Basement Unit Windows
- Louvers & Gable Sash
- Breakfast Nooks
- Combination Doors
- Screens & Storm Sash
- Corner (China) Cabinets
- Gli-dor Cabinets
- Ironing Board Cabinets

Bilt-Well Wood & Wood

EASY TO ASSEMBLE—
Home owners, Hobbyists and Handymen find them simple to set-up. A hammer and a screw-driver are the only tools needed.
The weather is better in Texas

Better at the new Hermann Hospital in the Texas Medical Center, Houston, anyway.

This ultra-modern hospital is completely air conditioned by Carrier. The Carrier Conduit Weathermaster System conditions outside air at a central point, sends it at high velocity through small-diameter conduits to individual rooms. The occupant controls the room temperature at the twist of a dial... without interfering with the supply of conditioned air.

Because the room Weathermaster unit has no motors, fans or moving parts, it is extremely quiet. Because all mechanical elements are centrally located, servicing is simpler.

Weathermaster units and conduits are factory fabricated. Installation is simple and rapid. Small-diameter conduits take up to 85% less space, require much less cutting and patching in existing buildings. So that whether you are designing a new or remodeled hospital, hotel, office building or apartment house... you’ll do well to consider the Carrier Conduit Weathermaster System. Carrier Corporation, Syracuse, New York.
And Better Homes & Gardens, America's 3rd BIGGEST man-woman magazine, helps build your business in other BIG ways —

**BHG is BIG** in reaching families building new homes — 7 out of 10. No other magazine can deliver so many natural customers for what you sell!

**BHG is BIG** in Five Star Home Plan sales. Five Star Home Plan No. 2001 outsold all its predecessors by 5 to 1! Think how many of your own sales may be directly or indirectly coming from this one BIG, BH&G service!

**BHG is BIG** in building-dealer influence. A manufacturer of plastic-finished wall panels says: "4 out of 5 of our building supply and hardware dealers vote BH&G as the magazine having greatest influence on their customers."

Yes, any 3½-million circulation is important. When 7 out of 10 families building new homes read BH&G, this circulation becomes super-important to you. And when all those millions use BH&G as their building, remodeling and replacement guide — that's ALL-important!

So it's easy to see what a BIG sales help it is to your brands when they're advertised to Better Homes & Gardens' 3½-million families.
Here’s how one of the Country’s Largest House Fabricating Plants can help you

CUT YOUR LABOR AND MATERIAL WORRIES BY 50% IN 1951

—Increase your volume and boost your profits, too

HERE ARE UNLIMITED
PRODUCTION FACILITIES for RESIDENTIAL HOUSING

• SINGLE OR MULTIPLE UNITS
• ONE OR TWO STORY
• PRECISION ENGINEERED—PANELIZED—PRE-CUT
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Our assembled package, produced from top quality materials to your exact specifications, provides you with a building ready for the following trades: ELECTRICAL, PLUMBING, HEATING, PLASTERING, FINISH CARPENTRY, AND PAINTING.

The LFI Package consists of:

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2. Fabricated exterior walls, including gables (with finished siding, cedar, or asbestos shingles, factory applied)
3. Windows, metal weatherstriped, with hardware, glazed, included in wall assembly
4. Exterior doors with hardware, hung in frames
5. Assembled interior partitioning
6. Pre-cut ceiling and roof framing or trusses
7. Interior doors and interior trim optional

Write, wire, or call us today for the name of the LFI representative in your area

LUMBER FABRICATORS, INC., Fort Payne, Alabama

The LFI Method of Construction was used to build the Ranch Home pictured above, from the Akron Builder’s own plans

Above is the popular 3-bedroom Tri-Level home. This house is protected by copyright and can be sold only by LFI Builders

Distinctive styling, sturdy construction, and economy of ownership have made this LFI Ranch House popular in 36 states.
We doubt that you've done much work for the Three Bears lately.

We haven't, either.

But we can help you provide the proper thermal environment for any client—anywhere—in any kind of structure.

We have a lot of literature on all phases of heating, ventilating and air conditioning. Information you should have in your files.

And we have a lot of very well informed control engineers—in our 89 different offices—who have a lot more information right at their finger-tips.

We sincerely believe we can help you on any project that poses problems of control of any kind—for control is Honeywell's business.

So, why not talk to Honeywell? Why not write to Honeywell for complete information on the equipment discussed in the column across the page? And why not do it now?
REVIEWS

In the light of these restrictions, it is not surprising that the erstwhile conservative British public should glance towards prefabrication with a much more affectionate eye than is customary in its American counterpart. Mr. Yerbury feels it necessary to dampen the hopes of individual home builders who cannot benefit by the savings of prefab developments. For them traditional methods (brick walls and timber and tiled roofs) prove cheapest.

Over and above these limitations, there is always the fine free play of human nature to keep up suspense to the end. Yerbury warns the complacent not to think that taking care of these factors means success: "the strictness with which local authorities interpret the rules varies; you may be lucky, you may not."

In the light of such a harrowing builder's progress, the trim houses which here demonstrate Britain's top postwar achievement, seem indeed, inspired—

S.K.


John Nash (1752-1835) is the grandfather of today's speculative builder, whose operations on a high, wide and handsome scale raised this role to an eminence it has seldom known since. Nash was the first to perceive that the urban building block could become far more impressive than its individual units might indicate. Instead of an endless repetition of single dwellings, Nash made all subservient to a single shapely facade which conferred distinction on all. It was outside his province to consider that this handsome front had no relation whatsoever to what lay behind it. For Nash, and for thousands of his copiers (who never flourished more bountifully than today) it is enough that he showed how every man's flat could be his palace.

Summerson tells the story of this adventitious builder and planner with balanced humor and insight. He is describing no stranger to the Twentieth Century when he comments on Nash: "He liked, above all, to be at the center of gravity of a big undertaking, juggling with manifold responsibilities. It was not self-dramatization; the essence of his point of view was to feel the reins in his hand, not to see himself in the saddle."

Here, very much alive, is the man who conceived, created, pushed, schemed and wangled into completion such monuments of respectability as Buckingham Palace, Piccadilly Circus and Regents' Park (above).—S.K.

(Continued on page 182)
There's Beauty and Economy in Architectural Concrete

When the terminal building for the Seattle-Tacoma International Airport was being planned, three fundamental goals were set. The structure had to: (1) be attractive and functional, (2) have low first cost and (3) have low maintenance cost.

These goals were realized by using architectural concrete walls and reinforced concrete frame and floors. Beauty was achieved by the simple lines and arrangement of masses of the building and the use of decorative features such as fluting, grillwork and cantilevered canopies. To assure best results special attention was given to formwork.

Besides combining beauty and low annual cost, architectural concrete meets every other essential structural requirement. It has great strength and durability and is firesafe. It also can be molded economically into ornamentation for any style or period. All these factors result in structures which please clients and investors alike.

Architectural concrete is adaptable to structures of any size or purpose—apartments, schools, hospitals, stores, factories and office buildings. Architects find architectural concrete a versatile material for creating beautiful, functional, economical edifices.

For more information about architectural concrete write for free, illustrated literature. Distributed only in United States and Canada.
What would happen to him in case of a HOTEL FIRE?

What would his chances of safety be, if he woke up in the middle of the night with smoke pouring in over the transom?

**His chances might be slim** in a hotel of flammable construction without these protections: fire alarms to arouse sleeping occupants before heat and smoke make halls and stairways untenable ... fire extinguishers and hose equipment throughout the building ... adequate separate means of exit, available from all parts of the building ... stairways and shafts protected by fire-resistant enclosures with fire doors ... fire walls to subdivide large floor areas.

**His chances would be favorable** in a hotel of fire-resistant” construction, with the above protections.

**But his chances would be excellent** in a hotel adequately and properly protected by an automatic sprinkler system such as Grinnell offers. Nearly seventy years experience proves this. Grinnell Automatic Sprinkler Systems check fire at its source, whenever and wherever it strikes, night or day, with automatic certainty. So, for safety in hotels ...

**SEE THAT GRINNELL SPRINKLER HEADS ARE ON GUARD**

In hotels, as well as in schools, hospitals, theaters and factories, there is a moral obligation upon architects and management to provide the utmost in protection of life and property. For your own sake be sure the hotels, hospitals, the plants, and the schools for which you are responsible are protected with Grinnell automatic sprinkler heads—your assurance of positive, automatic fire protection. Grinnell Company, Inc., Providence, Rhode Island.

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THAN HAMMER AND NAILS”
report enthusiastic users

what other
users say about
BOSTITCH H4's:

"We now apply three squares of asphalt shingles in the time we used to take for one," writes roofing contractor.

"30% labor savings on roofing and siding jobs," says pre-fab house maker.

"Cut labor costs in half applying heavy diamond mesh metal lath," reports a successful builder.

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This new H4 Hammer is sure to make as big a hit as the time-tested medium-duty Bostitch H2 Hammer. The H2, you know, has been adopted as standard by many insulation manufacturers and contractors. Builders, too, are enthusiastic about H2's for screening, lathing and roof-papering jobs. So, team up both Bostitch stapling hammers for faster, better fastening on every job.

This team lets you take full advantage of all the cost-cutting, time-saving features of the Bostitch Stapling Hammer principle. One-hand operation...other hand free for better and faster placing of materials. One effortless blow drives the staple all the way home. Extra reach cuts staging needs. And remember! No mashed fingers...no infected mouths.

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Take a housewife's eye-view of a CURTIS KITCHEN

When it comes to kitchens, Mrs. America is sharp-eyed. That's why she so readily appreciates the years of experience that have gone into the design and construction of Curtis kitchen cabinets. Here are some features she'll notice in the Curtis kitchens you include in your plans!

Close-up of Curtis wall unit showing large storage space. Cabinet is made in 36" and 44" heights and in eleven widths—from 12" to 44". All are 14" deep.

Just the thing for quick lunches. Tabletop folds and slides into unit. Space below is pan unit for large utensils. May be used alone, or with cabinet above.

Mixer and vegetable storage unit—24½" deep, 32" high, 18" wide. Ventilated vegetable drawer is below. This unit is a "must" with busy housewives.

Pan and bread drawer unit—has two small wood drawers 3" deep and one metal bread drawer 8½" deep, 19" long, 10½" wide. Two widths, 28" and 32".

For long years of strenuous daily use, Curtis cabinets are made of wood, painted two coats at the factory. They can be left "in the white" or finished in any color of the owner's choice. All hardware is furnished and applied. For complete information, mail the coupon.

Curtis makes a complete line of architectural woodwork for the modern home. Make your next house "all Curtis."

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Gentlemen:
I want to know more about Curtis kitchen and storage cabinets. Please send your free booklet.

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Graeme Park (above) was built in Horsham, Pa., 1722—early Swedish contribution to U. S. building. America's first row house (Jamestown, Va. 1640) is shown in plan at right.

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REviews

THE DWELLINGS OF COLONIAL AMERICA

The structures which our forefathers brought forth upon this nation are so often surrounded with a mist of sentimentality that they seem more like elaborate stage sets than lived-in houses. The books—and lifework—of Thomas Tileston Waterman form a healthy contrast to this attitude. Waterman's interest in historic buildings has always been strongly grounded in their nature as buildings. Their designs and techniques—from the reed-thatched huts of Roanoke to the delicate finials of Bulfinch—are allowed to speak for themselves in this delineation of the course and complexity of early American building. In a volume that is a model of self-effacement Waterman traces without apparent effort the intermingled contributions of the settlers—English, Dutch, Walloon-Belgian, Swedish, French, Welsh, Scotch, Irish and German—all had put in appearance before 1700.

The floor plans of many now-disappeared buildings are included here (for example Americans first row house, above). These recall what may one day be appreciated as Waterman's great claim to public gratitude. The Historic Buildings Survey, which he instigated and encouraged, has preserved for our nation a treasury of measured drawings on its outstanding early buildings. (This survey also kept a number of contemporary architects in bread-and-butter money during the Depression.) Waterman's understanding of the reality of colonial building is a pleasant antidote to the fake colonialization of so many contemporary builders.—S.K.

AMERICAN SCHOOL & UNIVERSITY, 1950-51.

Lest we forget that this is not the best of all possible architectural worlds, American School and University spreads out its yearly hoard of new school buildings to remind us. As its text admits and its photos make vividly clear, a great bulk of the present building designs differ little from the feeble, pretentious ideals of the 1920's and 1930's.

Such a volume has the beneficial effect of bringing within the range of all school personnel the best of new schools, with notes as to just what is commendable in each. Republished here, for example, are the six schools premiated by the American Institute of Architects at their Houston Convention.

Apt to tip the scales back to the side of confusion, however, an article like Walter Cocking's America's Outstanding School Buildings Since 1945. Such an article, professing admirable principles, uses as it illustrations a melange of schools present and projected. Some are good, some bad, some indifferent—not one of them is "outstanding."

(Continued on page 188)
Give homes 20% MORE LIVABLE AREA at Little Cost

- Whether you are building to sell or on contract, you can give homes approximately 20% more livable area by finishing basements inexpensively with Medusa Paints. When painted in any of the beautiful colors of Medusa Paints, you create for the home owner the possibilities of a delightful recreation room...a pleasant playroom...a clean workshop...a bright laundry...in all 20% more livable space.

And at such reasonable cost, too! All you need to do is to have the walls painted with Medusa Portland Cement Paint. This beautiful paint actually protects basements against dampness as well as decorates. Then, on concrete floors, use Medusa Rubber Base Paint...a super tough coating that bounces off wear and resists the action of cleaning compounds, water, and other alkalies. And while you're building a beautiful basement, be sure it's lastingly dry by using those famous Medusa Products...Medusa Waterproofed Cements, Gray or White, or Medusa Waterproofed Powder and Paste. Properly used in all concrete and mortar, they keep basements dry for years! Medusa Products Division of Medusa Portland Cement Company, 1013-1 Midland Building, Cleveland 15, Ohio.

You can build BETTER with MEDUSA PRODUCTS


...now available to Architects

Here, for the first time, is a new, fully illustrated Weldwood manual especially prepared for architects. It provides a wealth of valuable reference information in a single easy-to-use source — virtually a complete "short course" in the types, characteristics and uses of architectural grades of plywood.

The following is a partial list of contents . . .

**TYPES OF PLYWOOD**
Sequence Matched Sets, Algoma grade, Custom Matched Sets.

**TYPES OF VENEER CUTS**
Quarter Round, Half Round, Sliced, Rotary Cut . . . Butt, Crotch, Fiddleback, Swirl, Blister, Burl, Stumpwood, etc.

**CHART OF VENEER CHARACTERISTICS**
Texture, Color Figure, Origin, Veneer Length, etc., for 36 Woods.

**CHANGE IN SPECIFICATIONS**
As another step in our policy of standardization and simplification, all stock panels of Weldwood Lumber Core Hardwood Plywood are now being manufactured in 3/4" thickness instead of 13/16". This permits interchangeability with Weldwood veneer core panels which have always been made in 3/4" thickness.

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STAINLESS IDEA BANK  Architects make wide use of versatile stainless steel in remodeling Philadelphia bank building

HOWELL LEWIS SHAY, Architects

Interior canopy and heating columns. The heating problem associated with revolving door installations was met here by two specially designed and constructed convector units. Housed in stainless steel, they are thermostatically controlled by air admitted through the doors. With the stainless steel heating columns and canopy inside, the "picture window" entrance of glass and stainless retains its open, inviting appearance.

Building front. The bank's facade is of stainless steel, buff limestone, and double insulating glass. Recommendation of stainless for the exterior was based on the metal's permanent beauty and low maintenance cost. Also, as the result of careful study, it was found that stainless was no more expensive and was easier to work with than other metals requiring special treatment and protective coatings after fabrication. All stainless steel in the building front is (Type 302) 14 gage with No. 4 polish, except sign letters which are 16 gage.

While all types of steel are scarce now, here are some other architectural applications for stainless steel you might wish to consider for the future: Curtain Wall Panels • Doors and Windows • Signs • Marquees • Roofing and Roof Drainage Restaurant Equipment and Fixtures. For detailed information, see your Sweet's Catalog or write: Armco Steel Corporation, 61 Curtis Street, Middletown, Ohio. The Armco International Corporation, world-wide.
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ARCHITECTURAL FORUM  February 1951
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Sealed Insulation — A Product of Weyerhaeuser
Beaumont, Texas, is a Truscon town!...

Here are four Beaumont schools built better, stronger, safer, with many of the items in the wide range of Truscon Steel Building Products. Such outstanding preference for Truscon materials is testimony for their unusual quality, structural and functional advantages. In the window field particularly, Truscon offers an exceptional range of designs, permitting the most efficient installation for every classroom lighting and ventilating requirement. See SWEET'S for complete details of the Truscon line, or write direct.
Specify **Janitrol**

**GAS-FIRED UNIT HEATERS**

for these advantages

- Eliminates need of expensive central-heating system and labor costs of operating and maintenance men.
- Minimum of installation space required and no fuel to order and store.
- Flexible operation, heat is used only when and where it is needed.
- Low operating costs resulting from the efficient use of clean gas heat, automatically controlled.
- Engineering layout service assures sound installation planning to meet individual heating requirements.
- Heating can be combined with ventilating or summer air-conditioning distribution systems.

**SUSPENDED MODELS**

18 sizes and types provide capacities ranging from 30,000 to 450,000 Btu/hr. Features include individual ribbon burners converting heat to separate heat exchangers to provide greater efficiency in less space. Blower equipped units are used to quietly circulate warm air against higher static resistance, permitting the use of ducts.

**DUCT HEATERS**

No fan or motor is required for these units as installations are made to temper ventilating air or to supply heat through summer air-conditioning duct work where air is circulated by a blower system. 5 sizes provide capacities from 85,000 to 225,000 Btu/hr.

**HEAVY DUTY FLOOR MODELS**

Sectional construction of units permits heating capacities up to 1,500,000 Btu/hr. Sections can be equipped with directional diffuser outlets or to connected duct work. Units widely used for heating large areas such as airplane hangars, warehouses and plants handling large assemblies.

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*Write today!* for helpful guide on the practical use of unit heaters for commercial and industrial installations. Ask for A.I.A. File 30-C-43.
Nothing quite takes the place of hardwood for kitchen cabinets—the warmth and beauty, the permanence, the way wood lends itself to planning and installation. And today availability is not the least of wood's advantages. When you choose cabinets by Kitchen Maid, you are assured construction that has been tested and improved over 40 years, styling that's ahead of the field, customer approval that comes from a famous name. You also get from experienced dealers intelligent cooperation which can save much time and money. Decide now to select Kitchen Maid for your next project. Send coupon below for new catalog with specifications.

Doors are of solid, grainless Preswood. Handy hardwood cutting block saves counters. Dowels are used at all important joints. Heavy corner blocks reinforce base cabinets. Vegetable drawers—one of many features. Ventilated towel drier is a popular accessory.

**KITCHEN MAID**

*Cabinets of Wood*

For Kitchens of warmth and permanence

**KITCHEN MAID CORP.**
412 Snowden St., Andrews, Indiana

For basementless as well as basement type homes.

- The amazing new way of providing all the advantages of radiant heat PLUS greater heating uniformity without lag PLUS lower heating costs... PLUS circulation of filtered and conditioned air—at savings in cost of 30% and more.
- Takes less than 4 sq. ft. floor space... provides warmth at floors with blanket of heat at outside walls.
- Tested and approved by National Warm Air Heating and Air Conditioning Association in conjunction with University of Illinois. Highly publicized by authoritative builder, architectural and heating trade papers and newspapers throughout the nation.
- Send plans for free heating estimate.

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**ROOF DECKS**

- For variable spans up to 8 feet
- Nailable concrete surface provided on sloping roofs
- Heat insulation equivalent to 2 inches of cork
- Eliminates separate roof insulation
- Coefficient of Heat Transmission (U) = 0.16 Btu
- Good sound insulation and absorption
- Efficient and economical, exposed acoustical ceiling

**Typical Installations**

SCHOOLS—Auditoriums, Gymnasiums, Classrooms

CHURCHES • THEATRES

COMMERCIAL and INDUSTRIAL BUILDINGS

PORETE MFG. CO. North Arlington, N. J.
Natco Structural Clay Tile offers every desirable advantage for hospital wall construction—strength, permanence, attractiveness, firesafety, imperviousness to moisture... plus construction economy and practically no maintenance.

For interior walls, Natco Glazed Facing Tile provides added features of cheery brightness, cleanliness, sanitation, and germproof qualities so necessary to wards, rooms, kitchens, laboratories, operating rooms, corridors, etc.

Many of today’s newest and finest hospitals have used Natco Structural Clay Tile for both interior and exterior wall construction. First cost is last cost—because Natco Structural Clay Tile never deteriorates. Installation is easy and speedy with minimum material waste due to modular sizes. Each tile is marked “NATCO” as an assurance of quality. Write for Catalog SA-50 for information and details.

ST. VINCENT’S HOSPITAL
Toledo, Ohio

Interior views showing 6-T series Natco Structural Glazed Vitritile walls. Natco partition tile was also used in the building construction.

Architects—Maguolo & Quick, St. Louis

General Contractors—A. Bentley & Sons, Toledo, Ohio
Whether you are planning or building one residence, a multi-unit development, an apartment, hospital, hotel or other structure, Wall-Tex fabric wall coverings are a sound investment in beautiful, durable decoration.

Investors, owners and tenants are all better satisfied when rooms and hallways are beautified and protected with Wall-Tex. The strong fabric guards against plaster cracks, the colors and finishes are safely washable.

Wall-Tex full color magazine advertising is telling the Wall-Tex story to your prospects right now. They know Wall-Tex is a highly serviceable wall covering, decorator styled, famous for enduring beauty, a money-saving investment.

Send for new free Wall-Tex File Folder. Includes sample swatches. Shows range of recent applications: contains charts, technical data and factual information you need. Mail the coupon now!

Columbus Coated Fabrics Corporation
Dept. AF-21, Columbus 16, Ohio
Send your new free File Folder and sample swatches.

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address________________________________________

Send for new free Wall-Tex File Folder. Includes sample swatches. Shows range of recent applications: contains charts, technical data and factual information you need. Mail the coupon now!
85% PREFER OAK FLOORING for these sound, enduring reasons:

- Oak is the most durable floor. It withstands the weight of furniture and foot traffic better than any other floor.
- Oak is the most economical floor. No replacement of worn out spots is necessary with lifetime oak. It is the easiest floor to care for, too.
- Oak is the "healthiest" floor. Its natural insulating quality makes the big difference.
- Oak is the completely adaptable floor. Oak harmonizes with every type of house, with every style of decorating and with every period of furnishings.
- Oak is the only flooring that is available in a complete range of grades. There is a grade of oak priced for use in every type of house.

Because oak meets every flooring need—durability, economy, ease of maintenance, adaptability and healthfulness—it is the overwhelming choice of 85% of all prospective homeowners. National Oak Flooring Manufacturers' Association, Sterick Building, Memphis 3, Tenn.

OAK IS THE FLOORING THAT HAS EVERYTHING EVERYONE WANTS

There is a growing trend to show more Oak... Everett Brown, A.I.D., Decorator. Photo, Hedrich-Blessing

Tyler engineers have been working on the problems of open, self-service food store merchandising for years—are abreast of latest practice. The Tyler line, with over 400 models, represents the most advanced available—includes Open, Self-Service Cases for meats, produce, dairy products, frozen foods; sectional, steel-clad Walk-In Coolers; Welded-Steel Reach-In Refrigerators; economical, factory-finished Metal Shelving, check-out counters, etc.

The new Tyler Catalog is in reality a DATA BOOK on commercial refrigeration equipment—full of facts, dimensions, and specifications.

Get this FREE DATA BOOK!
DESIGN for Quiet, Firesafe BEAUTY

Fiberglas® Textured Acoustical Tile—the low-cost incombustible acoustical material offers this unique combination of advantages:

- High Acoustical Value
- Decorative Beauty
- Good Light Reflection
- Ease of Application
- Dimensional Stability
- Cleanable and Paintable
- Sanitary
- High Insulation Value

For complete specification information on Fiberglas Acoustical Tile, see Sweet's File or call your local Fiberglas acoustical contractor, listed in the yellow pages of the phone book.

Owens-Corning Fiberglas Corporation, Dept. 67-B, Toledo 1, Ohio. Branches in Principal Cities.

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with fibers of glass.

WRITE FOR FIBERGLAS DESIGN DATA

[Images of buildings and interiors with people working]

[Images of Fiberglas products and literature]
RIGID INSULATING SHEATHING eliminates need for diagonal corner bracing.

Having more than twice the racking strength of wood sheathing, Bildrite is the first processed fiber board to be approved by the FHA for horizontal application in frame construction without additional corner bracing. The sheathing is a homogenous material, composed of popular and jack pine hardwood fibers treated throughout with pulverized asphalt for complete moisture re-

Follansbee Seamless Terne Metal Roofing

for long-lasting, trouble-free roofs

You can be sure your client will have maximum roofing protection and economical metal roof construction when you specify Follansbee Terne Metal Roofing.

Follansbee Terne Metal Roofing is really lifetime roofing—many installations made over a half century ago are still in service. This is just one of the advantages of terne metal roofing; others you will want to consider are

• design possibilities
• fire-resistant construction
• roof and trim color combinations

Here's a flexible metal roofing which you can specify with confidence because its record of permanence is well-known. Detailed information on design and construction methods will be sent you promptly—just address Terne Metal Department, Follansbee Steel Corporation.

FOLLANDBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.
COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS • SEAMLESS TERNE ROLL ROOFING

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada.

Plants—Pittsburgh, W. Va.

FOLLANDBEE METAL WAREHOUSES

Pittsburgh, Pa. • Rochester, N.Y. • Fairfield, Conn.

Material and labor time involved in setting diagonal bracing are eliminated with this FHA approved structural insulation board.

Ingenious is a word Product News tries to reserve for one product a year and here is the product—the Thulman chimney. While playing an important role in Washington's alphabet world, Robert K. Thulman (previously Chief Mechanical Engineer for FHA and now with the HHFA) became well acquainted with the cost and behavior shortcomings of most masonry chimneys. He worked out a design for a preassembled metal chimney which could sell for less than $100 and, utilizing (Continued on page 204)
NOW YOU SEE THEM

NOW .......
YOU DON'T

..with VIKING FLUSH TYPE Sprinkler Heads

Here's proof of the greater beauty of Viking Flush Type Sprinkler Heads. Notice how Viking Flush Type Heads blend quietly and beautifully . . . even add a note of beauty to the office in the illustration. The Flush Type Head is unobtrusive. When a fire starts it springs into action . . . equalizes the chance of water against fire by instantly drenching it. In fact, the Flush Type Head is unexcelled for water distribution.

The Viking Flush Type Head is a typical example of the farseeing yet practical engineering that makes Viking the leader in the sprinkler field. And this engineering skill is complemented by the best distribution system . . . and the finest installation and service facilities available.

Your nearest Viking representative is ready to help you with the design of a sprinkler system for your next building. Because he maintains a completely stocked warehouse, a complete engineering staff, and an experienced, full-time installation crew, you'll find that he gives you the finest sprinkler system available. Contact him today, or write direct to the Viking Corporation.

Write for your copy of "Fire and Your Business" . . . facts on how a Viking Sprinkler System can protect your buildings from fire; forever.

ALL VIKING DEVICES ARE APPROVED BY UNDERWRITERS' LABORATORIES AND FACTORY MUTUAL LABORATORIES

the Viking corporation
HASTINGS, MICHIGAN
OFFICES IN PRINCIPAL CITIES
Here's the new TRANE CenTraVac
... it's more than a compressor!

Now... for the first time... Trane makes centrifugal refrigeration available for the all-important 45-
to 190-ton range.

Complete centrifugal refrigeration unit
cuts costs four ways

The CenTraVac is a new kind of centrifugal... hermetically sealed direct drive... with stable operation from 100% down to 10% of rated capacity... with efficient operation on reduced loads.

Power Saved on Reduced Loads!
CenTraVac has built-in capacity control. Horsepower saving runs parallel to capacity reduction over wide operating range. Owner pays only for chilled water actually used.

Simplified Installation Slashes Costs!
Compact, lightweight, vibration-free CenTraVac can be mounted anywhere from basement to penthouse without special foundation. One hermetically sealed unit is a complete chilled water refrigeration system. One wiring job—one set of connections—one system of controls.

Less Maintenance Time and Expense!
Designed to run without special attention, CenTraVacs are simple to turn on or off—or may be run continuously season after season. Unit has only two main bearings, force-feed oiled; direct connected water-cooled motor in hermetically sealed compressor eliminates gear boxes, shaft seals and similar devices, resulting in a machine that minimizes maintenance time and expense.

High Efficiency Means
Low Cost Cooling!
CenTraVacs are designed to deliver over a ton of refrigeration per horsepower. Efficient on small as well as large jobs. Five models—45 through 190 tons.
EVERY practicable device to keep its pupils interested and happy is incorporated in the new $430,500 elementary Blythe Park School, Riverside, Ill., which was recently featured in Life Magazine. The school was conceived as a low, friendly structure of three units connected by glassed-in corridors. These units consist of the gymnasium-theater-library building, main classroom building, and kindergarten. Each room has natural daylight on two sides. The school campus is a 5-acre public park.

Designed to serve the whole community, the gymnasium-theater-library building is open to all citizens of Riverside. Fluorescent lighting is recessed behind the splayed pine sounding boards of the basement auditorium and above the splayed acoustical tile ceiling.

Pratt & Lambert Paint and Varnish were used effectively in the decoration of this modern school. Warm, cheerful colors enhance its home-like atmosphere, while also protecting surfaces from wear and tear.

The Pratt & Lambert Architectural Service Department offers architects prompt, practical co-operation in securing appropriate decoration for any type of structure.

Pratt & Lambert odorless wall coatings—Lyt-all Flowing Flat and Solidex — have proven immediately popular with property-owners and painters. Complete details of these unique wall coatings on request.

Save the surface and you save all!
What an orchid is to a beautiful lady, Canvas Awnings are to distinctive domestic architecture. Well-planned homes and apartments glow with the charm of color. They give assurance of comfort and protection in summer—and allow maximum outside light during the comparatively sunless days of fall and winter.

Consult your local Canvas Awning maker. He offers a wide choice of fabrics and hardware to meet all practical needs.

THE CANVAS AWNING INSTITUTE, INC.
and NATIONAL COTTON COUNCIL
"There is No Substitute for Canvas Awnings"

For detailed information and test data, see Sweet's File, Architectural 15g—write for Do catalog.

The sound-deadening quality of the resilient cork base provides an unusually quiet floor.

DODGE CORK CO., INC., LANCASTER, PA.
Solved!
World's Tallest Trick

...in air conditioning

Every architect and engineer knows air conditioning jobs get tougher in multiple proportion to height. That's why New York's Empire State faced one of the trickiest air conditioning problems ever. It's the tallest building in the world.

Cooling off this giant involves engineering problems for which there are few precedents. Columns of refrigerated water nearly a quarter mile high—bearing down with hydrostatic pressures of more than 600 pounds per square inch—mean new kinds of equipment, new installation techniques. A plant capable of keeping these highest-in-history columns chilled and circulating—of re-processing without waste an ultimate of 5,000,000 gallons of water daily—must be designed and manufactured.

You should, of course, know the answer. It's the architect's and engineer's most frequent answer to air conditioning and refrigerating problems that can't be easily solved by precedent—

York equipment, York's seventy-five years of experience, York's seventy-five years of leadership in engineering and manufacture, have been chosen to help Empire State solve the world's tallest air conditioning job... and take the first step toward making selective air conditioning available to Empire State tenants where and when wanted.

WHEN YOU'RE FACED WITH ANY PROBLEM in air conditioning or refrigeration, remember York has the most complete nationwide organization of trained engineers to help you solve the initial headaches. And remember York's Certified Maintenance Plan saves your client the headaches afterwards.

YORK'S SALES POLICY IS TO WORK THROUGH YOU—to channel all contracts through the architect, engineer, contractor. Experience has shown that our knowledge, working with yours, brings best results. Check your York District Office to save time and detail on your next "tall" job. York Corporation, York, Penna.

The big advances come from YORK

Headquarters for—Refrigeration and Air Conditioning
PRODUCT NEWS

a simple physical law of gravity circulation, could rely on outside air for effective insulation. In cross section the chimney is a ring in a ring in a ring. The hotter — and therefore more rapidly—flue gases travel up the 6 in. vitreous enameled steel central core, the faster cold air is drawn down the outer concentric duct. According to Underwriters Laboratories, who tested the chimney to 180° down to a 180° turn, then up and out the middle concentric duct. According to Underwriters' Laboratories, who tested the chimney under continuous operation at a torrid 1,700° F.,

As hot gasses (gray arrows) travel up the chimney, cold air (white arrows) is drawn down the outer concentric ring, serving as effective insulation.

As hot gasses (gray arrows) travel up the chimney, cold air (white arrows) is drawn down the outer concentric ring, serving as effective insulation.

3 PRODUCTS

Spared to the times

A NEW PERSPECTIVE can logically be taken of the masonry situation, particularly as it relates to those units where local production paves prices to bedrock.

By the local conversion of local raw materials into highly desirable masonry units, primarily for local consumption, economic wastefulness is avoided. A new standard of values is created through practical decentralization.

Compact machines make possible the establishment of many small-investment plants, each to serve its own region. Masonry manufacture becomes a community enterprise. Cost economies resulting from streamlined production reflect in dramatically lower prices to the consuming public.

MASONRY...... Locally Processed

Low in cost, rich in eye-appeal, and offering a choice of design, Dunbrik, Dunstone and Cavitex combine to initiate new avenues of masonry flexibility ... to make available masonry units matched to any size or type of building or project.

- **DUNBRIK** is standard size brick, with liberal recess for weight reduction and mortar lock. Straight and accurate in all dimensions. High in compressive strength; low in absorption.
- **DUNSTONE** is a 2 or 3 multiple of Dunbrik . . .8" x 8", 8" x 12", 2½" high. Opens up new decorative possibilities.
- **CAVITEX** is a 16-inch long unit, putting emphasis on the horizontal. Modular in all dimensions. Technically, a hollow, load-bearing unit. Refreshingly new in concept.

All three are available in an extensive range of impregnated colors and shades, with self-contained waterproofing values.

Architects and contractors are urged to write us direct for literature and other descriptive material, also for information concerning procurement from local or nearby plants.


ELECTRIC GLASS RADIANT HEATING PANELS

fit into baseboards.

A modification of the company's room panels (BUILDING, Jan. 50) Electric glass baseboard panels provide a complete furnace-less heating system, or may be used as a supplemental heat source for homes, schools, and commercial buildings. In new construction the panels are recessed flush with baseboard or they may be surface mounted in existing structures. Consisting of a virtually unbreakable glass panel encased in a steel frame with hammered finish, the units have a chemical heating element fused into the back surface of the tempered glass. Surface temperature never exceeds 240° F. For operating economy, individual room temperatures may be controlled individually by means of a low voltage thermostat and relay. The baseboard panels are made in two sizes: a 200 watt, 683 Btu model measuring 30 in. long which sells for $19.50; and 300 watt, 1,024 Btu unit 42 in. long priced at $29.50. Both are 6½ in. high and 1½ in. deep. A junction cover plate covers the terminal block and glass mounting brackets. The infra-red heat radiated by the panels is clean and odorless. Room air remains moist and dust free. Having no moving

(Continued on page 210)
Making Daylight work better for you is our business.

Direct sun causes uncomfortable brightness near windows, extreme contrast in other parts of room. Insulux Fenestration (glass block plus vision strip) directs and spreads daylight to ceiling, keeps brightness at comfortable levels, provides vision and ventilation.

Putting daylight to work for you is the business of our Daylight Engineers. Your next problem may be careful designing for smooth operation and economical maintenance rather than of light control.

That was the chief problem before Holabird and Root and Burgee when they designed the Illinois Bell Telephone's second long-distance switching center in Chicago. While daylight was desirable, it was subordinate to good insulation for the air-conditioning system, exclusion of dust and dirt.

An Insulux Fenestration System provided this building with good insulation. It made possible lower cost air conditioning, heating and maintenance plus all the daylight needed. The Insulux glass panels will not rot, rust or corrode. No painting is necessary. Infrequent washing keeps the glass block sparkling.

Whenever you have a problem involving daylighting plus other building considerations, consult our Daylight Engineering Laboratory, Dept. MB-2, Box 1035, Toledo 1, Ohio. Insulux Division, American Structural Products Company, subsidiary of Owens-Illinois Glass Company.
Well-Planned Drive-In Restaurant uses strategically hidden, compact Frigidaire refrigerating units

LOCATION: Corona Del Mar, California
MERLE AFFLERBAUGH, Owner

Here's a happy departure from the Western tradition of roadside restaurants built to look like hot dogs, milk bottles and coffee cups. This new California drive-in looks functional—and, even better, it is functional.

The gleaming stainless steel shapes that fill its serving area and kitchen are all parts of an amazing machine—a machine capable of serving 2,500 people a day.

Many factors contribute to this high efficiency—and one important factor is the designer's use of a unique refrigerating mechanism. This mechanism, made only by Frigidaire, is a larger version of the unit used to power Frigidaire household refrigerators. It's called the Meter-Miser, and it's the simplest cold-making mechanism ever built—sealed in steel and oiled for life.

Because of the Meter-Miser's compact, rectangular shape, it was easy to design six of these units right into the stainless steel food-preparation island. Tucked under counters and hidden below shelves, they are out of the way—but easily accessible.

Meter-Misers serve in the main kitchen, too. For the three giant Frigidaire reach-in refrigerators and two big Frigidaire ice cream cabinets used there are all refrigerated by built-in Meter-Misers.

Says Merle Afflerbaugh, owner of the drive-in, "We chose Frigidaire Meter-Misers for two main reasons: 1. Their exceptional compactness. 2. Their fine record for low-cost, trouble-free service."

Stainless steel food-preparation equipment forms island at front of serving area. Here, concealed Frigidaire Meter-Miser units provide refrigeration for the fountain, two refrigerated display cases, the salad refrigerator, three refrigerated compartments, and refrigerated salad-and-dessert table.

Two 62-cubic-foot Frigidaire reach-ins stand back-to-back in center of main kitchen. Another is in the bakery section. Powered by Meter-Miser units, these reach-ins have a special forced-air cooling system that cuts food losses by eliminating "hot spots" inside the cabinet. Owner prefers reach-ins to walk-in coolers because, he says, they save steps and time—can be moved around if necessary.
Broad expanses of glass and simple slump stone walls characterize the exterior of the restaurant. The building is surrounded by a hard-top parking space of about 90,000 square feet. Main kitchen and bakeshop are located in a rectangular stone structure at the rear.

Here's a carhop's view of the front serving section of Merle's Coffee Shop. This open side of the octagonal serving area is protected from the weather by the sweeping marquee roof. In foreground is the beginning of the open-air terrace, where 32 diners can be seated at garden tables under shelter of the marquee.

This is Frigidaire's commercial Meter-Miser refrigerating unit. Built with watchmaker precision and an absolute minimum of moving parts, it is quiet and extremely efficient. Meter-Misers are available in 1/2, 1/4 and 1/3 hp capacities. All carry Frigidaire's special 5-year warranty.

A phone call will bring you detailed information on all Frigidaire Refrigeration and Air Conditioning. Call your Frigidaire Dealer—or the Frigidaire Distributor or Factory Branch that serves your area. Look for the name in the Yellow Pages of your phone book. Or write Frigidaire Division of General Motors, Dayton 1, Ohio. In Canada, Leaside 12, Ontario.

FRIGIDAIRE
America's No.1 Line of Refrigeration and Air Conditioning Products
Air Conditioners • Refrigerators • Food Freezers • Water Coolers
Electric Ranges • Home Laundry Equipment • Electric Water Heaters
Electric Dehumidifiers • Kitchen Cabinets and Sinks
LIKE ALICE, MOTHER CAN LOOK THROUGH THE LOOKING GLASS

To the MOTHERS—IT'S A WINDOW

At the Cleveland Hearing and Speech Center, instruction in corrective speech is conducted so the pupils and instructor can watch each lip movement. Their mothers can watch, too, for guidance in conducting supplementary home instruction.

This mirror magic, reminiscent of the famous Fairy Tale, is really very simple. The secret is in the use of Mirropane®, the transparent mirror. From the instruction room, it's an ordinary wall mirror, just like any used in speech instruction. But from the dimly-lighted observation room, it's a clear window!

This idea, affording sight unseen, is one you can use in many places. In schools, hospitals, institutions, stores, banks, offices, entrance doors—wherever you wish to provide a means for observing people without their suspecting it—Mirropane® can be highly useful as well as decorative. Write for full information.

MIRROPOANE

TRANSPARENT MIRROR • PRODUCT OF LIBERTY MIRROR DIVISION
LIBBEY · OWENS · FORD GLASS CO. L-121 NICHOLAS BLDG.
TOLEDO 3, OHIO

Beauty and Economy

... IN EXTERIOR FINISHES

Cabot's Stains are beautiful—they bring out all the loveliness of grain and texture—come in a wide range of colors from clear brilliant hues to weathering browns and grays, many available from no other source.

Cabot's Stains are practical—60-90% content of pure creosote oil, the best wood preservative known, preserves the wood and keeps termites out.

Cabot's Stains are economical too—they cost less than 1/4 as much as good paint—go on quickly and easily—keep their fresh colors for years.

Write Today for color card showing many unique colors available from no other source. Samuel Cabot, Inc. 230 Oliver Bldg., Boston 9, Mass.

Cabot's creosote stains

you can see that

Trinity White is the whitest white cement!

You'll get fine results with this extra white cement. It's true Portland Cement made to ASTM and Federal Specifications. If your dealer does not have it, write the office nearest you: Trinity Portland Cement Division, General Portland Cement Co., 111 West Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles.
IT'S GOT EVERYTHING, this NEW Universal-Rundle Catalog!

New architect-designed bathroom plans in full colors... Drawings and specifications of complete bathroom layouts, and of every individual Universal-Rundle fixture... Color schemes... Commercial, industrial, and institutional fixtures... Kitchen equipment, sinks, wall and base cabinets... The facts about fittings and trim... A catalog of complete help for the planning, specification, and installation of bathroom and kitchen fixtures... A "must" for your working library—send for your copy!

DESIGNS FOR BETTER BATHROOMS, are these full-color renderings of the finished bath, with detailed mechanical layout drawings and specifications. Planned by an architect, they help prospects visualize the fixtures in a harmonious, decorative setting, help them make up their minds.

FIXTURE PHOTOGRAPHS TO HELP YOU PLAN are here in profusion. Actual photographs of every fixture in the Universal-Rundle line, with full specification data and accompanying drawings—of bathtubs, lavatories, and water closets in the home, commercial, industrial and institutional fields.

SELLING KITCHEN FIXTURES is easier with help like this! Ten pages of photographs, drawings and specifications of Universal-Rundle Enameled Cast-Iron sinks, cabinet sinks, base and wall cabinets, and sink trim.

WATCH UNIVERSAL-RUNDLE IN '51! 1951 will see a big-space national advertising campaign to sell home builders and remodelers on the "first" quality and style of Universal-Rundle fixtures. Smashing full-page, four-color, eye-opening advertisements will be seen in such national consumer magazines as the Saturday Evening Post and Better Homes & Gardens early this year. Watch for them! Powerful merchandising, direct mail, displays, catalogs, consumer plan-books, newspaper ads, etc., will make the American public "U/R-conscious!"

Mail This Coupon Today!

UNIVERSAL-RUNDLE CORPORATION New Castle, Pa.

Gentlemen: Please rush me one copy of your new 1951 catalog. My letterhead is attached.

Name _____________________________

Street ____________________________

City __________________ Zone ______ State ______
PRODUCT NEWS

parts to replace or repair, the panels require no maintenance. They are factory guaranteed for five years.
Manufacturer: Appleman Art Glass Works, Bergenfield, N. J.

CERAMIC TILE form decorative motifs for walls and fireplaces.
Designer Warner Prins is tackling a century-old medium with a contemporary hand. His unusual
handpainted underglaze tiles are now available to architects and builders at prices little higher than ordinary solid color tile. Sets of 18 six inch tiles for fireplace facings range in design from linear abstract repeats to humorous one-of-a-kind figure studies, and in retail costs from $36 to $126. Colors, developed from metallic oxides, are rich and practically limitless. The tiles are given matt, gloss or crackle finishes which are stain and smoke resistant and easily wiped clean. The design illustrated (above, left) is made in black or gold on oyster white, and white on green, brown or blue spattered backgrounds. Price, in quantity orders, is $2.00 per sq. ft. The company will duplicate any submitted color swatch and also will produce original patterns for wall panels or large murals.
Manufacturer: Warner Prins, 36 East 22d St., New York 10, N. Y.

PORCELAIN ENAMEL WINDOW SILLS available for home applications. Originally developed for schools and multiple housing projects, porcelain enameled steel window sills are now available for home applications and other types of private and public buildings. They are fabricated in several stock patterns in 16 gauge steel and in 48 permanent colors, but may be ordered in quantity to meet architects' specifications for size, shape and color. Waterproof, chip and acid resistant, the sills are not likely to be affected by household chemicals spilled on them and so are especially suited to baths and kitchens. They are easily cleaned with a damp cloth. Prices vary from about $1.25 to $2.25 per lin. ft. according to depth, design and number of sills ordered.
Manufacturer: Bettinger Enamel Corp., Waltham, Mass.

(Continued on page 216)
an artist with a practical eye

When Artist Roland Rodegast built his suburban home near St. Louis, Missouri, he combined the beauty of modern architecture with the practicability of modern wood preservation.

Monsanto Penta (pentachlorophenol, technical), applied by pressure at the rate of six pounds of five per cent penta solution per cubic foot, preserves studding, ship lap and redwood siding. The residence is permanently protected against attacks by termites and other wood-boring insects . . . against decay caused by fungi. Both the beauty and structural strength are protected.

Pecky Cypress, used in the interior, is treated with Wood-tox, a formulation including Monsanto Penta, which makes wood water-repellent and dimensionally stable as well as protecting it against insects and decay. When treated with properly formulated Monsanto Penta, wood can be painted, varnished or beautified with modern finishes. Monsanto Penta is a permanent wood preservative. It does not leach out of lumber but penetrates deeper as time goes on. It is a chemical treatment that always is uniform, giving dependable results.

For suggestions on specifying penta-treated lumber and for information on sources of materials, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second St., St. Louis 4, Missouri.


Wood-tox: Registered Trade-Mark of Wood Treating Chemical Company, St. Louis, Mo.
Comfort and Savings

Provided with Metal Weatherstrip

It's mighty hard to provide maximum comfort in homes that do not have the necessary full protection of Metal Weatherstrip to seal the cracks around windows and doors. It literally puts a blanket around them... prevents needless heat loss and discomfort.

Metal Weatherstrip pays for itself in two or three years by savings in fuel alone. Reductions in fuel cost range from 20% to 30%. In addition, it's a weather-tight defense against rain, wind, storm, snow and all moisture.

For better Metal Weatherstrip it's "smart business" to talk with anyone of the Weatherstrip Research Institute members. Suggestions and inquiries about metal weatherstrip are invited—for the benefit of all.

Weatherstrip—the original Fuel Conservator...
Saves Most Fuel in Proportion to Cost!

Members:

- ALLMETAL WEATHERSTRIP CO.
- BARLAND WEATHERSTRIP MATERIAL CO.
- CECO STEEL PRODUCTS CO.
- CHAMBERLIN CO. OF AMERICA
- DAYTON METAL STRIP CO.
- DURAND METAL STRIP MFG. CO.
- E-Z TIGHT, INC.
- FABER WIRE COMPANY
- MACKLAND-BUDDEN CO.

Contact nearest plant: Dur-O-Wal Div., Cedar Rapids Block Co., 698 12th Ave., SW, Cedar Rapids, IA; or Dur-O-Wal Products, Inc., P. O. Box 628, Syracuse, N. Y.
Foundation washed away...yet

House stands intact!

Recently a flash flood in Omaha, Nebraska washed away the foundation of this partially completed home, dropping the structure into the excavation.

As the unretouched photo here shows, Celotex Insulating Sheathing held the wall framing intact, despite the terrific strain of the twisting action and jolt accompanying the drop!

Dramatic proof indeed of its superior structural strength and rigidity! One more reason why Celotex Double-Waterproofed Insulating Sheathing belongs in your specifications! Send now for free booklet giving full details. The Celotex Corporation, 120 South LaSalle Street, Chicago 3, Illinois.

Celotex Big Board Sheathing Meets F. H. A. Standards with NO CORNER BRACING

As the test results below show, 4 ft. wide, ¾" thick Celotex Double-Waterproofed Insulating Sheathing without corner bracing greatly exceeds exacting F. H. A. Standards, which require bracing strength at least equal to horizontal wood sheathing with corner bracing.

Yes—you can make this additional saving, yet build a better, stronger wall with this Celotex Double-Waterproofed Insulating Sheathing. Remember, it insulates as it builds!

Results of official tests prove 4-ft., 25/32" Celotex Insulating Sheathing beats rigid F. H. A. requirements by far!

<table>
<thead>
<tr>
<th>F. H. A. Technical Circular No. 12 Criteria</th>
<th>Average of Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Load, lbs.</td>
<td>Dry</td>
</tr>
<tr>
<td>5200</td>
<td>4000</td>
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<tr>
<td>All Load of 1200 lbs.</td>
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</tr>
<tr>
<td>Average Total Deflection, in.</td>
<td>0.1</td>
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<tr>
<td>Residual Deflection®, in.</td>
<td>0.6</td>
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<tr>
<td>At Load of 2400 lbs.</td>
<td>0.3</td>
</tr>
<tr>
<td>Average Total Deflection®, in.</td>
<td></td>
</tr>
<tr>
<td>Residual Deflection®, in.</td>
<td></td>
</tr>
<tr>
<td>*Deflection remaining after removal of load.</td>
<td></td>
</tr>
</tbody>
</table>

For better homes at lower cost...

Celotex BUILDING PRODUCTS
THE CELOTEX CORPORATION•CHICAGO 3, ILLINOIS

The magazine of BUILDING 213
MINIMUM BACKSET DEADLOCKS
USED ON ALL EXTERIOR DOORS
AT THE BON MARCHE STORE, SEATTLE

Installed in all Kawneer Narrow Line doors at the Bon Marche Northgate, these Adams-Rite Series 970 Minimum Backset Deadlocks are fitted into the narrowest stiles... and have been specified because of their design and quality construction.

The locks have a depth of only 1 5/8", yet they take 1 or 2 standard cylinders of any manufacturer, keyed to the job. The Thumb Turn (shown) is optional for emergency operation.

John Graham, Jr., Architect

Write for catalog

ADAMS-RITE MANUFACTURING CO.
540 WEST CHEVY CHASE DRIVE, INDIANAPOLIS, INDIANA, U.S.A.

ATTENTION MANUFACTURERS' AGENTS

The Magazine of BUILDING is compiling a new list of Dealers, Distributors and Manufacturers' Agents who are interested in adding new lines (building products, materials, specialties, household appliances, etc.). This list, when completed, will be available on request to interested manufacturers.

If you would like to be listed please write and be sure to tell us what territory you cover and what types of products you would like to handle.

Write: George P. Shutt
Director of Advertising
THE MAGAZINE OF BUILDING
9 Rockefeller Plaza
New York 20, New York
From any angle, quality and precision fabrication distinguish Pittsburgh Doorways

Heavy steel construction, reinforcing the heavy extruded aluminum frame, prevents Pittsburgh Doorways from getting out of line and permits Herculite Doors to swing easily always. In this lower section of the frame, note side-light track—an integral part of several standard style Pittsburgh Doorways. Also note how the unique Pittco Checking Floor Hinge is permanently placed in its reinforced box.

Because of these quality features and careful workmanship, it is easy to understand why Pittsburgh Doorways are noted for their lasting satisfaction and for their ability to cut labor costs on the job to a minimum.

Pittsburgh Doorways are factory-assembled to precision standards. Expert craftsmen use special checking gauges to assure absolute accuracy of all dimensions. This means the saving of several days' installation work at the site. There are no time-consuming calculations, no costly fitting, locating or fabricating details in the field.

Think of the total-installed cost—not just the list price; consider the quality manufacture that marks every detail of construction and you'll choose Pittsburgh Doorways every time! For complete information, write today to Pittsburgh Plate Glass Company, 2048-1 Grant Building, Pittsburgh 19, Pennsylvania.

Pittsburgh Doorways


PAINTS GLASS CHEMICALS BRUSHES PLASTICS

PITTSBURGH PLATE GLASS COMPANY
PRODUCT NEWS

ULTRA VIOLET REFLECTOR brings outdoor freshness to public rooms.

Even with doors and windows closed, the air in a school or hospital room equipped with an Air-Tron Louvered Upper Air Unit is said to remain fresh and practically germ-free. A powerful disinfecting fixture, Air-Tron has a large aluminum parabolic reflector which directs germicidal ultra-violet rays across the upper part of a room. Natural convection carries air currents up through the bacteria-destroying beam and then down again. Rays are not projected down into the room, however, where they might injure eyes or skin of people present. The 8 watt model provides protection for an area up to 80 sq. ft. and sells for $19.10. The 15 watt retails at $25.50. It will serve areas up to 150 sq. ft. For rooms up to 425 sq. ft., the 30 watt Air-Tron is available at $44.50. The units are finding wide acceptance in bakeries, laundries, restaurants and factories and public buildings.


GAS-BURNING INCINERATOR has automatic shut-off.

New time controls and a thermo-magnetic valve on the Incinor eliminate return trips to the incinerator to turn off the gas. When the selected time expires the fuel flow is stopped automatically. Made with a convenient ash removal drawer; cast iron grate, door and top; and heavy sheet steel firing chamber, the compact S-25 has a two bushel capacity. It is approved by the American Gas Assn. for use with natural, liquefied petroleum, manufactured and mixed gases. Retail price for the model is $119.50. Standard units without time control cost somewhat less.

Manufacturer: Bowser Inc., Incineration Div., Cairo, Ill.

NEW KITCHEN CABINETS are sleek, accessible.

In a move comparable to that of the early 30's in the automobile world, General Electric has taken one giant step in madame's kitchen and softened the lines on its new steel cabinets. The wall cabinets have counterbalanced doors which may be lifted up from the bottom with a finger's touch. When open the doors are out of the homemaker's way, eliminating the danger of bumping into them. Smaller sections fit directly beneath the

(Continued on page 222)
COLOR, used for decorative purposes in public and private office buildings, has taken on new significance in recent years because of its psychological and physical effect upon human beings.

- There is no longer reason for the depressing monotonies usually found in commercial structures. Pittsburgh COLOR DYNAMICS enables architects, builders and contractors to specify color arrangements that retard fatigue, increase safety and improve the efficiency and morale of office workers.

- Science has shown that colors stimulate and inspire, rest and relax, depress and fatigue. Pittsburgh has made use of this knowledge of the energy in color in developing COLOR DYNAMICS.

- With this painting system you choose with scientific accuracy the right colors for all types of offices in keeping with their purposes, their exposure to sunlight and their natural and artificial lighting.

- You lessen eye-strain, stimulate concentration, promote comfort and cheerfulness among those who work in these offices. Housekeeping problems are simplified.

- COLOR DYNAMICS makes office quarters look different and more attractive. It makes them seem longer or wider, higher or lower. You paint sunlight into dark and dismal halls and stairways. Lobbies and reception rooms reflect the spirit and character of their tenants.

- Why not discover for yourself how you can create a whole new world of helpful colors to bring new efficiency, new energy, new pleasure to those who occupy your buildings?

Let us make a COLOR DYNAMICS engineering study for you — FREE!

- For a complete explanation of what COLOR DYNAMICS is and how you can put it to work for you, send for our profusely illustrated booklet which contains numerous examples of its use in the painting of office buildings. It's FREE!

Better still, let us submit a color engineering study of your building, free and without obligation.

There's a trained COLOR DYNAMICS expert at each of our 75 warehouses. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have one of its representatives see you at your convenience. Or mail this coupon.

SEND FOR A COPY OF THIS BOOK!

Pittsburgh Plate Glass Co., Paint Div.,
Department MB-21, Pittsburgh 22, Pa.

1) Please send me a FREE copy of your booklet "Color Dynamics."

2) Please have your representative call for a Color Dynamics Survey without obligation on our part.

Name

Street

City. ______ County ______ State ______

Pittsburgh Paints
PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS
PITTSBURGH PLATE GLASS COMPANY
How Flexwood solved this architectural problem

Executive office, Abbott Laboratories, No. Chicago, Ill.
Designer—Harper Richards.

**Problem**

To give office modernity with warmth. Wall covering must compliment contemporary furniture, serve as background for fine paintings, provide in itself rich, handsome decoration.

**Solution**

Dark-toned English Oak Flexwood inside of panels provides subtle contrast with American Rift Oak Flexwood, lends enriching accent to paintings and other appointments. Panel treatment on door gracefully merges this element into harmonious interior pattern. Result is an exceptionally rich, inviting atmosphere.

**Free Book**

Free Book of Architectural Case Histories shows how Flexwood solved 17 actual architectural problems in private and public buildings. Send coupon below.


**United States Plywood Corp.**
55 West 44th Street, N. Y. 18, N. Y.
In Canada: Paul Collet & Co., Ltd., Montreal

Flexwood is manufactured and marketed jointly by United States Plywood Corporation and The Mengel Company.

United States Plywood Corporation, Dept. WJ
55 West 44th Street, New York 18, N. Y.
Please send me, without obligation, Flexwood’s Case-History Book; shows how Flexwood helped solve 17 actual architectural problems.

**Name**

**Address**
DO YOU KNOW THESE 5 TIMELY
G-E WIRING FACTS?

1. HOW MUCH EXTRA CURRENT CAN YOU ADD TO EXISTING RACEWAYS?
Size for size, Deltabeston® AVA cables carry more current than ordinary cables—pack more current into raceways—because heat-beating asbestos insulation permits higher operating temperatures. When you specify G-E Deltabeston cables, HOW MUCH CURRENT CAN YOU ADD?

2. WHAT REALLY MAKES THE DIFFERENCE IN CONDUIT?
Wiring installations get double-protection with General Electric White rigid conduit. First, the top-quality, thoroughly-tested steel pipe is galvanized. Then a tough, smooth coat of Glyptal® lacquer is applied. BUT WHAT REALLY MAKES THE DIFFERENCE?

ANSWERS

1. G-E Deltabeston AVA cables can add as much as 64% more current-carrying capacity than ordinary Type R building wire.

2. G-E White rigid conduit is hot-dip galvanized in pure zinc—a premium finish that gives lasting protection.

3. In laboratory tests General Electric mercury switches stand up under more than a million On and Off cycles—about 247 years of normal use.

4. The new standard grounding outlet (GE3588) is designed to take three-prong grounding plugs, two-prong polarized plugs, and regular two-prong parallel-blade plugs.

5. The new line of G-E bar hangers offers you the offset you need. New design lets fixture stud move easily for leveling and positioning, locks it tight when it's set.

FOR FURTHER INFORMATION on any General Electric wiring materials, see your local G-E Construction Materials Distributor, or write to Section K53-24, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

* Registered Trade Mark of General Electric Company

GENERAL ELECTRIC
You might think we'd be disappointed in the Levitt House for 1951. Why? Because its open planning calls for fewer doors and fewer locks by Sargent.

But we like this imaginative new home. And we're proud that for this latest design — as for 20,000 Levitt houses since 1946—the choice is Sargent's famous 4500 line lock.

The Levitt organization has realized the important part that good hardware plays in the modern house.

And we believe that the architect or contractor who watches carefully both price and quality — who values ease of installation, styling for today, reliability — will choose locks by Sargent.

That's the kind of detailed planning, from Sargent 4500 locks to television sets, that has made Levitt the largest home-builder in the world.

So we don't mind if he builds a better home that needs fewer locks. We're happy as long as you can't open a Levitt door without turning a lock by Sargent.

Better products by-

Sargent and Company

New York, New Haven, Conn., Chicago

Builders Hardware and Fine Tools since 1864
Using **Copper** wisely in
**Building Design** and **Construction**

**WRITE FOR DETAIL DRAWINGS**
(Numbered for A.I.A. Filing)
Details of the copper construction illustrated in this sketch are available in 8½" x 11" sheets convenient for filing. Other sketches showing how a little copper can go a long way in achieving good building construction will be featured in subsequent advertisements.

1. Copper edging strip designed to serve as a guide and provide alignment for the edge of trimmed asphalt shingles.

2. Copper edging for built-up roofing having a fascia board or cornice at edge.

3. For construction where a concrete slab forms the cornice, facing of 24 oz. cold rolled copper has sliding joints top and bottom, permitting independent, unrestrained movement.

**roof edgings of Copper**

Metal edgings which serve as gravel stops eliminate the need for more costly masonry construction. Copper is the preferred metal for roof edgings because of its lasting qualities, easy workability and weather-tight performance when properly installed. Sketches 2 and 3 suggest designs and method of installing. The edging strip shown in sketch 1 is for use on sloping roofs with asphalt shingles. For suggestions or counsel on any problem involving sheet copper write: The American Brass Co., Waterbury 20, Conn.

In Canada: Anaconda American Brass Ltd.,
New Toronto, Ontario.

Nothing lasts like **Anaconda® Copper**
larger cabinets and have doors which open from the top down. By making the larger units 6 in. lower than conventional models and using small compartments beneath the cabinets (usually wasted space) the overall design provides better accessibility to all parts of the storage area. Mrs. America (who, research reveals, stands about 5 ft. 2 in. and putters in her kitchens in flat heels or slippers) can easily get things from the back of the top shelf. For added cleanliness and better vision, wire shelves similar to those in refrigerators are used in the cabinets. Shelves in the "underwall" sections may be removed so that toasters and other small appliances may be stored in them. Not only do the rounded lines give the cabinets a fresh look far removed from the familiar sharp-edged boxes, but they create a more recessive appearance which harmonizes with the wall surface and eliminates the need for building expensive soffits above the cabinets. Corner sections 26 x 26 in. with open shelves are also being planned for the line which will be available in limited quantities in the Spring. Prices are expected to be about 15 to 20 per cent more than the standard units.

Manufacturer: General Electric Co., Bridgeport 2, Conn.

REFRIGERATORS have large freezer compartments. Three of the new refrigerators introduced by G-E have good-sized freezers across the top of the cabinets. One of them, the LC-8-H, is an 8 cu. ft. model priced at $299.95. It will hold 43 lbs. of frozen foods. Another 8 cu. ft. unit, the LF-8-11, has a separate door to its freezer compartment as does the 10 cu. ft. LF-10-H. These models sell for $329.95 and $395.95 respectively. The latter has room for 49 lbs. of frozen foods. All three refrigerators have magnetic latches which close the doors quietly and tightly, and a full-width tray is provided below the freezer for fast chilling of soft drinks or meat storage.

Manufacturer: General Electric Co., Bridgeport 2, Conn.

RUBBER BASEBOARD is sanitary, inexpensive. Sani-base colored rubber baseboard may be installed around kitchen cabinets; laundry, bathroom and playroom floors to form a positive seal of neat concave molding. Verminproof and durable, the natural rubber is made with a 5 x 1 1/2 inch torsion.
From shipping carton to finished skylight in record time with WASCOLITES, the completely prefabricated skylight units. Neat and attractive in appearance, Wascolites flood interiors with unobstructed light. Inside nothing but the sky is visible — and Wascolites are strong, shatterproof, absolutely water-tight.

Find out more about this revolutionary new skylight. Send for our WASCOLITE A.I.A. folder. And ask the name of your nearest WASCO representative. He has a WASCOLITE unit to show you.

WASCO FLASHING COMPANY - CAMBRIDGE - MASS.
Alfred Levitt says:

"Today's home buyers insist on an automatic washer...
Naturally, we pick the brand with the greatest public acceptance"

(P.S. All Levitt homes are equipped with a Bendix Automatic Washer)
With the cover off the case, it's easy to spot the Russwin "Ten Strike" Lock features that add up to extra value. Notice the exceptionally sturdy construction throughout... the forged brass knob hub and brass front with armored scalp... the heavy, formed, interior parts of rust-resisting steel... the smooth precision-made case that holds the parts in permanent alignment. Features like these have put Russwin "Ten Strike" Mortise Locks in a class by themselves for exceptionally long, trouble-free service... proving the economy of quality.

There are over 800 possible lock combinations in the Russwin "Ten Strike" Line... made from three base locks in two backsets. All have the famous Russwin Adjustable Ball Bearing Pin Tumbler Cylinder. One size mortise for all functions. Since all "Ten Strike" Locks are reversible, changes in door swings will not add to the cost of hardware.

Recommend locks with the extra value... the Russwin "Ten Strike" Lock Line. Write for catalog. Russell & Erwin Division. The American Hardware Corp., New Britain, Conn.
MINUTES MEAN MONEY

When you complete 38 homes a day!

"We use MATICO because it's easier, faster to install... assures low cost... high quality."

... says Levitt & Sons

America's largest builder of private homes.

Time is precious when you build 5,400 new homes a year. To meet such an exacting schedule, Levitt & Sons is geared to complete 38 new homes a day. That's why they select MATICO Asphalt Tile for flooring every room of their new 1950 Levittown economy-type homes and their Roslyn, N. Y., luxury-type homes. MATICO's precision-cut, squared edges save valuable installation time and MATICO assures a minimum of breakage — an important cost-cutting factor. Precision tested throughout manufacture, MATICO meets Federal specifications for flexure, indentation, curling and impact.

Homeowners like MATICO's durability... economy... and 27 rich, clear colors that harmonize readily with any decorative plan.

Specify MATICO for every type of installation — apartments, industrial plants, institutions, stores and homes.

Get to know MATICO

See our insert in Sweet's File Architectural section 13g/MAS. For free samples, write us on your business stationery.

MATICO colors and marbleization go clear through the tile... last the life of the tile.

Dept. 62

Mastic Tile Corporation of America
Member: Asphalt Tile Institute
Factories: Newburgh, N. Y. • Long Beach, Calif.
You can save $570

for every 10,000 square feet in your plant with Westinghouse Bus Duct

"On a recent field survey made by our Sales Engineering Division for the application of 440-volt plug-in bus duct versus wireway, it was found that for a complete bus-duct system the installed cost was $17.30 per 100 square feet, whereas for a complete wireway system with taps, the cost was estimated at $23.00 per 100 square feet. This cost does not evaluate all the advantages that plug-in duct offers for ease of making taps under safe conditions without shutdown."

The Buffalo Electric Co., Buffalo, N. Y.

---

**FIGURE YOUR APPROXIMATE COST HERE**

<table>
<thead>
<tr>
<th>Square Feet</th>
<th>Bus Duct</th>
<th>Wireway</th>
<th>You Save</th>
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<tr>
<td>1,000</td>
<td>$173.00</td>
<td>$230.00</td>
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<td>45,250.00</td>
<td>57,500.00</td>
<td>14,250.00</td>
</tr>
</tbody>
</table>

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You can be SURE... if it's Westinghouse Bus Duct

Many plants have found in Westinghouse Bus Duct a system of power distribution impossible to match for low installed cost and high carrying capacity in limited space.

Wesinghouse Duct, in completely prefabricated sections, varying in length to suit requirements, is convenient to handle and easy to hook up. The longer the run, the greater the saving.

And Duct is easily disassembled for quick expansion or changeover—critical today when equipment must operate at uninterrupted top capacity, top efficiency.

Experienced Westinghouse Field Engineers can help you plan your secondary power distribution system. Phone your nearest Westinghouse Office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-30046
on NORTON non-slip Floors and Stairs

- Permanently non-slip
- Extremely wear-resistant
- Non-resonant

In office, cafeteria, washrooms and throughout your plant slipping can be eliminated. Water, chemicals, oil will not remove the permanent non-slip protection provided by Norton Floors. The extreme wear-resistance of Norton Floors to the heaviest foot traffic makes their installation an economical investment in long, trouble-free service. Also, they are quiet and comfortable to walk on.

You have four choices of Norton non-slip floor products: (1) Stair and Floor Tile, (2) Ceramic Mosaic Tile, (3) Aggregate for Terrazzo Floors and (4) Aggregate for Cement Floors.

Write for our free Catalog No. 1935 or see our Catalog in Sweet's Architectural or Engineering Files.

NORTON COMPANY
Worcester 6, Massachusetts

PRODUCT NEWS

in. core in flexible strips which can be fitted to curves as easily as to straight areas. Price for a carton containing a 20 ft. length of molding, waterproof Sani-cement, a brush for application and instructions is $4. Sani-base is available in black, gray, red, blue, green and yellow. Colors are permanent so that once installed, the base molding needs no painting. An occasional waxing along with the floor will keep its finish glossy and easy to clean. Although the cement secures it to wood or tile floor and wall surfaces, the molding may be removed at any time for re-use elsewhere.

Manufacturer: Cass Products Co., 6127 N. Cicero Ave., Chicago 30, Ill.

METAL FLOOR BRIDGING costs builder 10 cents less installed than wood.

Introduced at the Home Builders' Show in Chicago last month, Hercules trim-looking floor bridging should prove to be a practical product in residential construction. Formed of 20 gauge rustproofed steel, the bridging has sharp prongs on each end which bite into the joists (on 16 in. center) as the two parts of the bridging are pulled down and snap-locked together. No nailing nor sawing is required. Flooring can be laid first and the bridging applied underneath afterwards. A set of ordinary wood bridging, cut from lumber on the job and nailed in place, the builder about 40 cents. Installed cost for a set of the new metal braces is 30 cents. If necessary, the Hercules bridging can be removed and re-set easily during heating, plumbing or electrical alterations.

Manufacturer: Mover Mfg. and Sales, 2491 Manchester Rd., Akron, Ohio.

PISTOL GRIP HACK SAW can cut for unlimited distances.

Unrestricted by the usual hack saw frame, the Endless Hack Saw will cut through almost any thickness of material and for any distance. It can be used for many jobs unapproachable with an ordinary hack saw: cutting out parts of floorboards, wall panels, metal doors, etc. The tool will take any standard 10 or 12 in. blade. An (Continued on page 232)
There's a shape
type and color
Facing Tile for every job!

You can use Structural Clay Facing Tile almost anywhere—and with maximum ease!

That’s a big claim. In fact it took the combined efforts of the Facing Tile industry’s leading manufacturers to make that claim a fact.

Today that fact is of real importance to you.

It means that, with Facing Tile, you can design unhindered by material limitations. You can select materials with greater ease. And, since Facing Tile is produced in modular sizes, you can build faster, and at less cost. You can always be sure that the Facing Tile you use is a fine material at its very best.

To accomplish this the Facing Tile Institute works with leading architects, universities and government agencies. Research determines the colors, shapes, sizes and quality standards that will best meet your needs, both structurally and functionally.

The result is a versatile, easy-to-use product that you can get from any Institute member. And it is guaranteed to pass each of the rigid tests of quality set up to maintain the Institute's standards.

Whatever you build, any of the Institute members will be pleased to help you in planning the job. Call on them at any time, or for complete technical data on Facing Tile, write the Institute, Desk MB-2, for our new catalog 51-C.

FACING TILE INSTITUTE
1520 18th Street, N.W., Washington 6, D.C.
Completion of the Johnson Wax Research Laboratory marks a milestone in the effective use of reinforced concrete. Created for S. C. Johnson & Son, Inc. by famed architect Frank Lloyd Wright, the 154-foot tower and related structures used 6,960 yards of concrete, reinforced by 504 tons of bars and 542 tons of Wheeling Steelcrete—solid steel mesh made from 3/8-inch plate, the heaviest expanded metal produced to date. In the four views below, Steelcrete and bars are seen as used in conjunction throughout various parts of the structure.

Steelcrete for reinforcing is only one of many products for which architects and builders rely on Wheeling. In the complete line of Wheeling building materials, they know they will find products that are the ideal solution to construction problems—whether in advanced design such as the Johnson Wax Research Laboratory, or for buildings of more conventional type.
THE WHEELING LINE OF BUILDING MATERIALS INCLUDES:
Steelcrete Reinforcing Mesh,
Expanded Metal, Metal Lath and Metal Lath Accessories,
Tri-Rib Steel Roof Deck, ExM Angle Partitions and ExM Vault Reinforcing to meet 10 Insurance Classification.
Write for descriptive literature and technical data.

In this dramatic night view, the 154-foot Johnson Wax Research Laboratory shows the unique construction of its alternating full floors and circular mezzanines, all cantilevered out from a single reinforced concrete core. In its 2000 tons, the tower incorporates 542 tons of Wheeling Steelcrete Reinforcing Mesh.
**Mueller Climatrol**

**Compact, Efficient—Quickly Installed!**

---

fuel-thrifty boilers
add sales appeal to every job you build!

This famous name on a radiator or radiant installation wins immediate acceptance from your clients. And their satisfaction — years afterwards — is goodwill that pays dividends.

Compact, beautifully styled, the Mueller Climatrol gas boiler is built for today's homes . . . sized to give close-to-capacity fits for every job . . . designed for quick, easy installation . . . and built to deliver trouble-free comfort for years.

Specify or recommend the Big Name in Heating — Mueller Climatrol — for all your radiator or radiant heat jobs. Your choice is backed by Mueller's 94 years of home-heating leadership. Write for our new "all product" catalog. . . .

Manufacturer:

---

PRODUCT NEWS

enclosed spring returns the blade automatically after each stroke. There are no holding pins to become bent or broken, and breakage of the blade—supported in the front casing by three steel balls—is said to be very low. Manufactured in England, the device retails in the U.S. for $3.95.

Distributor: Ziskind Co., Inc., 49 W. 37th St., New York 18, N. Y.

SAFETY VALVE shuts off gas flow following earthquake or severe explosion.

In event of an explosion or earth tremor, a chain-suspended ball in the Guardian valve automatically drops down to seal the gas line and cut off gas flow outside the building. It thus greatly reduces the possibility of fire or explosion from dangerous gas leaks in earth or masonry pockets. In the valve's normal or open position the brass ball rides on a special incline clear of the gas flow channel; when shaken by an earth shock of damage-causing intensity the ball drops on to a synthetic rubber gasket, completely sealing the outlet. The valve may be reset after removing a threaded cap. The 1 in. size for most residential applications sells for $24, installed. Eight larger sizes up to 6 in. are also being manufactured.

Manufacturer: Guardian Valve Co., Box 465-E, Redwood City, Calif.

REVOLVING DOOR LENS gives one-way view.

Equipped with a wide-angle precision ground lens, the Detector Optical Door Viewer gives the user a full picture of the immediate area around the door front at a glance, but does not allow persons outside to see in. It is designed to fit any door; the only installation requirement is the drilling of a small hole to accommodate the instrument. Stationary and revolving models are available at $3.95 and $4.95 respectively. The latter has a lens set in a patented movable part so that it can be swiveled to almost any position.


**(Technical Literature, page 240)**
Why Builder Ralph D. Talbott EQUIPS ALL HIS HOUSES WITH ELECTRIC RANGES

The Talbott Building Company of Baltimore, Md. sold 44 of these houses in one day. Priced at $8,990, they have two bedrooms, living room, dining room, and completely electric kitchen. They are known as low cost, luxury homes.

These Talbott houses in the Lochean development have electric kitchens which include electric sink and dishwasher with waste disposer, automatic electric water heater and electric refrigerator. And the automatic range—of course, it's Electric!

"When I build a house," says Mr. Talbott, "I make sure to install the kind of equipment my prospective purchasers will want. I've found out what they want, and the way my houses sell proves that I'm right. The equipment might vary a bit from house to house—but there's one thing goes into every house I build. That's a modern, automatic Electric Range. When a woman sees that range, she sort of takes it for granted that everything else is up-to-the-minute."

Are you equipping your houses with the cooking equipment women want—automatic modern Electric Ranges?

ELECTRIC RANGE SECTION
National Electrical Manufacturers Association
155 East 44th Street, New York 17, N.Y.

ADIMRAL • COOLERATOR • CROSLEY • DEEPFREEZE
FRIGIDAIRE • GENERAL ELECTRIC • GIBSON
HOTPOINT • KELVINATOR • LEDO • MONARCH
NORGE • PHILCO • UNIVERSAL • WESTINGHOUSE

These well-known builders are also on the Electric Range Bandwagon!

William Levitt—Levittown, L.I.
C. Williams—Teanack, N.J.
Samuel H. Walker III—Kensington, Md.
Arnold Hartmann—Newton Centre, Mass.
C. Ronald Marcotte—Cincinnati, Ohio
William A. Zeh—Los Angeles, Calif.
120 Reasons why RUBEROID dealers are better served

One of the Ruberoid factory sales representatives shown on this map is located close to you. He's ready to supply you with all the information, service and sales aids you need to help you build business and profits with Ruberoid Asphalt and Asbestos Roofing and Siding products.

Your Ruberoid salesman can help you boost business with such sales leaders as Ruberoid TITE-ONS, the original interlocking, wind-defying shingles . . . Ruberoid STONEWALL Board, one of the most universal building materials ever made, Asbestos-Cement Siding and a hundred other Ruberoid products.

Besides product leadership, Ruberoid offers you the support of a powerful advertising campaign in such magazines as Time, Good Housekeeping, Better Homes and Gardens, Country Gentlemen, Successful Farming, Farm Journal, Cappers’, etc. . . . and, in addition, Ruberoid is first in the roofing and asbestos siding fields with the Good Housekeeping Seal of Approval, for extra sales support.

Your Ruberoid salesman can offer you prompt, efficient service from one of Ruberoid's eleven modern plants strategically located. For a bigger and better roofing and siding year, call your Ruberoid salesman now!
...again in 1951 LEVITT Homes provide TRACY Stainless Steel Kitchens exclusively

As in past years LEVITT & SONS, Inc., stress top quality in every detail and feature of their projects, including, of course, the TRACY STAINLESS STEEL KITCHENS which bring lifetime joy, beauty and convenience to thousands of fortunate families. The breath-taking Landia development on Long Island proves again that only Levitt can out-Levitt Levitt.

All over the country TRACY STAINLESS STEEL KITCHENS surge forward in their natural growth, as featured equipment in the fast-selling houses of leading builders, and through the nation-wide system of Tracy distributors and dealers. These kitchen specialists are meeting the solid demand for the enduring beauty of satiny, easy-to-clean stainless steel—and at prices which satisfy the budget-conscious new or remodeled home program.

In its new affiliation with the internationally recognized Edgewater Steel Company, Tracy production is scheduled for expansion. Added administrative and technical resources will give added force to the Tracy slogan—"SKY HIGH QUALITY—DOWN TO EARTH PRICES."

TRACY MANUFACTURING COMPANY
Division of Edgewater Steel Company
PITTSBURGH 30, PA.
They'll never find a "bargain in lighting" by "picking fixtures". Yet you meet hundreds like this every day. And so do we.

No one fixture will solve all lighting problems.

There are, in fact, literally thousands of luminaires engineered to do specific jobs. One may be the right answer—or it may take two or three.

Good lighting combined with practical economics takes the services of a qualified lighting engineer.

Whether you plan lighting, buy lighting or install lighting, the services of a Westinghouse lighting engineer are available to you.

Westinghouse PLANNED LIGHTING PAYS
...and **Hotpoint** Leads in Modern All-Electric Kitchens and Home Laundries!

Whether you are remodeling or building a single dwelling, an apartment house or an entire subdivision, you can set the standard for Better Living in the homes you build... with **Hotpoint All-Electric Kitchens and Automatic Home Laundries**.

**Hotpoint's labor-saving** electric appliances take over—automatically—the tedious, unpleasant, time-consuming kitchen and home laundry chores of today's modern homemaker. Thus, more time and energy are conserved for the more important responsibilities.

**Engineered to be the finest**... designed for the greatest utility and styled at the peak of modern custom, **Hotpoint All-Electric Kitchens and Automatic Home Laundries** add the distinguishing quality to the truly modern home.
MODERN KITCHENS...

THES DRYERS  •  ROTARY IRONERS • FOOD FREEZERS  •  CABINETS

(A General Electric Affiliate)

5600 WEST TAYLOR STREET, CHICAGO 44, ILLINOIS

White Now...

for free literature on Hotpoint Home Appliances ... Hotpoint will gladly give you helpful counsel in kitchen and home laundry planning for your particular project.

Hotpoint Inc.

CLOTHES DRYERS • ROTARY IRONERS • FOOD FREEZERS • CABINETS

(A General Electric Affiliate)

5600 WEST TAYLOR STREET, CHICAGO 44, ILLINOIS
TECHNICAL LITERATURE


Complete information on the recently developed Screwlock furring channels is presented in this publication. A handy reference chart gives essential details on methods of application for using the incombustible metal channel with materials to be attached by screws. Some of the construction materials which may be fastened to Screwlock are acoustical tiles, insulating sheets and wall board. Photographs and diagrams illustrate installations and provide drafting details.


The guide makes it quite simple to work out the watt requirements and power consumption for any room or building to be heated with the manufacturer’s electric glass radiant heating pane. Several pages of drawings show various structural features which must be considered. After the heat loss for the building is determined in Btu’s, it is converted into watts required. The number of panels needed to fill these requirements can then be established easily. A practical feature of the booklet is the table from which operation costs can be figured for installation in any section of the country.


Useful installation directions and performance data on many of the firm’s lighting units designed for home use are covered in this folder. Among the attractive fixtures for outdoor and indoor applications are recessed incandescent ceiling lights, fluorescent units and bed lamps. All of them feature scientifically ribbed glass diffusers which control the pattern of light efficiently without a minimum of glare.


Uses and advantages of architectural porcelain enamel are described in this booklet. Applications in store fronts, showrooms, and service stations are illustrated. Engineering details of construction and erection methods are explained with large, well-drawn details.

FLOORING. Dodge Vinyl Cork Tile. Dodge Cor Co., Inc., Lancaster, Pa. 8 pp. 8½ x 11 in.

Various features of the firm’s cork-based vinyl floor tile are described in detail in the catalogue. A color chart shows the 23 patterns in which this durable flooring is produced. Included also are results of tests made of the tile in comparison with other hard surface floor coverings. Installation instructions and directions for care and maintenance are given.


This design information sheet includes descriptive and specification data on textured and perforated acoustical products and application by means of adhesive, mechanical suspension, or clipping on wood furring strips. The publication is one of the series awarded a certificate of merit by the American Institute of Architects and Producers Council, Inc. for product literature.


The pamphlet illustrates and gives specification for combination metal door frames, jamb and trim; and tin clad doors.

(Continued on page 246)
EVERY ADLAKE ALUMINUM WINDOW GIVES YOU THESE "PLUS" FEATURES:

- Minimum Air Infiltration
- No Warp, Rot, Rattle, Stick
- Finger-tip Control
- No Painting or Maintenance
- Ease of Installation

For
Georgia Baptist Hospital,
It's ADLAKE . . .
The Weatherproof Windows
That Pay for Themselves!

YES, the ADLAKE ALUMINUM WINDOWS in handsome Georgia Baptist Hospital form a perfect weather seal against air infiltration—and ultimately they will pay for themselves by eliminating all maintenance costs except routine washing! And what's more, they'll last as long as the hospital itself!

In a test conducted by an independent research organization, an ADLAKE ALUMINUM WINDOW was opened and closed one-million times—and after the millionth opening still moved as easily, and fitted as snugly, as it did before its test! Only ADLAKE WINDOWS offer the combination of woven-pile weather stripping and patented serrated guides that assures minimum air infiltration and absolute finger-tip control. They keep their smart, modern good looks and easy operation for the life of the building.

Find out how ADLAKE WINDOWS can save you money! For full information, drop a card to The Adams & Westlake Company, 1122 N. Michigan, Elkhart, Indiana. No obligation, of course.
A basic Levitt merchandising principle
on display again—at LANDIA!

This is the new LANDIA house at Jericho, Long Island, N. Y., which Mr. Alfred Levitt designed.

In true Levitt tradition, plans for the Landia Development call for a full share of built-in features . . . features such as those that have sold Levitt homes by the thousands during the past few years.

One of the major features of the Landia house, in the $13,000 price range, is the attractive and efficient General Electric Kitchen.

In this kitchen, electrical servants take over much of the drudgery of housework. With this kitchen, families have more time for leisure and the better life!

There is no doubt about it: today's home buyer—and the buyer of the future—wants his home to be a complete home... a home with the worksaving General Electric Kitchen.

In the Landia kitchen, the dishes are washed and dried automatically in an under-the-counter G-E Dishwasher. There's a luxurious electric Range with many timesaving features. The G-E Refrigerator is family size. And there's a G-E Food Freezer that keeps 140 pounds of fresh-frozen foods within elbow reach.

The Levitt Landia Kitchen is another example of how successful and practical builders all over America include all-electric living by General Electric, in the houses they build. Home Bureau, General Electric Company, Bridgeport 2, Connecticut.

You can put your confidence in—

GENERAL ELECTRIC
Business is on the carpet, and carpet is our business

To serve its function, carpet must complete your design and your color plan. It must also stand up for years under daily wear. Your local Alexander Smith-Masland Carpet Contractor is a carpet specialist. He can tell you which weaves, in which qualities, will give your client the necessary service. He can show you literally hundreds of patterns and colors available to you. Let his years of experience save your time and your client’s money. Call on him for expert advice, as well as skilled, economical installation.

Alexander Smith and C. H. Masland
CONTRACT CARPET'S
295 Fifth Ave., New York 16, N. Y.
Grange Cooperative Warehouse, Spokane, Washington, dimensions 165' x 150'. Roof is placed on top of cantilevered glued laminated girders on 16' centers. Three-inch tongue and groove wood roof sheathing is attached directly to top of girders; no purlins. Only two rows of posts in the entire building. Drawings show other applications.

Build for Efficient Production and Low Cost, too!

Open floor areas required for efficient industrial production and low cost, permanent construction are both accomplished with glued laminated girders of Timber Structures, Inc. These girders are made of kiln dried structural Douglas fir material. They are:

- **Built to any size or shape.**
- **Dimensionally stable**—no seasoning action, no maintenance problem.
- **Readily available**—non-critical material.
- **Handsome in appearance when left exposed.**

Completely prefabricated and delivered ready for erection without cutting or fitting, these girders go up quickly and easily. Parapet walls may be held at minimum height with substantial savings in cost.

Timber Structures, Inc., welcomes consultation on any building problem, complex or otherwise. See your nearest Timber Structures office, or write us the details of your project. Fill in and mail the coupon for "Engineered Timbers", an illustrated booklet giving detailed information on glued laminated structural units.

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The FASCO Ventilator Line is complete. Models for ceiling, inside or outside walls.

Levitt & Sons, America's largest home builders, have featured FASCO for years.

More and more women are insisting on a kitchen ventilator in their new home. They know it keeps the home fresh, clean, and free from cooking odors. They want it quiet, automatic, smartly styled, and dependable... in short, they want a FASCO kitchen ventilator.

Easily installed. Fit all thicknesses of walls. Very inexpensive. A big home selling feature item.

WRITE TODAY FOR COMPLETE INFORMATION

**Fasco Industries, Inc.**

ROCHESTER 2, N.Y.

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**Always Specify**

**Haws**

**for Highest Quality**

A complete line of fountains, electric water coolers, faucets, filters and accessories. • Individual or multiple installations. • A reputation for reliability since 1909. • Check in Sweet's or write for complete Haws catalog.

HAWS DRINKING FAUCET CO.

1441 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

Agents and Sales Representatives in All Principal Cities
The Curtis "Sno-Flake", a new indirect incandescent luminaire, is outstanding in beauty of design and efficiency. It utilizes either a 300 or 500-watt mogul base silvered bowl lamp. The functional one-piece die-cast aluminum louver completely shields the lamp neck from view, eliminating distracting and uncomfortable glare. Equally important is the fact that the louver is designed so that there are no horizontal reflecting or diffusing surfaces to collect dust.

The "Sno-Flake" is supplied complete with louver, husk, canopy, self-aligning stem and necessary wire for connecting to new or present outlet boxes. The louver is finished with high temperature baked white "Fluracite" enamel. Component parts are finished metallic aluminum baked enamel.

The "Sno-Flake" is equally effective for classroom, office, store, and general commercial illumination.

Write for Bulletin 2407 for complete specifications and details.

CURTIS LIGHTING, INC. 6135 West 65th Street Chicago 38, Illinois

CURTIS LIGHTING, INC., DEPT. 82-C7
6135 WEST 65TH ST., CHICAGO, ILLINOIS

Name
Address
City State
CUT CLOSET CONSTRUCTION COSTS Completely!

with RA-TOX FLEXIBLE DOORS

as selected by Levitt

for the Landia House

With the Ra-Tox Flexible Door, all the costs of standard closet construction can be eliminated. The Ra-Tox Flexible Door can be hung from wall to wall and from ceiling to floor... taking the place of the closet wall section otherwise needed. You save the complete cost of special closet framing, wall surfacing, trim, hardware, fitting and finishing. The cost of the closet is only the cost of the Ra-Tox Flexible Door... an important dollar saving for every bedroom unit you build. First introduced less than one year ago, thousands of Ra-Tox Flexible Doors are already in stalled in Levittown and in homes throughout the country. Write for complete information.

RA-TOX FLEXIBLE DOOR FEATURES:

- LOW COST... supplied ready to install, with all hardware and finish painted.
- BEAUTIFUL APPEARANCE... harmonizes with any room... supplied in wide color range or natural wood finish.
- QUALITY CONSTRUCTION... made of strong special basewood splints woven together with tough seine twine.
- VENTILATION... air circulates through door.
- SAVES SPACE... door folds to door frame.
- LONG LIFE... unique design plus quality materials assure long wear-life.
- EASY OPERATION... moves quietly and smoothly on durable nylon glides.

THE HOUGH SHADE CORPORATION • RA-TOX DIVISION • JANESVILLE, WISCONSIN

RA-TOX FLEXIBLE DOORS ALSO USED FOR...

ROOM DIVIDERS • RUMPUS ROOMS AND DENS • BETWEEN-ROOM DOORS

TECHNICAL LITERATURE


A stimulating approach to the coordination of contemporary drapery and upholstery textiles is found in these new fabric guides. Good sized swatches ranging from hand woven Indian spun silk to serviceable sailcloth are placed in complementary color and texture groups. Prices (often surprisingly moderate) are quoted next to each fabric. A distinctive hand print acts as key design for each set. One of the designers represented, Eszter Haraszty is to be credited for the thoughtful conception of the series.


Those concerned with planning public washroom will find this new booklet helpful. Illustrated with diagrams and colored halftones, the catalogue covers toilet and dressing room compartments, shower stalls and cabinets, and hospital cubicles. It contains 20 color chips and a tabular summary of the materials and finishes, ways the five types of toilet compartments are used, and specification data for each style. The drawings include construction details, elevations and installment layouts.


The bulletin illustrates the new line of Textolite plastic surfacing patterns in full color. Applications described for this high pressure laminate include kitchen counters, tables, and lavatory vanities. Complete construction details are presented, and the material's abuse-resistant characteristics itemized.

LUMBER. Where to Use Douglas Fir Lumber. West Coast Lumbermen's Assn., 1410 S.W. Morrison St., Portland 5, Ore. 16 pp. 8½ x 11 in.

This handsomely illustrated publication should be a useful reference for many in the construction industry. It covers the properties, characteristics and grades of Douglas fir, gives recommended grades for interior and exterior applications, and points out hundreds of structural and industrial uses of this versatile softwood.


Details on the company's new self-priming centrifugal pump line are given in this bulletin. Built without valves, the pumps are said to be as efficient as standard centrifugal units. They are made in sizes ranging from 1⁄4 to 5 h.p., with open and closed impellers, and can handle suction lifts up to 25 ft.


Illustrated with color photos and renderings, the booklet shows the entire Youngstown line and gives specifications and features. It includes sections on the Jet Tower dishwasher and a food waste disposer. Ideas on kitchen planning, meal preparation and clean-up, and unusual uses of steel kitchen equipment are also described.
...used in the world's finest buildings

The day and night wearing traffic throughout great buildings demands Schlage Cylindrical Locks...

Proved by over 25 years experience and use, Schlage Locks are today the highest achievement of the lockmaker's skill.
For More Power at Less Cost to
FACTORIES
APARTMENTS
OFFICE
BUILDINGS

Cyclonic Combustion!

Performance proves Cyclotherm years ahead in steam generation efficiency. The exclusive Cyclonic combustion principle produces more heat than conventional generators and does it faster and more economically.

The reasons are many, the proof is yours for the asking, write Dept. D.

Years Ahead in Steam Combustion...

Cyclotherm Corporation
Oswego, N.Y.

SPECIFICATION AN

The advertising pages of The Magazine of BUILDING are the recognized market place for those engaged in building a house or any building could be built completely of products advertised here. While it is not possible to certify building products, it is possible to open these pages only to those manufacturers whose reputation merits confidence.

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SECURITY
MODEL SFA AUTOMATIC GAS-FIRED
HI-LO COMBINATION

INPUT
62,500
80,000
100,000
125,000
BTU

Yes, sir... TWO-IN-ONE because only standard Security SFA Furnaces need be kept in stock. Factory-assembled and wired to serve in closet-type or usual basement-type installations. Return air duct connector for basement application is shipped knocked down... can be attached to the back or to either side in a matter of minutes.

All controls are located in one compartment. Quick, accurate adjustments... easy replacements are expedited without disturbing other wiring. Built-in filter racks can be placed at installer's option.

Built of top-quality materials throughout. Complete information, specifications, prices and discounts available. Write today!

SECURITY MANUFACTURING CO.
1630 Oakland Ave. Kansas City 3, Mo.

NOW... the
TWO-IN-ONE Furnace

For Closet Installations
Eliminates Duplicate Stock... Completely Factory-Assembled in One Package!

For Basement Installations

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