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THE PULSE OF BUILDING is violently uneven as the industry suffers the initial effects of the new economy. Housing starts go up, but mortgage commitments go down. Controls on credit are eased, but others are tightened

The shiftover from "peacetime" to a garrison-state economy was finally being felt by the building industry. But the effects were remarkably uneven. Commercial builders were wriggling uncomfortably under the heavy bans placed on new nondefense construction. Meanwhile, housebuilders were barrelling along as if nothing had ever happened. They began the year by starting more houses than ever before. January's starts were 87,000 units, almost 11% higher than the previous January's 78,700. And, preliminary estimates of total private and total public construction during February, while down 7% from January, were still 22% ahead of February 1950. It looked like a good old-fashioned boom—but it wasn't. It was just the last fling for the housebuilders before they settled down to the austere diet of credit and material controls which the government's mobilization planners had prepared for them.

There were several reasons for the winter boom. And all of them were temporary. The overall reason was that the builders wanted to get as many houses under way before they were completely boxed in by controls. (Luckily, it was good mild buildinc weather in most parts of the country -except for a perverse cold spell in the South.) Most builders still had a sizable number of easy-credit mortgage commitments left over from pre-Regulation X days. With materials getting scarcer, and higher-priced, they decided that it was now-or-never. Many had big inventories of partially developed land which they did not want to carry at a loss in case there was a more serious clamp-down on housebuilding later on.

How long would this mopping-up operation last? Most Washington housing pundits gave it another two months, no more. The best indication of this was the steep drop in the number of FHA *applications* during January: they were down to 14,000, less than half those filed in the comparable period last year. VA "requests for appraisal" were down more than two-thirds from last Summer. In estimating 1951's housebuilding prospects, these figures were a more realistic measure than the industry's stem-winding construction in January and February.

The most significant news out of Washington last month, however, were the *exceptions* that were being made to Regulation X. In mid-February HHFAdministrate P amond Foley announced that three because areas—Paducah, Ky., San Diego, Calif., and Augusta, S. C.—would be exempt from the regulation so that housing for workers in new plants in each of the areas could be started without delay.

The Veterans Administration also announced a minor exception to Regulation X. It ruled that a veteran who bought a lot before the regulation went into effect with the intention of building on it was exempt until April 18.

Although builders received small encouragement regarding credit restrictions, there were indications that the government would be more sympathetic in the future to their materials needs. The outright prohibition against copper which NPA had decreed for housebuilding in January was amended last month to include additional items but to permit the use of all-important copper piping. And the equally drastic aluminium order still permitted the use of windows for awhile.

These easements were minor but they indicated that the Washington planners were realizing—a little late—that blanket materials restrictions would cripple the housebuilding industry at a time when its services were needed to provide shelter for defense workers and maintain employment.

DEFENSE HOUSING BILL, after a second look by the industry, appears less repulsive than at first glance, but still contains some objectionable wrinkles

Taking a long, second look at the Defense Housing Bill last month, the industry felt that maybe the proposal was not as bad as it had first seemed (BUILDING, Feb. '51, p. 9). On second thought the industry might be better off with it than without even if some of its rough edges could not be smoothed down.

Meanwhile, the legislative machinery processing the measure was cranking somewhat slowly. Both the Senate and House Banking Committees had wound up their public hearings; were now holding endless closed-door sessions to see what kind of a bill they could agree upon for submission to their respective Houses. The trouble was

LAST MONTH'S WASHINGTON DIARY

- 2/1 NPA bars use of aluminum in more than 200 items, including residential roofing and siding, storm windows, architectural ornamentation, Venetian blinds.
- 2/5 Secretary Sawyer of Commerce Department appoints Manly Fleischmann as Administrator of NPA.
- 2/6 NPA authorizes 18 field offices to act directly on special hardship applications for commercial construction permits.
- 2/9 NPA amends M-4 to permit construction without authorization of buildings for radio and TV broadcasting, newspaper, magazine and book publishing.
- 2/15 Federal Reserve Board amends Regulation X to limit loans on nonresidential buildings to 50% of lender's estimate of value.
- 2/16 NPA issues anti-hoarding ban on antimony and lead; plan to allocate manganese after April 1.
- 2/19 NPA relaxes copper order to permit use of lighter-grade tubing for water systems in buildings indefinitely beyond April 30; extends cut-off for production of copper pipe, other products beyond March I to allow use of copper inventories; bans nonfunctional use of copper in 50 more products, including refrigerating and air conditioning equipment.
- 2/19 NPA revises M-4 to allow improvements on hotel and office buildings up to 25 cents per sq. ft. per year.
- 2/19 VA eases credit curbs on veterans who purchased building lots before October 12, 1950; exempts them from Regulation X until April 18, 1951.
- 2/21 NPA bans fabrication of aluminum windows and air ducts after June 30.

that much of the testimony they had heard was contradictory, even from industry spokesmen on the same side of the fence. Thus, some segments of the industry approved the whole measure; others straddled the issue by withholding all comment; still others took a yes-but attitude; a few wanted none of it. The last group drew a hot retort from Chairman Maybank of the Senate Banking Committee whose own state of South Carolina is already trying to cope with the housing shortage created by the location of the H-bomb plant in its Savannah river area. He thundered at them that they would be better advised to study the problem more thoroughly before rushing in to condemn all proposals for dealing with it and counseling delay. "We have delayed preparedness too long," he shouted.

The committees' hearings had succeeded in persuading most members that some sort of action would soon have to be taken to provide defense housing. Helping to build up the case in this respect was a letter from Defense Mobilizer Charles E. Wilson to the chairmen of both committees calling attention to the need for the bill. He warned that "if the required housing and community facilities are not

(Continued on page 13)



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Public housing via the back door

What rubbed most building spokesmen the wrong way was the bill's wide open provision for direct public construction of defense housing in remote places. While the more realistic among them recognized that some steps of this sort were perhaps unavoidable, they did not want to see public housing sneaking in through the back door. In fact, President Alexander Summer of the National Association of Real Estate Boards came forth with a suggestion whereby private enterprise would do the whole job. His proposal: Let FHA set up a special program for 100% mortgages to finance rental housing in so-called remote areas. There was scant likelihood that this suggestion would be taken very seriously. Committee members were already forried over the 90% mortgages called for under the new Title IX part of the bill for defense housing and were considering an amendment to require builders to certify that any loan they received did not exceed the cost of the house plus the land.

On the other hand, spokesmen for labor groups had made it clear in their testimony that without public construction the program would flop. They had no objection to letting private builders carry as much of the load as they could. But they were convinced that there were many problem areas into which private enterprise would not venture no matter how much FHA tried to run interference with high percentage loans. They also doubted that builders could get within pocketbook range of most defense workers under the proposed cost limits. According to HHFA estimates, rents for single family houses under the program would range from \$75 to \$93 a month; for multifamily structures from \$77 to \$89. This same agency had figured that government construction under Title II of the bill would rent for from \$64 to \$90 a month, including utilities.

One basket for all housing?

There was also some talk about trim-3 billion underwriting authorization that HHFA Administrator Foley had requested for defense housing and for other FHA operations.

Only about a third of the underwriting authority would be used for defense housing—enough for around 100,000 units. But the regular FHA program under Title II was beginning to run out of financing funds as were some of the other sections. Even though it was not designed to absorb the extra risks involved in building to meet emergency needs, Title II could conceivably take up some of the defense housing slack. Nevertheless, Congressmen were inclined to take the view that money for regular housing should not be mixed with funds for special defense programs.

Far-sighted industry men thought that Foley was probably right in asking for a lump sum since with it he could make adjustments between the defense and regular housing programs. If it would take three or four months for the defense housing section to get rolling, more steam could be put behind FHA's regular operations. After all, the quota for 1951 had been fixed at 850,000 units in determining the supply of critical materials that would be available after defense production requirements were met. Since only a small part of this would be earmarked for defense housing, it would make sense to put the FHA in shape to handle some additional regular business.

Outlook

At month's end it appeared that, if FHA needed more money, it would have to make a separate trip to Capitol Hill to ask for it.

It also seemed likely that the House Committee would add to the bill's \$8,100 basic mortgage limit an extra \$900 for defense homes in high cost construction areas.

REGULATION X RELAXED to meet emergency housing needs

Recognizing that the defense housing emergency has already caught up with some communities and is breathing down the necks of others, federal housing chieftains late last month decided to extend what relief they could by a cautious relaxation of credit curbs under Regulation X. Prime mover in the process was a new inter-departmental committee set up to call the housing shots—an area designation committee. Obviously, this organizational step was a tip off as to how the new housing program would be thrown into gear. It answered a question that had been perplexing many observers.

In the capacity of a bird-dog, the committee would point to the areas where a housing pinch was likely to develop as a result of defense production. In the same manner it would indicate places where community facilities might be over taxed. Example: Suppose the military authorities wanted to give large new contracts to the two main industries in Schnectady, N. Y. —American Locomotive and General Electric. The committee would spring to action, ask HHFAdministrator Foley for a quick answer as to what effect an employment expansion of say 100% by both firms would have on the local housing situation. It would ask the Federal Security Agency about the impact on schools and hospitals and a yet undesignated bureau about a possible strain on local utilities such as water and sewage systems.

If meanwhile the Defense Department had indeed stepped up production in this locality, the committee would tell HHFA and other operating agencies to get busy and program the necessary facilities. In no way would it concern itself with the actual work of providing housing or the other adjuncts of living called for in the new Defense Housing Bill.

So that the new area designation committee might be close to the defense production picture, its chairman-Ralph Kaul

Francis C. Ward



—was moved over to General Harrison's shop in NPA. Formerly Kaul headed the office of housing and community facilities of the NSRB.

South Carolina is first on the list

Ralph Kaul

By month's end, the new system had put through a plan for suspending Regulation X for a limited number of housing units at the Atomic Energy Commission installations in the Savannah River area of South Carolina and at Paducah, Ky. Although studies indicated that 3,650 additional permanent family units would be required for the personnel of the South Carolina H-bomb plant, it was decided to program only 500 units at this time because of the shortage of community facilities. In other words, the credit curbs would not be lifted for more than this number of units. A little more fortunately situated in respect to schools, water supply and such, Paducah was more generously allowed to set aside Regulation X for 1,000 units.

(Continued on page 17)

How to Catch an Eye



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NEWS

Other gimmicks in the relaxation order were that the housing would have to be held for workers certified by the Atomic Energy Commission and that rents and prices must be in line with income levels. Extension of this limited relief fell considerably short of satisfying those clamoring for a general lifting of the credit restrictions in defense areas. Assurances were given by the federal agencies, however, that other places could be freed from the curbs as soon as a consistent policy could be worked out.

Action to date seemed to indicate that defense housing allotments were going to be doled out more carefully than in World War II. The new school of thought winning out in Washington was obviously proceeding on the theory that one of the biggest mistakes made last time was the helter skelter programming indulged in regardless of the relative needs of the places involved or the ability of local utility and school systems to stand an additional impact.

MILITARY HOUSING SCHEMES proposed to replace the Wherry program and send houses to Europe

Faced with insufficient housing for the families of its married non-coms and commissioned officers, the Department of Defense is scrounging around for a way to get it built. Congress has resolutely refused to provide funds for the direct construction of this type of housing by the military services themselves. Reason: The Appropriations Committee of the House has concluded after repeated investigations that it costs entirely too much. A somewhat grudging exception is made in Alaska and other far off bases where it is difficult to coax in private builders.

To a large extent, both Congress and defense officials have relied on the Wherry Act to house married military personnel. Under this mechanism for gearing private enterprise to the task, FHA insures mortgages on rental housing erected on or adjacent to military posts. As the procedure has been revised, the station commanders designate a local architect to prepare plans and then award the contract to the lowest bidder. The architect is paid out of the proceeds of the mortgage. The builder owns and operates the property.

But for some time the armed services have been dissatisfied with the Wherry Act's results. They complain that the device is not only cumbersome but also largely ineffectual in stimulating housing at the more remote bases. Moreover, it has not produced low enough rents in most cases. Starting with the highest three grades of non-coms and going up to the topmost general, the rental allowances range from \$67.50 to \$150 a month. Wherry Act housing for all three of the services has averaged around \$75 a month. This has made it hard to take care of some of the veteran sergeants whose state of well-being is essential to the building up of an adequate fighting force.

A new housing agency?

So far, 150 Wherry Act projects have been programmed involving a total of 61,797 units. Only 650 units in three projects have been completed, however. To finance the program, Congress gave the FHA \$500 million worth of insurance authority with a provision for making another \$500 million available at the discretion of the President. It is now doubted that this second installment will ever be requested, even if the Atomic Energy Commission is permitted to come under the terms of the act as proposed in the new defense housing bill.

Instead, the Defense Housing Advisory Committee would like to switch to a new plan. In a report to Secretary of Defense Marshall it has proposed a special issue of bonds guaranteed by the government. A housing corporation would be set up to sell the bonds and use the proceeds to finance rental housing projects at military bases. Private builders and architects would be called on to do the work the same as under the Wherry Act. The only difference: the government rather than the builders would own the property (actually under the present program the projects revert to the government after a stipulated time) and the FHA would be squeezed out of the picture. It is argued that under this approach it would be possible to achieve lower rents since the government could borrow the money for much less than the 4% rate charged on FHA rental housing mortgages; also that there would be less difficulty about getting projects built in isolated places.

Houses to Europe

Meanwhile, the Department of Defense has recently been afflicted with another housing headache. Its advisers have pointed out that as more troops are sent to Europe the makeshift device of requisitioning family housing that has been employed in the case of the occupation force in Germany, will no longer suffice. This is hardly the way to win friends and influence people anyway, even in former enemy territory. Various proposals are being considered, ranging from the use of prefabricated units to the construction of permanent quarters of a type that would fit into the long-term rehousing programs of the countries involved and could be used to provide shelter for our foreign friends after the emergency. This last suggestion is considered to be so inherently logical that it probably won't be used.

SCHOOLHOUSE CONSTRUCTION is threatened by materials shortage

With more children enrolled in its schools this year than ever before, the U. S. faced a serious breakdown in its already-delayed classroom building program. This warning came last month from an Atlantic City workshop conference sponsored by the National Citizens Commission for the Public Schools. Said the workshoppers: "School construction is now being slowed by material shortages and is threatened with complete stoppage." To offset any further delays, they suggested that the Federal government set up a building materials priority program since "the schools of America are essential to ideological warfare."

COMMERCIAL BUILDING BAN runs afoul of NPA's contradictory policies

Because it rushed ahead with its permit system for commercial construction before it was ready to receive applications, NPA was slightly embarrassed last month. It had promised to start processing cases by February 15. But, as some of its own counselors had warned, it was far from ready to handle the expected flood of applications. Looking around for a way out, NPA hit upon the idea of inducing the Federal Reserve Board to come to its rescue by superimposing credit controls on top of the construction ban. Somewhat reluctantly, the Federal Reserve went along. It ordered that those planning[®] commercial construction jobs would have to put up at least 50% of the cost in cash.

Obviously, this maneuver would thin down the number of applications and thus relieve the presure on NPA. However, official statements endeavored to gloss over the fact that these two methods of control are completely contradictory. If the objective of the permit system is to give preferential treatment to a commercial construction job that will contribute to the mobilization effort or is particularly important to a com-

(Continued on page 21)

PRATT & LAMBERT PAINT AND VARNISH



ESQUIRE-CORONET BUILDING, BOULDER, COLO. RALPH STOETZEL, Architect, Chicago. HAMMER CONSTRUCTION CO., General Contractors, Boulder, Colo.

ERECTED last September, this new building at Boulder, Colorado, houses Esquire-Coronet's circulation department. Although the headquarters of the Company are in Chicago, the circulation department was transferred to Boulder to increase operating efficiency.

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NFWS

munity, it makes no sense to try to discourage the work by requiring heavy cash payments. Some jobs deemed most essential might be held up by the lack of equity funds. On the other hand, projects less necessary to the defense program could conceivably be in the clear in respect to financing funds.

Last month there was some official willingness to concede that the government was tripping over its own feet in this program. At least the Federal Reserve Board intimated that it would be disposed to grant more favorable credit terms in deserving cases. Meanwhile, it backed down a few notches in its limitations on expenditures for the maintenance and remodeling of office buildings. For large buildings of this type, including hotels, it decided to put the restriction on a square footage basis-not to exceed 25 cents a sq. ft. during a 12month period. For all other buildings, the amount cannot exceed \$5,000 a year.

INDUSTRIAL BUILDING, fed by government's decentralization and tax policies. swells to boom proportions

By last month industrial building was underway at a breakneck pace that surprised almost everybody. February's volume, estimated at \$94 million, was more than twice that of February 1950. Many thought we had built enough plants during the last war (\$25.6 billion worth) to take care of us now. But architectural and engineering offices specializing in industrial work were on 7-day week schedules and already turning down jobs by the dozens. Many a smaller architectural firm, facing a cut-down of work in other building types, was making plans to link up with other smaller firmsand get an organization of a size and shape to take a slice of the booming factory-work.

These were the big reasons why industrial building was moving almost as fast as it had during the early years of World War II:

The Air Force was insisting on at least two suppliers for every contract item. A spectacular example of this policy: Kaiser Frazer's contract to make the Packet or Flying Boxcar, hitherto produced only by Fairchild. The Air Force was bringing the auto industry in long before it had to (there was enough production capacity within the aircraft industry to take care of all current Air Force orders), because it wanted many armament production lines to start moving in many different plants. This would make it easy to step up production sharply and quickly-if the need came. Another part of Air Force policy: suppliers of the same

item should be in widely separated parts of the country. This is considered a necessary security provision in the age of Atomic War. This policy of multi-contracting will probably be carried through by all the military services. Industrial building men think it will mean doubling our plant requirements.

The five-year write-off for tax purposes granted for needed plants is telescoping plant expansion programs (once planned for over the next ten or fifteen years) into the immediate present. Certificates of necessity are being granted on a much wider basis than they were in the similar program of the last war. Manufacturers are getting certificates, not just for direct war production, but for almost any kind of plant contributing to total essential production. Although mobilization boss Charles Wilson is reported to think the 55 to 80% coverage permitted on some nonmilitary plants too high, chances are that these percentages will not be whittled down very much on any plant considered important to our economic health. A fundamental in shaping this policy is the belief of the Administration's economic advisers that gross national product can be pushed from \$279 billion to \$325 billion with maximum production. This means maintaining civilian production at a high level and putting war production on top of that. Many top men in the government believe it is the only way we can support our foreign program without dangerously crippling our economy. They also believe it is possible to push it to a point where we can get along without price and materials control.

As compared with a policy favoring direct government building during the last war, the government this time is drawing private money to the front. Thus the majority of manufacturers are planning new plant facilities more carefully for longrange use after the present emergency. Big architectural and engineering firms report that the great majority of industrial work now on the boards is private work-and that, almost without exception, these plants are being planned for permanent, civilian production. The fact that the plant will be temporarily converted to direct war production is, of course, kept constantly in mind in executing the design. But the basic layout is being planned for long-time use.

Adding some urgency to these basic reasons back of the factory building boom is the fact that many government-built World War II plants were sold without a recovery clause.

PEOPLE

Architect Nat Owings resigned as Chairman of the Chicago Plan Commission. During his three years on the Commission, Owings fought a series of lively running battles with the defenders of the status quo in one of the nation's worst-planned cities. Recently, the Chicago Tribune had been sniping at Owings because Skidmore, Owings & Merrill, had taken on several large projects which required Plan Commission approval. Most Chicagoans believed, however, that the real opposition to Owings came from the railroads who resented his proposals to shift their downtown stations in his redevelopment plan for the Loop (BUILDING, May '49). Architect Owings announced that he is going to Japan for a long stay to join Partner John Merrill on private business.

The California Apparel Institute announced that architecture had become "one of the six leading California industries,' then proceeded to give Welton Becket of Los Angeles a scissors-and-needle medal for being the "industry's" top practitioner in the State.

Major General Pat Hurley, famed wartime envoy to China, turned up in Denver to build little houses. His firm, Artcraft Builders, Inc., announced that it would build 1,200 three-bedroom units to sell for less than \$10,000.



Hurley

Died: Lewis H. Brown, chairman of the board of Johns-Manville Corp., on January 26 at Delray Beach, Fla.

Michigan's Cranbrook Academy Museum announced a memorial exhibition in honor of Architect Eliel Saarinen, late great teacher at the school. It will be held from April 12 to May 6.

In Wichita, a reporter went out to visit Mr. & Mrs. Bill Graham to see how they liked their Dymaxion house after four years. Said Mr. Graham: "I still haven't found a house to beat it." Theirs is the only existing model of the famed aluminum-skinned, onion-shaped prefab designed by Buckminister Fuller (BUILDING, April, '46). The Dymaxion-owning Grahams are (Continued on page 24)

85% OF PROSPECTIVE HOME OWNERS give six reasons why they prefer oak flooring:

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not only satisfied with their house but also with the plot of ground they bought back in 1947 to put it on. Mr. Graham spends most of his time tending to the oil wells he has hit since he moved into his round house.

At Long Island's Levittown, Builder Alfred Levitt had a distinguished visitor who wanted to get some pointers on building big subdivisions. The visitor: Architect Mies van der Rohe who has designed a small house for a proposed development near Chicago. Said Mies to Alfred: "I know already how to build a house. But about money I know nothing. So I come to you to find out how to make these houses real."

RENT RECONTROL proposed despite Los Angeles' case history

In Washington, the Administration continued to play political football with rent control. This time it looked as if Harry Truman's housing advisors were manuvering to recontrol rents for the duration of the new international emergency. The President's emergency powers must be extended by Congress before June 30. There were indications that he will ask the legislators to include rent recontrol in the bill extending these powers. Meanwhile, the Senate Banking & Currency Committee reported favorably on a resolution extending until June 30 the March 31 cut-off date for requests for the continuation of Federal rent control.

Los Angeles lesson

When rent control was lifted in Los Angeles in December, local CIO leaders (who had lead the fight to keep controls) predicted that rents would jump to scandalous proportions. Late last month, the newsnosey *Wall Street Journal* assigned a reporter to find out just what had happened to rents in the nation's fourth largest city.

Rents have indeed gone up, the Journal reported, but the CIO's prediction of hogwild landlord profits had not come true. Rises ranged from 5 up to 15%. However, since most decontrolled apartments are prewar buildings, owners have had to plough back much of their increase for remodeling. Those who didn't found their tenants leaving for postwar apartments or new houses. Builders sold 10,000 houses in normally-slow January - one of the best months they ever had. The overall result of this shift from decontrolled apartments was the first noticeable rise in overall apartment vacancies in many years. Said one landlord to the Journal's reporter: "The increase in vacancies is perfect proof that the Government by keeping rents under control, created artificial scarcities."

BUILDING REVOLUTION devised by MIT researchers for survival

From the attic rooms of MIT's school of architecture in Cambridge, Mass., in late January there emerged a set of building specialists, dazed by learning the magnitude of the dispersal problem, dazed no less by the Buck Rogers future of buildings, sparked not by comics but the need for atom-age survival.

MIT professor Karl W. Deutsch had translated safety from atom attack into terms of transportation, communication. Said he, the metropolis must be dispersed where it now stands. Come catastrophe, no command can prevent rat-like desertion. To deter attack: not shelters but making the results uneconomically meager for the attacker by spreading the target. His prescription: around the metropolis, an empty belt, and ring railroads, highways. Beyond that, widely spaced semi-autonomous communities, connected to the center by an efficient wheel-spoke transportation pattern. Instead of today's central goods storage and services, tomorrow's decentralized storage and services working inward.

But the thinking that really stood the meeting on its head came from "Dymaxion" Buckminster Fuller and his enthusiastic student researchers. To support "autonomous deployment," they had researched drastic reductions in crucial needs such as power, water. Among them: detergents; atomization such as now is used cleaning mud from trucks; vapor compressor distillation producing one gallon by 20 watts input for recirculation; sterilization of waste. In fuel, 20% of energy consumption now used for space heating to be cut by windmills, solar collectors, electricity captured from moisture movement in soil.

Surprise of all, Fuller's own latest "geodesic shelter," with a relationship to present housing comparable to the relation between the airplane and the oxcart. This time, it had to be taken with absolute seriousness. MIT and the Aluminum Co. of Canada were hard at work on it.

BUSIEST MORTGAGE MAKER is Long Island's John Halperin who attributes his \$113 million success to service

The nation's biggest mortgage maker is Long Island's John Halperin. Last year he originated, processed and closed a record volume of 6,663 home loans totaling \$113 million. Reading like a Who's Who of Long Island builders, his roster of (Continued on page 28)



AGC's 1951 president is Glenway W. Maxon, head of Dayton's Maxon Construction Co.



National Production Authority's Frank Creedon promised contractors little relief from materials shortages this year.



Houston Contractor D. A. Harmon (right) chats with Boston Architect William S. Parker during a meeting at which Parker explained the AIA standard contract form. Harmon is retiring head of AGC's Building Contractor's Division.



Delegate John Nicholson of New Bedford, Mass. (left), indulges in shop-talk with Leslie G. Miller of Fond du Lac, Wis.

NEWS



ASSOCIATED GENERAL CONTRACTORS, meeting in Boston, prepare for shift to defense construction. Included in the shift: some tough material shortage problems

Two themes dominated the 32nd annual convention of the Associated General Contractors last month at Boston's Hotel Statler. The first was the obvious one that the nation's heavy-construction builders would have to shift a major part of their activities during the coming year to the mushrooming defense program. The second theme was less obvious—and more troublesome. It was that they would have a tough time getting the materials to do the job.

James Coyne

The 500 delegates were told by government officials that construction volume would probably hit \$25 billion this year (down \$3 billion from last year's record high), provided that materials are available to carry out this schedule. Steel-the backbone of the heavy construction industry --- was being heavily requisitioned by defense and defense-connected industries at the rate of 35% of total annual capacity now, an increase of 20% in less than five months, Frank Creedon, head of NPA's construction division, told the convention. Foundry capacity would be increased from 104.2 million ingot tons to 118 million tons by the middle of 1953. Until that time, Creedon pointed out, no substantial relief was in sight.

Copper problems

More immediately important to most of the delegates, however, was the effect of NPA's M-12 order restricting the use of copper. Speaking from the convention floor after Creedon's talk, H. C. (Chan) Turner, head of the nationally-big Turner Construction Co., warned that the copper order "will delay or end \$5 billion worth of construction" this year. Said he: "I'm wondering whether the construction industry isn't being hamstrung when it doesn't use proportionately as much copper as other industries." John Haynes, head of NPA's building materials branch, retorted that the industry had been allotted 80,000 tons of copper this year, compared with the 130,-000 tons it normally uses. "Proportionately, it is not being hit hard on copper," he pointed out. Despite this assurance, Chan Turner and many another delegate wondered how they were going to put up buildings after the April 1 ban on a long list of important copper products went into effect.

Scared sponsors

Many delegates reported that the overall effect of NPA's materials restrictions and the M-4 order prohibing commercial construction without the NPA approval was to scare off those sponsors of commercial buildings who were not initially determined by the new Federal Reserve Board ruling that they put up at least 50% of the cost of the building. Said H. C. Rawlins of Shreveport: "They don't want to start anything they don't think they can finish."

With a large part of the private market being chipped down by Washington orders and local fears, most AGC members were thinking harder about direct defense construction. There was going to be a lot of it (see p. 21). Maj. General Lewis Pick, boss of the Army Engineers, told the convention that the Air Force and the Army's construction needs had trebled in recent months. These two services alone would require about \$2.4 billion in construction this year.

One hitch in getting this and vital construction finished on time was the threat of shortages on construction equipment. Ralph Left, H. C. Turner, new head of AGC's Building Contractor's Division, tells convention that strict NPA orders may throttle new building construction this Spring. In picture above Boston Contractor John Volpe doodles cost figures with Architect Charles Maginnis during a convention luncheon.

K. Stiles, president of the Construction Industry Manufacturers Association, reported that the steel pinch may force a cutback in equipment. Said he: "A great many manufacturers in our industry are actually faced with a slowdown or a possible shutdown due to insufficient materials. With no organized plan yet operative that would allocate materials to essential industry, it is a mad scramble to get what materials are available and it is impossible to maintain planned production programs." He declared that, with more orders backlogged by the industry than ever before, the solution was a controlled materials plan.

Labor front

One bright spot in the industry was its labor relations. AGC's managing director, H. E. Foreman, reported that "there has been an almost complete absence of stoppages of work caused by jurisdictional disputes" as a result of co-operation between AGC and the construction-trades unions. The wage-price freeze issued in January, however, had introduced new problems in the industry's labor-management pattern. The trouble with the national wage freeze as applied to the construction industry. AGC's labor committee report pointed out, is that it could not be administered fairly because of the temporary nature of employment in the industry. The convention approved a resolution to set up a wage adjustment board for the industry, with representation from labor, management and the public sitting on it. AGC officials pointed out that plans for such a board had been well advanced by the national Wage Stabilization Board before the labor members walked out on it February 16.

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A lightweight, rigid unit, combining acoustical effi-ciency with a durable, smooth surface. Perforations (to within ½" of the back) assure repeated paintability, easy maintenance. Available in a variety of sound-absorbent 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. Perfo-rated with small holes ex-tending almost to the back, this tile provides high acous-tical absorption plus unre-stricted paintability by either brush or spray method.

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SURFACED TILE A cane fibre tile with a flame-resistant surface. This tile meets Slow Burning rating contained in Federal Speci-fications SS-A-118a. It may be washed with any com-monly used solution, satisfac-tory for good quality oil-base paint finishes, without im-pairing its flame-resistant surface characteristics and without loss of sound-ab-sorbing capasity. Repainting with Duo-Tex flame-retard-ing paint will maintain peak efficiency. Supplied in all sizes and thicknesses of reg-ular cane tile.



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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.



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Combines a face of perfo-rated steel with a rigid pad of sound-absorbing Rock Wool to provide excellent with attractive appearance, durability and incombusti-bility. The exposed surface of perforated steel is finished in baked-on enamel. Acou-steel is paintable, washable, cleanable. *Trademarks Rep. U. S. Pat. Off.

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- Made Entirely of Steel... trouble-free operation is assured. Won't stick, warp or sag.
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NEWS

clients lists 117 names, including the incomparable Levitts, for whom he arranged 5,299 permanent loans.

Last month when the 1950 annual report of J. Halperin & Co. was released, many a mortgage man wondered what brings so many big builders to Halperin's sleek, modern offices in Jamaica, Queens. The answer came from Vice President Harry Held of New York City's Bowery Savings Bank which took \$45 million in mortgages from Halperin's builders in 1950. His explanation: "Top-flight service —complete and efficient...."

Halperin's service to clients is indeed extensive and attractive. Drawing on 26 years' experience in the field, he works with architect and builder at the inception of a housing project, advises them on neighborhood trends, rentability, salability and compliance with FHA regulations. He files the builder's application



"Automatic 400" Ceiling Sprinkler "Automatic" Pendant Sprinkler



The development of the "*Untomatic* 400" Ceiling Sprinkler discounts the adage that you can't have beauty and fire protection too. For here is a sprinkler head that is designed to blend perfectly with the appointments of the most tastefully designed interior—finished in bronze or chrome, bright or satin, it projects less than one inch below the ceiling surface. Yet, regardless of its beauty, it's ready, willing and able to automatically extinguish fire whenever called upon to do so.

You'll find the *"latomatic* 400" Ceiling Sprinkler installed in the most distinctively decorated offices, stores, restaurants and public buildings. No longer is it necessary to sacrifice "eye appeal" in order to have fire protection that offers both safety and savings.

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"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA YOUNGSTOWN I, OHIO



DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA for FHA approval (89% of his mortgage volume is FHA insured) and acts as catalytic agent to speed it through the governt agency. After the houses are sold, Halperin does all the bewildering and complicated detail work needed to get FHA, VA and bank approval before the permanent mortgage is written and the buyer takes title to his house. All the paper work, all the checking, all the leg work and all the head-

aches connected with FHA commitments, construction loans and mortgage processing are Halperin's. Says he: "Some of our builders haven't been down to the FHA in three years!"



Other lenders perform roughly the same functions for their builder clients as Halperin does. Few, however, match his speed and organization. With an impressive system of Wheeldex cards and colored folders (each week has its own bright shade), Halperin's lieutenants keep careful watch over every batch of loan applications and commitments going through the office. The smallest delay is spotted immediately and investigated. (One lone green folder remaining on a shelf stands out strikingly when the current week's color is maroon.)

Last year's record housebuilding activity not only boomed Halperin's business, but also the mortgage volume of other members of his fraternity. Based on annual reports released in the last two months, here is a list of the leaders and the extent of their 1950 business (in millions) arranged according to the type of service performed:

Originating placing and closing of Mortgages:

J. Halperin & Co.-\$113

T. J. Bettes & Co., Houston, Tex.—\$81 Eastern Mortgage Service Co., Philadelphia, Pa.—\$50

Dovenmuehle, Inc., Chicago, Ill.-\$40

SERVICING OF MORTGAGES:

T. J. Bettes & Co., Houston, Tex.—\$231 Eastern Mortgage Service Co.—\$180 Stockton, Whatley, Davin & Co.—\$126

STRAIGHT BROKERAGE:

Huntoon Paige & Co., Inc., New York City-\$123 placed.

R.O.W Removable WOOD Windows



Show the woman prospect how R•O•W Windows can be REMOVED for washing or painting both sides indoors by pushing each sash to the left against spring pressure.



Then tell her about the recent window-washing time test that proved an R+O+W Window may be washed, both sides, in 2 minutes as against 6¹/₂ minutes for the ordinary window.

For the name of your nearest distributor and the facts on $R \cdot O \cdot W$'s "Window-Washing Time Test"—fill out the coupon at right.





All R+O+W sash may be removed and painted at one time and in one location. Sash may be covered and stored away from frames to reduce breakage costs. Removable sash reduce reglazing and other maintenance expenses.



Free Paint Lock in this Amazing Way: Press exposed metal sash channels (at left) and sash in against spring pressure, paint lock is broken. A whole house takes just a few seconds.

R.O.W SALES COMPANY 1327 Academy—Ferndale 20, Michig Yes, at no obligation, please send m plete information and the name of t distributor.	gan te com- he nearest R+O+W
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Four factors determine the insulating value actually delivered

FOR MANY YEARS, the insulating value of a material has been based on the BTU rating. Such a test, made in a laboratory under perfect conditions of temperature and humidity, can hardly tell the whole story of what actually happens in the finished house.

When you select insulating material, you also need to know how much water the material will absorb—and how long it will take the water to penetrate through the board. As a fourth factor you also should know whether air will pass through the material in any appreciable quantity.

To determine the meaning of *true insulating value*, we invite you to study the chart at the right. Homasote's leadership is clearly indicated.

To give your client *real comfort*, important fuel savings, lasting freedom from drafts and mildew—and maximum structural strength *without corner bracing*—always specify *weatherproof* Homasote.

HOMASOTE COMPANY, Trenton 3, N. J.





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ITEM	DESCRIPTION	AVERAGE 11 BOARDS		HOMASOTE	
		B.A.	A.A.	B.A.	A.A.
No. 1	BTU	.356	1.1.8.1.5	.43	
No. 2	By vol2 hrs.	6.2	44.45	4.1	4.0
No. 3	Hours	15.09	5.24	47.0	45.0
No. 4	cm²/sec./m²	1095.0	1323.0	30.0	48.0

THIS CHART shows how Homasote compares with the average of 11 other boards on: (1) BTU rating—the lower the better; (2) water absorption—the less the better; (3) time of water penetration through the board—the longer the better; (4) rate of air flow through the board—the lower the better. All figures are from tests made by an undisputed, *independent* bureau of standards . . . These figures show why Homasote envelops a home in a material that gives the owner the nearestto-perfect combination for true insulation.



Nova Sales Co.—a wholly-owned Homasote subsidiary—distributes the Nova Roller Door, Nova-I. P. C Waterproofing Products, the Nova Shingle and Nova-Speed Shingling Clip and the Nova Loc-Nail. Write for literature.





Effective, long-range rust control must start in the plans and specifi-cations for any structure — particu-larly when iron and steel are impor-tant structural materials. Architects and builders find that RUST-OLEUM offers excellent protection — particu-larly in hidden or inaccessible areas where damaging rust conditions can bread unchecked breed unchecked.

It's particularly essential to safeguard the strength and usefulness of structural columns and beams, metal deck ceilings, crawl spaces and many other details of construction. These are readily damaged over the years where fumes, manufacturing processes and condensation due to limited ventilation cause serious rust damage that may threaten the safety and life of the entire structure.

RUST-OLEUM'S capacity to stop rust has been proved in industrial applications for many nationally-known companies, and leading railroads

for the past 25 Its tough, years. pliable, rust inhibiting film resists the basic causes of rust - dampness, brine, salt air, and general weather-ing-indoors and outdoors.

Discuss effective rust control with your clients. To solve your rust-inconstruction RUST-OLEUM. Specify RUST-OLEUM as the primary or shop coat on all steel, metal sash, structural beams and bar-joists, fire escapes, etc. Your clients will readily recognize that future protection of sealed-in steel begins with the primer coat.

We're ready at all times to consult with you on rust problems and offer specific recommendations. See the complete RUST-OLEUM catalog in Sweet's Architectural File, or write for a copy. Industrial Distributors in principal cities of the United States and Canada carry large stocks of RUST-OLEUM for immediate delivery.

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Steps are Lighter ... Doys one Bright

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Years of trouble-free service at extremely low maintenance cost make this plasticasbestos tile a favorite for school floors.

Proper investment of public money is a heavy responsibility. So people connected with the construction and operation of schools turn to Flexachrome* floors.

This plastic-asbestos flooring material is a "natural" here. It's rugged . . . really rugged. Years and years of students' scuffling feet scarcely leave a sign of wear.

And, it's so easy to keep Flexachrome floors at their best. All it takes is sweeping, to remove loose dirt . . . periodic washing . . : water-waxing, if desired.

When it comes to beauty, Flexachrome colors are unsurpassed. 33 brilliant colors . . . true colors, from sparkling white to rich, glossy black.

In short, Flexachrome gives you color to enhance any decorative scheme.

And, Flexachrome's wide range of sizes combine to give you almost unlimited design versatility.

It's resistant, too . . . highly resistant to acids and alkalis . . . and completely greaseproof.

This means you'll want floors of this vinyl plasticasbestos composition tile in Home Economics departments, cafeterias, industrial arts shops . . . even in science classrooms and laboratories.

A letter will bring you specifications, product data and samples, together with a description of our free design counsel and floor layout service.

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Another York-Sized Job

World's first fully air conditioned skyscraper apartment houses

Philadelphia's ultra modern cliff dwellings-

the 25-story Rittenhouse Claridge and 20-story Rittenhouse Savoy reach new highs in 100% air conditioned multiple housing.

As so often happens

when York helps out on the tall, tough jobs in air conditioning, the architects and engineers are missing many a headache.

RENDERINGS BY SAMUEL I. OSHIVER



York Fan Window Unit. "Open" view shows Tri-motor Impeller.



Sponsor: Matthew H. McCloskey, Jr. and Kevy K. Kaiserman Architect: Oshiver, Knopf and Fieldstein

Consulting Engineer: Leslie S. Tarleton Builder: McCloskey & Co.

Mechanical Contractor: Ambrose-Augusterfer Corp.

York's years-ahead techniques

are effecting installation and operating economies . . . and making each tenant a weather czar in his own domain, not the dependent of a fixed and centralized air supply.

York's new Fan Window Unit

above, gives each room its own onthe-spot weather laboratory. Individually equipped to take in fresh air and circulate it—curried and cleaned to mountaintop freshnessat any rate of supply the dweller desires. Filters recirculated air . . . another York plus over centralizedair-system units.

The only central supply system

is water, chilled for cooling and dehumidifying in summer and warmed for winter heating, piped to the Fan Window Units.

With no bulky air ducts

to honeycomb the building-with no air handling equipment to eat up engine room space—the structural, architectural and economic advantages are very obvious.

UNLOAD THE HEADACHES AND DETAIL

of your air conditioning problems. Come to York... where the science came of age—where the important advances are pioneered. Protect your clients with the York Certified Maintenance Plan. Check your York consultant—see classified directory. Or write York Corporation, York, Pa.





Headquarters for - Refrigeration and Air Conditioning
DEPENDABLE



RUGGED



ECONOMICAL



Von Buprin Type x devices

Where the exit calls for an extra measure of dependability, ruggedness and exterior styling, combined with economical cost, look to Von Duprin "Type X" Exit Devices.

Type X is a high grade, vertical rod standard line, constructed entirely of bronze, with a number of superior features unusual in this class. Consider: crossbar and lever arm unit operating on $\frac{1}{2}$ "floating axles, dogging features at both ends of crossbar, independently operating top and bot-

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FIRE AND PANIC

EXIT

DEVICES

tom pullman latches. For extra strength and life, all latches, rod guides, interior cams and lever arms are *drop-forged*.

Get the full facts on Type X from your Von Duprin "Exit Engineer." The full range of models and functions assures the right combination for your requirements. And for rim-type operation, there is the companion line, "A Regular." Ask your builders hardware consultant, or, for the name of your "Exit Engineer," write:

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SAFE WAY OUT!

SIMPLICITY AND STRENGTH IN STYLING DISTINGUISH THIS NEW KAWNEER STOCK SASH



KAWNEER RESILIENT-GRIP CONSTRUCTION INSURES RELIABILITY AND SAFETY

All the functional dignity of contemporary design is embodied in this handsomely-styled new Kawneer Stock Sash.

Its simplicity and clean planes reflect the rugged strength inherent in the sash itself.

Incorporated in this new assembly is the famous resilient-grip principle which is unequaled in structural soundness. Steel springclips minimize breakage due to normal structural settling, high winds, or hard blows. For complete details, write The Kawneer Company, Department MB-62, 1105 North Front Street, Niles, Michigan or Department MB-62, 930 Dwight Way, Berkeley, California.



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*So quiet, Typhoon is the favorite of theatre owners everywhere.



Write for literature and name of nearest dealer.

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All-copper condenser and coils...dual control grille...over-size components...sloping coil design for superior dehumidifying action.

LETTERS

FROM THE PRIZE WINNERS

BUILDING:

Thank you for the wonderful news that my entry won first place in the NAHB-FORUM House Design Competition. I can't tell you how much this award means to me.

> BRUCE M. WALKER Cambridge, Mass.

BUILDING:

Thank you sincerely for the honor.... Words cannot express my happiness.

WALLACE S. STEELE Minneapolis, Minn.

BUILDING:

I congratulate you on the wonderful manner in which you ran the competition.

> GEORGE MATSUMOTO, Asst. Prof. School of Design North Carolina State College Raleigh, N. C.

BUILDING:

The sponsors justly deserve the highest praise heaped upon them for the spirit of their undertaking and their intelligent program. It does my heart good to see such great effort extended to this field of design which has been deserted for so long. . . .

> W. ROWE SMITH, Designer Provo, Utah

BUILDING:

My sincere thanks. This has been a very exciting competition, and I am sure its influence will be felt by the housebuilding industry for a long time to come. . . .

> SANFORD H. WACHTEL, Architect New York, N. Y.

BUILDING:

... Extremely pleased to be so honored.... JACK O. BOYTE Atlanta, Ga.

BUILDING:

. . . A pleasant surprise. . . .

ROLAND H. LANE Anchorage, Alaska

BUILDING: Very happy. . . .

ROBERT SAWYER Raleigh, N. C.

BUILDING:

. . . Extremely pleased. . . . SEYMOUR R. JOSEPH, Architect New York, N. Y.

BUILDING:

Thank you for our award and for making possible this competition. It has brought us close to the problems of the small home builder. And we hope it has indicated to the building industry that architects and landscape architects are aware of its dilemma. Because the small (Continued on page 38)

To Save Both Time and Money Specify SUPERIOR UNIT WOOD WINDOWS



BILT-WELL weatherstrip assures easy sliding the year 'round. Swelling or shrinking will not affect the smooth weather-tight aperation.



Superior Windows Are Distributed Throughout the 37 Eastern States by Reliable Building Material Dealers

CARR, ADAMS & COLLIER COMPANY, Dubuque, Iowa

Manufacturers of the

Famous Bilt-Well Line • Mantels & Telephone Cabinets • Multiple-Use & Linen Cabinets • Stair Parts • Nu-Style Cabinets • Superior Unit Wood Windows • Exterior & Interior Doors • Entrances • Shutters • Clos-tite Casements • 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

Superior Windows offer tremendous advantages in reducing building costs and in lowering maintenance expense.

Superior Patented Weatherstrip . . . this is a completely weatherstripped unit. The exclusive jamb-liner equalizes all dimensional variations in the window and provides a weathertight, snug fit at all times.

Superior Windows Are Counterbalanced . . . overhead spring balances, guaranteed for the life of the building, insure easy, smooth sliding windows.

Superiors Are Built To Last . . . made of kiln-dried Ponderosa Pine with 11/8" thick jambs and 13/4" thick sills, all of which is chemically treated with a *toxic, water-repellent preservative to insure excellent stability.

Superior Windows Are Ideal . . . the sash can be installed and removed while plastering and painting (during construction prior to setting "inside stops") without damaging the weatherstrip.

*Approved by NWMA





Warmth and Lasting Beauty of Parkay Hardwood Floors Within Reach of Every Building Budget



Give them floors that they can point to with pride-today or twenty years from now. Specify Parkay-the only genuine hardwood flooring in 3/16" thickness. It saves material without sacrificing wearing surface-permits use with other resilient

floor materials without changing floor levels.

Parkay comes to the job ready-finished—an important time-and-money-saving feature. It is applied quickly with special Parkay Adhesive over any sound subsurface-cement or wood. Final result-beautiful, enduring hardwood floors that cost little or no more than ordinary strip finished on the job.

Parkay flooring made of choice American Oak, is offered in two styles—9" x 9" Tiles and 9"-wide Broadboard in random lengths. Both styles may be used for attractive wall paneling. Also available—Parkay Haddon Hall Pattern (basketweave) Flooring. For complete details see Sweet's Architectural File or write direct for free literature and sample. Parkay, Incorporated, Louisville 9, Ky.



LETTERS

house and its relationship in a neighborhood gives form to our society and landscape it is the largest opportunity for the planner and builder to contribute to American democracy.

> ROBERT L. MACKINTOSH RICHARD H. WHEELER Cambridge, Mass.

BUILDING:

. . . One of the finest contests ever held. Certainly it presented a realistic problem, and I'm glad there were so many taking part. . . . Incidentally, the change in the name of your magazine was certainly timely, and I'm sure the magazine will continue to be the outstanding publication in the field.

> RICHARD B. POLLMAN, President Pollman Construction Co. Detroit, Mich.

BUILDING:

. . . The results of this competition should prove to both architects and builders how vital they are not only to building, but as members of a great team to each other.

Rarely has it been my pleasure to share in a day so filled with enjoyment as was the day the competition awards were presented. The excitement of the awards, the thrill and appreciation of seeing the Walkers' glory in this wonderful milestone of theirs, the opportunity of meeting people who are so compatible in thought and spirit, the challenge of the ideas presented, and the party sponsored by BUILDING, all were part of this experience. . . .

I again compliment you and all connected with this great effort. For myself and all others who shared in the fruits of this competition, I extend a hope for the coming years of peace and great strides in building.

> SOL N. GELLMAN, Industrial Designer Milwaukee, Wis.

BUILDING:

My appreciation to NAHB and THE MAGAZINE OF BUILDING for sponsoring and promoting the excellent Builder's House Design Competition and for inspiring students like myself to do what small part they may in contributing to better building, better business and better living.

As an award winner, I wish to commend the presentation and panel discussion of entries, as well as the party for the winners afterward. As an observer and listener, I feel also that other comments are due.

From the first announcement, I have firmly believed that the basic purpose of fostering a closer relation between builders and architects is a sound and noble one. The interest shown in the competition and the large number of excellent entries prove that the objective is of national importance. The contemporary character of the winning designs, their obvious clarity of plan and studied livability, with fitting elevations and orientation, set a new concept of a builder's house, the concept toward which we all were striving. Outwardly, the competition (Continued on page 42)



Trend In Home Heating Is to Zone Control

With the accent on freer living and the rambling house, zone control of heating has now become recognized as the most practical way to meet the varying temperature needs of different "areas" in the home. In the house above, for example, Architect David Searcy Barrow found the best plan was to set up separate zones for the living-dining area, the sleeping area and the utility area. And with a Honeywell thermostat strategically located in each of the three zones, the whole house can be kept at the right temperature -in any kind of weather.



University of Illinois Research and Educational Hospitals

When the University of Illinois' new research hospital is completed on the school's medical campus in Chicago sometime this year, it will be equipped with medical science's latest and best instruments for probing the un-

Holabird & Root & Burgee, Architects and Engineers, Chicago

known. And playing an important part in helping to advance medical science will be Honeywell controls-controlling humidity, and furnishing each room with individual temperature control.

E. P. Heckel and Associates, Special Consulting Engineers, Chicago





414 New Apartments - All With **Personalized Heating Control**

The Algonquin Apartments-made up of six of the country's finest functionally designed buildings - will be completed sometime this year on Chicago's South Side. Each of the buildings will have 69 apartments-and each apartment will be equipped with Honeywell personalized heating controls. And to make sure of economical, trouble-free performance, the heating plant in each building will be controlled by a Honeywell Aquastat system.

Associated Architects: Pace Associates, Chicago Ludwig Mies van der Rohe, Chicago Herbert S. Greenwald,

For additional information on any of the installations or products in this report, call

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coupon below and mail it to us today. MINNEAPOLIS-HONEYWELL REGULATOR CO. Dept. MB-3-23, Minneapolis 8, Minnesota Gentlemen: Please send me further information on Electronic air conditioning control. Midget Radiator Valve. PHC for apartments. Zone control for homes. Hospital heating and air conditioning controls. Name Firm Name Address. City.

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Zone

IN THE RECREATION ROOM

To complete the comfort facilities in the recreation area and to relieve the "traffic" pressure on master bathrooms, self-contained leakproof Weisway Cabinet Showers are available in models especially designed and priced to make extra bath facilities possible even with limited building budgets.

Weisways are economical of space, too,—a three-foot square, or even less, is enough. They are readily installed in old or new homes without special treatment of building walls or floor. Don't confuse Weisways with ordinary "shower stalls." Weisways are quality fixtures, proved by years of service in finest homes.



More Bath Facilities with Weistony CABINET SHOWERS In Homes of Every Price



HENRY WEIS MFG. CO., INC. 3 O 2 Weisway Bldg., Elkhart, Indiana Please send your new catalog of the complete line of Weisway Cabinet Showers.

City	State
Address	
Firm name	
Individual	

Vitreous Porcelain FLOOR AND WALLS

The famous Weisway VP models combine the advantages of guaranteed leakproof construction, unaffected by settling or shrinkage of surrounding materials, with vitreous porcelain enamel walls and the exclusive Foot-Grip, No-Slip floor of vitreous porcelain on heavy enameling iron. No metal underpan is required, no messy mastic needed for installation. Weisway in-a-wall models are available for built-in shower installations.

Weisways are offered in a range of models and in five beautiful colors, in addition to white, to meet a wide variety of planning ideas and requirements.

Get this NEW CATALOG

Contains detailed information and specifications on the complete Weisway line, including samples of the five sparkling colors in which Weisways are now available. This new catalog should be in your files-mail coupon or write for it now!

LETTERS

was a great success. Inwardly, I must confess to serious doubt.

After the initial hurrahs had subsided, I made a point of spending several hours in the exhibition hall—where delegates to the NAHB convention were inspecting the displayed designs—in order to listen to comment (discreetly, I hope) and try to determine what the general feeling was. The outspoken reactions were varied, but usually disappointing. Many of the ladies were quick to grasp the livability of the plans and were even intrigued with the contemporary aspects and economical possibilities. Certain progressive builders who are keeping up with the times were pleased with the top awards and spoke of minor adaptations to varied locales.

Others balked like mules. Two prosperous looking gentlemen went so far as to loudly degrade the whole movement and to threaten to write organized protests over the "waste of money" on awards that had used large glass areas "not like *any* shown by the product exhibitors!" I had imagined that demand might boost manufacturers to change some out-dated models and products for better ones and newer ideas—but perhaps we are stuck with the old until many people awaken from "construction cost comas."

The Tracing Paper Cribber's Collaborative also appeared to make hurried phantom tracings approximating some of the winners—plans losing the basic design subtleties and finesse of the originals by their slip-shod type of focus. With these were the remarks of having draftsmen do "more appealling" elevations by pouring over the plans the *soup du jour* of ornamental iron and shutters or flagrant changes toward the fricassee facade. Then came the last-minute scrawl of the designer's name, the use of which in conjunction with these "adaptations" would make it all legitimate and whitewash the indelible bar sinister.

At this point I left, discouraged and not a little confused. The challenge had been met with capability and enthusiasm, but without the closest care and culture, even the seed planted by the competition might die before it blooms, or else materialize as another weed to blight the land.

Here's hoping that THE MAGAZINE OF BUILD-ING will water the seed as best it can, for I've no doubt that it alone can continue to promote what it has chosen to foster.

> MARK LOWREY New Orleans, La.

FAIR HARVARD

BUILDING:

I have been analyzing the results of the recent competition which has given our School of Architecture in Harvard such an unusual boost. I give you below the details, as you may not know many of the names of our boys who won prizes.

Of 2,727 competitors 16 Harvard men-two staff members and 14 present or recent stu-(Continued on page 44)



ALL-AMERICAN COUNTER-TOP SINK. One-piece construction of porcelain enameled cast iron—in white and eight Crane colors. Two 8-inch deep basins, 17" x 15½". Four-inch high back. Chromium-plated trim includes Dial-ese controls, swinging mixing spout, retractable hose spray. Overall size: 38" x 22". Consult your Crane Branch or Crane Wholesaler.

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LETTERS

dents of the Harvard School of Architecturewon over 50% of the total national and regional prizes, namely \$16,750 out of \$33,000.

I am proud of this result, the more so as all these are men who have gone through our curriculum during recent years.

3413

WALTER GROPIUS, Chairman Department of Architecture Harvard University Cambridge, Mass.

• For winning the team prize, congratulations to Harvard's 16 and its justifiably proud captain.—ED.

FLLW

BUILDING:

My humble compliments on the Frank Lloyd Wright take-out. It is an eloquent report on the old master and a very good look indeed at the pause-giving perception of his mind.

His sense of *place* as opposed to mere structure is a philosophical idea with great appeal for those Americans who think they can identify the rising spectre of intellectual nomadism peering around the corners of the juke box.

But one further thing I would like to see your magazine penetrate: How is it *really* to live and to work in these *places?* Since they must have been built by thoughtful people, there should be a few among them who can be interesting and articulate about the change Wright wrought in their lives.

FRANCIS BRENNAN New York, N. Y.

BUILDING:

... I never was and am not now interested in Frank Lloyd Wright's work and ideals and egoism.

MYRON S. TELLER, Architect Kingston, N. Y.

BUILDING:

Your January issue containing Frank Lloyd Wright's recent work is a commendable effort and much in keeping with the previous issues devoted to the same field. . . .

Since the emphasis in your magazine seems to be shifting from theory to practice—at least it is so indicated by the gradual resolution of its title—why not cut off the dog's tail in one fell swoop? Right now it is difficult to decide whether our bound copies should bear the name ARCHITECTURAL FORUM; ARCHITECTURAL FORUM THE MAGAZINE OF BUILDING; THE MAGAZINE OF BUILDING; or just plain BUILDING. After all, TIME and LIFE seem to get by very well with their terse titles.

> JOSEPH S. ELFNER Department of Horticulture University of Wisconsin Madison, Wis.

• It's the Magazine of Building .- ED.

BELLUSCHI'S ZION CHURCH

BUILDING:

The January issue of BUILDING has a feature (Continued on page 48)

Admiral THE

SHOWER CABINET WITH A

VITREOUS PORCELAIN ENAMEL INTERIOR

The smooth, glass hard, vitreous porcelain interior surfaces of the Admiral Shower provide the ultimate in cleanliness and sanitation, they remain white and impervious to wear for a lifetime. Exterior of side and back panels are regularly finished with vitreous porcelain enamel ground coat, but can be furnished to match interior at small extra cost. Front stiles and head rail, bonderized, galvanized steel finished in white synthetic baked-on enamel. Receptor, deep type terrazzo made of black and white marble chips and white cement. Sizes 36" x 36" x 80" and 40" x 40" x 80". Illustration shows this shower equipped with a Fiat Dolphin heavily chromium plated glass door. The Admiral shower is suitable for high grade residential and institution installations.

> Complete specifications in Sweets' Architectural Catalog File, or write any of the three Fiat plants for catalog.

FIAT METAL MANUFACTURING CO.

Three complete plants 9301 Belmont Ave., Franklin Park, III. Los Angeles 33, Calif. Long Island City 1, N. Y. Canada—Fiat showers are made by Porcelain and Metal Products, Ltd., Orillia, Ontario





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WINDOW?" WHAT IS IMPORTANT IN

containing detailed report on air infiltration test by Pittsburgh Testing Laboratory, to Dept. AF-3.

Write for detail file on Ludman Windotite glass louvered windows and doors.

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New "Safety-Sealed" Gas-Heating Unit needs NO chimney, NO ducts NO electricity!



Brings zone-controlled heat to a single room, suite of rooms or an entire building!

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LETTERS

story of the new Zion Lutheran Church of Portland, Ore.

The members of Zion are proud of this national recognition of their fine new building. It was a distinct thrill to work with Pietro Belluschi in planning and completing this building of contemporary design which has resulted in so much favorable publicity. . . .

Distinguished visitors continue to frequent the building and express their admiration of the worshipful atmosphere achieved. . . .

The members of Zion wish to congratulate your magazine for its fine coverage.

PAUL KOPPELMAN Portland, Ore.

BUILDING:

As pastor of the Zion Lutheran Church of Portland, Ore., permit me to express the appreciation of the members for the favorable comment their church received. They hope that through the erection of this church they have not only provided themselves and others with a beautiful place of worship, but that the architectural design employed will show others the way to achievement of emotional fulfillment without copying the externals of past architectures. Your article will further this ideal.

> REV. ALWIN L. RUBIN Portland, Ore.

FRANKLY ...

BUILDING:

Your magazine stinks!

RICHARD B. THOMAS, Architect New York, N. Y.

BUILDING:

... We are delighted with the continuing excellent quality of your magazine and the numerous feature articles on the great men in architecture.

You are producing a "great magazine."

VICTORINE & SAMUEL HOMSEY, Architects Wilmington, Del.

ARCHITECT SUGGESTIONS

BUILDING:

I am substantially in favor of the new "rapprochement" between architects and builders. . . . Furthermore, I respect the interest and activity your magazine has shown toward this end. However, I feel that the article entitled *Twelve Architect Suggestions for the Merchant Builder* in your January issue will not help the situation but may hurt it.

Some of the ideas are neither new nor specifically "architect suggestions"; some of them are not applicable to houses built *en masse;* and some of them are crackpot, appealing only to limited special customers (or clients)....

It is nonsense to claim that Levitts' overhangs to omit gutters, high windows, big windows, or open plan can be particularly attributed to (Continued on page 52)



"In the dining area we have louvered Wakefield Grenadier fluorescent fixtures giving a high level of light. The lighting and colors combine to give employees a psychological lift when they visit their cafeteria for lunch, or during the morning and afternoon rest periods. It's a real fatigue tonic.

We've also found that good lighting facilitates cleaning, encourages neatness and shows-off the resulting cleanliness of our cafeteria."

SCOTT & FETZER COMPANY

Lighting an Employees' Cafeteria to give the employees a psychological lift with the *Wakefield* Grenadier

In feeding and traffic areas where lighting is a stimulus to action, the Wakefield Grenadier is highly efficient. It is a louvered fluorescent unit, well shielded, with a direct-indirect component that adds sparkle to food and merchandise and expedites movement. It is recommended for stores, eating places and particularly for school and college cafeterias and corridors.



Available for two or four bi-pin or Slimline lamps. May be installed in continuous rows. Metal-framed side panels become a luminous white when lamps are lit. All reflecting surfaces turned downward so they collect a minimum of dust. Available with single or double spotlight assembly. Write for catalog showing complete Wakefield line of fluorescent and incandescent fixtures.

THE F. W. WAKEFILD BRASS COMPANY, VERMILION, OHIO



Four examples of the use of Pittsburgh Glass by contemporary architects



MORE AND MORE, the country's leading architects are "designing with Carrara Glass." Here is a high quality, finely-machined, easily handled product, with joints that are true and even. In this bathroom, Carrara Glass has been effectively used for the walls and ceiling, as well as for the unusual doublelavatory counter top. (At right) THE NEW COPA CITY theatre and restaurant at Miami Beach, Florida, is an outstanding architectural creation. It was natural that Pittsburgh Products should be chosen for this splendid building. Extensively used are Pittsburgh Polished Plate Glass, Herculite Doors, Door Frames, Mirrors and Pitto De Luxe Metal. Designer: Norman Bel Geddes, New York City; Architect: Norman Giller, Miami Beach, Florida.

(Below) HERE IS A DETAIL of one of the five stores located in the lobby of Copa City. Note the use of flat panels of Pittsburgh Plate Glass in the semi-circular display windows.





TWINDOW, Pittsburgh's window with built-in insulation, permits new latitude in window design. Without sacrificing heating or air-conditioning economy, it makes it possible to gain all the important advantages offered by large windows. Architect: Edward T. Wassell, Wilkes-Barre, Pa.

TWO OR MORE PANES of Pittsburgh Polished Plate Glass, with a sealed-in air space between them make up a Twindow unit. When using two panes, Twindow provides almost twice the insulating effectiveness of single-glazed windows. Even better insulation results when three or more panes of glass are used. Forty-seven standard picture window sizes are available for either wood or steel sash.





Your Sweet's Catalog File Contains a complete listing and descriptions of Pittsburgh Plate Glass Company products. PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

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"Hygrol" Absorbent Liquid Dehumidifies Fresh Air Without Refrigeration

NIAGARA Air Conditioners or Dehumidifiers using "Hygrol" liquid absorbent give precise control of air temperature and humidity...at lower operating cost, with large savings in space and with smaller and less expensive equipment, in many applications.

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Investigate this new Niagara Method for "comfort" air conditioning as well as to protect quality in hygroscopic material, or processes or instruments, or to prevent condensation damage to metals, parts or products.



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LETTERS

"architects," either specifically or generally. All these items, in one form or another, have been the property of the industry as a whole for years. . . .

The mirror trick was old when Louis XIV was just a gleam, and the "new" uses are not essentially different. . . .

As for the vanishing dining room, you win on this one. Yeon's solution is brilliant and can certainly inspire some functional solutions for builders.

The eating bar is good enough, but old hat. I did one in Oregon in '39, and it wasn't original then. . . .

The folding kitchen is a good idea but not adaptable to general middle-class family living where the kitchen is more or less in use more or less all day. It would never be folded.

The outdoor room—Twitchell & Rudolph are my favorite house architects—for Florida. Their ideas are strictly for local consumption and usually cost lots of money.

The reflecting pool is an attractive gadget. I think I'll put one in at my own place. But imagine 5,000 or 1,000 or even 200 identical or similar houses with identical or similar lily ponds.

The chimneyless fireplace—the Franklin stove numbers don't answer the description, as they are really stoves connected to bonafide chimneys. We used one of Koch's and I believe it works all right. (Why shouldn't it?). But all the others are strictly individual solutions of dubious decorative value, and would be prohibited by codes in many localities.

Raised fireplaces, I grant, have some advantages but I doubt that either sales or livability would be noticeably improved by builders using this type. Certainly, in small houses the raised outer hearth should be omitted, as it tends to reduce floor space.

> GERSON T. HIRSCH, Architect New York, N. Y.

P. S. Regarding Belluschi's fine and intelligently designed church in the same issue, you state that the freestanding laminated wood arches support the entire roof. However, the interior photos show a heavy member running from each truss to each side wall, this member in turn supporting a purlin carrying roof planks, the other ends of which also rest on side wall plates. By inspection about $\frac{1}{3}$ of the weight of the roof load, therefore, rests on the walls. However, it does appear that all *thrust* is taken by the arches.

CODES VS. PROGRESS

BUILDING:

I was greatly pleased to read your article on The Codes versus Progress in the December 1950 issue. This common-sense approach to building codes is a major evolutionary step in American architecture.

While the article is excellent, I call to your (Continued on page 56)

DUNHAM

Cuts fuel costs up to 40%





provides precision temperature control for every type-every size-building

No matter how frequently or rapidly outside weather conditions change, Dunham Vari-Vac* Differential Heating instantly compensates for these variations—and delivers the precise amount of steam needed to assure maximum comfort.

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Heat supply and demand perfectly balanced.



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Some codes already permit greater bonding stresses and the elimination of hooks when A305 bars are used. Similar changes in the ACI Building Code are

awaiting final approval. You'll find it pays to specify improved A305 reinforcing bars on your next job. When indicating the size, use the new number designation. A new bar chart covering these designations will be sent upon request.

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Higgins blocks are bonded under terrific heat and pressure with marine-type waterproof glue - impregnated with penetrating varnish sealer of 100% phenolic resin base, and treated with a powerful INCORPORATED IN W ORLEANS BONDED HARDWOOD

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part of block. Precision made to exact 9" x 9" face. Blocks come with final finish.

Ideal for radiant heating. Grooves on back of blocks act as heat conductors, assuring uniform heat with practically no increase in water temperature. Easy to install direct on any type subflooring. Can be blind-nailed or laid in adhesive. You can specify Higgins Flooring with confidence, wherever a flooring of rich beauty and permanence is desired.

ENTIRE SUBDIVISION SOLD OUT IN 6 WEEKS!



Like the way this "Modernfold" folding wall either creates an extra bedroom or expands the living room? Schleicher's customers did. 90% insisted on this optional feature!

"Modernfold" Doors Big Factor in Success!

If you want to know how to sell houses fast ... listen to what Schleicher's Forsythe Corp., Gary, Ind., builders, say.

6 weeks after our Model Home Opening, we bad sold out our entire subdivision of 125 homes under the \$10,000 class. "Modernfold" doors throughout the house were a vital factor in this success. Buyers were enthusiastic about the beauty and space-saving ability of these accordion-type doors . . . the flexibility offered by the "Modernfold" partition.

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And "Modernfold" doors can actually cost no more than conventional doors because they eliminate trim, painting, hardware. Schleicher's Forsythe Corp. adds the extra thought that "Modernfold" doors saved them additional sales expense because houses sold faster. No wonder builders specify more and more "Modernfold" doors. For full details, look up our installing distributor in your classified telephone book under "doors"...

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Notice in plan how "Modernfold" doors are used in practically every room to save space —space which would be wasted with swinging doors.

Plans for builders are available by contacting Schleicher's Forsythe Corp., Gary, Indiana.



NEW CASTLE PRODUCTS, P.O. BOX 833 NEW CASTLE, INDIANA Gentlemen: Please send me full details on "Modernfold" doors. Name. Address.

City.....State.... In Canada: Modernfold Door Company of Canada, Limited, Montreal.

LETTERS

attention that the sketch on page 116 credited to Erie Enamel Co., shows our patented building section, Armco *Steelox*. This panel is fully covered by several U. S. and foreign patents.

My heartiest congratulations on a job well done in pioneering intelligent solutions to the building code muddle.

> R. BLICKENSDERFER, Manager Building Sales Armco Drainage & Metal Products, Inc. Middletown, Ohio

HIDDEN WIRE

BUILDING:

The article, Subdivision of the Year in the December issue of your magazine, is a most interesting one. . . .

I notice that several electrical fixtures are hung from the ceiling. Since there are no ceiling joists, how is the BX cable concealed?

> FRANKLIN E. NEUMANN Westport, Conn.

• The local building code permitted use of conduit in the insulation layer of the built-up roof.—En.

REPORT FROM GERMANY

BUILDING:

Hitler, like all dictators, would not tolerate any contemporary architectural expression in any form. As a net result, Germany, generally speaking, is facing a very serious problem since young Hitlerian-educated architects are just now coming into their own. Since they might have been the world's architectural leaders under the brilliant inspiration of the Bauhaus movement, it is extremely depressing to look around and see classicism and formalism rearing its ugly posterior again. Those few architects who are valiantly trying to approach architecture from a sensible angle are told without qualification they should go to America to practice because their architecture is too modern and definitely not acceptable to German tastes. Modern architecture and U. S. architecture are synonymous, so it would seem.

> R. F. AREY Captain, U. S. Army Stuttgart, Germany

REPORT FROM HIROSHIMA

BUILDING:

Hiroshima is getting up, but only the two big roads . . . swell Catholic church is under construction. . . . People are building shacks. Yes, we know hurricanes and earthquakes, but Japs are poor and give up everything. Several months ago I heard a noise of riveting of steel skeleton. I haven't heard it for many years. . . . Hiroshima-Peace-Memorial-Park Competition — the first prize design gave us a big question because they used Messrs. Eero and Eliel Saarinens' idea shamelessly—the arch tower. I don't understand why Japs imitate everything so rapidly. Maybe we are now in the Kid Era.

About U. S. housing problem, we Japs cannot (Continued on page 60)



Ceiling, Silencer, Floor or Roof — One Economical Package

It soaks up sound. It's structural material. It's ceiling and subfloor—or ceiling and roof. It's incombustible. You can smack its perforated bottom . . . or paint it . . . without hurting it, or its acoustical efficiency, a bit.

It's the new Fenestra* Acoustical "AD" Building Panel with a sound reduction coefficient of 0.80! Speedily and easily erected, these long-span panels are going into plants, schools, theaters, churches, hospitals, stores all over the country . . . because they save time, labor, materials and money. They're another standardized Fenestra Product engineered to cut the cost of building.

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Size: 6' to 24' long, 16" wide, 3", 41/2", 6" and 71/2" deep. 16 to 13-gage USS Steel.

Elements: Cellular panel.

 $\frac{1}{8}$ " holes, 946 per square foot, in bottom surface. Wire-chair insulation support. 1" thick, 41/4-lb. density glass fibre sound insulation, coated one side. 16gage cover plates for top.

Fenestra has made similar acoustical-structural products for 20 years and is a member of Acoustical Materials Assn.

Send coupon for specifications, load tables, installation details, etc. Or call your Fenestra Representative (listed in yellow pages of phone book).

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age steel 18 USS, alum. 16 B&S. Ex- rior alum. face ribbed or plain.	Standard width 16". Depths 1½" to 7½". Gages 18 to 12.	Address

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Typical uses of penta-treated wood

Wherever wood is used, penta treatment will give it longer life. The following table gives the amount of 5% penta solution in oil that a cubic foot of wood should retain for maximum protection.

	Humidity average to low	Humidity average high	
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Joists and girders	6	8	
Screeds and subflooring	6	8	
Factory flooring	6	8	
Roof plank	6	8	
Platforms and decking	6	8	
Posts and fences	6	8	
Cooling towers		8-10	
Sign material	6	8	
Millwork	6	8	
Highway guardrails	6	8	
Railway cars	6	8	
Bridge timbers	8	10-12	
Utility poles	8	8-10	
Crossarms	6	8	

Note: Higher treatments are recommended where wood is to serve under severe conditions, such as in the tropics. Recommendations will be furnished on request. Industrial construction for mobilization will give longer, more dependable service if you specify the *protection* of Monsanto Penta for the lumber you employ.

Monsanto Penta (pentachlorophenol) protects against termites and other wood-boring insects and controls decay caused by fungi. Treated with properly formulated Monsanto Penta, wood can be painted or varnished.

Write for details on *how to specify* penta treatment for lumber ... for names of companies that can supply material treated with Monsanto Penta ... for firms able to custom-treat your lumber ... for brands of formulations with which you can do your own treating effectively. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

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Tripler General Hospital, U. S. Army Medical Dept., Hawaii — Architects: York and Sawyer, New York City. 11/2" Alberene slip sills.

sills, stools, and trim of ALBERENE stone are

Detail showing $1\frac{1}{2}$ " thick slip sill with $1\frac{1}{4}$ " stool and $2\frac{1}{4}$ " belt course.

Regular Grade Alberene Stone is an ideal material for exterior trim because it can be cut into thin sections, permitting substantial economies. It offers freedom to the designer — by making possible greater reveal, to give just one example.

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Where a darker color is desired, we suggest

Alberene Serpentine. It is a darker gray in rubbed finish, black when honed, and black with a slight greenish cast when polished.

The high chemical resistance of both stones, which has made them favorites for use in laboratory equipment, also makes them ideal for *window stools* in laboratory buildings.

Since there is a decided difference in price between Alberene *Regular Grade* and *Serpentine*, architects' specifications should be carefully worded so as to clearly call for the type desired. Ample supplies of both materials are available.

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IN CANADA—International-Van Kannel revolving doors are available through Eastern Steel Products, Ltd., in Toronto and Montreal.

LETTERS

understand why you need many houses. Repatriations? Demobilizations? Why? They left from their homes; they were not born in Europe. Maybe they carry too many wives and kids from abroad? Or you have a habit to change homes just like you change cars each year? Jap home planning is very hard if wife prefer western style and husband Jap style, or on the contrary case, too. You know, Japs sit down on the floor and you don't. So the partition between Jap and Western room is the question.

Anyway, very glad your magazine is still on.

MASAO SASAKI Osaka, Japan

REFLECTIVE SURFACES

BUILDING:

Your November article on the use of reflective surfaces in Dr. Clarence Mills' Experimental Cooling System states that "These foil wallcoverings function as effective heat 'mirrors' with a reflectivity close to 90% for radiant heat." While this statement is substantially correct, it does not take into account the fact that a substantial amount of heat is transferred from and to the interior wall and ceiling surfaces by convection and conduction. Furthermore, these figures refer only to the conductance of the interior surfaces and not to the over-all heat transmission of the wall or ceiling. For this reason, I think it is misleading to say that "If radiant heat put into a room were held there through use of heat-reflective surfaces, the heating problem could be considerably diminished, saving a great deal of fuel in cold climates." The following sentence could be similarly misunderstood: "And with proper radiation conditions, the air circulating in the room might not have to be heated at all, but could be drawn directly from outside and used at outdoor temperature."

According to the 1950 Heating, Ventilating and Air Conditioning Guide, the surface conductance for still air of a vertical surface having an emissivity of 0.83 is 1.52. Under the same conditions, but with an emissivity of 0.05, the surface conductance is 0.74. Translated into the over-all coefficient of transmission of a standard frame wall consisting of wood siding, building paper, wood sheathing, studding, gypsum lath and plaster, the over-all coefficient of the construction having an inside surface emissivity of 0.83 would be 0.244. With an emissivity of 0.05 which corresponds with that of the average surface covered with aluminum foil, the over-all coefficient of transmission of such a construction would be 0.208. The calculated reduction in the rate of heat transfer through the construction based on these figures is 14.8%.

According to these figures then, the maximum reduction in the rate of heat transmission through the wall under winter conditions would be 14.8% and substantially less than this for the building as a whole when other sources of heat loss are taken into consideration. This seems to be considerably at variance with the statement on p. 130, that the "heat load actu-(Continued on page 64)



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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.

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Smith

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LETTERS

ally required was thus only 38% of the calculated load."

From the present available data it appears that a reflective material used as a wallpaper on interior wall and ceiling surfaces is not an effective means for reducing the heat loss of a building.

> PAUL D. CLOSE Technical Director Wood Fiber Products Simpson Logging Co. Seattle, Wash.

GLASS GABLE ENDS

BUILDING:

Thermopane glass gable ends, examples of which were so interestingly illustrated on pages 114 and 115 of your January issue, have been under discussion here for some time. We have had requests for them but have refused to accept all but a few orders.

The company is very much interested in such cut patterns, but conditions facing us today make it most impractical to give such dimensional Thermopane active consideration at this time. There are, of course, reasons for this.

First of all, the tin situation makes it appear now that we will be forced to sharply reduce production of Thermopane by April, at a time when the backlog of orders for Thermopane is piling higher and higher.

Secondly, the government will not permit us to use our brand new Thermopane plant, which would have enabled us to double our Thermopane capacity.

We would like to fill orders for diagonal cuts of Thermopane and undoubtedly will after the present international situation has leveled off. Such shapes would be rather expensive, perhaps prohibitive in cost in many instances. Eventually, of course, in a large market and with standard cuts I suspect prices would find a reasonable level.

> EARL AIKEN General Sales Promotion Manager Libbey-Owens-Ford Glass Co. Toledo, Ohio

GEOMETRIC CALLISTHENICS

BUILDING:

... A magazine could have no higher goal than to bring together the builders and the professional men who serve them: the architect, the engineer and the *landscape architect*.

I have been patiently waiting for you to recognize the landscape architect as one who can and has made a great contribution to the building industry. However, after seeing your selection of the Subdivision of the Year (Dec. '50), I am convinced that you never heard of the profession. To call such geometric callisthenics "site planning" is to insult the intelligence of the many hundreds of us who have spent the better part of our lives in site planning work.

> MEADE PALMER, Landscape Architect Warrenton, Va.



a high-pressure laminate surface, designed for long life and lasting beauty. Nevamar is not affected by grease, alcohol, fruit acids, ammonia, bleach, ink or similar substances. It will not craze, crack or peel. Nevamar is resistant to cigarette burns and withstands boiling water. Nevamar may be cleaned with soap and water.

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Brand new patterns—over 150 decorator-selected colors and prints to lend enchantment to any room. And here is *lasting* beauty—for Varlar is completely practical, washes like tile, washes like *new* up to 25,000 times! It's the money-saving way to decorate homes, offices, or public buildings ... any walls that require beauty and practical cleaning methods !

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OR FREE	Address
SAMPLE	City

UTILITY ROOM vs. BASEMENT

Market survey reveals growing popularity for the basementless house

The program for the NAHB-FORUM House Design Competition, the results of which are presented elsewhere in this issue, required that all houses be designed without basements. This requirement was based on the hypothesis that the trend in the small house market is away from the basement. Apparently, this theory was sound, for the University of Illinois has since released the results of its survey on consumer preference concerning the basement vs. the ground floor utility room. It concludes that 37 per cent of prospective small house buyers prefer the basementless house with a utility room and that its popularity is steadily growing. The detailed findings of this survey are discussed below by Robert Ferber, Director of Economic and Business Research, University of Illinois, and his colleague, Hugh G. Wales.

How willing are people to accept a utility room as a substitute for a basement? This is a question that is bothering builders and homeowners alike. Although utility rooms are much cheaper to install than basements, many a builder does not do so for fear of difficulty in selling the finished product, and many purchasers balk at houses with utility rooms for fear of low resale value.

Some light is thrown on this question by a survey recently conducted in Champaign-Urbana, Ill. Concerned with people's attitudes toward prefabricated housing, this survey contained the question: "If you purchased a prefab house, would you want a utility room or a basement with the knowledge that a basement would add at least \$600 or \$700 to the cost of the home? Judging by the response to this question, most people still prefer basements to utility rooms, but a surprisingly substantial minority would rather have a utility room. Of the 439 people interviewed, 35 per cent expressed a definite preference for a utility room, as against 59 per cent for a basement. Only 3 per cent had no preference and another 3 per cent were not sure of their attitude or did not answer the question. In other words, of those people who did express some preference, 37 per cent favored a utility room.

Interesting differences in people's attitudes are brought to light when the data are analyzed from the standpoint of more homogeneous population groups. This is especially desirable in the case of this survey because of the local

(Continued on page 72)



starts with a floor of FREMONT RUBBER TILE

Whether your building problem concerns small homes with limited budgets or remodeling, figure the economy values of Fremont Rubber Tile. It's easy to lay, can be installed in any kind of weather without heat and keeps the job on schedule, withstands more abuse than other types of flooring and requires only a minimum of care to stay sparkling new for many years. It's available in many smart decorator colors that add to the resale value of the home. Make the next bath start practical... with FREMONT Rubber Tile.



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ACOUSTICAL MATERIALS

Which installation method? Here are some points you should know about each

T HE method of installation for an acoustical ceiling should be chosen with care. Just as there is a best acoustical material for each job, there is usually a best way for that material to be put up. A wise choice of methods always means a saving in time and money in the long run and results in a more serviceable installation.

The methods are covered here in general order of cost, from lowest to highest.

1. CEMENTING, NAILING, SCREWING

Cementing to plaster

It's very often possible in remodeling work to cement acoustical tile directly to the plaster ceiling. This is the most common of all methods and usually least expensive. The plaster, however, must be in good condition since cementing requires a smooth, solid base surface. Where the ceiling has been painted, a test should be made to see if the adhesive will bond satisfactorily. The recommended test



is to install a single tile, leave it up 48 hours, then remove it. If the paint has not softened, it's safe to cement.

Nailing to wood furring

Where the ceiling surface is rough and uneven, $1'' \ge 3''$ wood furring strips may be used as a base for nailing or screwing the material. The strips should be shimmed so that they are perfectly level. In new construction it is often possible to furr across the joists. Nailing methods have the advantage of a slightly higher absorption efficiency. Building paper is used to avoid "breathing."

Cementing to gypsum lath

If the acoustical material is one that cannot be nailed, such as a mineral wool tile like Armstrong's Travertone, it may be best to install gypsum lath and cement the acoustical tile to it. This not only provides more rigid construction but has the added advantage of acting as a good fire stop.

Screwing to gypsum sheathing

A good method for installing a perforated fiber material like Armstrong's Cushiontone is to apply the material with screws to a base of gypsum sheathing. The use of screws in any installation is one of the most secure methods of attaching a material. Armstrong contractors use a mechanical "screw-jig" to drive the screws rapidly.

Cementing to brown coat plaster

For an acoustical ceiling that is unusually rigid and an excellent fire stop, tiles can be cemented to the brown coat of plaster. This method will also cut down on sound transmission through the ceiling.

2. MECHANICAL SUSPENSION

Adaptable to both old and new construction, mechanical suspension systems do much to eliminate problems of ceiling design. They conceal overhead pipes, air-conditioning ducts, and electrical conduits—bring a clean modern appearance. Mechanically suspended ceilings are often used where old ceilings are too high. They are ideally suited to troffer-type lighting fixtures and the extra space made available above the ceiling simplifies the installation or repair of these concealed fixtures. In addition, over-all lighting in the room is often improved by a lower ceiling with


a. The H-runner system

b. Screwing to gypsum sheathing

c. The metal pan system

good light-reflecting properties. Suspended ceilings usually do a better sound-conditioning job because the absorbent surface of the material is brought closer to the source of sound. In many cases, they make heating systems more efficient by reducing the volume of the room.

Mechanical suspension methods in old construction are likely to be more expensive than most others because of the extra time and materials necessary for each job. In new construction, however, you may save money by eliminating plastering and other finishing. For example, ducts are concealed by the suspended ceiling for appearance.

The H-runner system

There are several good ways to suspend mechanically fiber, mineral wool, and cork acoustical materials, like Armstrong's Cushiontone, Travertone, and Corkoustic. One of the most economical is the "H-runner" system, shown in (a). This system is fast because the materials are attached directly to the supporting members. Acoustical materials must be kerfed and back cut.

Cementing to suspended gypsum lath

Sometimes it's desirable to suspend gypsum lath as a cementing base for the acoustical material. This provides a non-breathing ceiling and a good fire stop. In the case of suspended mineral wool materials, this is probably the most desirable system to use.

Screwing to suspended gypsum sheathing

One of the best methods of suspending a fiber material is by suspending a base of gypsum sheathing, then screwing the material to it, as shown in (b). You have unusually tight construction, a non-breathing ceiling, and a fire stop.

Cementing to dropped plaster ceiling

In about the same cost range as the preceding system is the use of a dropped ceiling of brown coat plaster and cement application of acoustical tile. It provides a solid base, a non-breathing ceiling, and an excellent fire stop and reduces sound transmission.

Metal pan suspension system

The only system that's suitable for the suspension of metal pan materials, such as Armstrong's Arrestone, is shown in (c). It is the most expensive but has practical advantages for many kinds of installations. Arrestone is the most efficient of Armstrong's acoustical materials. Its special system of erection allows the units to be taken down individually and moved for remodeling or for access to pipes, ducts, and wiring above. Access doors can be eliminated.

SEND FOR FREE BOOKLET, "How to Select an Acoustical Material," which answers many other questions about sound conditioning. Write Armstrong Cork Company, 5403 Stevens Street, Lancaster, Penna.







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THAT "FINISHED LOOK" — FOLDOOR comes in a wide choice of beautiful, colored, highly durable plastic-coated fabrics to harmonize with any color scheme. Topped with an attractive cornice. FOLDOOR installations have that finished look.

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UTILITY ROOM vs. BASEMENT

influence on the survey results of the presence of the University of Illinois in Champaign-Urbana and the presence of heavy industry. The picture insofar as the U. S. as a whole is concerned might be quite different. Such an analysis is possible because information was obtained on the basis of type of residence, income, occupation, family size.



The chart above pictures the way people living in various types of residences feel about utility rooms. Clearly, utility rooms are most popular among apartment dwellers, where the proportion preferring them (43 per cent) is almost as high as that favoring basements (47 per cent). On the other hand, dwellers in standard houses appear to be somewhat less disposed toward utility rooms, and this is especially true for the occupants of prefab houses.

Questioning the respondents on the reasons for their preference yields some very revealing information, as is shown in the tabulation below. Convenience and a dislike of stairs are the main reasons given for preferring utility rooms. Cost considerations were mentioned explicity by about 5 per cent of the respondents. (Continued on page 76)

REASONS FOR PREFERENCE BY TYPE OF RESIDENCE

Basement too expen-				
sive	6%	-%	8*%	6%
Basement too damp.	1*	7*	5*	2*
Don't like stairs	10	17*	11*	10
More convenient	7	7*	11*	8
No worry about flood-				
ing	4	_	2*	3
Other reasons	16	7*	22	16
Total for utility				
room	44	38	50	45
lacement herause		00	02	
More space	40	60	47	50
Better besting	7	10*	0*	0
Detter neating	14	10	14#	14
Other reasons	14	13~	14-	14
Total for base-				
ment	70	83	70	72
No preference	3	-	2	3
No answered, not sure				
or don't know	3	3	5	3
Total 1	20%	124%	136%	123%
		and the second se	and the second se	

* Percentage unreliable because of small sample size. Percentages do not total 100 because many respondents gave more than one answer.



built like a bridge



96" T-12 SLIMLINE and STANDARD 40-WATT LUMINAIRES

Framed-plastic, aluminum or steel side-panels; designed for quick and easy surface or pendant mounting, individually or in continuous row.



BUILDING FOOT-CANDLE LEVELS

This actual photograph of a pendant mounted "Monroe" Slimline Luminaire proves our point that it's "built like a bridge." The "Monroe" is not recommended for heavy foot-traffic, but its bridge-like construction provides for perfect alignment on continuous runs with hangers spaced only at every 8 feet. This minimum of hangers and the unit's rugged construction mean reduced installation costs and improved appearance.

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CONTRACTOR INC	U-FACTOR (Btu./sq.ft/hr/ F.)	WEIGHT (Ib./sq. ft.)
2" KAYLO LAMINATED PANELS WITH CEMENT- ASBESTOS FACING	.30	6¼
8" SOLID BRICK	.50	84
3" HOLLOW CINDER BLOCK	.42	30



...Erected <u>Fast</u> and Built to <u>Last</u> with KAYLO LAMINATED PANELS

Here's the modern way to build better curtain walls or interior partitions, *and* with an available material —Kaylo Laminated Panels. In one operation, 32 square feet of strong, insulating, fire-safe wall goes into place.

Kaylo Laminated Panels have a core of calcium silicate (not glass)—a remarkable chemical compound which is completely inorganic and incombustible. The Kaylo core is securely bonded to facings of cement-asbestos with a waterproof adhesive. Installed with proper joint systems, the Kaylo Laminated Panels meet ASTM one-hour fire standards.

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Kaylo Laminated Panels may be attached to either steel or wood framing. They can be sawed, nailed or drilled with standard tools. Kaylo Laminated Panels provide better walls, reduced building load, increased floor space and easier erection for nearly every type of building.



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A typical example of steel framework in one of the LIFE plant buildings. Junior Beams contribute vitally to the ease and speed of construction.

JUNIOR BEAM ROOF PURLINS SAVE TIME AND MONEY IN CITY'S PLANT CONSTRUCTION PROGRAM

The citizens in the area of Scranton, Pa., have embarked on a farsighted program of industrial plant construction. They call it Lackawanna (County) Industrial Fund Enterprise—LIFE. Its aim is to attract new industries which will provide the district's unemployed with sorely-needed jobs.

Early in the program, the Anthracite Bridge Company, Scranton, worked out an economical building system which has been used in almost every new plant erected.

most every new plant erected. J&L Junior Beams play an important role in making this low-cost, speedy construction possible.

For example, in Building No. 1 of LIFE's program light-weight Junior Beams were installed as roof purlins. A five-man crew with a light truckcrane plus another five-man "bolting-up" crew erected the entire steel framework of the 180' x 460' building *in less than 10 days*!

ing in less than 10 days! The uniformity of Junior Beams made them readily adaptable to variations in design, and their ease of handling further speeded construction—two factors that saved time and money on the job.

Junior Beams, produced exclusively by Jones & Laughlin Steel Corporation, are easy to install, require no fabrication other than end connections and bolt holes. They are rigid, vibration resistant, shrink proof, and have a lower de-

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flection factor than other structural sections of equivalent weight.

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UTILITY ROOM vs. BASEMENT

Among those preferring basements, more space is by far the most important factor, though quite a few respondents also cited "better heating" as a reason for their preference. The desire for more space explains why a relatively smaller proportion of prefab dwellers favor utility rooms. Prefab houses are generally smaller than standard houses, and their need for storage space is likely to be more acute.

Noticeable differences in preferences are also apparent by income level, occupation, and family size, as is shown by the following charts. The income chart is particularly interesting—it shows that preference for a utility room is greatest at both the high and low in-



come levels. However, the reasons why low income families prefer utility rooms are quite different from those given by upper income families. Strangely enough, a dislike of stairs appears to be the main reason for so many low income families preferring utility rooms; 32 per cent cited this factor. On the other hand, the high income families who prefer a utility room are mainly influenced by a host of "convenience" factors — easier to take care of, easier to watch the children.

PREFERENCE BY OCCUPATION



Judging by the occupational breakdown charted above, preference for a utility room is greatest among the professional-managerialproprietor class, the principal reason being "convenience." The main factor causing the other occupational groups to lean heavily to-

(Continued on page 80)



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UTILITY ROOM vs. BASEMENT

ward basements is the additional space obtained in this manner.

The family-size breakdown chartered below reveals a surprising tendency for very large as well as small families to prefer a utility room. At first thought, this might seem inconsistent with the well-known fact that large families generally need the most space and therefore would seem more likely to prefer basements. The explanation lies in the fact that this group contains a large proportion of high-income families-largely because many of these families have more than one wage earner - and generally have a fair amount of space, so that the convenience motive often outweighs any desire for additional space.

These results enable a more accurate appraisal to be made of how people are likely to be divided on the subject in other cities. A utility room finds greater favor in the higherincome levels as well as among those in the professional-managerial-proprietor occupational group. The fact that Champaign-Urbana contains a disproportionately large number of such people would seem to indicate that the national proportion favoring utility rooms may be less than the 35 per cent obtained in this survey. On the other hand, the fact that the question relates to the purchase of prefab housing acts in the opposite way. Since prefabs are generally smaller than standard houses a person is more likely to prefer a basement with a prefab. Another factor tending to bolster the preference for basements is that \$600 to \$700 is the absolute minimum additional cost involved in installing a basement - in many areas this sum would barely be sufficient for a half-basement.

It is evident from this survey that the use of a utility room as a substitute for a basement has achieved a good deal of popularity. Even today a surprisingly large number of people seem to prefer utility rooms. And considering our current national trend toward higher levels of income, there is little doubt that the utility room idea will gain further popularity.

PREFERENCE BY FAMILY SIZE







This is Mr. George Decker ...

at the doorway of one of the houses he and Oliver Martin built in Stratford Acres, Stratford, Conn.

"Why hello!" says Mrs. J. Ritzul. The Ritzuls have occupied this house for 7 months now. Mr. Decker is paying them a visit to learn how they now like their General Electric all-electric home.



Mr. George

Just a year ago, recalls Mr. Decker, 8400 persons visited the model home . . . and within 48 hours all 50 homes planned (each with General Electric Kitchen-Laundry) had been sold at \$10,500 each. This despite the fact that other houses in the immediate neighborhood were not selling!



"Bryan and I were just clearing the dinner table," explained Mrs. Ritzul. "It's so nice to wash away messy food waste and not be bothered with garbage cans. We wouldn't give up our General Electric Disposall[®] for the world!" Mr. Decker just grins.

GENERAL



"All our friends wish they had a G-E Dishwasher too!" says Mrs. Ritzul. "I had no idea our G-E Dishwasher would get our dishes so clean and sparkling—to say nothing of the time saved!"

"Gives Mummy more time to read stories to me," interrupts little Bryan.

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You can put your confidence in-





"By the way, Mr. Decker, my pots and pans don't get black any more! This G-E Range is so clean and it cooks so f-a-s-t! I really don't mind cooking a bit, and our electric bills for the entire house are *less than half* of what I thought they would be—*never* over six dollars!"



"There's room for ever so much food in our G-E Refrigerator—and it's so easy to keep everything in place. I don't think there's a finer refrigerator made than a G-E."

"I agree with you, Mrs. Ritzul. That's why we had a G-E Refrigerator installed in our home, too!" comments Mr. Decker!



"I'm so glad a fully automatic G-E Washer was included in our kitchen, Mr. Decker. As you know, I just turn on the controls and I can walk away to do other things. Our G-E gets clothes lots whiter than the machine we were using in the place we used to live in!"



Mr. Geo. Decker, like so many other successful builders, included the cost of the G-E Kitchen-Laundry right in the selling price of his houses. His purchasers are paying for their homes under the low monthly payment advantages of the "Packaged Mortgage."

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Home Bureau, General Electric Co., Bridgeport 2, Conn.

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ROOF DATA ON THE CONSOLIDATED VULTEE AIRCRAFT PLANT, FORT WORTH, TEXAS

Designers & Builders: The Austin Company.....Cleveland Roofing Contractors:

Hamilton Roofing Co	.Fort Worth
Building Materials Co	.Fort Worth
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3

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10

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BEHIND THE BLUEPRINTS

Buildings and biographies of the judges of the NAHB-FORUM House Design Competition



PIETRO BELLUSCHI, newly appointed Dean of the Massachusetts Institute of Technology's School of Architecture and Planning, has practiced his own regional brand of contemporary architecture in the northwest for 25 years. A native of Ancona, Italy, and a graduate in architectural engineering of the University of Rome, he came to the U. S. in 1923 on an exchange fellowship to study at Cornell. Following graduation he worked in the Idaho copper mines for nine months, then settled down to a drafting board in the Portland, Ore., office of the late A. E. Doyle to become chief designer, then partner (the latter in 1933). Since 1943 he has practiced under his own name. Belluschi's work, divided between residential, religious and commercial buildings, is characterized by a gifted handling of materials.



West Coast volume builder FRITZ BURNS has been active in home building for almost 30 years, since his arrival in California at the age of 21. Already a real estate salesman par excellence, young Burns' sales managing commissions for a Minneapolis concern were then in excess of \$100,000 a year. He was also, by that time, a veteran of World War I, in which he had been an 18-year-old second lieutenant. He grew up in Minneapolis, went to the University of Minnesota, before interrupting school to enter the Army. After the war he attended the University of Pennsylvania, left that institution to become sales manager of the Minneapolis realty firm. Burns' spectacular start in Minneapolis has been sustained throughout his career. He has built thousands of houses, since 1946 with industrialist Henry J. Kaiser.

(Continued on page 92)



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Weldwood® Fire Doors (Underwriterlabeled for Class "B" openings) do just that. In a recent test, the temperature one foot away from the unexposed side of a Weldwood Fire Door stayed down to only 102°F., after one hour's exposure to flame. Indeed, the temperature of this unexposed face of the door was well under 400°!

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Now you'll get a pleasant surprise. For the price on that order is astonishingly low . . . so low that no modern building can afford to be without the protection these doors give it.

Weldwood Fire Doors are now available in standard sizes up to 4' wide. If desired, they can be furnished with a $10'' \ge 10''$ glazed light.

You owe it to yourself to get complete information on this Underwriter-labeled Fire Door. Write today, and ask us to send you full details.

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The "100 Memorial Drive Apartments," Cambridge, Mass., give fire protection

Apartments," Cambridge, Apartments," Cambridge, Mass., give fire protection a dressed-up appearance with Weldwood Fire Doors in the corridors. A. Osborne Willauer & Thomas Worcester, Inc., were the architects.

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BEHIND THE BLUEPRINTS

Buildings and biographies of the judges of the NAHB-FORUM House Design Competitie





O'NEIL FORD, able, 45-year-old Texas archited was born in the big state, was raised, schoole and trained there. He studied at North Texa State College, has had no formal architectura education except for I. C. S. courses. Six year at a drafting board in the Dallas office of Davi R. Williams gave him background enough to han out his own shingle in 1931. For three years h designed rural housing for the Federal Govern ment in East Texas and Georgia, resumed privat practice in 1936. He was a flying instructor i World War II, now runs a unique design estal lishment with partner Jerry Rogers on a spraw ing farm outside San Antonio. In typically Texa style, Ford commutes several hundred miles from job to job in his own plane. In addition to con temporary house design with a distinctive regiona character (see cut), he does nonresidential worl

Robert C. Lautmo



Washington Architect CHARLES GOODMAN has been pioneering contemporary design in the con servative national capital for 17 years. Born in New York City in 1906 and educated at the Uni versity of Illinois and the Armour Institute of Technology, Goodman came to Washington i 1934 as architect for the Public Buildings Administration, was responsible during his stay for \$20 million worth of Government buildings through out the U. S. His structures embodied refreshing change from the ubiquitous "post office Federal" architecture rampant then and now. In private practice since 1938, Goodman has designed a number of contemporary homes for Washington luminaries, often acting as his own contractor. During World War II, he was chief architect-engineer for the Air Transport Command, planned its handsome, award-winning Washington Air Terminal. His postwar work has been varied; it features several well-designed, highly successful groups of small modern houses (see cut) constructed by operative builders in the Washington area.

(Continued on page 96)

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BEHIND THE BLUEPRINTS

Buildings and biographies of the judges of the NAHB-FORUM House Design Competition



Architect WHITNEY R. SMITH is a California native son who has rarely strayed from its borders. Born in Pasadena 40 years ago, Smith received his architectural degree in 1934 from the University of California, now has his design office with Wayne R. Williams back in his own home town. Before establishing a private architectural practice in 1940, Smith worked for the Farm Security Administration in San Francisco and Washington and for architects Harwell H. Harris and W. L. Pereira. The Smith design portfolio includes a diversity of building types, featuring small homes, mass housing projects (public and private), medical buildings (see cut) and commercial structures of which the best known is the excellent, prize-winning Linda Vista Shopping Center in San Diego. He has also found time to teach architecture at the University of Southern California (1941-42) and Scripps College (1946 to the present time).

Hedrich-Blessing



PHILIP WILL, JR., partner in the Chicago design firm of Perkins and Will, won his architectural degree with honors from Cornell University in 1929. He worked with partner Lawrence B. Perkins on public housing projects and at General Houses, Inc. (prefabricators), formed the present organization with him in 1935. The firm has a national reputation based on its many (\$38 million worth) notable school and university designs, including the Crow Island School done with the Saarinens and singled out by the Museum of Modern Art for inclusion in its definitive exhibition "Built in U. S. A., 1932-1944." School specialist though he is, Will has nevertheless done a great deal of commercial, industrial and residential work, including land planning and small house design (see cut) in the large-scale merchant building fields.

(Continued on page 98)



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This new member of the ever-expanding Toch City had included in its construction a number of Toch R.I.W. products...R.I.W. Toxement Paste, R.I.W. Toxkure Concrete Curing Compound, R.I.W. No. 232 Plasterbond and Dampproof, R.I.W. Marine Cement Foundation Coating.

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BEHIND THE BLUEPRINTS

Buildings and biographies of the judges of the NAHB-FORUM House Design Competition



CY WILLIAMS, tall, affable MIT alumnus has met with equal success as housebuilder and panel prefabricator on New York's Long Island. Eighteen years ago Williams started as a carpenter's helper for a construction company, rose to superintendent in two years, left soon after to become an independent builder. From 1935 to World War II he designed, built and sold out several subdivisions (some 300 units), including one large Colonial development, authentic down to the last hitching post. Williams was introduced to prefabs during the war when he erected some for the Washington, D. C. Alley Housing Authority. At war's end he developed a sound system of panel prefabrication and site erection, added to it a workable distribution scheme and came up with an attractive house of contemporary design and great consumer appeal, erected in subdivisions of 50 or more by numerous distributors throughout the New York-New Jersey metropolitan area (see cut).

Hedrich-Blessing



For 18 years Ohio-born L. MORGAN YOST has practiced architecture from his quiet suburban office on Chicago's North Shore. His home-like office is particularly conducive to the design of the neat contemporary houses (see cut) for which he is widely known. A 1931 graduate of Ohio State University, he is predominantly a residential architect, has designed hundreds of merchant and custom-built houses on sites from Chicago to Chile. In addition to dwelling design, he has also sprinkled his practice generously with commercial and institutional work. Yost is an active participant in local AIA activities and an equally avid researcher of the early development of modern architecture in America. As hobbyisthistorian, his main interests are the Chicago architectural "school" (Wright, Elmslie, Walter Burley Griffen, George Maher) and California's native greats (the Green Brothers, Bernard Maybeck, Gill and others).

ARCHITECTURAL FORUM

THE MAGAZINE OF BUILDING

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Prize winning 1951 NAHB house design offers possibilities for many types of heating systems. The utility room is centrally located and big enough to include both the G-E oil or gas Warm Air Furnace and the new G-E model FE Home Air Conditioner,

NEW IDEAS ABOUT HEATING AND COOLING

General Electric's "Climate Engineers" offer: a heating plan for the 1951 NAHB prize-winning house; an inexpensive year 'round air conditioning system for moderately priced homes; a full line of home heating equipment for any type of system.

One of the most desirable methods of heating the winning home in the 1951 NAHB house design competition is with General Electric's unique *Air-Wall* System. With this system, a standard G-E Warm Air Furnace, either gas or oilfired, is used.

Small diameter ducts are put in the concrete slab and connected to specially designed G-E Air-Wall Registers located in the rooms under the windows. Warm air, sent through the ducts, warms the floors. Then it is fanned out through the Air-Wall Registers over the cold outer walls. These walls are also warmed and the home owner, therefore, gets a combination of radiant and warm air heat. Because the G-E Air-Wall System uses only 4" diameter ducts, metal savings are not uncommon.

The G-E Air-Wall Heating System is only one of many recent advances by G-E "Climate Engineers." Take as another example the new G-E model FE Home Air Conditioner (cooling). It is connected in parallel with either a G-E gas or oil Warm Air Furnace and makes year 'round air conditioning possible, automatically cooling in summer as well as heating in winter.

Another new product is the G-E Automatic Air-Wall Register. It has a sensitive built-in thermostat which controls an air-flow damper. Now, homes completely equipped with this register are more comfortable; automatic, individual room temperature adjustment is provided when unusual temperature conditions occur, caused by a fireplace, sun heat or room crowding.





Interesting G-E Air-Wall Heating installation in Denver is made with ducts in concrete slab of basementless house. Unit is General Electric Gas Furnace.

New G-E Automatic Air-Wall Register is adjustable, and has a built-in thermostat which opens and closes a damper to admit or shut off heat from furnace.





Year 'round air conditioning system showing new G-E model FE Home Air Conditioner (left) with G-E Gas Furnace. G-E Oil Furnace may also be used.

A full line of quality home heating equipment for any type of heating system: G-E Gas Furnace (1); G-E Oil Boiler (2); G-E Gas Boiler (3); G-E Oil Furnace (4).

No matter what heating system you plan, there's a General Electric Furnace or Boiler, for either gas or oil, to do a better job...and offer fuel savings to the home owner. GENERAL ELECTRIC COMPANY, AIR CONDITIONING DEPARTMENT, BLOOMFIELD, N. J.

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> See catalog in 1951 Sweet's Architectural File 17A/Mi

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G-E "Light-Conditioning" prize-winning home

"Light-Conditioning", new concept in home beauty



Design by Mr. Bruce Walker, winner of first prize in contest sponsored by NAHB and The Magazine of Building.

GENERAL ELECTRIC's Light-Conditioning program, announced last Fall, was developed for modest homes similar to the one Mr. Walker has designed. Light-Conditioning creates new standards in lighting by applying the latest developments in lighting fixtures and lamps. And it will add new comfort and sales appeal to the homes you plan and build.

YOUR CLIENTS WILL WANT IT

Home buyers will be asking for Light-Conditioning. General Electric is selling the Light-Conditioning idea with ads in major magazines and commercials on the Fred Waring Television show. Electric service companies in many areas are opening model homes to demonstrate Light-Conditioning. Already more than a million copies of General Electric's Light-Conditioning Recipe Booklet have been placed in the hands of the public. Another big reprint is on the press now.

COST IS MODEST

How much does it cost to Light-Condition a home? Costs vary, depending on size of the home, of course, and local conditions. In comparison with outlays for home furnishings, Light-Conditioning involves only modest outlays. And your clients will find themselves repaid many times over in the comfort, beauty and livability of their homes.

RECIPES POINT WAY

General Electric's new Light-Conditioning recipes, developed by leading home lighting specialists, show exactly how to Light-Condition a home. First of their kind ever published, these recipes are complete and specific . . . 22 of them cover every lighting situation in the home. They tell what type of fixture to use in every room of the house, give recommended bulb sizes, show actual measurements for lamp and fixture placement. Illustrations on the opposite page show suggested ways of applying the General Electric Light-Conditioning recipes to the award-

winning home designed by Mr. Bruce Walker. Write for your free copy of the Light-Conditioning recipe booklet, "See Your Home in a New Light". Lamp Department, General Electric Company, Dept. 166-B3, Nela Park, Cleveland 12, Ohio, And for more information about Light-Conditioning, see your local electric service company.





General Electric ads on Light-Conditioning are now appearing in the Saturday Evening Post, Ladies Home Journal, Better Homes & Gardens, Small Homes Guide and other magazines.

recipes show how to give praise-winning light!

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1. Every room of the prize-winning home can be Light-Conditioned. Living room has wall valance with fluorescent tubes over window, two wall lamps over desk. Valance lighting gives room a spacious feeling.



2. Dining room ceiling fixture adds sparkle to the table and soft, relaxed lighting for the rest of the room, allows use of table for games, etc. (Recipe for dining room also recommends lighted wall valance.)



3. Recipe for Light-Conditioning the kitchen recommends fluorescent tubes under cabinets and over sink and range, plus fluorescent fixture on ceiling. Light-Conditioning makes kitchens cheerier and easier to work in.



4. Plenty of light from above and from both sides of the mirror is the result of Light-Conditioning the bathroom. Annoying shadows are eliminated. Shaving, make-up, washing are easier and faster.





Steam-Pak installations like this one are saving their owners money all over the country. One installation costing \$10,000 saved \$20,000 the first year in fuel costs and manpower.



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HOUSE DESIGN COMPETITION

—a milestone toward architect-builder collaboration

This issue of BUILDING is dedicated to the great House Design Competition jointly sponsored by the National Association of Home Builders and this magazine.

Measured against any yardstick, the competition's significance is far reaching:

More than 11,000 architects and other design experts studied the competition program which outlined the tough problem of designing a livable, buildable, salable small house. While many of them gave up along the way, a record-breaking 2,727 followed through and submitted entries. If each of these designers devoted only 40 hours to his solution, a total of 13,635 man-days of high-priced talent was spent on the problem of giving the merchant builder and the public a better house. (See Competition Report, page 104).

A jury of eight top-flight architects and builders, chairmaned by MIT's Architectural Dean Pietro Belluschi, spent the best part of a week evaluating this mountain of work and reporting its findings. (See Jury Report, page 107).

To 63 winners in every part of the country went 84 prizes totaling \$57,000—the biggest fee ever paid for the design of a 1,000 sq. ft. house. (See list, page 110).

In themselves setting a new high standard for builder houses, the prize-winning designs demonstrate many new ideas and trends which can contribute much to the improvement of residential design in general. Among them: devices for eliminating corridor space; interior bathrooms which save money and reserve perimeter space to better use; bathroom fixture arrangements which accommodate the whole family with privacy but without duplication of equipment and waste of space; living, dining, kitchen combinations which permit the flexible use of limited floor area; ingenious planning to create economical multi-purpose rooms; exterior designs which may be easily varied to avoid monotony in subdivision work; site planning tricks which make the most of the typical $60 \times 100'$ lot and give it a measure of privacy. (See prize houses, page 111).

A by-product of the house design competition was the development of a wide variety of new plywood built-in features, economical methods of double-glazing small houses and improved kitchen plans embodying the use of standard metal cabinets. (See prize details, page 142).

Finally, only four weeks after the prize winning house designs had been announced, 22 builders from coast to coast were already negotiating with the designers for the privilege of building them. And 100 other builders had made preliminary inquiries in the same direction. Thus, our important phase of the competition was only just beginning.

But the competition's real significance is best measured, not by any of these specific yardsticks, but by the simple fact that such a competition was sponsored by the nation's home builders (who last year recognized for the first time that the design of their product needed professional attention) and that the competition problem was grasped so enthusiastically by the architects (who until recently felt that the small house for the merchant builder was beneath their dignity). Thus the competition's success, however measured, is an important milestone along the road to widespread architect-builder collaboration and better house design for the average American family.

COMPETITION REPORT

A big builder's big idea is parlayed into the biggest architectural contest in history. After months of headaches, hard work and some high humor, housebuilding reaps the benefits of a \$57,000 investment in design improvement





Competition announcement first appeared in BUILDING's September issue, Such publicity drew 11,000 inquiries.

Program setting forth rules and regulations of the competition detailed the design problem.

Mailing tubes containing competition entries were received in Chicago. Photo was taken two days after competition closed, before most entries had arrived.

Oscar Associates



Presentation of the prize-winning houses in this issue BUILDING marks the climax of the greatest design competit in the history of housebuilding. Eleven thousand archite designers, draftsmen and architectural students studied competition program; 2,727, another record number, s mitted designs; 63 won prizes. Never before have so m people in the design profession been so interested in a sir problem. Never before has the financial reward been great—\$57,000, exclusive of awards in locally sponso subsidiary competitions. Never before has a competition | a broader, higher purpose—to encourage closer collaborat between architect and builder and stimulate the improvem of small house design.

This big competition was logically inspired by one of housebuilding industry's big men: Tom Coogan of Miam a big man whose 220 lb. weight is balanced by his thoughts and the big contributions he made to the induas the 1950 president of the National Association of Ho Builders. Last summer he suggested that BUILDING cond a competition as part of its editorial campaign for clo architect-builder collaboration. He backed this suggest with an offer of \$15,000 of NAHB's funds for prizes and penses. The editors willingly accepted the challenge, matc NAHB's offer, agreed to conduct the competition and plored means of further augmenting the prize money.

In sympathy with the competition's goal and mindful its promotional possibilities, six far-sighted manufactur and trade associations quickly lined up behind NAHB BUILDING. As associate sponsors, American Gas Associat General Electric Co. and Kwikset Locks, Inc., each cont uted \$5,000 to the national and regional prizes. As speaward sponsors, Douglas Fir Plywood Association, Libh Owens-Ford Glass Co. and Youngstown Kitchens by Mul Mfg. Corp. each put \$2,000 in the general prize and expe kitty and offered \$8,000 of side prizes for various pha of the small house design problem in which they were p ticularly interested: plywood built-in features, the use glass and kitchen planning, respectively. In addition, NA encouraged its member associations to sponsor local conte raise local prize money and thus broaden the competitio base and swell the purse.*

One client, 2,700 designers

Meanwhile the design problem took shape. It was decide that the house should meet the requirements of the type merchant builder and, in turn, the typical family for which he builds. This meant a gross floor area limit of 1,000

* For the results of the biggest of these local contests, see p. 230.

ft. and, since new small houses early last fall could be built to sell with land for \$11 a sq. ft. even in high cost areas, it meant a top sales price of about \$11,000—a figure which fits the budget of the mass market. It also meant three bedrooms to accommodate the 3.2 people who comprise the typical family. Since a basementless house can be built anywhere (it is the norm in many parts of the country) and enjoys increasing popularity everywhere, it was logical to eliminate the basement from the competition, rather than require that each house have one.

While FHA and VA design and construction requirements were recognized by the program, a broad interpretation of them was purposely permitted—contestants were allowed "a fair interpretation of general FHA and VA requirements" with authority to disregard the interpretations of local FHA and VA offices. This permitted them to blink at many of the Government's picayune restrictions concerning contemporary design, roof pitch, dwarf partitions, open planning, multiple use of space, etc.—restrictions which are tending to freeze small house design to yesterday's patterns— restrictions which, if followed to the letter, would have inhibited the imagination of the contestants and produced only a series of uninspired house designs little better than those built today. It is hoped that the results of the competition will prompt FHA and VA to take a fresh look at their old design standards.

A blizzard in mid-October

By September the many details were at last approved by the competition's various sponsors; 3,500 copies of the 12page program were printed and the competition got under way with a two-page announcement in BUILDING (see cut). Augmented by newspaper releases and direct mail promotion, this announcement brought a blizzard of mail requesting copies of the program. The daily total of requests started mildly enough at 61, but reached a storm of 611 within a week and hit a peak of 1,167 one Monday in mid-October, just as the supply of programs was about exhausted. This unexpected flurry overtaxed the machinery set up for handling requests and required that the program be put back on the presses-two factors which accounted for the unfortunate delay experienced by many contestants in the receipt of their competition literature. Program requests continued to arrive daily by the hundreds until mid-November and didn't start to drop off markedly until December 5th-only ten days prior to the competition's closing date. They are still coming in spasmodically from hopefuls who have failed to read the fine print. (Still unexplained is the reasoning



After ironing, entries were classified by region and preliminarily evaluated on basis of quality (above) then jury examined each design as it was displayed on easel (right).





Jury members deliberating before the display easel. Above, standing, l to r: two jury assistants, Yost, Smith, Ford. Seated: Williams, Burns, Goodman, Belluschi and (back to camera) Will. Picture from opposite direction (below) includes Professional Adviser Carl Lans standing between Belluschi and Will.

Photos: Percy H. Prior, Jr.





Architect Jurors Goodman and Ford compare notes in final elimination of competition designs.

Builder Jurors: Burns ponders over a design after Williams has completed his notes and moves on to next table, Goodman beyond.

Technical Jurors Smith, Will and Yost (below, l to r) compare entries in the special awards phase of the competition.



Photos: Percy H. Prior, Jr.



Jury Chairman Belluschi (right) gives his vote to recorder in closing hours of judgment.

COMPETITION REPORT (continued)

behind the most extraordinary request—for the program of the Kentile competition, also conducted by BUILDING, but way back in 1948!

Although the program warned that questions about the competition and requests for interpretations of the program would go unacknowledged, a goodly number were received. But the inquiries were of no great importance, viz.: "Do I determine the upper lefthand corner of my paper while looking at it from the front or back?" and "I can't get everything on a 20 x 30 in. sheet, may I use a bigger one?" and "Is Hawaii part of the continental U. S.?" and in the same vein, "What have you got against us Canadians?" Finally and frantically by telephone: "Since I can't possibly finish my presentation by 5 p.m. on December 15th, may I have an extension of time?"

Apparently most of the contestants, typical of the profession, squeezed every minute out of the time limit; few entries had been received prior to December 15th. Those who procrastinated to the bitter end were confronted with a shocking coincidence: Of all the 365 days in the year to select for a strike, the post-office truckers picked December 15th, and contestants in many cities found that the post office would accept no mail weighing more than 8 oz. BUILDING's editors were again snowed under—this time with telegrams and phone calls from all over the U. S.: "What will I do?" Answer: The deadline was waived; all entries received prior to the judgment were given equal consideration.

From shell case to mangle

The postal log jamb was broken during the weekend and on Monday six weary mailmen dumped 800 mailing tubes in the Chicago office rented for the purpose of processing the competition entries. Next day came the deluge—1,100 tubes, then a sharply diminishing number each day until the total reached the recordbreaking figure of 2,727* and the piles of tubes almost filled the 14 x 20' office to its 14' ceiling. The containers were every shape and size including a black metal stove pipe and a heavy cardboard cylinder which had once held an artillery shell. Stuffed inside of one big tube during its handling by postal men was a small tube addressed to a laboratory in Minnesota and containing a blood sample between two glass slides! The men unwrapping the tubes soon learned to expect most anything.

Then came the problem of flattening out the tightly rolled drawings. This was solved by feeding the sheets through a home laundry mangle borrowed from the manufacturer. (Two days after it was installed, an attractive young lady arrived to demonstrate how to iron collars and cuffs and how to pleat a skirt!) The "laundry" encountered only one serious problem: one contestant had used adhesive letters on his drawing which were promptly picked up by the mangle's hot cylinder and transferred to an inappropriate spot on the next drawing to go through the machine.

During the next three weeks, Professional Adviser Carl Lans and the jury's four assistants (graduate students at the Illinois Institute of Design) screened the submissions for eligibility, sorted them according to region and tentatively evaluated their quality.

^{*} Previous record: 2,040 entries in the General Electric Co.'s Home Electric Competition conducted by BUILDING in 1935.

Hors de combat were those entries which disregarded major competition requirements, such as sheet size, which might have given them an unfair advantage over the other law-abiding entries. One misguided contestant used four sheets of $20 \times 30''$ paper to present at larger scale the eight drawings which the others had to compose on a single sheet.

The regional distribution of entries was closely related to population; except that the big, most populous Midwest region produced 75 fewer entries than the smaller, less populated East-Central region. The complete breakdown:

A.	New England	211	E. Southwest	273
В.	East-Central	734	F. Rocky Mountain	99
C.	Southeast	446	G. Northwest	297
D.	Midwest	659	No region	8

To facilitate the Herculean task of judging this many designs, each group of regional entries was further divided into three parts: 1) those of obviously inferior design, 2) those of obviously high quality which would require close consideration by the jury, and 3) those—the biggest proportion—whose design quality fell somewhere in between. Since the designs ranged all the way from amateur doodling to professional perfection, this grading of the entries was not difficult.

The secret jury

On January 8 the eight men who had accepted BUILDING'S invitation to determine the prize winners emerged from their anonymity to assemble at the Moraine Hotel in Highland Park, Ill. (The jury's identity had been concealed from the contestants to prevent them from designing houses to suit the jury rather than the public.) They came from all directions. Architect Pietro Belluschi, selected by the jury as its chairman, was on his way from his home in Portland, Ore., to occupy the Dean's chair at M.I.T.'s School of Architecture. His colleagues on the National-Regional Jury were Architect O'Neil Ford of San Antonio, Charles Goodman of Wash-(Continued on page 196)



First prize winner Bruce Walker and wife receive the good news in their Cambridge apartment.



Walkers at NAHB Convention session in Chicago examine model of prize winning house with retiring NAHB President Tom Coogan and BUILDING Editor and Publisher P. I. Prentice.

Prize winners after presentation of awards in Chicago:

Top row, l to r: Nagel, W. R. Smith, Wheeler, Athens, Dart, Lowrey, Joseph.

Center row: Steele, Gellman, Mackintosh, Girone, Compton, Hanson, Chase, Diament.

First row: Welch, Hajjar; Whiteley, Wachtel, (Prentice), Walker, (Coogan), Rapson, Macsai.





The jury in action, l. to r.: Smith, Williams, Will, Yost, Burns, Ford, Goodman and Belluschi.

CHARLES M. GOODMAN • WHITNEY R. SMITH • PHILIP WILL, JR. • CY WILLIAMS • L. MORGAN YOST

Narrowing down a field of 2,727 house designs to a few prize winners is no mean task and a somewhat frightening responsibility. It can be successfully and equitably accomplished only under certain ideal circumstances. In the first place, the preliminary screening and evaluation of the submissions must be extensive, thorough and unprejudiced. The jury must be comprised of competent critics who are completely in sympathy with the purpose of the competition. They must work well together, and they must be willing to work hard.

This jury was fortunate in all these respects, for the circumstances under which it worked were indeed ideal.

The careful screening of the submissions for eligibility and preliminary segregation according to quality proved to be extremely well done and made it easy for the jury to concentrate its time on the difficult task of separating the best designs from the good ones. In a competition as large as this, it was logical that a large proportion of the designs could be easily and quickly classified as "only fair" or even "poor." However, in fairness to all competitors, the jury examined every eligible submission — although it admittedly did not dwell for long on designs which were obviously of inferior quality in one respect or another.

Architects and builders

The jury, comprised of both architects and builders and representing almost every section of the country, worked well as a group. Only in a few cases did it become necessary to resort to majority rule to reach a decision. Usually, after some give and take on the part of individual members, decisions were unanimous.

The jury was in complete agreement on the basic tenet underlying all of its deliberations—that to win an award a design had to represent a caliber of builder house design somewhat in advance of today's practice. It was felt that the results of the competition should lead the industry—not mirror its present design status, not even the better part of it. It was also agreed that extremely radical design should not be rewarded, for it would be too far ahead of current practice to meet the requirements of the program.

In general, it was felt that the level of design displayed in the competition was good—but not excellent. And that goes for even the better half of the 2,727 submissions. Apparently, many of the nation's really skilled designers were too busy last fall to enter the competition or perhaps too busy to devote sufficient time to the perfection of their solutions to the problem. Although it was encouraging to see students and young, unknown architects working their way up the ladder, it was also disappointing to find so few big architectural names on the back of prize-winning drawings. Perhaps the best and best-known architects just are not interested in the small house—an unfortunate facet of the small house design problem which it was hoped this competition would help solve.

The quality of design and scope of imagination displayed by the entries in the Special Awards phases of the competition were particularly disappointing. But in the defense of the contestants it must be admitted that the competition program was at least partially at fault in that the required use of standard sizes of certain prefabricated parts in two of the three contests certainly did not stimulate the imagination. Nevertheless, the three series of Special Award winners do present some noteworthy new ideas in the design of plywood built-in features, in the use of glass and in kitchen planning. The jury was favorably impressed by the following characteristics of many of the house designs:

1) Recognition that the small house must accommodate children as well as adults—this was apparent in the provision of children's play space within the house, frequently in the form of a multi-purpose room in addition to the living area. It was also frequently apparent in the provision of an entry from the play yard, in addition to the more formal "front door."

2) Dual use of space—circulation areas enlarged to accommodate children's play things, laundry equipment, dining tables, etc.

3) Interior bathrooms which free the windowed perimeter of the house for more important rooms.

4) Integration of indoor and outdoor living areas.

5) Generous storage facilities indoors and in the carport or garage—an important consideration in the absence of a basement.

All these good points-and many others-are illustrated by the four top prize-winning designs.

Forgotten ingredients

On the other hand, the jury viewed with alarm the fact that many designs did not make more use of the basic ingredients of a good, economical builder's house:

1) A square or rectangular plan.

2) Minimum corridor space.

3) Avoidance of diagonal circulation through the living room.

4) Close integration of kitchen, service entry and garage.

5) Back-to-back kitchen and bathroom.

6) Back-to-back heater and fireplace.

7) Adequate sun protection of large glass areas.

8) Living room facing to the rear or otherwise screened for privacy.

9) Possibility of turning the house on the lot for the purpose of proper orientation and variation of street elevations.

Too often the contestants reduced their bedrooms, living rooms and kitchens to bare minimum sizes to make room for separate dining spaces or multi-purpose rooms which turned out to be too small to be very useful. There were too many big houses squeezed down to fit the 1,000 sq. ft. limitation, too few admittedly little houses with a built-in feeling of spaciousness—achieved through careful planning.

The jury was appalled at the quantity and variety of dogeared design clichés which cluttered up otherwise presentable houses and which would add unnecessarily to their cost: "flying boards" projecting out from roofs in every direction, square holes cut promiscuously in flat and sloping roofs, the lavish indication of interior flagstone flooring (with tongue in cheek, the jury assumed it was meant to be linoleum), miles of sliding panels of clear glass, clerestories and butterfly roofs by the hundreds, ponderous garden walls of masonry which were run into the houses, etc., etc., *ad infinitum*. (Juror Ford suggested that someone could make a fortune peddling these clichés by the wagonload.)

On a regional basis the Southwest (Southern California, Arizona and New Mexico) produced the most disappointing designs. Having made its selection of the best from this area, the unbelieving jury went through the entire 273 submissions again in a fruitless search for something still better. (If nothing else, this "second look" provided a reassuring check on the screening and evaluation methods used by the jury and its assistants.) It was also felt that the designs for the Rocky Mountain area did not do justice to the inspirational character of the landscape in that region. As can be seen from a glance down the list of prize winners (page 106), the New England region, and Cambridge, Mass., in particular, seems to have come out on top. (The coincidence that the top prize went to a design for the Northwest by a Cambridge contestant has been of considerable embarrassment to the jury chairman who lives in the Northwest and now works in Cambridge.)

Although the results of the competition may be disappointing in some details (and completely so to the 2,700 conscientious contestants whose designs failed to reach the top), the jury feels that the major purpose of the competition has been successfully fulfilled. The attention of a broad segment of the design profession has been focused on the tough problem of producing an attractive, livable, economical small house which the merchant builder can easily build and sell. By studying the prize-winning solutions to this problem the builders, in turn, can learn the meaning of contemporary architecture and appreciate the benefits to be derived through close collaboration with thoughtful contemporary architects.

After several days together discussing the problems of designing, building and selling small houses, the architects and builders on the jury departed with increased respect for each other and a vastly greater appreciation of the other fellow's important role in the collaborative effort of producing good houses. Such an interchange of knowledge and beliefs as it was the privilege of this jury to enjoy would be of immense benefit to all architects and builders and, in turn, to the housebuying public. The jury heartily recommends that similar discussions be held from time to time in every community.

*

The foregoing report reflects the joint observations of the entire jury. Following are comments of individual jury members on various phases of the competition and its judgment:

Charles M. Goodman, Architect: Looking at 2,727 drawings made me increasingly aware of the depressing fact that the architectural profession seems unaware of the very real contribution it could make to the subdivision house; namely, space planning. The technique of embellishing a conventional plan, done thousands of times by builders throughout the U. S., with tricks (such as flagstone floor indication to define space and folding walls to pretend there was an open plan where one did not exist) was all too common not to be considered an attitude on the part of the profession. What seemed to be missing was the selling of the architect's knowledge of the anatomy of space and his know-how in developing space and its envelope into a builder package magnetic enough to be sold without benefit of advertising. A fresh arrangement of interior space was, all too often, accompanied by a poorly developed envelope. Since our job as jurists was not only to recognize fresh ideas of space arrangement but also to consider their development into a shell attractive enough to make a salable product, we could not premiate many fresh space ideas.

It is in this field, the articulation of space, that we had hoped the profession would shine. But we feel that here is where the profession seemed to be most intimidated by the fact that the competition was being sponsored by a builder association. This fact and its inherent connotation that everything had to be practical, if dull, seemed to scare off fresh thinking and resulted in many uninspired solutions of questionable merit.

There was too much pulling and shoving of the shell into arrangements other than the simple rectangle, which hlithely (Continued on page 204)

PRIZE WINNERS

NATIONAL PRIZES

First—\$7,500 Bruce M. Walker (p. 111) 19 Alpine St. Cambridge, Mass.

HONORABLE MENTION-\$500

Second—\$5,000 Ralph Rapson (p. 1

Ralph Rapson (p. 115) MIT Department of Arch. Cambridge, Mass.

Third-\$2,500

Wallace S. Steele (p. 118) 806 Thornton St., S. E. Minneapolis 14, Minn.

Fourth-\$1,000

George Matsumoto (p. 120) 3210 Ruffin St. Raleigh, N. C.

Ernest Wright (p. 122) 5 Brewster St. Cambridge, Mass. Harold Blewett (p. 127)	Robert L. Mackintosh Richard H. Wheeler (p. 123) 21 South St. Cambridge 38, Mass.	Sanford H. Wachtel (p. 124) 4 Peter Cooper Road New York 10, N. Y.	Mark P. Lowrey (p. 125) School of Architecture Tulane University	Ambrose M. Richardson (p. 126)	
Harold Blewett (p. 127)			New Orleans, La.	Chicago, Ill.	
Cambridge 38, Mass.	A. William Hajjar Ronald Whiteley (p. 128) 1157 S. Atherton St. State College, Pa.	Donald Olsen (p. 129) 71 Norwood Ave. Berkeley 7, Calif.	J. David McVoy & Harold C. Rose College of Architecture University of Florida Gainesville, Fla.	(p. 130)	
REGIONAL PRIZES	First—\$750	Second—\$500	Honorable Mention—\$250		
NORTHEAST (A)	Ernest Wright (p. 122) 5 Brewster St. Cambridge, Mass.	Robert L. Mackintosh Richard H. Wheeler (p. 123) 21 South St. Cambridge 38, Mass.	Hugh Stubbins, Jr. Mario Pfaff & S. T. Lo Associates (p. 132) 103 Pleasant St. Lexington, Mass.		
EAST CENTRAL (B)	George Matsumoto (p. 120) 3210 Ruffin St. Raleigh, N. C	Sanford H. Wachtel (p. 124) 4 Peter Cooper Road New York 10, N. Y.	Robert Sawyer (p. 133) 32 East West Haven State College Station Raleigh, N. C.	Kenneth Sklar (p. 133) 231 Duffield St. Brooklyn, N. Y.	
			Fred Loeffler, Jr. (p. 134) 5827 Holden St. Pittsburgh 6, Pa.	John R. Strang (p. 134) Route 2, Box 665 Fairfax, Va.	
SOUTHEAST (C)	Ralph Rapson (p. 115) MIT Department of Arch. Cambridge, Mass.	Mark P. Lowrey (p. 125) School of Architecture Tulane University New Orleans, La.	Jack O. Boyte (p. 135) Georgia Tech Box 4939 Atlanta, Ga.	(See note, below)	
MID-WEST (D)	Wallace S. Steele (p. 118) 806 Thornton St., S. E. Minneapolis 14, Minn.	Harold Blewett (p. 127) 9 Mellen St. Cambridge 38, Mass.	Ambrose M. Richardson (p. 126) 5711 Blackstone Ave. Chicago, Ill.	Robert Diamant John Macsai (p. 136) 420 E. Surf St. Chicago, Ill.	
			Vito A. Girone (p. 137) 1902 Kessler Blvd. South Bend 16, Ind.	Richard B. Pollman (p. 137) 18600 Schoolcraft Rd. Detroit 23, Mich.	
			Ray E. Roush, Jr. (p. 138) 3970 Marburg Ave. Cincinnati 9, Ohio.		
SOUTHWEST (E)	Kazumi Adachi Dike Nagano Robert W. Blachnik (p. 139) 1578 West 35th Place Los Angeles 18, Calif.	Alexis Dukelski Harry R. Kemm (p. 139) 3320 Woodbine St, Los Angeles 34, Calif,	Leland Evison (p. 140) 1372 W. Colorado St. Pasadena, Calif.		
ROCKY MOUNTAIN (F)	A. William Hajjar Ronald Whiteley (p. 128) 1157 S. Atherton St. State College, Pa.	William W. Lyman, Jr., W. Danforth Compton George A. Welch (p. 141) 1430 Massachusetts Ave. Cambridge 38, Mass.	W. Rowe Smith (p. 141) 1266 Cedar Ave. Provo, Utah		
NORTHWEST (G)	Bruce M. Walker (p. 111) 19 Alpine St.	Donald Olsen (p. 129) 71 Norwood Ave. Barkelay 7 Celif	Warren B. Heid (p. 142) 35 W. San Carlos St. San Loca Calif		

PRIZE WINNING DESIGNS are presented on the following pages in the order indicated above; first the 13 national prize winners —beginning on the opposite page—then the 16 regional winners which did not also win national prizes —beginning on page 131. (One regional award was withdrawn last month with the concurrence of the jury, for the design was found to be ineligible.)

The presentation of each prize winning design includes a description by the editors (including quoted remarks by the jury) and a statement by the contestant.

Prize-winning designs in the special awards phases of the competition are presented separately —beginning on page 143.

FIRST PRIZE, NATIONAL

FIRST PRIZE, NORTHWEST REGION

BRUCE WALKER, CAMBRIDGE, MASS.



This house came to the top because of its spacious yet unpretentious floor plan, its clean, handsome yet gentle exterior appearance, the feeling of shelter which the design imparts and its refreshing freedom from architectural clichés. Though not as exciting as some of the other prize winners in its details, this is a big little house whose all-round good sense and good taste are outstanding. It is best suited, as designed, for a lot on the south side of the street in the Northwest Region, but its plan could easily be adapted to most any lot in most any part of the country. It would be easy to build, easy to look at, easy to live in, and easy to sell. It is therefore an ideal house for a builder's development.

Unlike some of the other premiated houses which are squeezed-down versions of big houses, this first prize winner is admittedly a little house—but with a built-in feeling of spaciousness. It has no separate multi-purpose room, but the $13' \ge 22'$ living area is big enough to accommodate quiet conversation, formal or informal dining, and the children's games or work. All three of its bedrooms are of comfortable proportions, and two of them may be combined into a daytime playroom. The bathroom is bigger than average and subdivided. Closets are numerous, large, and augmented by



WALKER is a 27 year old native of Spokane, a product of its public schools and Seattle's University of Washington where he studied architecture. After a three-year trick in the Navy as an officer he returned to the university and, upon graduation (BA in 1949), married a fellow-student, Ottilie Niederle. Fortified with two years' experience in the Spokane architectural offices of E. J. Petersen and McClure & Adkinson, Walker moved East, entered the Harvard Graduate School of Design, spent his spare time working with Architect Samuel Glaser in Boston and, last summer, with The Architects Collaborative in Cambridge. Next June Walker will receive his masters degree.

FIRST PRIZE, NATIONAL

built-in bedroom dressers and by storage space at the end of the carport.

The kitchen is strategically located close to the front door, the children's play space and the carport and drying yard at the side of the house. And, the dining space is only a few steps beyond the large uncased opening in the kitchen wall. The living area and master bedroom overlook the rear yard.

Although considerable space is devoted to circulation, it is concentrated in the hallway and does not interfere with the use of the major rooms. The jury was favorably impressed with the back-to-back position of furnace and fireplace (a prefabricated unit) but somewhat disturbed by the wide separation of kitchen and bath.

WALKER: "In 1,000 sq. ft. I tried to give the many activities of the average family an opportunity to function in such a way that they do not seriously interfere with one another. The all-purpose room is





the focal point of the house. Adjoining it is a permanent relaxation and conversation space with fireplace, radio, records and books. An occasional guest may be accommodated for the night by curtaining off this conversation space. The kitchen is easily accessible to the all-purpose room for serving meals and supervision of small children by the housewife.

"In a house of this size I feel the need for outdoor living space is great; therefore I planned for a screened porch and outdoor terrace.

"I believe the general appearance of this house has a sincere regional quality and would not be considered too radical by the public. At the same time it retains a contemporary expression and offers more in livability than is usually found in a minimum house.

"These are some of the elements of design which were given serious consideration: An ease and simplicity of construction carried to a point which does not jeopardize the expression of the house . . . A most pleasant use of the lot, particularly the rear yard . . . Achievement of a pleasant approach . . . Ease of circulation within the house and clear definition of parts and activities . . . Economical grouping of the mechanical elements.

"Provision for adequate storage, including adequate closet space and built-ins in the bedrooms . . . Natural light and ventilation."











Models of Ralph Walker's first prize design—above: street view shows weather protection of front entry and access walk from the carport. Also noteworthy the smooth integration of the carport and house design. Below: bird's-eye view of a larger model without its roof shows how partitions are extended up to the low pitched roof, creating an attractive and economical sloping ceiling in every room except the hall. This view also shows relationship between the living room and screened porch, and the rear wall fenestration is visible in the mirror.



SECOND PRIZE, NATIONAL

FIRST PRIZE, SOUTHEAST REGION

RALPH RAPSON, CAMBRIDGE, MASS.



Commended particularly for its "distinguished handling of space" and the "inherent appeal of its floor plan," this house was considered the best among those which provided a separate multi-purpose room to accommodate the active phases of family living.

In many other details its unusual design is outstanding. For example, the entire perimeter of the house is available for windows, doors and furniture placement because the service and storage facilities are grouped in the center. Lighted and ventilated from above via a clerestory, the bath and utility room are windowless interior rooms backed up against one wall of the kitchen. (One section of the kitchen counter lifts up to give access to the utility room.) This service core, along with a small entry and coat closet divides the living area of the house in two—the right half for quiet family living and formal dining; the left half—an expansion of the usual hall—for family dining, children's play and miscellaneous other purposes.

Unfortunately, this duplication of living facilities within the limits of 1,000 sq. ft. has required that all the elements of the house be of bare minimum dimensions. Thus the living room is only 12' wide. The multi-purpose room is only 10'-2'' wide and the bedrooms are correspondingly tight. Moreover, the jury felt the clerestory over the multi-purpose room was unnecessary and that the alternate exterior elevations did not measure up to the quality of the basic house.



A prize-winner in eight previous design competitions, 35-year-old Architect RAPSON is an assistant professor of architecture at MIT. He was educated in the public schools of Alma, Mich., Alma College, University of Michigan (BA) and Cranbrook Academy of Art. Since then he has worked for a number of top-flight architects including Eliel and Eero Saarinen, George Fred Keck, Paul Schweikher and Perkins & Will. For four years he headed the Department of Architecture at Chicago's Institute of Design under the direction of Moholy-Nagy, with whom he was also associated on several design jobs. He joined the MIT staff, in 1946, now concurrently practices architecture (mainly residential) and owns and operates a Boston store dealing in contemporary furniture, fabrics and lighting equipment.



MULTI-PURPOSE AREA

"The plan evolved from these basic factors provides two distinct though closely interlocking areas. One is a multi-purpose area for active living; for children and adult rumpus and play; for sewing, ironing and clothes drying on bad days; where the family might take most of their meals and which the mother would not need to worry about keeping spic and span, since guests would normally be entertained in the second area—the space for the more conventional type of living. The utility core, of which the food center is part, is placed between these elements for ease of access and direct control of both.

"It is evident that the plan of the house makes for maximum flexibility in siting. The through quality of the two major rooms encourages development of either the front or rear of the lot, providing cool northern and sunny southern outdoor living. Likewise, the plan could be orientated east-west with advantage. Certain orientations might suggest a change in fenestration on the long side of the living area. It will be noted that two of the bedrooms have direct cross-ventilation, and all bedrooms open directly to the multi-purpose area with its clerestory and through ventilation.

"It was considered essential that the plan be enclosed in a simple, basic shape. The resulting rectangular gable roof, with its scissor-type clerestory, is only one of several ways the space might be enclosed economically."



12'-3"





THIRD PRIZE, NATIONAL

FIRST PRIZE, MIDWEST REGION

WALLACE S. STEELE, MINNEAPOLIS, MINN.

The builders on the jury were impressed with the "very considerable selling appeal" of this design. The plan is excellent—particularly that quarter of it accommodating the entry, kitchen and multi-purpose extension of the living room.

The entry is of generous size, and is equipped with a really big coat closet which is "right where it belongs." Moreover, the central location of this entry, in conjunction with the near square shape of the house, permits the house to be turned on the lot for different orientations.

The kitchen not only has direct access to the main entry but is completely open to the multipurpose room for easy supervision of playing children. The two-way counter between serves both as a breakfast bar and a children's work table. A few steps beyond is space for family dining and a door closing off the bedroom half of the house.

Had the exterior design been handled with a little more finesse and had the garage been better integrated with the house, this design might well have won a still higher national award.

STEELE: "In the house-site relationship I attempted to devote as much free space as possible for family and communal use, yet maintaining a degree of privacy for the owner in relating house to site, garage, fences and planting. The plan was developed to provide a carefree way of life for the family and to supply its needs and pleasures.

"A sheltered entry even for a house of this size was considered necessary, particularly for Minnesota with its mud, snow and ice. The storage room adjacent to the entry is planned to serve as a defining point between kitchen, dining and living areas, besides accepting coats, games, brooms, etc.

"The living area is "tucked away" as much as possible, yet kept readily accessible to the entrance, outdoors and to the other components of the house.

"The kitchen and its adjacent play-dining space is, I feel, the most pleasant and flexible part of the house. The kitchen is the control point of the house and the headquarters for the homemaker. From it, she has control of the front door, dining space, bath and indoor and outdoor play areas. The counter between kitchen and play space serves as a snack bar and food preparation surface, also as a hobby, work and repair table.

"The play-dining space may on occasion be extended into the living area to support dances or other large participation activities. Despite its great flexibilities, I feel the play-dining area can adequately provide space for both family and formal dining.

"The sleeping wing is isolated as much as possible from the active work center of the house, and provides quiet study space for the children."





STEELE was born in St. Paul 25 years ago, but was raised and educated in Minneapolis. After 2½ years with the Air Force as a navigator and radar observer, he entered University of Minnesota, graduated from its school of architecture in 1949. Since then he has worked with St. Paul Architect Brooks Cavin and gained considerable experience in the design of low cost housing.





FOURTH PRIZE, NATIONAL

FIRST PRIZE, EAST CENTRAL REGION

GEORGE MATSUMOTO, RALEIGH, N. C.

It is difficult to believe that a $12 \ge 16'$ living room, three $9 \ge 12'$ bedrooms, a $9 \ge 12'$ dining room, a $12 \ge 12'$ multi-purpose room plus a vestibule and essential service and storage facilities can be included within a 1,000 sq. ft. house. But here is proof positive in a $21 \ge 48'$ rectangle. In addition, this design demonstrates several other good design ideas: closets of varying depth in the bedrooms; a sliding partition to permit daytime combination of one of the bedrooms with the multi-purpose space; pass-throughs from the kitchen to both the multipurpose room breakfast bar and to the dining room.

While some of the jury members criticized the location of the efficient U-shaped kitchen, directly opposite the bath, others argued that this was a logical arrangement for a family with small children. The plumbing fixtures are not back to back (like the fireplace and furnace), but they are on a direct plumbing line from the street. The corner entry would create no circulation problem, for it would be used almost exclusively by guests; the family would normally enter at the center of the house.

The study of the relationship between adjacent houses (see perspective) drew favorable comment from the jury; their exterior design did not.

MATSUMOTO: "The changing demands of a family as children age, and the unpredictable interests and activities by which every family departs from the average, demand flexibility in both the amount and the use of space. This house can be varied or increased from no bedroom to four bedrooms. Modular closet-partitions in the private area facilitate changes. This variation and the addition of a fireplace would make it possible to build from the same basic pattern for a wide range of sales prices.

"The structural system uses an 8' spacing of exposed wooden beams or customary A-frame construction. Centrally placed, the mechanical core serves as a sound barrier between the private area and the social area. Noisy outdoor areas are toward the street and the house serves as a sound barrier between the street and the quiet rear lawn. The kitchen is placed so that the housewife can supervise childrens' play and participate fully in family activities while working in a centrally located space."





MATSUMOTO is an assistant professor of architecture at North Carolina State College and a practicing architect in Raleigh. A native of San Francisco, he graduated from its public schools to the University of California, transferred to Washington University in St. Louis, Mo. (BA in architecture '43), earned his MA in 1945 at Cranbrook Academy of Art. His practical education includes two years in the design department of a home building organization, a series of jobs with architects Fuhrer & Fuhrer, George Fred Keck, Saarinen & Swanson, and Skidmore, Owings & Merrill. He has won numerous competition prizes including the \$10,000 Grand Prize for the best over-all regional plan for the Chicago- area in the "Herald American Better Chicago" National City Plan Competition.













HONORABLE MENTION, NATIONAL FIRST PRIZE, NORTHEAST REGION



ERNEST WRIGHT, CAMBRIDGE, MASS.

A square floor plan with one big room occupying half the house

Because this house has almost a square floor plan $(31'3'' \times 32'0'')$, its perimeter is within a few inches of the absolute minimum (127') for a 1,000 sq. ft. house. Within this economical envelope the disposition of the various elements is good and space is used to the utmost for purposes other than circulation. Location of the front and rear entries permits the house to be easily turned on the lot for different orientation and for street front variation.

The living half of the house is actually one big room whose ceiling slopes with the roof to enhance the feeling of interior spaciousness. It is subdivided only by dwarf partitions around the kitchen and a freestanding coat closet at the entry The jury felt that the carport would be better next to the service entry, but recognized that in its present location it screens the terrace from the street.

Although the design was criticised for its definite isolation of living and dining spaces (a smaller coat closet would have been better) and the "unhappy and superfluous sunshade" across the front elevation, it was considered "an elegant and beautiful little house."

ERNEST WRIGHT: "Perhaps the most important thing in this design is the pitched roof and ceiling over the living-dining-kitchen section. With no collar beams or ridge beam the thrust of the rafters must be taken by diagonal roof sheathing or plywood panels, a homely application of the stressed skin principle.

"The disadvantages, of course, are the smells and noises from the kitchen, which can be minimized by an exhaust fan over the range and a cork tile floor in the kitchen-dining section. Open shelves between kitchen and dining space would give a degree of visual separation; beyond that I think the kitchen should be open in today's house for the servantless family.

"Extra storage space beyond the usual closets is a necessity. Dropping the ceiling over the hall and middle bedroom to make a small attic helps this design in another way—the spaciousness of the pitched ceiling over the living room would be enhanced by contrast with a low ceiling in the hall."

WRIGHT is a 30 year old native of Duluth... trained in architecture and engineering at Virginia, Yale, Bucknell and Harvard's Graduate School of Design (MA 1949)... four years with Navy Construction Battalions ... journeyman carpenter ... furniture designer ... worked in architectural offices of Anshen & Allen and Mario Corbett (San Francisco) ... now with The Architects Collaborative (Cambridge, Mass.) HONORABLE MENTION, NATIONAL SECOND PRIZE, NORTHEAST REGION



ROBERT L. MACKINTOSH & RICHARD H. WHEELER, CAMBRIDGE, MASS.

Stall bedrooms for children make way for convertible play space

Also close to a square in shape, this 996 sq. ft. house features a 10'3" x 14' playroom created by squeezing the two children's bedrooms down to stall-like proportions. As the children grow older, their space can be re-subdivided (as shown in the alternate plan) into two fair-sized private rooms. In its basic form the house is virtually without hall space. Said one of the jury's builders: "I like the plan; in fact, I'd like to build that house for my daughter, but with four bedroom stalls instead of two." Other jury members commented favorably on the size and relationship of the living and dining areas. While they are actually combined in one big room (16'2" x 21'2"), "there is a very strong division between the living and dining spaces." The jury did not like "the stupid little board over the front walk."

Local FHA offices might raise their eyebrows at the two small bedrooms in the basic plan, but Chief Underwriter Curt Mack at the initial display of these prize-winning designs said that the playroom could be counted as bedroom space for mortgage loan purposes.

MACKINTOSH & WHEELER: "In a low cost house for New England the amount of costly outside wall is a paramount problem. The closer a house is to a rectangle the cheaper and easier it is to build. However this often means a sacrifice in the interest created by light and shadow on the faces of the building. Therefore we provided those indentations that seemed reasonable.

"With the climate in mind we used glass where we felt the space and the use of the room warranted it. Such a space is the dining area where a close visual link with the outside terrace is desirable. We also felt that there would be a distinct dining area but one which could be expanded when necessary.

"Even in a small house an entrance area is important for insulation against eight months of cold weather in this area as well as insuring privacy for the living area."

MACKINTOSH, born 25 years ago in Newton, Mass., lives in Needham, practices architecture in Cambridge against the background of a masters degree in Landscape Architecture from the Harvard Graduate School of Design.

WHEELER, also 25, is Boston-born but a resident of Royal Oak, Mich. and a graduate student at Harvard ('51)... architectural experience with Shreve, Anderson & Walker and Eberle M. Smith Associates in Detroit, Carl Koch & Associates in Cambridge and Coletti Brothers in Boston.



the magazine of BUILDING 123

HOUSE DESIGN COMPETIT



ALTERNATE STREET FRONT ELEVATIONS

Outdoor living room results from use of glass, fence and garage

HONORABLE MENTION, NATIONAL SECOND PRIZE, EAST CENTRAL REGION



SANFORD H. WACHTEL, NEW YORK CITY

A really private outdoor living room is difficult to obtain within the confines of a 60' lot. But here it is-inexpensively created by the extension of the house's front wall to the garage. Other details of the plan which earned the jury's favor: a centrally located entry which serves all parts of the house, logical sequence of kitchen, breakfast bar and dining space, a three passenger bath economically backed up against the kitchen, children's bedrooms which can be combined, the provision of abundant storage space and built-in bedroom furniture. On the other hand, the lavish use of glass high up in the gable ends was criticised as difficult to shade and clean and as contributing to heating costs. Another demerit: the long walk between garage and service entry.

WACHTEL: "The larger glass areas are shielded from the neighbors and the street. In the case of the living room, for instance, privacy is gained and an outdoor living room is created by strategic placing of the garage and by extending one wall of the living room. True you don't have a long vista from the living room but are there ever any vistas in a neighborhood of such small houses? The living room gets lights and air from the street side yet its occupants cannot be seen. The occupants are not cut off from the street either because a window is provided for this. The glass wall in bedroom No. 1 is shielded by a high fence which runs along the rear lot line.

"By providing a breakfast bar we were able to see into the kitchen, extending our vision and bringing the housewife out of exile in the kitchen. Exhaust fans remove the problem of smoke and odors. There is no utility room. The heating unit and laundry equipment are all located in the kitchen thus freeing the area which a utility room would occupy to be distributed among the other rooms. This is possible because of the tremendous improvement in appearance and operation of this equipment."

A 31 year old native New Yorker, WACHTEL, helped build the New York Worlds Fair (as a water boy) and the Syracuse Air Base (as an Army designer) ... received his Bachelor of Arts degree from Harvard in 1945... worked with Architects J. Gordon Carr and Voorhees, Walker, Foley & Smith and Designer-Builders Ross-Frankel... now with Architects Carson & Lundin.

TIONAL PRIZE WINNERS



Living and sleeping areas grouped symmetrically around service core

HONORABLE MENTION, NATIONAL SECOND PRIZE, SOUTHEAST REGION



MARK P. LOWREY, NEW ORLEANS, LA.

This 960 sq. ft. house struck one of the jury architects as "an intriguing delineation of an original plan." Said one of the builders: "I have never seen this house before—everything the designer has done is an improvement." Most intriguing is the symmetrical arrangement of the L-shaped living-dining area and the L-shaped sleeping area around the central service facilities.

To combat the southeast's hot, humid climate and its insects, the house is raised off the ground, through ventilation in each room is augmented by a central clerestory with movable sash, and one wall of the master bedroom, as in the dining space, opens upon a screened "balcony." Other noteworthy features: the use of batteries of closets to isolate the noisy zone from the quiet zone, modular post and lintel framing with 2 x 6'' roof sheathing; flooring cantilevered 3' beyond a minimum foundation; a folding wall combining the two children's bedrooms into one large play area.

LOWREY: "This small house was designed for the climate of the southern region.

"Basically, the construction consists of standard brick foundation walls on concrete footings, thus allowing an elevated floor and a constant flow of air beneath the house to remove dampness and wood rot common in the South. The framing members are $4 \ge 4''$ uprights and $4 \ge 10''$ rafters on a module of 5'. The hall clerestory acts as a flue bringing air from outside through the house and passing it with the warm air near the ceiling out over the roof, which is white to reflect the sun's heat.

"The carport roof acts as a cover over the entrance walk and the rear roof overhang between the screened areas provides southern sun control for the living and kitchen area. Windows are built directly to the wall framing and are fixed glass with projected panels. This allows them to remain open during the frequent southern rainy spells."

LOWNEY was born 24 years ago and still resides in Marks, Miss... two years in the Navy... worked with Washington, D. C. Architect A. R. Clas and Builder Paul Frizzell ... now a senior in Tulane's School of Architecture ... has won five \$100 awards in Chicago Tribune Better Rooms Competition.

Service core separates living and sleeping areas

Although a corridor running completely through the small house from front to service entry is admittedly a luxury, it has helped this plan rather than hurt it. It furnishes direct access to all rooms from either entry without unduly compressing room sizes. It is part of a service core which separates the bedroom and living areas. The core's other components: an entry hall with coat closet, an interior bath with clerestory, a utilityheater room and a laundry. In this position the laundry is conveniently related to the kitchen, drying yard and the bedrooms which are the source of most dirty clothes and linen.

The jury was impressed by the "well conceived, straightforward plan within a simple square." Actually the house measures $30' \times 33' 4''$.

RICHARDSON: "The essential features of the house are simplicity of shape and construction, a central utility core and the provision for expanding the bedroom portion. With construction costs too high for the average family the option of expansion and the possibility of adding terraces and other amenities to a basic house seem fundamental.

"Equally important is the use of a minimum number of interior partitions so these were deliberately held to those essential for bearing walls. The partitions separating the bedrooms from the utility corridor were glazed so that the children's rooms might be easily observed and extra through ventilation could be easily achieved. The fact that a restricted lot with neighbors on either side was a fundamental called for the utmost privacy in sleeping and living area, hence high windows were used in the bedrooms and the living areas were arranged for maximum screening from adjacent lots.

"The kitchen and utility areas were placed to provide supervision over children's play areas and for convenience to the utility yard."

RICHARDSON was born in Helena, Ark. 34 years ago ... transferred from University of Chicago to Illinois Institute of Technology ('39) ... has since been a designer for Architects Skidmore, Owings & Merrill except for four years with the Air Corps Engineers from which he emerged as a major.



HONORABLE MENTION, NATIONAL HONORABLE MENTION, MIDWEST REGION



AMBROSE M. RICHARDSON, CHICAGO, ILL.







HONORABLE MENTION, NATIONAL SECOND PRIZE, MIDWEST REGION



HAROLD BLEWETT, CAMBRIDGE, MASS.

An excellent arrangement of rooms within only 918 sq. ft.

The most unusual feature of this well arranged floor plan is its 918 sq ft. area—about 82 sq. ft. less than that of most of the other houses. Despite this important saving, the master bedroom is bigger than most (145 sq. ft.), and the two smaller bedrooms are of typical size (170 sq. ft. total). While small, the living-dining room enjoys good proportions and the kitchen and storage space are adequate. Moreover, the designer reserved space for an entry hall at the center of the house where it serves all elements.

Even without benefit of carport, the house is clean and handsome in exterior design and fits handily on the small lot.

BLEWETT: "The simplicity of structure and massing should appeal to both builder and architect.

"The house is bisected *both* ways for joists lengths of 14' and 18'. This would allow the ridge of a gable roof or the valley of a butterfly roof to run either longitudinally or laterally. Of course, either a flat roof or a shed roof would also work. These possibilities would help give the necessary variety and individuality to the exterior appearance of a new neighborhood.

"The kitchen is located with easy access to the entrance and to the living areas of the house and permits convenient supervision of children's bedrooms. The living and sleeping areas are well defined and separated with sound-absorbing wardrobes and storage units. The important rooms open away from the street toward the larger back yard and probable view. The bathroom is situated primarily for easy accessibility from the bedrooms but still close to the kitchen and entrance. Circulation is confined to a brief and compact hallway.

"I feel that the appearance of this house and the materials suggested in the drawings are very much in character with the climate and topography in the upper Midwest and would be readily acceptable to the people there."

BLEWETT, a 27 year old native of Anoka, Minn., received his BA in Architecture at the University of Minnesota in 1949 and his Masters degree from Harvard two months ago ... worked a year and a half with Architects Long & Thorshov in Minneapolis ... more recently, while in Cambridge, with The Architects' Collaborative and Bogner & Richmond ... an Army veteran.

Big living-dining room is integrated with terraces on either side

Although the presentation is deceiving, the floor plan of this house is a rectangle with a social terrace off the living room to the left, and a play terrace off the dining-recreation room to the right. The former is shielded from street and neighbors by a fence, the latter by the carport, its closet and its extended wall. Within the house a freestanding low storage partition separates the living and dining-play area. While the entry at the corner of the living area would normally mean diagonal circulation through the room, this entry would be used almost exclusively by guests; the family would use one of the three doors down the carport side of the house.

The 996 sq. ft. plan was different enough to be "most interesting" to the jury; the design in general, "simple and mature."

HAJJAR & WHITELEY: "From the standpoint of the housewife, this plan is ideal in that it allows her to command a view of the entire house from the ample kitchen. She is able to supervise the children at play and yet maintain full control of the front. It is possible for her to observe the approaches from the street side and, with a minimum of steps, answer a call from either the front or "back" door. Her work areas are conveniently arranged and storage is more than adequate. "The children have excellent play areas in the dining room and its adjoining terrace. Some untidiness in this area will be well screened from the street. The children are in close proximity to the bathroom, kitchen and storage; yet, in circulating around these areas, they cause no disturbance to the adult social space.

"The construction is completely based on a simple 3' 4" module, only deviating from this in a few interior partitions and spaces. The windows are standardized to this module and only three types are used. The use of a glazed overhead type door between the dining room and play terrace creates a very flexible space at a minimum of expense."

HAJJAR, born 31 years ago in Lawrence, Mass. studied architecture at Carnegie Tech, earned his masters degree at MIT ('41) ... taught architectural design at Washington State ... three years in the Navy ... now associate professor on the design staff at Penn State and a practicing architect and furniture designer. WHITELEY was born in England in 1913, educated in Canada ... University of Manitoba Cold Medal and Royal Architectural Institute of Canada Gold Medal ... MA from Harvard... has taught at Kansas State; now assistant professor at Penn State ... specialty: small house research.



HONORABLE MENTION, NATIONAL FIRST PRIZE, ROCKY MOUNTAIN REGION



A. WILLIAM HAJJAR & RONALD WHITELEY, STATE COLLEGE, PA.

HONORABLE MENTION, NATIONAL SECOND PRIZE, NORTHWEST REGION



DONAL OLSEN, BERKELEY, CALIF.

Walls of glass open all rooms to screened-in lawns

Screening fences and shrubbery are integral parts of the design of this glass-walled house, for without them such a house on a 60 x 100' lot would be a veritable fish bowl. Of course, blinds and draperies at the windows could also be used to achieve privacy. The large glass areas set in sliding frames fuse the house and lot and thus create a feeling of spaciousness: they also capitalize on distant views for which the northwest region is famous. The design was commended for its straightforward approach to the small house problem and for its splendid detailing. However it was felt that the required fencing would be too expensive and unbecoming to the street-particularly if a row of such open houses were to be built. Criticism was also made of the "holes" in the roof-"an expensive cliche."

OLSEN: "Maximum utilization of the site predicated this plan. Considering the setback requirements, the deep lot and the economic desirability of a compact house it became quite natural to develop a plan that utilized the front yard as well as the back for actual livable outdoor space.

"The large central living and dining space, fully open at both ends, provides continuity visually and actually between the front and rear yards. This central space is the flexible element

of the scheme; depending on location, it may be widened or lengthened or made pie shape in either direction to fit variations in site or budget. While the dining and sitting areas are free from circulation, (circulation occuring at the center of the space) this space becomes the nucleus or center of family life and activity in its most traditional sense, instead of an isolated wing. "The fireplace is located to be enjoyed from the dining as well as the sitting area. It provides a functional division between the areas, but in no way destroys the unity of the total space. Because of the simple, uniform and relatively short span framing across the house, the structure is economical. Since the roof joists span the maximum openings in all cases, involving no posts or lintels, the large windows and door areas offer no problem whatever."

Architect OLSEN is 31; a Minneapolis native, a graduate of Minnesota and Harvard (MA^{*}40) and a one-time designer for Saarinen, Swanson & Saarinen, Franklin, Kump & Falk, and Skidmore, Owings & Merrill ... presently with Architects Wurster, Bernardi & Emmons in San Francisco.



Cross plan permits through ventilation of every room

Although this house with its big perimeter and roof area obviously stretches the budget to the limit, it embodies several new design ideas for the southeast region.

Plan of the house proper is a Latin cross with a bedroom in each small wing and the livingdining-kitchen area in the long shank. Thus each room has two opposing exposures to capitalize on whatever breeze may be stirring. The bedroom wings are clustered around a bath and a half at the plan's crossing. In this position they require no valuable perimeter wall and are economically close to the kitchen; they are lighted and vented through a clerestory.

HONORABLE MENTION, NATIONAL



J. DAVID MC VOY & HAROLD C. ROSE, GAINESVILLE, FLA.

The cross plan is squared off with covered terraces and a carport at the corners. Besides increasing the sheltered living area, these screened terraces or porches give sun protection to the many big windows and glazed doors. This is a squeezed down version of a good big house. More than most of the other prize winning designs, it needs a few more square feet; the living room, for example is only 11' 4" wide and the dining space is minute. However, the jury felt that the interesting ideas in its plan offset these shortcomings.

McVov was born in Joplin, Mo., in 1920 but has lived most of his life in Gainesville, Fla. where he attended public schools and the University of Florida—first as a student (BA in Architecture '42) and now as an assistant professor of architecture. He has served in the Navy and has worked with Donald Desky Associates (industrial design) and several Florida architectural offices, is now an AIArchitect. . . . Rose was born the same year in Newport R. I., raised in Providence, graduated from Rhode Island School of Design assistant professor at Florida, he is associated with McVoy in the practice of architecture and in low cost housing research.



REGIONAL AWARDS

To recognize the effect of climate and geography on small house design and to encourage the submission of designs from all parts of the U.S., each contestant was required to design his house for a particular region. For this purpose the country was divided into seven regions as shown on the map below.

It was recognized that there are marked climatic variations within these regions, but a more refined division of the country would have produced too many regions and perhaps too few entries per region in some cases. (For example, on a strict climatic basis the state of Florida alone might logically have been divided into two or three regions.) Thus, the seven designated regions represent a compromise between the wide range of climatic variations within the U. S. and the practical aspects of conducting a design competition.

Each region was allotted a First Prize (\$750), a Second Prize (\$500) and from one to five Honorable Mentions (\$250 each), based on the region's relative population. Following is a definition of each region with the number of its Honorable Mentions indicated in parenthesis:

- A Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont. (1)
- B Delaware, District of Columbia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Virginia, West Virginia. (11)
- C Alabama, Florida, Georgia, Louisiana, Mississippi, Texas, (except portion directly south of New Mexico). (2)
- D Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Wisconsin. (5)
- E Arizona, Southern California (south of the straight line between north boundary of San Simeon and north boundary of Shoshone), New Mexico, West Texas. (1)
- F Colorado, Idaho, Montana, Nevada, Utah, Wyoming. (1)
- G Northern California (north of the straight line between north boundary of San Simeon and north boundary of Shoshone), Oregon, Washington. (1)

On the following pages are presented the regional prize winners which did not also win national prizes.



HOUSE DESIGN COMPETITION



Handsome house designed for privacy and economy

Nearly square in shape $(29\frac{1}{2} \times 33\frac{1}{2}')$, this compact house would be easy and economical to build. Kitchen and bath are back to back; heater and fireplace use a common stack and are centrally located for easy distribution of heat; a bearing partition runs down the center of the plan, simplifying the frame.

All major rooms are opened to the large front and rear yards; only the kitchen faces to the side and in this position it permits easy supervision of the play yard and is handy to the bath, the front entry and the automobile. Also noteworthy: the large storage room, the circulation-free living room, double use of the corridor (for dining) and the "neat presentation" of the design. However, the jury was unhappy with the location of the dining space.

A graduate of Georgia Tech ('33), STUBBINS is a 39-year-old architect famous for his many handsome buildings (particularly houses and housing) and a long list of architectural honors and competition prizes. He is associate professor of Architecture at Harvard.

Divided bathroom and big kitchen spell convenience

For the price of only an extra lavatory and 5' of partition, this house enjoys most of the convenience of a two-bathroom scheme. And half of the bath is equipped with a two-way closet for production-line handling of soiled and clean linen. Opposite the conveniently placed entry hall is a kitchen whose 151/2' length would make any housewife happy. The range and the heater are placed on either side of the fireplace to permit common venting.

Other good points: all major rooms face the rear; bedrooms are of generous size and are equipped with big closets and built-ins; fenestration is standardized thanks to the use of a 4' module. However, the jury considered the dining space inadequate and thought that the exterior design was "susceptible to improvement."

SAWYER is 28 years old, an Army veteran, and a fifth year student in the School of Design at North Carolina State College.

3

Unusual plan includes interior kitchen and bath

Two-thirds of this rectangular house is one big room subdivided by two islands: 1) the back-to-back kitchen and bath surrounded on two sides by closets, and 2) the heater-fireplace combination surrounded on two sides by a range and a kitchen counter. Thus the living-dining area of the house is a large Lshaped area boasting convenience and flexibility. From her central kitchen headquarters the housewife can watch over her children at play and serve meals in whatever direction suits the occasion.

While the house is "beautifully economical," the design of the shell was considered neither beautiful nor salable. The lack of wall space for kitchen and laundry equipment and storage cabinets was also criticized.

SKLAR is 27, a New Haven resident, an Air Force veteran, a senior at Brooklyn's Pratt Institute and winner of a special citation in The Museum of Modern Art's Lamp Design Competition.



HONORABLE MENTION, EAST CENTRAL REGION

HONORABLE MENTION, EAST CENTRAL REGION

ROBERT SAWYER RALEIGH, N. C.

KENNETH SKLAR BROOKLYN, N. Y.

3



HOUSE DESIGN COMP



ALT 3



Kitchen control center has direct access to every other room

The most interesting aspect of this home is the planning of the kitchen and its relationship to the other rooms. In the first place the kitchen is big-big enough to handle the laundry operation without interference with food preparation. Secondly, it connects with the bedroom hall in one direction as well as with the livingdining room in the other direction. Thus, the house wife has a choice of two routes in answering the front door bell. (Most family traffic in and out of the house will be through the kitchen entrance which is close to the garage and play area.) The kitchen-livingdining half of the house is actually one big room to give a sense of spaciousness to this area. A glass panel between the kitchen and the child's bedroom (or hobby room) gives the mother in the kitchen supervision over still another room.

LOEFFLER is a 33 year old native of Pittsburgh, a Carnegie Tech graduate ('40), a registered architect with the firm of Hoffman & Crumpton.

2

Dining room does double duty as an entry hall

By accommodating the functions of dining and reception in a single space, this house presents a big pleasant room to the visitor and leaves the $12 \ge 19'.6''$ living room completely free for living. The dining-hall is a traffic center directly serving every other room in the house, further protecting the privacy of the living room. (The TV set can be relegated to the bedroom which, at the pull of a curtain, becomes a living room alcove.)

Because the house is long and narrow $(43' \times 23' 1'')$, it may be economically constructed with the aid of a trussed roof, storage walls and nonstructural partitions. Although "not distinguished," the exterior design was commended for the "feeling of shelter" given by the overhanging roof.

STRANG is 24 years old, an army veteran who graduated in January from the University of Virginia's School of Architecture.

3

Interior bath permits expansion of bedroom hall into play area

In the shank of this T-shaped plan an interior bathroom subdivides the space into four rooms: foyer, living room, kitchen-laundry and multi-purpose area. An -enlargement of the usual hall, the multi-purpose area handles the heavy bedroom-bath traffic in early morning and evening and meanwhile may be used for work, play, laundry drying and miscellaneous other purposes. The big kitchen-laundry is between this multi-purpose area and the rear play yard, permitting the mother to supervise the children in either direction as she works.

Large glass areas add spaciousness to the rooms and at the front of the house are screened from the street by the carport storage closet and a planting screen to preserve privacy. Roof overhangs offer sun protection and give a sheltering appearance to the house.

BOYTE is 31, an Air Force veteran, a fifth year student at Georgia Tech's School of Architecture and a summer employee of Architects Louis Asbury & Son and Walter Hook & Associates.

The States of the

HOUSE DESIGN COMPETITION



Economy of square enhanced with back-to-back plumbing

Because it is square in shape $(31'-6'' \times 32')$ and has a central entry, this house may be used on either side of any street with proper orientation. Thus, on an east-west street a house on the south side would have its kitchen to the front, its living room to the rear (as shown in plan and perspective above), while a house on the north side would put the living room to the street. On a north-south street a 90° turn of the garage would still permit the living room and children's bedroom to enjoy the southern exposure.

Other noteworthy design details in "a plan that works well": back-to-back kitchen and bath, a utility room extension of the kitchen ("these two elements might better have been interchanged"), circulation through the "well proportioned living room" limited to one end of it, big bedroom closets positioned to act as sound barriers, cross ventilation in every room.

DIAMENT (29) and MACSAI (25) are natives of Hungary, liberated from Nazi concentration camps by US Army; together won first prize for design of Budapest war memorial, studied architecture in Hungary and US (Miami University in Ohio), now with Skidmore, Owings & Merrill.

2

Interior court adds living space to L-shaped plan

Comprised of two distinct parts—a living area and a quiet sleeping area separated by a 40' long battery of closets--this L-shaped house has an outdoor living room. It is enclosed by the garage and across the front by a wooden framework supporting panels of translucent glass at eye level.

Inside, the L-shaped living-dining-entry area is pleasant and spacious, but the plan was criticized for the poor relationship between the kitchen and the other rooms—circulation between them is circuitous. Moreover, the house has no service entrance.

GIBONE, 41, was born in Orange, N. J., is now a practicing architect and instructor at Notre Dame. His education is extensive: Newark School of Fine and Industrial Arts, Atlier Newark, N. Y. University, Harvard Graduate School, Fontainbleau, Cranbrook.

3

L-shaped kitchen-laundry is biggest room in house

The plan of this house won the admiration of the builder members of the jury because of the space devoted to the L-shaped kitchenlaundry. It is big enough to accommodate a breakfast bar or table, an ironing board, a sewing center or a play pen; and was therefore considered "a very salable feature." On the other hand, some jury members felt that "the living space suffers at the expense of the excessively big kitchen." They considered the plan "quite ordinary in conception but done better than most" and felt that the elevations left much to be desired.

The large storage closet at the side of the carport is included in the 1,000 sq. ft. floor area.

POLLMAN is president of the Pollman Construction Co., publisher of several house plan books, designer behind a stock plan and scale model service, and a notable success in each of these fields.



HOUSE DESIGN COMPETITION



CINCINNATI, OHIO

Column and beam structure produces unusual design

Comprised of ten 8 x 12' bays, this house is framed with 4 x 4" columns supporting 4 x 10" beams. Their tapered ends extend about 4 to 5' beyond the walls to protect the windows against sun and rain and give the design an attractive ground-hugging appearance and feeling of shelter. Such a frame permits the 2 x 6" plank roof to go up first, eliminates the need for expensive structural walls and partitions.

Other noteworthy details: concentrated utilities, a kitchen which may be opened to the living room by means of a folding screen at the breakfast bar, a convenient relationship between kitchen and the main and service entries, considerable built-in furniture to save space in the bedrooms, a pleasant and easily furnished living room.

ROUSH, 30, is a graduate of the University of Cincinnati, a one-time student of the Paris Architect Jacques Greber, now a designer with Carl A. Strauss in Cincinnati.

Utility core ties living and sleeping wings together

This H-shaped plan makes a distinct separation of the three basic functions of a house: living, sleeping and utility. Tying the two flanking wings together, the central utility core economically concentrates the plumbing in a single partition and includes a useful row of closets along the main entry hall. The shape of the house permits cross-ventilation in two of the bedrooms, but has the obvious disadvantage of an excessive perimeter. Although impressed by its "good plan and studied elevations," the jury criticized the house for its lack of overhangs and for the unnecessary horizontal boards connecting the various elements of the house.

ADACHI, 37, was born and educated in California (University of California, '39), worked with Architects Ketchum, Gina & Sharp, now with Spaulding, Rex, DeSwarte . . . NAGANO, a 30-yearold California native, graduated from Yale and Harvard (MA '45), once worked with the same two firms, is now with Robert E. Alexander . . . BLACHNIK, 28, was born in South Dakota, schooled at Iowa State and Harvard (MA '45), has worked with Spaulding, Rex, DeSwarte and Albert C. Martin, is now with Douglas Honnold.

3 Long, narrow house has spare room and extra bath

This design demonstrates how much useful space can be packed within the limits of 1,000 sq. ft. The house measures 20'-10" x 48' and, in addition to the usual basic rooms, boasts a second complete bath (a luxury in this price bracket) and a semi-private alcove off the living room (beyond the two-way fireplace) which may be used as a study, guest room, or parlor. However, this space stretching has been accomplished at the expense of the living area and the kitchen. Other shortcomings: excessive floor area required for circulation, poor relationship between garage and service entry, too many expensive walls and fences, one of which extends into the house.

DUKELSKI, born in Russia, came to the U. S. in '21, graduated M.I.T. School of Architecture, studied at Fontainebleau, practiced architecture in New Jersey, now with MGM's Art Department in Culver City . . . KEMM, a native New Yorker, and Columbia architectural graduate, has practiced architectural, industrial, and interior design in Los Angeles, is now an MGM designer.


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ALTERNATE ELEVATIONS

HOUSE DESIGN COMPETITION



Eight bays are divided equally between living and sleeping areas

An interesting experiment in the use of a large module in small house construction, this design is based on the repetition of bays approximately 11' square. The bedrooms and bath occupy four bays; the living-dining-kitchen area, the other four. The designer contemplated that these bays be roofed with common but colorful redwood 2 x 3's laid on edge to form a laminated diaphragm requiring no inside finish, no insulation. Extending well beyond the curtain walls, this roof has a substantial and sheltering appearance which impressed the jury. However, some aspects of the house design met criticism: the indicated use of four different finishing materials on the end of the house and the rather rigid furniture placement which does not take advantage of the fact that the living room and one bedroom may be combined.

EVISON, 50, was trained at the University of Southern California, and Beaux Art Institute and Art Center in Los Angeles, worked for numerous architects, has designed houses for builders, now has his own practice including a builder client.

Contract of the second seco

The most interesting aspect of this house is its offset plan with central dining space big enough for use as a two-way entry hall, corridor and playroom. Thus composed, the same house can be sited differently on adjacent lots to achieve a wide variety of street fronts and therefore an interesting grouping of houses within a development. (The small scale site plan shows 16 of the 24 variations possible for the four basic orientations of the house.)

Other notable features: a big square, circulation-free living room; a long, well-planned kitchen; a clean, straightforward envelope with an intelligent use of glass.

LYMAN, 34, a graduate of Michigan and Harvard (MA '40), has worked with a long list of prominent architects (including Gropius & Breuer, Carl Koch, Hugh Stubbins, Saarinen & Swanson, Skidmore, Owings & Merrill), now has his own practice in association with Charles Burchard . . . COMPTON, 31, got his architectural training at Princeton, Harvard and MIT (MA '47) and experience with Carl Koch, Coolidge Shepley, Bulfinch & Abbott among others, now has an office of his own . . . WELCH, 26, got his BA at Chicago's Institute of Design, is now working on his masters at Harvard.

3

Butterfly roof opens major rooms to Rocky Mountain view

SMITH: "The most noteworthy thing about this design is that my family lives in it—and likes it. The bath arrangement works well, allowing maximum utility with minimum space and number of fixtures.

"The butterfly roof is ideal in this region, since it keeps water and icicles away from the eaves and its upsweep to the glass areas opens the house to the rugged mountain view. From a practical standpoint, the fireplace locates the heating elements in the center of the house. From a standpoint of design, it inspires a warm, friendly feeling to face its masonry texture and planting upon entering the front door. The 6' wall between living room and master bedroom causes a lot of eyebrow raising but it succeeds masterfully in making a small house appear luxuriously large. The continuity of ceiling expanse, repetition of glass and gaily decorated far wall of the bedroom creates a very friendly, unrestricted feeling.

SMITH, 31, has no formal architectural schooling, was taught drafting by Architect Roger Woods of Salt Lake City and design by Fred L. Markham, with whom he is now associated.

REGIONAL PRIZE WINNERS







HONORABLE MENTION, NORTHWEST REGION

WARREN B. HEID SAN JOSE, CALIF.



L-shaped living-dining room overlooks rear yard

"This is a very acceptable builder's house" according to one of the builder members of the jury. "I have many customers asking for a place to hang a vine and set a row of flower pots." Designed for northern California, this house will satisfy those customers with its patterned glass screen and planting box between the living room and entry hall. Connecting all rooms in the house, this hall keeps circulation out of the living room which, along with the dining alcove, is opened up with walls of glass to the rear yard.

Demerits: Lack of a convenient service entrance when the garage is added; lack of freshness in the alternate exterior designs.

HEID, 27, is a native Californian, an ex-army sergeant, a graduate of the University of California's School of Architecture, and a designer for Architects Binder & Curtis in San Jose.



Presentation of special first prizes is made by NAHB's retiring president, Tom Coogan (dark suit), to Chase (Kitchen Planning), Joseph (Glass Use) and Hanson (Plywood Built-in Features).

PLYWOOD BUILT-IN FEATURES (p. 144)

Sponsor: Douglas Fir Plywood Assn.

PRIZE WINNERS

GLASS USE (p. 152)

Sponsor: Libbey-Owens-Ford Glass Co.

SPECIAL PRIZES

In conjunction with the NAHB-FORUM House Design Competition, three sponsors offered special prizes for various phases of design in which they are particularly interested. Listed below are the sponsors and the winners of these prizes. On the following pages are presented the first four prize-winning designs in each category, plus selected designs which received honorable mention.

KITCHEN PLANNING (p. 156)

Sponsor: Youngstown Kitchens by Mullins

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Alvard Dobles 3069 Lucaya St. Miami 33, Fla.	Joseph J. Roberto Carolyn Roberto 104 Lexington Ave. New York, N. Y.	Prentice Bradley 74 North St. Pittsfield, Mass.	Lambert J. Soucek, Jr. 49 S. Washington St. Hinsdale, Ill.	Eric R. Bancroft Ching C. Cheng 245 Avenue "C" New York, N. Y.	Robert A. Little & Associates 1303 Prospect Ave. Cleveland 15, Ohio
Robert A. Little & Associates 1303 Prospect Ave. Cleveland 15, Ohio	W. Rowe Smith 1266 Cedar Ave. Provo, Utah	Jack Freidin 2766 Sedgwick Ave. Bronx 63, N. Y.	Eldon C. Teschner Route No. 2 Smithville, Mo.	Edward D. Dart Pennyroad Dundee, Ill.	George Matsumoto 3210 Ruffin St. Raleigh, N. C.
William & Barbara Pfo 326 Castlegate Road Pittsburgh 21, Pa.	outs Richard G. Stein Mount Airy Road Croton-on-Hudson, N. Y.	Sol N. Gellman 308 W. North Ave. Milwaukee, Wis.	Warren W. Weaver Thornwood, N. Y.	Joseph N. LaBorde Box 2254 University Station Gainesville, Fla.	Richard B. Pollman 18600 Schoolcraft Rd. Detroit 23, Mich.
Stewart Pike 108 Creston Ave. Audubon, N. J.	Warren W. Weaver Thornwood, N. Y.	Richard B. Pollman 18600 Schoolcraft Rd. Detroit 23, Mich.	Taina Waisman Sidney L. Katz 639 E. Third St.	Roland H. Lane 1218 Westlake N. Seattle, Wash.	Lucille B. Raport 4508 Forman Ave. N. Hollywood, Calif.

HOUSE DESIGN COMPETITION PLYWOOD BUILT-IN FEATURES

FIRST PRIZE EDWARD W. HANSON, STILLWATER, MINN.

Shelf-door wardrobe is combination closet and dresser

Used with modification in six different places throughout the house, this space-saving wardrobe contains a chest of drawers, a hat compartment and box-type doors whose mirrors, shelves, shoe racks, hampers, etc. eliminate the need for much of the "store furniture" which clutters up today's small rooms.

No dream design, the shelf-door wardrobe was developed by Hanson in 1947 for his own home and has since been perfected. Says he: "Instead of placing conventional type doors in my closets, I had a millwork shop fabricate rectangular frames of $1 \times 5''$ boards, on which was placed a sheet of $\frac{1}{4}''$ plywood. These made long boxes about 5'' deep which, when placed upright, became hollow doors.

"I first divided this hollow space with a series of lipped shelves for storage of miscellaneous items, telling my wife and my two daughters to be good little guinea pigs and tell me how the shelves should be arranged and what other purposes this hollow space might serve. After two years of use the "Shelf-Dor" evolved into the forms illustrated. The form varies according to the user. The father's, for example, has plenty of shoe racks, a tie section, a mirror placed at the right height for tying ties, and shelves for sox, handkerchiefs, shirt studs, sweaters, etc. One shelf remains always empty, ready for the loose change, billfold, checkbook and all other miscellaneous items a man carries and puts on top of his dresser at night.

"These storage doors plus a chest of drawers in the wardrobe have enabled me to throw away the old dresser I had always used in the bedroom before."

HANSON, 42, was born and raised in Minnesota, received his BA in architecture at Minnesota Institute of Technology, has done detailing for a millwork company, managed the general contracting department of a lumber company, worked in an architect's office, now heads the architectural and sales promotion department of the Central Lumber Co. in Stillwater, specializes in designing small houses for builders and other customers.



RIZE WINNERS



Storage cabinet with folding table

screens back of kitchen fixtures

Separating the kitchen from the adjoining room (a multi-purpose space in this case), this plywood device consists of two-way cabinets, shelves and a two-piece drop-leaf table. It is high enough to screen from view the kitchen work counters but low enough to permit the housewife in the kitchen to overwatch the adjoining space.

The designer has built a similar feature in his own house and vouches for its "ease of construction and practicability." He recommends a piano hinge for each drop leaf, suggests that, if butt hinges are used, two gate legs be provided.



HOUSE DESIGN COMPETITION

Thirteen built-ins suggested to organize storage in every room

Most interesting of the 13 uses of plywood in this house is the battery of storage cabinets built into the bedroom hall (below). Designed to the house's 48" structural module, these cabinets have an open base and a low height to eliminate the need for bending and reaching. (The house's shed roof slopes upward toward the cabinet wall, producing a higher than normal ceiling.) In this position they, incidentally, serve as a permanent screen in the otherwise glass wall, giving privacy to the hall. All cabinets are lighted from above by a fluorescent reflector which slides in a continuous channel. (For other details of this house see p. 152.)



RECORD STORAGE B DESK UNITS STORAGE WALL: LINENS AND BLANKETS HAT BOXES SHOES SEASONAL CLOTHING SPORTS EQUIPMENT TOYS GAMES AND MISCELLANEOUS HOUSE ITEMS. COUNTER BAR BETWEEN COUNTER BAR BETWEEN KITCHEN & DINING PASS-THRU GLASSWARE DISHES SILVERWARE LIQUOR BAR STORAGE. DRAWER CHESTS & VANITY. DRAWER CHESTS & DESKS. SLIDING ROOM DRVIDERS. BRIDGE TABLE + CHAR STORAGE. BUILT-IN TELEVISION IN CLOSET. SLIDING CLOSET DOORS. DRAWER STORAGE BELOW BEDS. PLYWOOD LIGHTING COVE. PLYWOOD WALL PANELS. PLYWOOD CEILING PANELS.

PLWWOOD TYPES SPECIFIED: (PLYPANEL GRADE A-D) WALL PANELS IN L.R.+ & R. CEILING PANELS IN B.R. STORAGE WALL IN B.R. HALL INTERIOR A-A-DFPA) SLIDING ROOM DIVIDERS L.R. CABINETS + B.R. CHESTS. INTERIOR A-B-DFPA DINING COUNTER BAR SLIDING CLOSET DOORS PLYSHIELD EXT-DFPA OUTDOOR STORAGE UNI







SLIDING FLUORECENT REFLECTOR IN CONT-INUOUS WIRE CHANNEL.

FLEXIBLE FITTINGS ADJUSTABLE SHELVES PULL-OUT HANG-ROD WOOD PEGS DOWELS PULL-OUT TRAYS -FOR PLANNED UTILITY. EXTERIOR WALL. SLIDING DOORS. VENT OPENINGS. SLIDING ASSEMBLY. SECTION.

A

N.

HOUSEHOLD CHILDRENS SPORTING SEASONAL HAT BOXES BLANKETS GOOD S GAMES EQUIPMENT CLOTHING SPARE SHOE LINENS & FLEXIBLE UTILITY WITH MODULAR SIZE PLYWOOD STORAGE UNITS. 2

PLYWOOD BUILT-IN FEATURES PRIZE WINNERS





 IO
 FOAM
 RUBBER
 BEDS
 ON
 SAGLESS
 SPRINGS

 PLYWOOD
 FRAME.
 TOY
 BOX
 ON
 CASTERS.

 G
 PLYWOOD
 ROOM
 DIVIDERS
 SLIDING
 PANELS.





HOUSE DESIGN COMPETITION

FOURTH PRIZE

NICK ATHENS, LOS ANGELES, CALIF.

Folding cabinet dresses up the sewing machine for the living room

The sewing machine is no longer a piece of equipment which must be hidden in a closet between uses. One end of this otherwise conventional living room bookcase accommodates the machine and the numerous small storage compartments required by the seamstress. The hinged cover drops down to become a work basket; the box-type door swings 180° to provide knee room under the machine. The utility of this built-in might be improved by a larger work surface which would permit the machine to be moved out from the wall for sewing large pieces.

HONORABLE MENTION WILLIAM & BARBARA PFOUTS, PITTSBURGH, PA.

Pull-out table in storage wall saves space in living-dining room

The storage units shown below extend across the end of a living-dining room into the kitchen (at right of drawing) and hide a six-passenger table as well as the usual kitchen and dining accessories. The table is comprised of two leaves, each of which is pivoted at the corner and rolls out from under the counter top on a 2 x 6" leg fitted with a rubber tire caster.



SECTION X-X





HONORABLE MENTION STEWART PIKE, AUDUBON, N. J.

Plywood "curtains" permit variation of wall-to-glass ratio

The fenestration of this living room may be changed at will, by sliding panels of 5%'' plywood over the big glass wall. Thus, the owner may vary the size and pattern of his window area to suit the outside temperature, the time of day, the occasion, or his whim—a modern version of the traditional window shutter.

HONORABLE MENTION

WARREN WILSON WEAVER, THORNWOOD, N. Y.

Two-passenger lavatory has foldout step for children

The design of this double lavatory for the bathroom includes a plywood cabinet with shelves and a disappearing step which raises / children up to the standard counter height.

At the far right the same designer suggests a backyard closet for garden tools and chairs. Raised off the ground, the compartment for wheeled tools has a "Dutch door," the lower half of which is hinged at the bottom to form a ramp.



HONORABLE MENTION

JOSEPH J. ROBERTO, NEW YORK CITY CAROLYN ROBERTO, COLLABORATOR

Cleaning closet on wheels follows the housewife as she works

A new idea in closet design is this wheeled broom closet which may be pulled from its niche in the kitchen and moved about the house during the cleaning operation. Containing all the necessary cleaning and polishing utensils, including a tank-type vacuum cleaner, it should save the housewife many steps by making it unnecessary for her to return to the kitchen for forgotten items.





JAMB

5/8 PLYPANEL (FIXED)

5/8 PLYPANEL (SLIDING)

5/8 PLYSCORD . SHEATHING

HONORABLE MENTION PROJECT DESIGNERS & PLANNERS, NEW YORK CITY

Flexible storage units reduce hardware and construction costs

Still in the development stage, this system of storage units is flexible enough to accommodate everything from books to clothes. Vertical "fins" are hooked into metal standards secured to the studs. These, in turn, are pegged to support shelves, flaps (instead of cabinet doors) and closet doors. Thus, the expense of hinging, latching and fitting doors is almost eliminated.



	TA- storage	
	dresser	
2	DRESSING	1

m	slorage
E	wardrobe
1.5	-desk
77	-drawers
3]透	CHILD













Wall cabinets for bedroom and bath provide convenient storage

Designed to accommodate miscellaneous accessories which clutter up the tops of dressers and tables, the bedroom wall cabinet (right, above) carries beneath it a fluorescent fixture for indirectly lighting the dressing table. The bathroom wall cabinet replaces and doubles the capacity of the usual medicine cabinet and permits the use of a really big mirror over the lavatory.





HONORABLE MENTION ALVARD DOBLES, MIAMI, FLA.

Two-way clothes hamper saves steps from bedrooms to laundry

Located conveniently between the laundry end of the kitchen and the bedrooms (the source of most soiled linen and clothes), the lower portion of this linen closet is a two-way hamper accessible from either side. Although the designer considered the need for a disappearing table more important, the back of the clean linen shelves might also have been opened to the laundry as well as to the hall. The unit would thus save steps during both phases of the laundry operation.

HOUSE DESIGN COMPETITION GLASS USE

FIRST PRIZE SEYMOUR R. JOSEPH, NEW YORK CITY

A demonstration of the versatility of glass inside and out

Throughout the long, narrow (15' 4" x 65' 2") rectangle of this solar house glass is used both functionally and decoratively. The house's simple shape and 48" modular structure produces uniform wall openings which are filled with standard sizes of doubleinsulating glass or with corresponding panels of plywood. The entire south wall of the house (model photo, right) is so fabricated and, in addition, uses two fixed horizontal panels of heat-absorbing glass on the outside to screen the summer sun from the living room and master bedroom. In conjunction with these sun shades, the use of double glazing throughout makes it possible to use the floor area right up to the windows, summer or winter-a particularly important consideration in small rooms.

Inside, translucent glass in the hall partition achieves bi-lateral lighting of the two small bedrooms, and sliding glass panels above the door height permit cross ventilation of these rooms. Mirrors and glass cabinet doors are specified to add convenience and a feeling of spaciousness to the rooms. For additional details of this house, see page 146.

JOSEPH is 37, a graduate of NYU's School of Architecture and Allied Arts ('41), the winner of three previous competitions, now associated with William C. Vladeck as Joseph & Vladeck, AIA, specialists in the design of department stores, specialty shops and custom residences.





PRIZE WINNERS



HOUSE DESIGN COMPETITION

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SECOND PRIZE

KAZUMI ADACHI, DIKE NAGANO & **ROBERT W. BLACHNIK, LOS ANGELES**

Patterned opaque glass walls combine light, texture and privacy

Clear, double-insulating glass is used sparingly in this H-shaped house, which is described more fully on page 138. In addition to the large, fixed picture window in the living room's south wall, the transparent material appears only in small awning-type sash high up on the walls of the other rooms and in the front and rear doors. But, as shown in the elevations to the right, other types of this glass are used in quantity where privacy and light, not view, are the important considerations. A by-product of this generous use of opaque and patterned glass is an interesting variety of textures in the inside and outside finish of the house.

Also illustrated is the use of 1/4" glass in the construction of a two-way china cabinet hung from the ceiling between the kitchen and dining space.



THIRD PRIZE

HUGH STUBBINS, JR. & ASSOCIATES, LEXINGTON, MASS.

Fixed glass and casements used for view and ventilation

Each major window in this house is comprised of a big, almost square sheet of double glass permanently fixed in place, plus one or two smaller sheets set in vertically hinged steel sash. (Patterned glass is specified for the privacy of the bathroom.) This uniform handling of the glass for view and ventilation gives a pleasant rhythm to the fenestration of the house as seen in the rendering below.







- window wall thermopane
- glozed gorden door 2 potterned gloss 3
- glass-top dressing table 4 5
- mirror in entry cabinet patterned gloss at entrance
- 67 tull-length mirror
- thermopone in steel sosh-see detail



FOURTH PRIZE

MARK JAROSZEWICZ, BLOOMFIELD HILLS, MICH.

Standard size glass sets module for design of house

The controlling dimension in the design of this modular house is the 421/2'' width of one of the standard sizes of double-insulating glass. When set in a projecting aluminum sash, this 221/2 x 421/2" glass unit may be aligned with a fixed unit measuring 251/2 x 451/2", another standard size. With the exception of the horizontal strip of high windows in the living room's north wall and the vertical strips beside the entry doors, all window frames are prefabricated from lumber and are three lights high. Where high sills are desirable, as in the bedrooms and bath, one or two of the lower panels of glass are replaced with 3/4" plywood on the outside and 1/2" plywood on the inside (indicated by white panels on the elevations).





all glazing except strips at exterior doors is z thermopane 452,252, all vents are ABC alum. proj. sash 455,255 glazed with 'z thermopane 42'z 22'z, where high sills are desired, tp. panels are replaced by 34 exterior grade douglas fir plywood, it was attempted throughout the house to use standard type construction, familiar to every builder in the country rather than to use supposedly economical but in reality cost-raising detailing tricks.

HONORABLE MENTION

SOL N. GELLMAN, MILWAUKEE, WIS.

Simple detailing of window structure cuts double glazing costs

Besides limiting himself to only two standard sizes of double glass panels, this designer proposes a simple window framing technique to hold down construction costs. As shown in the circled details to the right, the framing members are merely rabitted and finished 2×4 's.

Like the house presented above, this one is designed on a 4' module (note grid) which handily accommodates standard double glass panels. The resultant fenestration pattern is repeated in the framing of the carport (see south elevation) and the trellis which screens the side yard (east and west elevations).

Inside the house glass is used in the bedroom mirrors, in the door to the water closet and in the sliding doors of the kitchin-dining pass-through.



HOUSE DESIGN COMPETITION KITCHEN PLANNING

FIRST PRIZE

JAMES M. CHASE, NEW YORK CITY

Compact kitchen plan is based on study of work flow

The limitation on kitchen space in the small house demands that the room be compactly and efficiently planned. This kitchen measures only $10 \ge 15'$ (including breakfast bar and hall closts), yet provides sufficient space and equipment for laundry work as well as food preparation. And despite the fact that one entire wall is a window to make the room seem bigger, adequate cabinet space has been provided.

Behind this plan is an analysis of the work flow in each of three housekeeping activities (laundry, house cleaning and food preparation) and the careful integration of these activities in a single room.

Here is the designer's description of the result: "In the laundry center soiled wash is taken from a hamper under a work counter (where it had been funneled from beneath the corner linen closet) to the washer, dryer and disappearing wall-hung ironing board. Finally, after the various laundering processes are completed, clean linen is placed in the linen closet, the back of which is directly accessible from the work counter where the operation began.

"The cleaning center (a closet) is centrally located between the food and laundry zones, making it unnecessary to pass through either work zone to obtain housecleaning utensils.

"In the planning of the food center the flow diagram suggested a slight derivation from the popular U-shaped scheme to permit a logical sequence of food manipulations, starting at the receiving point and ending at the consuming point.

"Storage space in the work center was meticulously studied and it was decided to make as much use of the three windowless walls as possible. Prefabricated metal wall cabinets fitted well into the scheme due to their modular dimensions."

CHASE is a 29-year-old native New Yorker, son of a master builder, Air Corps veteran, Yale graduate (BA in Architecture, '49), former employee of Architects Chapman, Evans & Delehanty, now with Architect Clinton A. Scholfield.



RIZE WINNERS

SECOND PRIZE FREDERIC C. NAGEL, CHICAGO, ILL.

Long, narrow room includes space for furnace and dining table

A fresh adaptation of the pullman-type kitchen, this $8' \ge 15'-10''$ room accommodates half the furnace and half the dining table, as well as the usual kitchen and laundry equipment. In addition to the step-saving triangular grouping of the range, refrigera-

tor and sink, it features a work counter built over the laundry equipment on one side of the range and on the other a multi-purpose table extending beyond a sliding door into the living-dining room. This versatile builtin may be used as a kitchen desk, sewing counter, bar or secondary dining table. Standard metal base and wall cabinets provide abundant storage space.



HOUSE DESIGN COMPETITION

THIRD PRIZE LAWRENCE G. EVANOFF, SPOKANE, WASH.

Efficient U-shaped kitchen is combined with dining alcove

This design combines all the efficiency of the U-shaped kitchen with the convenience of an adjacent dining alcove—distinct from and in addition to the more formal dining facilities in the living area. While physically separated by the range, a base cabinet and the two-way glass-enclosed cabinets above, the two parts of the kitchen are visually one. Thus, the dining space may be used for supervised children's play.

Evanoff: "In this plan the children are allowed access from the outside to their bedroom and bath without having to cross through the kitchen or living areas. Toy storage is conveniently located just inside the back door and the eating space in the kitchen doubles for play space during the day—this allows the children to be *near* the mother without actually being *underfoot*.

"By means of a sliding door to the children's room, they have free access to a larger play space, yet are within sight of the mother.

"Work areas of the kitchen are planned for maximum efficiency with all the functions of cooking, washing, ironing and family meals located in one compact area.

"When the neighbor lady drops in for a visit, the cloth is laid and tea is served. While local gossip is exchanged and the children are being supervised, mother may continue with her daily chores from behind the subtle protection of her U-shaped work area.

"Steel kitchen cabinets were ideally adapted to the plan after the space requirements were determined."



FOURTH PRIZE

GUY G. ROTHENSTEIN & ARTHUR HINDEN, NEW YORK CITY

Dining table slides into kitchen for setting and cleaning

Economically backed up against the bathroom, this kitchen consists of a screened alcove off the living-dining area. The screen is a door-high storage unit with projecting work counters on the kitchen side and a movable table in the center. Mounted on legs with casters, the four-passenger table may be set in the kitchen, pushed through the storage unit into the dining space, then pulled back into the kitchen for clearing after the meal. (Doors in the storage unit open over the table to permit clearance of china and glassware.)

Designed to align with the projecting work counter in the kitchen, the table is normally adjusted to extend this counter the full length of the storage unit. Pulled into the kitchen, the table may also be used for informal meals or to increase the available work surface.

While the storage unit conceals the kitchen from the living area, the fact that it does not extend all the way to the ceiling exaggerates the living room's apparent spaciousness—a notable achievement in small house design.



HOUSE DESIGN COMPETITION

HONORABLE MENTION

ERIC R. BANCROFT & CHING C. CHENG, NEW YORK CITY

Range and heater are grouped around chimney for easy venting

Backed up against the living room fireplace, the interior side of this kitchen accommodates all the heat-generating equipment of the house, thus simplifying the venting problem. Next to the range is a serving center consisting of a work counter, a pass-through with two-way cabinets above and, in the dining space, a serving wagon whose design is integrated with the pass-through.

Along the kitchen's window wall are additional storage cabinets and a sink and refrigerator postioned to form a 15' work triangle with the range.



HONORABLE MENTION LUCILLE B. RAPORT, NORTH HOLLYWOOD, CALIF.

Dining-kitchen offers presentable appearance to living room

The kitchen is the woman's No. 1 room. This one was designed by a woman and features several variations on the usual theme. In the first place, since it is only partially screened from the living room, care was taken to locate the sink, refrigerator and range at the far end of the room, with the range shielded behind a spur partition. Secondly, the kitchen was made large enough to take a standard dining table. ("A nook is usually of cramped proportions . . . and a snack bar offers about as much relaxation as eating at a drug store counter.") Finally, the numerous base and wall storage cabinets are supplemented by two closets—one for cleaning utensils, the other with shelf-doors for canned goods and miscellaneous kitchen accessories.





HONORABLE MENTION

KAZUMI ADACHI, DIKE NAGANO & ROBERT BLACHNIK, LOS ANGELES

Standard cabinets are modified with tailor-made fronts

Texture and color are introduced in this otherwise typical kitchen by modifying some of the standard white metal wall cabinets with special sliding doors. As shown in the detailed perspective, the wall cabinets over the work counters are equipped with sliding panels of clear glass, perforated metal and another sheet material painted a contrasting color.

Other noteworthy details, a pop-up table leaf to extend the size of the buffet counter for dining purposes, a stainless steel splash pan to cover the wall area between wall cabinets and base cabinets.





HONORABLE MENTION J. P. LIGONNET, STILLWATER, OKLA.

Bar and dining table are integrated with an in-line kitchen

Seldom are such flexible dining facilities as those included in this design so well integrated with the kitchen work area. All of the equipment in this kitchen-laundry is lined up along the outside wall. Opposite is a bar which seats four on the living room side and doubles as a serving counter for the dining table only a couple of steps away.

Also noteworthy is the use of alternately high and low standard metal cabinets over and between the kitchen's three windows and the built-in ironing board which disappears beneath the bar's counter top.



Despite its large wall openings, the kitchen has sufficient wall and base cabinet storage.





HONORABLE MENTION GEORGE MATSUMOTO, RALEIGH, N. C.

U-shaped kitchen serves dining space on either side

Located between the living room's dining alcove and the multi-purpose room of the fourth prize house in the national competition (p. 120), this step-saving kitchen is equipped with a pass-through in each shank of the U to faclitate the serving of meals in either direction. Sliding panels control the opening to the dining alcove; a bottom hinged panel on the opposite side drops down to form an eating bar in the multipurpose room (details, above right).

What is frequently dead space at the corners of the U is put to good use in this design: an electric hot water heater is concealed in one corner, an automatic clothes washer in the other. Access to the latter is from the multi-purpose room where the washer is conveniently close to the ironing board, the sewing machine and the rear door to the drying yard.

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ROUND TABLE REPORT: Attack on wastes joined by country's biggest architects and builders

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Once again the building industry is setting an example for every other industry in 1) facing up to the fabulous wastefulness of America's fabulous productivity and 2) developing a program to reduce its own waste of critical material and manpower.

On the following pages is the full report of THE MAGAZINE OF BUILDING'S third Round Table which included seven of America's most famous architects, five of the very biggest builders, and a dozen top flight engineers, material producers, and other experts.

These leaders of building agreed unanimously that an all-out attack on waste could cut the cost of commercial and industrial construction 25% or more in materials, man-hours and, therefore, dollars. Their findings exactly parallel the conclusions of the second Round Table which drew up a program for cutting waste in home building (THE MAGAZINE OF BUILDING, Feb. '51).

If every other industry would afford even half the savings these two building Round Tables have outlined for the construction industry, the total savings would be enough to pay for the whole rearmament program whose cost could then be taken, not out of the American standard of living, but out of the American standard of waste.

Already there is good news of progress on the program for reducing home-building waste:

1. The Directors of the American Institute of Architects have given their formal, unanimous support to the program after the joint committee of the American Institute of Architects and the National Association of Home Builders had filled in the proposals for standardization with specific detail. They recommended the substitution of the 2 x 3 stud for the 2 x 4 in single-story construction, the standardization of doors and windows, the precutting by the lumber industry of a new series of square end lumber lengths to permit dry wall construction with neither cutting nor waste. Also, a standard 7' 8" stud length for a standard 8' ceiling height, a standard plumbing assembly for the in-line type of bathroom backing on a kitchen and a septic tank design standardized according to size of family. The joint AIA-NAHB Committee found immediate support for its recommendations from the NAHB and the Producers Council.

2. The National Association of Home Builders, inspired by the Round Table report, has launched an ambitious conservation program and made plans for organized local action to win popular support for code reform.

3. The U.S. Savings & Loan League is calling the Round Table's recommendations to the attention of its entire membership.

Unfortunately, no action whatever has been taken by either HHFA or NPA, whose cooperation is essential to the quick success of the conservation program outlined by the Round Table on how to save materials and manpower in home building. When the Round Table recommendations were transmitted to HHFA that agency issued a long release protesting that it had been working for conservation ever since the fighting began in Korea, but three weeks later it had still done nothing on any of the four steps on which the Round Table asked its cooperation (most important of these: a prompt review of the property requirements of its 62 FHA offices, which the Round Table had declared even more wasteful than most building codes).

NPA, which in October found the homebuilding situation critical and insisted that home building must be cut back harder than any other industry, in March took the completely contrary position that there is no emergency to warrant its intervention to help the home builders save materials and manpower. NPA did, however, indicate its general approval of the Round Table conservation program.

The Round Table Technical Report

Commercial and industrial building costs in materials and man-hours can be cut 25%

We are all agreed that very great savings in materials and man-hours (and therefore dollars) are possible in the construction of hospitals, schools, apartments, office buildings, stores and other commercial and public buildings. Substantial savings are also possible in the construction of factories and warehouses.

These savings would require an all-out attack on waste and wasteful practices through:

- 1. A broad program of standardization,
- 2. Better design with more care for economy,
- An end to the over-design which characterizes almost all construction,
- 4. Quicker application of technological advances already tested and available.

Total savings possible under this 4-point program could easily run 20%. They might run much higher.

We believe such an attack on waste as we propose for our industry could also achieve amazing savings in almost every other sector of our economy. Waste in building is widely publicized, but as planners and builders for every other industry we have a perhaps unique chance to see how much they too could save by better planning, better standardization, and quicker application of technological advances. Our wastes may differ in degree, but not in kind—except for this: we suffer more than most from wastes imposed by local, state, or national laws or ordinances.

In building, the attack on waste can succeed only through a new kind of team work and wholehearted cooperation among architects, engineers, builders, owners, suppliers, and union leaders. It requires relief from the most notorious wastes now forced upon us by building codes, by union regulations and jurisdictional disputes, by overzealous school, hospital and other bureaucratic standards. It calls for faith in the dynamic resourcefulness of private initiative and a thoughtful attempt to take the profit out of wastefulness and harness the profit motive to conservation.

Substantial progress towards the realization of these savings has already been made. In fact, it can almost be said that all the foundations needed for a dramatically successful program of conservation and waste elimination have already been laid by years of little publicized effort by pioneers in every sector of our industry.

Because these foundations have been laid, the problem now is not so much to *develop* a program, but to *translate* into action a program already available and, more particularly, to speed that action so that its benefits can be realized quickly to serve our country, our economy and our industry in the present emergency.

The absolute and over-riding needs of rearmament are now so great that they will exert tremendous pressure on every segment of our economy. They are so great that they can be met only by real sacrifice—and there are only two places where that sacrifice can be made—the American Standard of Living or the American Standard of Waste. Faced with that hard alternative and with the double spur of patriotism and self-interest, we dare hope that every element in our industry and every governing body with power over our industry will cooperate to effect quickly reforms whose need has too long been pressing.

If the savings we know are possible cannot be realized under the pressure and the stimulus of this emergency, they may well be delayed for many years.

Some of these great savings can be achieved by a quicker application of advances in construction technology which are already tested and available.

Each of us could cite many economies made possible by better technology which could and should be in more general use but are now forbidden by antiquated building codes, blocked by union restrictions, or neglected by backward designers and builders.

Just as examples of these unrealized savings, we might mention those made possible by welding, precast and prestressed concrete, lightweight aggregates, the plaster pump, curtain wall construction, reinforced brick masonry, many new ways to lay bricks more efficiently, and flat roof drainage systems, on which one of us recently saved \$125,000 and many tons of pipe on a single factory job.

Some of these great savings can be achieved by better planning and more economical design.

These are perhaps the most difficult savings of all, for there is no short cut to their attainment. They require creative imagination and superior talent. They require countless days of study and re-study on each separate project to work out the least wasteful plan and design, beginning with the choice of the location and the planning of the site and carrying through to every element in the building. They require a degree of teamwork between architect, engineer, builder, supplier and owner which is now all too rare—a teamwork under which the architect and engineer will have the constant cooperation and advice of the builder in selecting the most economical means, a teamwork under which the owner will carefully study his own needs and be kept informed as to savings offered by various modifications in his requirements, a teamwork which would carefully consider the availability and economy of materials.

No effort could be more rewarding, however, and we know of many cases where this effort has produced cumulative savings of 25%. No economy could be more false than an attempt to skimp on architectural or engineering design, for the sure result of that skimping will be great waste of construction material and construction man-hours.

One great obstacle to better design is the unconscionable amount of time good designers must waste complying with unnecessary and often senseless regulations, not only in building codes and union rules but also in hospital, school and other standards.

(Many architects have found they can design better buildings for erection outside this country where they are free to concentrate on good and economical design instead of spending so much time figuring ways to satisfy needless requirements.)

A second great obstacle to better and more economical design is the great amount of time that is wasted on special details for want of broad standardization. Today's critical shortage of good engineers and designers makes this waste of their time all the more deplorable. Furthermore, it will delay the erection of many urgently needed buildings.

Some of these great savings can be achieved by an all-out attack on the overdesign which now characterizes almost every aspect of almost every construction job from house to skyscraper.

Some of this over-design is the result of careless architectural, engineering or building practice, but most of the overdesign is forced upon our industry by over-cautious, unscientific and often absurd requirements imposed by ordinance in the name of health or safety.

Overdesign required in plumbing forces us to waste thousands of miles of pipe—and pipe is in short supply. Overdesign in electrical installation is required by two codes out of three. Overdesign in wall thickness is mandatory almost everywhere, often doubling the weight of the structure and wasting thousands of tons of steel to support the unnecesary masonry.

Especially during this emergency it is particularly important that every structure should be designed to meet its use, purpose and needs, and no more. Some of the most notorious overdesign requirements should be singled out by agreement between the American Institute of Architects, the Society of Civil Engineers and the Associated General Contractors. And the Office of Defense Mobilization should ask the patriotic cooperation of code authorities and union leaders to revoke the most wasteful requirements immediately, or at least to suspend them for the duration of the emergency.

In a fluid economy like ours, with its accelerating tempo of obsolescence, it is senseless to design every building to last forever.

But by far the greatest savings and economies are dependent on the introduction throughout our industry of a vast and comprehensive program of stand-

ardization—a program of standardization which at long last would let our industry share more fully in the benefits of quantity production which, over the past half century, have revolutionized almost every other American industry. The architects among us are unanimous that intelligent standardization would give them not less but more freedom for good design. The engineers among us are unanimous that intelligent standardization would permit as good or better engineering at far less cost. The producers among us are unanimous that intelligent standardization would permit enormous economies in the manufacture and distribution of building products, and would further permit still greater savings through the prefabrication of many more parts of the building. The builders among us are unanimous in supporting the maximum standardization and prefabrication consistent with good design.

As a simple example of the economies offered by standardization, we might cite the steel framing of commercial buildings, where inch differences in column spacing are taken for granted and no attempt has ever been pressed to standardize a modular spacing. If after careful study architects, engineers and builders could agree that the requirements of almost every structure could be met by columns spaced 20', 24' 28' or 32' apart (or on some other increment), the whole economics of steel construction could be revolutionized. To complete this revolution, NPA might well invite the patriotic cooperation of code-making authorities in accepting national standards for floor loadings and perhaps for wall weights. Structural shapes could then be rolled by the mile, stock piled in a minimum of sizes, ordered out by the bay, and sold at prices reflecting all these economies.

Such a program of standardization is already well advanced in industrial construction where trusses are now prefabricated in 10' increments from 30' to 90' in length, but the full economies of this industrial standardization cannot be realized until regional roof-loading standards are accepted.

We cannot begin to list the thousand-and-one other places where standardization would permit revolutionary economies with no sacrific of good design. The spacing of plumbing fixtures has already been almost standardized without achieving any of the benefits of full standardization. If the present multiplicity of inch and half-inch differences could be reconciled, standard plumbing assemblies could be prefabricated to achieve very great savings. Similar savings could be achieved if architects would concentrate on a small number of window widths and a small number of window heights, instead of requiring window-makers to manufacture and stock as many as 300 different sizes of a single window type.

Even ten years ago it would have been Utopian to suggest this 4-point attack on the wastefulness of construction, but since the beginning of World War II, substantial progress toward the realization of all these savings has been made.

It took 50 years to develop a new architecture based on today's methods and today's materials. Only within the past decade have architects succeeded in winning public acceptance for substituting this living and contemporary architecture for the wasteful imitation of styles developed to meet the needs and utilize the methods of bygone times when labor was cheap and technology rudimentary.

It took 30 years to develop national or regional building standards for almost every sector of construction. Only within the past decade have these standardards found expression in a series of standard building codes whose tested provisions can be recommended for immediate adoption in every community. And only in recent months has a program been worked out for keeping these standard code provisions up to date by reference.

Because these standards are now ready and because this new architecture based on today's best methods and materials has been accepted, it is no longer Utopian to attempt the enormous savings we have urged.

It has too often been said that ours is a backward industry. It would be much fairer to say that ours is a frustrated industry.

The Round Table Technical Report

No other American industry is plagued by such a multiplicity of senseless regulations, some of them supported only by ignorance but many of them supported by the selfish interest of those who profit by the wastes entrenched in these rules and regulations. And no other industry finds its progress towards standardization blocked at so many turns by widely varying local regulations. What progress could the automotive industry have made if, instead of producing one standard car to sell from coast to coast it had found itself compelled to turn out hundreds of different models—a separate model to meet the requirements of almost every town?

These varying building code requirements are the greatest single obstacle to the savings we have urged, but still we are agreed that much progress can be made if architects, engineers, builders, suppliers and owners will stop blaming codes and union rules for all the wastes in building. Even under a bedlam of regulations many savings can be achieved quickly by concerted action.

For example, there is nothing in any code to forbid the manifest economies of dimensional coordination on the 4" module urged by the AIA, the Producers' Council and the American Standards Association—economies conservatively estimated at more than two billion dollars a year. These potential savings have been known for years, but only a handful of architects and builders have tried to profit by them.

Similarly, there has never been anything in any code to block the savings from standard column spacing, or the savings of more standard window sizes, or the savings from standard toilet spacing.

The hard fact is that very strong forces of shortsighted selfinterest are working to delay many of the savings and economies we all know are possible. It is unfortunately true that someone stands to make money from too many of the wasteful practices entrenched in codes, union rules and bureaucratic standards.

On the other hand, it must be recognized that the immediate profit motive exerts little pressure towards the economies of standardization. The savings of quantity production will not accrue to the first owners, the first architects or the first builders who pioneer a standardization program. On the contrary, they will accrue to those who follow after.

And so, with the profit motive working too often in reverse and with official codes and regulations too often encouraging waste instead of conservation, it is small wonder that building's progress towards greater economy in materials and man-hours is still too slow.

We believe the 4-point conservation and economy program we have outlined will command the support of every thoughtful man in building. The problem then is how to translate this support into action. To that end, here are our specific suggestions for how the Federal Government can help, how state and local officials can help, what the mortgage lenders the fire underwriters, the manufacturers, and other groups can do.

Our four-point program has set its sights high. Our recommendations for action will be strictly down to earth.

These recommendations are strictly private enterprise recommendations designed to harness the profit motive to conservation and give owners, suppliers, designers, builders, and labor new incentives to help save. Although many recommendations are addressed to the Federal Government, none of them calls for any Federal subsidy or for any extension of Federal control. In fact, the most important help asked from any governmental agency, local, state, or national, is relief from certain wastes they force upon us.

Federal government has threefold responsibility to help industry reduce waste

The Federal Government has a threefold responsibility and a threefold opportunity to help our industry

to cut its wastes-as allocator of scarce materials,

as coordinator of the economy,

and perhaps most importantly as our industry's biggest customer

So far, since the end of World War II, it has been given very little help in any of these three capacities to such a conservation program as we propose.

As allocator of critical materials, it is high time the National Production Authority really thought through a better and more direct formula to save critical materials in construction than a blanket cut like the present temporary suspension of all commercial building or even a licensing system deferring certain types of work. Federal controls designed to conserve materials and manpower should leave the industry free to continue as much building as possible provided the needed economies in critical materials are made.

Believing as we do in the dynamic resourcefulness of private initiative, we are confident that tremendous savings would result from an incentive system under which allocation of critical materials would favor builders and communities cooperating in conservation.

During the emergency critical materials should not be allocated to any project unless the owner certifies that his application asks for no more than is necessary under such conservation standards as the National Production Authority may prescribe in furtherance of a waste elimination program such as we have outlined. And those conservation standards should also be enforced wherever the Federal Government enforces secretary of labor wage standards. As coordinator of the economy, it is high time the office of Defense Mobilization appointed an overall construction coordinator, for America's biggest industry has a major part to play in these critical times.

The coordinator should be picked from among the half dozen ablest men in our industry. He will need courage to stand up to tremendous pressures, long experience and knowledge to exercise judgment among conflicting claimants, imagination, and that most essential of all executive talents—a capacity for sound generalization to avoid the need of constant and confusing improvisation.

A second urgent need in the Office of Defense Mobilization is a strong standardization office, staffed with able men and provided with adequate funds. One of the best men in this standardization office should be assigned to work with the building industry.

National policy, clearly declared, allows maximum production for civilian use *after rearmament needs for materials and manpower have been met*. Under that policy conservation deserves a top priority in building, for without a vigorous and successful conservation program civilian construction must be cut back hard.

To start this conservation fast there are four immediate steps the building coordinator could and should take.

1. Since the chaos of local building codes is the greatest single cause of waste and over-design in building, he should ask the patriotic cooperation of every local government to bring its local building codes in line with the tested standard provisions of one or other of the national or regional standard codes, including

The National Electrical Code

The New National Plumbing Code

Basic Code of the Building Officials Conference of America

The Uniform Code of the Pacific Coast Building Officials Conference

The Southern Building Code of the Southern Building Officials Conference

Even these codes retain many wasteful requirements, and in many cases the requirement in one is much more severe than the requirement in another. The least rigorous of their standard provisions should be accepted as at least adequate everywhere during the emergency; and after the emergency it is our deep hope that most communities will not only retain these least rigorous provisions but provide for keeping them constantly up to date by reference.

2. Since standardization offers the greatest savings possibilities of all, the construction coordinator should call together representatives of the architects, the engineers, builders, and material producers to explore what standardization would allow the biggest immediate savings without sacrificing good design. This conference would almost certainly urge immediate and universal action to assure the known savings of dimensional coordination on the 4" module sponsored by the American Institute of Architects, the Producers Council, and the American Standards Association. Beyond that, we hope it would recommend certain larger modules for column spacing, window widths and heights, plumbing spacing, etc., which would permit standardization, prefabrication, and quantity production on a scale our industry has never known before, with very great savings in both materials and in construction labor.

3. Since no manpower saving is possible in building without the whole-hearted cooperation of the building trades unions, and since the unions have hitherto opposed many waste cutting proposals, the building coordinator should bring building labor and building employers together. More and more unions in other industries are recognizing that increased productivity is the one best way to increase the earnings of labor. In this time of manpower shortage it should be possible to work out a mutually profitable plan that would enlist Labor's support for a broad program to save both manhours and materials.

4. Since the shortage of steel is particularly pressing, we believe the Coordinator should single out conservation in steel for special attention. Specifically, we recommend that he call together representatives from the American Institute of Architects, the Associated General Contractors, the Society of Civil Engineers, the Institute of Steel Construction, and the American Iron & Steel Institute to consider what increase in the allowable tensile strength of steel would be safe and proper for all buildings erected during the emergency. In most communities the working stress is now limited to 18,000 or 20,000 lbs. per sq. in. In the last emergency this limit was raised to 24,000 lbs. Without exception, all the buildings thus erected have stood the test of time, and we believe that after consultation with these technical authorities the Coordinator will find there is no reason why all states and all communities should not be asked to modify their building codes immediately to permit 24,000 lbs. stresses.

We believe further substantial steel savings, especially on industrial construction in which the Government will have the most direct interest, could be achieved if the Coordinator would work out with these same groups a satisfactory standard for roof and floor loading and invite patriotic cooperation of the various code authorities to permit these savings at once.

Field welding of steel members is now forbidden by the codes in many communities, although its proponents claim that its wider use could reduce the amount of steel needed in construction by as much as 10%. The Coordinator should explore on what basis the various code authorities should be asked to relax their provisions on welding.

The National Building Code of the National Board of Fire Underwriters.

As building's biggest customer the Federal Government has a unique opportunity to further conservation. For example:

1. The Federal Government is exempt from local codes but usually subjects itself to the code requirements of every community in which it builds. By so doing, in effect, it gives aid and comfort to all the influences working to continue the choas in codes. It would be a very real help if the Federal Government would reverse this policy and announce that from now on Federal construction will not conform to local requirements in excess of the least rigorous standard provisions of the nationally recognized codes.

2. It would be a very real help if the Federal Government would adopt dimensional coordination on the 4" module recommended by the A.I.A., Producers' Council and American Standard Association, and issue instructions that from now on all buildings erected with Federal funds must be designed to take advantage of the savings offered by dimensional coordination. Such design will not prevent execution in non-conforming materials where these are the only ones available; but it will greatly encourage the production of dimensionallycoordinated materials. Hitherto, dimensional coordination has been delayed because the *first* job in an architectural office is more costly to detail. Once the hurdle has been cleared, the next job and the next after that are greatly simplified so that those who have once embarked on dimensionally coordinated design will be found happy to continue.

3. Similar action should be taken on all further construction standardization plans which may be recommended by the Office of Defense Mobilization and the National Production Authority.

4. It would be a real help if the Government would order a review of the construction requirements laid down by its own bureaus, with an eye to eliminating the most wasteful. Our experience has been that these Federal requirements are often more excessive and more wasteful than the local codes. A case in point would be the voluminous and often anachronistic standards for Veterans' hospitals.

5. The Federal Government could encourage better and more economical design if it were more willing to pay architectural, engineering and building fees sufficient to cover the cost of creative collaboration. Most contracts are now awarded on competitive bids with no prequalification of bidders beyond their ability to post a band. The experience of private construction is that the best builders will not spend the time and money needed for a serious money-saving bid in such a freefor-all, and it is noteworthy that with prequalification eight top flight builders submitted close bids on a \$2,000,000 hospital in Morristown, N. J., but without prequalification only one big contractor was willing to bid on a \$20,000,000 hospital in Manhattan.

How others can help the conservation program

State and local governments, whose codes are the greatest single cause of waste, can help by speeding action to bring them in line with national standards without waiting for their help to be asked by the Office of Defense Mobilization.

The Mortgage Bankers Association can help by asking all lenders to give higher appraisals to projects economically designed and constructed. There is no better way to put the profit motive to work for conservation than to make it clear that banks will base their loans on conservation standards and that waste must be paid for out of equity money.

Building materials manufacturers can help by establishing substantial price differentials in favor of materials ordered in a limited number of modular sizes. The biggest reason architects order so many special sizes is that today it is usually just as cheap to order a special size as to order a standard size. If the pricing of building materials offered substantial savings on certain standard sizes, the profit motive would quickly operate and owners would be first to insist that their architects take advantage of these price differentials. We are confident that manufacturers would soon find it far more profitable to have their sales concentrated in fewer sizes. The transition might involve some temporary lessening of profits. Manufacturers might find this period of high taxation a good time to get the transition completed.

The insurance companies and other corporations with large building programs (like the Federal Government itself) can advance conservation materially by insisting that all their construction should be designed to take advantage of the savings of modular coordination and other standardization. We believe they would find this profitable. We are certain that their example would be important to the conservation program and that by providing a large immediate market for standard products they could contribute materially to the general use of standard items.

The fire underwriters can help by pushing forward the very important research instigated by the Bureau of Standards to base fire protection requirements on probable fire loads instead of the unreasonably rigid standards in effect today.



photos: Roy Stevens

They said these things:

Comments made at the two-day Round Table by some 30 representatives of the building industry as condensed from 367 pages of stenotype transcription

PRENTICE: The call for this meeting was a call for consideration as to whether during this emergency certain things should be done in the building industry so that we will have a better industry during the war and a better, less hamstrung industry after the war.

In addition, there is the question of compromises which have to be accepted during the emergency. The premises of this meeting is that the needs of the military have got to be met, although we hope the military won't waste materials they don't have to waste.

Military need is paramount, and we are interested in helping them to get everything they need. Assuming that the military is not going to take over the entire economy, our economy as a whole has got to function on a less wasteful basis than has been the American characteristic up to now.

TURNER: There are two bases for action: One is how to use materials better through better design. The other is, how can we save materials through substitutions?

FOLLIN: There is a third part, and that is how to increase the supply of items like structural steel—because maybe then you can spread their use a little further. Obviously, there isn't going to be enough to satisfy all the civilian uses after all the military uses are met.

EKEN: Our first business is to look at the building industry and what is wrong with it, which means architectural and engineering, as well as construction, and how we can bring it up to date. Even with the war effort scaring us to death in the background, we ought to get our feet on the ground there first and then, when we do that, we will have to listen to what our government and military people tell us must be done, and adjust ourselves to that.

We should first find out how we can do the best job we know how, with the least amount of material. That will enable us to do our job cheaper and counteract the terrible disadvantages we have in cost. Unless we do something to pull these costs down, people can't build buildings.

KUMP: I think the problem of saving material can be separated into three basic elements: design, codes and standards, and technology, or strength-weight ratio materials.

Each one of them can negate the other by inefficiency. In the problem of saving, you have to take into consideration all three, which will also save labor, transportation costs, man-hours, etc. I should think we should take each item and see what the recommendations are for each.

I would say in technology of materials, try to make our research more efficient, the materials more efficient to withstand more stress, raise the allowable stresses.

In design, I think the problem of continuity and efficiency in reducing the amount of material is important—why not continuity in girders in multistory buildings rather than columns, etc.?

Codes and standards are dependent upon the other two if savings are to be made. I think trying to attack each thing separately is a very difficult thing. I think it is a whole problem, all interrelated.

BECKET: I sometimes wonder if we are not building all of our buildings too well. It seems to me we are building for eternity while our cities are becoming obsolete in 50 to 100 years. I see no reason why we should build a building today to last longer than, say, a 99-year lease. Then the thing ought to be torn down anyway.

I read where you have 600 hotels in Manhattan, and only two of those are over 50 years old. I don't think we can go far enough with human protection and fire protection. But it seems to me to be ridiculous to have garages all over the country built for 125 lb. load when we all know 50 lbs. is adequate.

EKEN: I think we have all been hurt in thinking that when you build a building it should be there forever. The thing that makes a building obsolete more than anything else is not a question of its construction; it is a question of light and air. If you can put a building where it can have light and air and where it cannot be restricted in any way, there is no reason it shouldn't last 99 years because the only thing you would have to do would be to pull pipes out of pipe shafts and put new ones in.

BECKET: Wouldn't you say that after 99 years we would have made some progress?

EKEN: Yes, I would. We are both shooting at extreme statements here now.

PRENTICE: I have a suggestion here from General Bragdon. He suggests that one of the things on which we are agreed is that during the emergency every structure should be designed to meet its use purpose and needs, and no more; and that there should be no overdesign. I would certainly say "Amen" to that. BRAGDON: The reason we in the military are so interested in proper design is that we want all critical material conserved. We had a maxim in the first World War that you did a perfect design job or, when you pulled out, your structures would fall down immediately. That doesn't hold all the time. But by and large military construction in time of war is of a temporary type or at most is semi-permanent. This is so because otherwise there wouldn't be enough materials to build what we have to.

BECKET: I hope that the Army and the Navy will not build the kind of construction they did in the last war—but will build a more permanent type which we will have ready if we need them. If they had built better buildings during the last war, we would have had a lot of these buildings to use now.

BRAGDON: Had we not resorted to the cheaper types of construction, we would never have gotten the required number of men in camps or trained them—not for another six months.

UNDERWOOD: Someone said something about temporary buildings. They are the most permanent things we build, such as the buildings we have on the mall in Washington. In the small compartment of government that I occupy, we maintain and operate the buildings, so we are very much concerned about construction because it is not easy to get a dollar out of Congress. The "temporary" buildings are now costing us enough in maintenance so we can practically rebuild them every five years—perhaps more often.

STANDARDIZATION: Man-hours, materials and money could be saved by a greater degree of standardization throughout the industry

PRENTICE: I think, Mr. Gannett, you have said that in industrial construction you have found a tremendous amount of standardization perfectly practicable, and that if you could get greater uniformity in the codes and rules under which you operate, that standardization would help very much.

If you could design uniform loads instead of having one load in one place and another load in another place, for example, you could carry that standardization further in industrial construction.

GANNETT: Yes, that's right.

In certain places we encounter what we think are unusually severe requirements for roof live loads. In the State of New Jersey we don't see any need of a live load of 40 lbs. a sq. ft. We think 30 lbs. would be enough.

PRENTICE: You find that where you are able to get this standardization you get very great economy out of the standardization? GANNETT: That's right.

Standardization in design, if it can be carried all the way through the building, can result in tremendous time saving.

PRENTICE: It isn't just through one building but it is through many buildings you are finding this standardization is working for you?

GANNETT: Yes. We find that many manufacturers, not all, rather like to use bays 40 x 60', and the areas we are covering today with column spacing of those dimensions is just tremendous. GIFFELS: I agree very closely with Mr. Gannett's ideas as to the advantages of standardization and the fact that it has taken place in industrial construction.

Our work is very largely industrial. I don't speak with any authority on hospitals or other commercial buildings, but the typical one-story industrial building is a very highly developed thing.



MR. EKEN: (left) "With the price of steel what it is today, something's got to give."

MR, GANNETT: "Standardization carried all through a building can result in tremendous time saving."

I presume at least 90% of the floor space we design for industry is now one story, and as Mr. Gannett says, it has been simplified. There was a time when we went to a lot of trouble to work out light curves for monitors and we had our buildings loaded with monitors.

That was about 20 years ago. Today monitors are becoming a rarity.

The building is just a big, flat-roof box of bays that are very typically $40 \ge 60$ and often 50 ≥ 50 , or longer. The typical factory building has been simplified to quite a remarkable degree. There is very little waste of material as compared to other buildings.

TURNER: I might bring out that standardization is not merely having the same size window or something else throughout the whole building. It means utilizing a product which is a standard product that a manufacturer produces.

In one case where we were trying to reduce the cost of a building, we suggested a standard

size window and the designer said, "I have designed 800 windows the same size." That is not standardization. The only way you are going to get benefits is by using a product that a manufacturer has set up to produce by the thousands. COONLEY: I have been a manufacturer for 52 years. Most of that time I have been a manufacturer of valves and fittings and an adviser on conveying machinery. I have been a standardization crank since World War I, when I was thrown head-on into a situation in ship building where we found almost no interchangeability. Our program was slowed up and the costs were high, due to the fact that we constantly had to redesign the piping on our ships because we couldn't get standardized, interchangeable equipment.

Frankly, I feel that in the building industry, not necessarily because of your own fault, you have made less progress in standardization than in almost any other industry.

BRUTSCHY: In plumbing, whatever standardization we have had has come from the contracting end. I would say that the speculative builders start it, because they go out and say, "I want to build a multifamily house, and how much can I get this plumbing done for?" The fellow would say, "I don't like your bathroom." He would say, "What do I care what kind of bathroom it is? You give me a bathroom and don't go outside the general room limits. How much can I get it done for?"

In other words, price dictates what will be the economical thing to do and, frankly, that is how the so-called unit bathroom is used today. Metropolitan uses it. New York City Housing uses it. And your total roughing is within a space of 3'. It is all within the wall. That is a cheap bathroom. It comes from necessity.

I know of no other thing that has been done in plumbing that has been standardized. It comes back to your owner. I think you have a job of education with your owner.

PRENTICE: I will tell you without any hesitation what the argument is that is going to take care of the owner. If standardization makes possible the kind of savings that I am sure it does, money is going to talk to that owner just as fast as it talks to any speculative builder, and I do not think the architect is going to have very much trouble with the owner after he has the prices for going along with standardization.



MR. SIEDER: "If you cut down on stresses you are certainly going to save steel. . . ."

STRUCTURAL STEEL: Allowable unit stresses should be increased from 20,000 lbs. to 24,000 lbs.

PRENTICE: Mr. Graham, am I right in thinking that a great deal of steel in construction could be saved by stepping up rated strength? GRAHAM: The structural steel industry has been pretty well standardized, and work has been done along that line for 50 years by the American Society for Testing Materials and many engineering organizations like the American Railway Engineering Association and the American Institute of Steel Construction.



MR. GRAHAM: "Any steps toward raising unit stresses should be very seriously considered."

When I first started in business, 12,000 lbs. was the accepted unit stress. It somewhat later became 16,000 lbs., and it stuck at that for a long time. About 25 years ago, it became 18,000 lbs. and, in the last 10 years or so, 20,000 lbs., largely through the efforts of the American Institute of Steel Construction.

The steel itself has been improved in that time. Otherwise, such changes in working stress would not be within reason.

During the last war, they did step it up to 24,000 lbs., I think, for emergency purposes. Because there has been so much work in standardizing heavy steels and methods of design, I don't think that very much can be done except possibly stepping up the unit stress temporarily. I think that any steps taken toward raising unit stresses should be very seriously considered before they are undertaken.

I suppose something could be done toward adopting uniform loads in building codes, but even there different localities might not agree on factors that are induced by weather conditions—that is, snow loads, wind loads, earthquake loads.

SIEDER: There are some places that use 22,000. As a member of the committee on the New York City code some years ago I might say it was a very controversial matter. There is no reason, in my estimation, why it should not be at least 22,000. We did use 24,000 during the last war. PRENTICE: How did that experiment turn out? Did any harm come of the 24,000?

GRAHAM: No, I don't think there did. But when you step up your tension unit stresses from 20,000 to 24,000, you do not make comparable changes in the compression stresses, so the saving of steel was nowhere near in proportion to 20,000 to 24,000. The compression stresses are the ones that are the more dangerous, and they didn't increase them nearly that much. PRENTICE: What did they do to the compression stresses?

GRAHAM: Very little.

PRENTICE: If you leave the compression stresses unchanged, what good does it do you, in tonnage, to change the tension stresses? GRAHAM: You save in members if you step up the tension stresses.

EKEN: They are going to be forced to make this change. When we get to the place where we pay the price for steel we are paying today, something's got to give pretty quick. This coast for a long time was a steel region; no one wanted anything to do with concrete. Now, a lot of that is changed. With the present-day prices for steel we have to find some way of holding down the cost. So we are doing a lot of concrete work around here.

TURNER: Our engineers feel there is no reason why 22,000 lbs. should not be used, whereas in most places it is 20,000 lbs., and there are some places where it is 18,000 lbs.

I think the big problem today is to conserve material.

GIFFELS: I think that higher stresses can be used. I think the higher unit stresses that were used in the last war did not result in any failures that I heard of. I don't know why we don't use them now. If they were all right for five or ten years in fighting a war, they are all right for 50 years when we are not fighting one.

You can't increase the stresses very much but you can save quite a bit of steel, and steel, of course, is one of the most critical things of all. EKEN: I don't think you are going to get very far if you are going to try to do the utter limit in one jump. If you got the stresses, for example, from 20,000 up to 24,000, I think that you would have made a tremendous saving, and you wouldn't have a lot of people who would be nervous about it, and reluctant to move.

If we can come along with proper evidence that here are buildings that have been standing on the 24,000 lb. basis for all these years, well, what can be more conclusive than that? If you try to go beyond that, you sort of intimidate a lot of people; they are afraid.

REAR ADMIRAL ALEXIS: I am 100% with that. It was brought out here that in the automobile industry they have been so bold as to use a safety factor of only 2. There you have 3,000 to 4,000 lbs. of bulk moving at 60 miles an hour compared to a static building with a safety factor of 4.

It seems we probably have been too conservative. I don't know. It might be a matter of ignorance.

GANNETT: I don't like to use a safety factor of 4. I think it is rather confusing, because steel's elastic limit is about 32,000 lbs., and that is considered roughly the ultimate of where you could get with steel design. While steel does not actually fail in tensions to about 66,000 lbs., nevertheless, when you reach this point of elastic limit there is a sharp elongation.

BAY SIZES: Great savings could result from using standardized bays in commercial buildings

EKEN: I'd like at this time to put something out here that probably everybody will taken exception to.

We known that about our most economical spacing of columns in commercial buildings is around 20 x 20. In general, that is about the most economical size we know. If we could design by a standard of column spaces-bays, for instance-the saving would be almost beyond belief. Just think what would happen if the steel people got out steel in standard bays and you ordered it by that. There wouldn't have to be any design; there wouldn't have to be any of those shop details, and a vast amount of work would cease to be done. I don't know if that would appeal to the engineers at all, but if you could get the design by a 20 x 20 bay you wouldn't have to wait for the steel because the company would carry that sort of steel in stock. If we ever get to that sort of thing we could save money on buildings by the jugful.

GANNETT: That is what we do in industrial buildings, Mr. Eken.

PRENTICE: I can see that those savings could be terrific. Standardization that Andy Eken is talking about is something which is going to call for the cooperation of architects, steel fabricators and structural engineers. KUMP: I would rather put it on this basis: If you could design this very efficient standard bay and come out with the minimum amount of steel that it takes, and set up a standard of so many pounds per square foot, and let somebody shoot at it, somebody might come up with a better designed bay.



MR. BECKET: "Let architects and engineers use their ingenuity."

MR. ROOT: "A fundamental savings can come from a plan that is efficient." EKEN: I think your engineers would be able to quickly answer that question. I don't think there is anything intricate in that.

KUMP: Wouldn't the poundage per square foot be an important factor?

BECKET: That's right. I think that is the best suggestion. In other words, let the engineers, architects or builders use their own ingenuity, and allow them so many pounds of critical materials per square foot of building.

I think there are some advantages to it, but I think it is going to be a little difficult to find a 20' module that would work for, let's say, a hotel, which usually would be 14 or 28, and an office building or a hospital or what-have-you. You'd have to have a number of different sized bays.

PRENTICE: Let's not die for purity on this one. Let's start with Andy's suggestion that we should agree on one standard. If you couldn't agree on one standard, maybe you could agree on three or four standards.

BECKET: There's no doubt but that he's right. TURNER: I think it is desirable to work in the direction of trying to standardize, trying to find satisfactory column spacing, etc., and loads. But when you come to an industrial building, I don't think you can do that because in an industrial building you have to design a housing for a manufacturing process, and in an industrial building it may be 40' or 60' you have to go to because of processing requirements. So suggestions as to 20 or 25' apply to a commercial building or warehouse, but can't apply to industrial construction.

PRENTICE: Mr. Gannett, I am pretty sure that the Austin Company has standardized on a 40' truss and a 60' truss and, I think, one other. GANNETT: We run them 10' apart from 30' to 100'.

PRENTICE: You have standardized, and most of your buildings, I think, are done with 40' and 60' trusses now. At any rate, I am sure you have no 39' trusses, and I am positive you have no 39'7" trusses.

BLISS: We are here to decide the best way to save critical material. We are talking about steel. I think I am opposed to an attempt to standardization of design to meet all types of industrial and commercial construction. I don't think it is practical from the standpoint Mr. Becket expressed. I don't think it is flexible enough.

We are talking about something we can get accomplished, and I think we should strive to get a program started that will be beneficial as soon as possible. I think the two things to be accomplished in steel is: (1) increase the allowable working stresses to probably 22,000 lbs.; and (2) standardize codes.

We operate in all the states of the union, and I guess all you gentlemen know there is such a wide variance in allowable live loads that if that thing could be fixed we'd probably be further in saving tons of steel than any one thing we could do.

The Southern States Building Code allows 75 lbs. per square foot for stores. But the City of Louisville requires 125 lbs. There is a difference of 50 lbs. per sq. ft. That is a sizable item.

SIEDER: I'd like to endorse that, Mr. Chairman. We've got to assume the engineer knows his business. We can't take away from the engineer his initiative and his ingenuity in designing most economically. We can't get to the point of standardization to such an extent that we can tell the engineer just what he must do.

GOOD DESIGN: The architect and engineer are in a position to cut costs through efficient design

ROOT: I would suggest that one of the fundamental savings that can be made in building design is in the basic plan and in the efficiency of the plan. It may be that what Andy Eken says about standardization may save a good deal of money, but if it is designed and used in an inefficient plan, it may well cost you more.

I have seen such humdrum problems as basements submitted by owners which become, when put to the architect, a problem of design to bring that area within the bounds of great economies. I remember a problem of a kitchen in which careful architectural planning saved \$25,-000 a year in the saving of one checker.

That is a small example, but it applies to all planning, and I make a plea that sometimes industrial construction as well as commercial construction is very inefficient in the way it is planned and costs a lot more money than it has any business to cost.

WEED: I think the conscientious architect thinks of design not in terms of architectural treatment but in terms of plan, structure, mechanics and electrical equipment, fixtures—and all



MR. KUMP: (left) "I don't agree that architects are doing the most efficient job."

MR. WEED: (center) "He is not just a man to hang schmalz on a frame...." of the parts required to make a building function efficiently. The selection of the material considers all these things.

Economy starts with a good design which considers the conservation of manpower. We don't design to use labor uselessly any more. That is the reason for thought on the part of architects and engineers along the line of standardization and prefabrication of parts.

EKEN: My feeling is that the great thing the architect does, from the point of design, is not the thing that he hangs on the exterior. The thing that stamps him as a great architect is designing a building with a minimum number of square feet and cubic feet in it that houses all those things he delivers to the owner.

In other words, the architect can save a lot more money by not having so much perimeter wall to enclose his space. He can save more brick than we can save per day per bricklayer.



ADMIRALS ALEXIS AND JELLEY: "The Navy is as much interested in economical construction as anyone else,"

GIFFELS: Any good engineer designs not merely to produce a building with the smallest number of cubic feet of concrete or the smallest number of tons of steel, but to produce most efficiently a mechanism where something can be used by the owner to accomplish his purpose.

If the designer can save man-hours in operation of the plant after it is built, that is the thing he wants to do. I don't think anything we can say here is going to change that, unless we can produce some better conditions under which we can operate.

If we can improve labor practices or do something that will lead to more practical codes, and improve all those conditions under which the engineer and the architect have to operate, that is the thing we ought to point to.

GANNETT: As I have listened this morning, I get the impression that we are very critical of what has been accomplished, and I think we have a right to be. Nevertheless, I think a lot has been accomplished over the past years. I think we get better designs from architects than we used to. I think they are wide awake to the problems of trying to save materials.

I think there are many new things in construction that are being used within limits, such as precast concrete, insulated metal wall panels and other things. But I think there is still much to be accomplished along these lines.

In our feeble way, we try to do some things, such as the standardization of framework of buildings. We have long been interested in welded trusses, and we think we have developed not only economical designs but very flexible designs. I don't believe it is as essential in commercial construction as it is in industry where manufacturers use their truss framework to suspend trolleys and other things of that kind.

We have developed what we call a free-loading design truss. We don't always have to apply the loads at certain different panel points. We can often apply them a little off the panel point without any real sacrifice in carrying capacity of the truss. It can still meet requirements.

You mentioned in your last Round Table Conference the use of added space in housing. We do the same thing in our truss design work. We use that space between the bottom and the top for our heating and ventilating equipment, electrical equipment and sometimes light mezzanine floors.

An outstanding example of that kind of design is the building for the A. B. Dick Co. in Chicago. In that building we have done a number of things that are typical, such as assembling ventilating and other equipment on platforms on the floor and then raising them completely assembled up in the truss. In other words, we eliminate work in the trusses on scaffolding and obtain lower labor costs. In a small plant in Paterson we had only three platforms to raise but on that small job we saved \$2,400 in our heating and ventilating cost.

I think there is a big opportunity for greater integration in design. When we install a lighting fixture, say a fluorescent lamp, there is the lamp, the reflector, the ballast, a lot of wiring and supports for the lighting fixture. If more can be done to bring that all into one unit, I think great savings could be made.

We have done a little along those lines. We designed a unit in which we hoped to assemble everything and raise them up complete for a span of, say, 20'. We did that on one job at a saving in the lighting and ceiling installation combined of between \$150,000 or \$200,000. We couldn't utilize the full savings that were possible because of labor restrictions. I think this thing of greater integration in design has got some big possibilities, and, to get the best results, it means cooperation from labor.

MODULAR COORDINATION: It could bring a great advance but it's no good unless everyone uses it

WHITLOCK: One case history of modular coordination might be a good example.

The AIA and the Producers Council together inaugurated the basic idea that there should be some coordination of building materials and some standardization. We came to a realization that the standard of 4" was the most flexible and perhaps the most economical to coordinate the dimensions of building materials. The architects said to the producers, "You produce the material, and then we will design it."

The exterior people—brick, lumber, millwork —and makers of all the component parts of the exterior wall, made a concentrated drive to have materials manufactured on a 4" module.

Then we came to the sad realization that the architects had dismissed it from their minds. The manufacturers had to carry a double inventory instead of a single inventory, both module and nonmodule products.

Whereupon we went back to the architects, and it has been only 12 months now that the AIA has attempted to stimulate them to accept this economical practice which they had originally suggested.

Now we find that there are a number of very prominent architects who, on a policy level, think it is a good idea; but when they get to the drafting room, the head draftsman says, "I am not going to do it," or he refuses to study it through.

KUMP: I would like to defend the architects' position. I don't think it is entirely the architect. We have designed a lot of buildings in module dimensional coordination in which it is difficult to get contractors to figure. They are not used to seeing this in a building.

The contractors themselves are just as entrenched and dogmatic as the architects. Their men are not used to it. They want to figure it out their own way. The superintendent has not seen it before, and he would rather not fool around with it.

WEED: I agree with you. There are builders who are very much interested in it too, but the big majority prefer their well-known methods of throwing things together.

GILLETT: Prior to World War II, we produced a line of windows for monumental buildings, and we had 2,000 different types and sizes in our catalog.

Coming out of the war, under the guidance of module coordination, we reduced the list to about 300. Today that line of windows shows a relatively small increase in price over our prewar prices as compared with our other window products which, before the war, had a greater degree of standardization than this monumental type window.

PRENTICE: On this module coordination business, I have yet to find anybody who isn't for module coordination in principle.

My impression is that the reason module coordination isn't getting further faster is because —as the first Round Table Conference brought out—some like it and some don't. If it is to succeed everyone must use it. The architects have to go along with it; the supplier has to go along with it; the builder has to go along.

Here in New York the bricklayers were willing to make module bricks but the New York City Housing Authority wouldn't go along with that. Eventually the New York brickmakers got tired of holding the bag and went back to what they had always been doing.

This is an example of what can go on today when the choice is not between whether you are going to build wastefully or economically, but MR. GILLETT: "We cut 2,000 types and sizes of window to 300...."



whether you are going to build economically or not build at all. My hunch is that on module coordination nobody is going to get anywhere until somebody puts some sort of pressure on. Here is something which the entire building industry agrees can effect great savings. Somebody has to do something by way of pushing this thing off dead center.

Why shouldn't the government put the heat on to get some of those savings for its huge construction program?

JELLEY: I see no reason why it shouldn't. I think that is what we agree with in principle, but no one has done very much about it.

UNDERWOOD: The little part of the government which I represent not only believes in module coordination but practices it. We had hoped, before the Korean situation, to build a lot of brick post offices. We found that the number of states where module brick were produced was so few that we were fearful we would either never get the post offices built, or we would build them so expensively that we would have to quit buying stamps.

I believe there is a great deal of virtue in the module system. I think we will achieve it by the slow process of education and belief.

MR. WHITLOCK: "We came to the sad realization that architects had dismissed it from their minds...."



WHITLOCK: There are big segments of the U. S. Government who are building today who do not have the advocates that you are talking about. Down in the Southwestern states, where the brick manufacturers went completely module, the Veterans Administration in connection with one of its hospitals took the design off the shelf—which was nonmodule—and started to ask for bids, eight miles from a brick plant which was producing only module brick.

To have nonmodule brick brought in would have meant 280 miles transportation. We called their attention to the fact and they said, "We will not redo that design. We will haul the brick 280 miles." There was a public howl made of it. The specifications came out nonmodular with an alternate for module permitted.

When a brick manufacturer is asked whether he is going to make module or nonmodule brick, he is going to say that he wants to produce what he thinks is going to sell the most brick.

FOLLIN: I don't see any reason why the building industry should not get strongly behind modular coordination, and particularly I think, it deserves the support of the architect. The architect must lead the way to this reform in building. Without the architect it never will go into effect. The designer is the man who must set the pace.

HARMON: I might cite one instance. We wanted to use module face brick and we saved some \$2,500. The architect said he just had to have the old reliable. That was on a hospital costing about \$1,500,000. There was \$2,500 involved in savings.

BUILDING CODES are steadily improving but are still a major barrier to a conservation of material and manpower

PRENTICE: I am sure you are agreed that codes are a major barrier to more economical construction; that it would be a fine thing for (a) the conservation of material, and (b) for the good of the construction industry, if something could be done about the rationalizing of the codes, and the sooner the better.



MR. PRENTICE: "We are in an emergency now and codes are a major barrier to economical construction."

GILLETT: Here are some of the problems confronting the general adoption of uniform codes. Code activity is a function of a building official who is paid in his local community for safeguarding the lives of people who live there. I don't think there is a tendency on the part of the building commissioners to get along with lower standards. If we built buildings people could live in for the rest of their lives and be positive that no building would fall, or there would be no loss of life from those buildings, building commissioners would be very happy.

Therefore, code adoption must come from an incentive of that man to do a better job, or it must come as an incentive for public-minded citizens in a community to do a job.

WEED: In Florida we came to the conclusion that the BOCA and the Southern code didn't do much for us. In some instances they did, but all in all they were practically a rehash of old standards that we have known for 25 years or more.

For instance, fire towers are required in every building regardless of whether it is an open-air building or a closed building. It is still there the same old provision.

Does anyone know of a code that is going the right way to correct the old ideas and bring them up to date so that the designers can have a little more freedom and save us money? BECKET: I think the Pacific Coast code has been adopted in most of the communities in 11 Western states. Some of the larger cities have not adopted it, including Los Angeles. But it is an excellent code.

VOSS: In connection with code coordination: I have been working for many years to integrate the industry in the hope that we will not be doing things that just feather somebody's pocket to the exclusion of everybody else's pocketbook.

There is in existence today an organization known as the Building Research Advisory Board of the National Research Council that can do just this thing. BRAB is not a government agency. It is composed of all the elements of the industry and is charged with the duty of developing standards by making advisory suggestions to bodies, places making tests, or any group that has any money to spend for anything else, and to channel it into this organization for the benefit of all.

That is a going organization. They are now proposing to establish a Building Research Institute, which will furnish the necessary money to round out this coordination. This is one of the most important things in this whole picture. BLISS: We have had a lot of experience in the matter of protection or nonprotection of escalator wells for department stores. We found that the Cincinnati code was so stringent we would have to enclose all the wells with two hour fire protection, which destroyed the effect of visual observation from the moving stairways. Finally they changed their code but we had to substitute a very expensive smoke ejection system plus a deluge system.

At Indianapolis, where we are completing a building of comparable size, we were not required to do anything except put a smoke curtain beam around the well. In Cincinnati we had to spend \$75,000 to \$100,000 more to do the same kind of installation.

DAVISON: I would like to refer to an article in December in THE MAGAZINE OF BUILDING. The assumption there was that if codes were altered to allow the techniques of industrial construction to be used in apartment houses, a great deal of money could be saved.

We found an example of an apartment to be erected in Alaska that used the techniques of industrial buildings. It is the first apartment house to use them because it was outside of building code area.

BECKET: I want to ballyhoo our 11 Western states. I think we are 'way ahead of you on



MR. DAVISON: "If codes were altered a great deal of money could be saved."

codes. Maybe it is a challenge to the rest of the country.

My pet subject is lightweight construction. We have used it in both the Prudential and General Petroleum building. In those buildings we saved 33% of the normal amount of steel because our code permitted it.

In loads, we all agree that it is pretty ridiculous for some cities to have a 50 lb. load and others 125 lbs. Under our uniform code it has now been reduced to 50 lb. which, I think, is still a factor of safety of almost 3.

WEED: I feel a lot can be done in this emergency to find ways and means to do away with the old worn-out provisions that exist in nearly every city code in America.

The fire requirements are entirely too stringent. They are designed for protection in large cities where exposures are great and where exposures in the past were much greater than they are today.

We are attempting to open things up to avoid exposures, and on our 200 bed hospital in South America that condition did not exist at all.

The other big saving we made was in designing the structure itself to make it possible to use the labor that existed down there. We did not have trained personnel to build the building. We went to precast concrete units, that could easily be made on the site. We trained crews down there to do it. The results were very satisfying because the workmanship in many instances was really above American standards.

I believe if there were some way we could have a review of the codes in large cities, particularly at this time, with the hope that we can get some of those old restrictions waived, it might be a big saving that could be effected.

In our own practice, we have been able to make big savings where we could get outmoded provisions waived in the codes.

PRENTICE: I guess it is an understatement to say that Doug, with his structural clay products industry, has had more success in getting codes straightened out than anybody else has.

I wish you would tell us more about that and more about the one thing you haven't got straightened out but which is a very good thing. That is codes by reference.

WHITLOCK: I will describe how we have gone about our code revision in the brick and tile industry.

The American Standards Association is a very effective means of bringing together the factors interested in a code provision. We developed
a proposed masonry code which we laid before the competitive elements of the industry for discussion and improvement, and, finally we came to a conclusion and had the agreement of all competitive elements on a masonry code provision.

We then took it to the Pacific Building Officials Conference and had it put into the uniform code for the Western states. Then we got it into the Building Officials code and took it to the Southern code, and we took it to the federal agencies, and with the endorsement of the Bureau of Standards, who had worked with us in the development of it, we had it accepted in all of the points where building officials have assembled.

When we had similar provisions in all the codes, it has been practically axiomatic that whenever a code is up for discussion we appear and say, "This code has been accepted in all of these places."

The difficulty that we have not got solved is this adoption by reference, because our code provision is constantly being revised to be kept modern. It was revised just last week on the West Coast by a complete revision of the reinforced brick masonry section. Our engineers, with the West Coast engineers, arrived at a revision based on experience out there.

In order for us to modify those codes, we have got to go back over this whole field again and get each change put in, and that is a legislative matter.

There is a movement on foot to advocate a model law whereby the codes could be modified or the provisions adopted by reference.

ASHLEY: If you want me to express my opinion, Mr. Prentice, on a national electrical code, I think that both you and I are going to be walking around with a cane and glasses before you can get it, because there is too much politics in a national code.

PRENTICE: There is still no harm in our hoping. I just want to make sure we are all hoping the same thing.

ASHLEY: The thing Mr. Voss is doing—getting a code state by state—is a far better arrangement. It grows into the state rather than being forced. I know I have been working on a code for over 15 years in Connecticut, and it has just come into life.

It takes a long, long time to get all the people lined up behind it because you have not only your builders and your architects and your owners, but the plumber and the steamfitter, etc., who all come into that thing, and their votes count.

PRENTICE: I know this new national plumbing code is coming along, which eliminates a lot



MR. ASHLEY: "It takes a long time ... and you and I are going to be walking around with a cane and glasses before you can get it." of things that I have heard denounced for all these many, many years. It is one thing to have a national plumbing code proposed, and it is another thing to have something done about it. They can have all the national plumbing codes in Washington they want, but that doesn't mean you are going to have it in Ohio before 1962, unless something gets done about it.



MR. BRUTSCHY: "Plumbing is a custom business because everyone thinks he knows all about it."

BRUTSCHY: You said something about its adoption. That is going to be the real problem. There can be no question but that we should have a uniform code. What it is is one thing. I am not speaking for the code, but it is high time that we do have uniformity of code practices, whether they be state or national. Nationally it would be better.

PRENTICE: Bill, have you seen the code? GILLETT: No, I have not seen it. I understand it is at the printer. I understand it is in print, or will be off the press shortly.

So far as the matter of adoption is concerned, there are certainly only two approaches to it. One is by government edict. I think most people in private enterprise hope that that would be avoided. Second is through adoption by major code agencies who promote individual community adoption. There is certainly great activity over the country in bringing about some of these reforms from a code standpoint on a national basis. I think there is more activity in that line than there has been in a long while. The only thing that might be dangerous is a recent trend in the last year of code writing by individual states.

PRENTICE: I can join you in viewing that with some alarm. I take it that it is the sense of this meeting that the sooner the new national code comes into general use, the better.

That brings you to the question of what to do where voluntary action fails.

BALLINGER: I am going to say something that may surprise you in connection with the codes. We work throughout the eastern United States. We go into strange cities. Their code laws are a little different from those we have been accustomed to.

I have had my engineers go to the building inspectors in various cities, explain the situation and show the calculations. There is usually some flexibility in codes. There are a few things they will not change. But very often we are able to receive consideration that has saved our clients a great deal of money. I think we should approach this question of codes along that line, trying to educate the inspector, and I think we will get somewhere.

VOSS: In the old days architects built monuments to themselves at the owner's expense. Engineers and I, myself, have tried to write something that would be strong enough to last forever and that would cost just as much as it possibly could. Those are the standards that are now written into some of our building codes.

I regret that we have piles of masonry all over the U. S. that are not doing a thing, not even keeping weather out.

It is my impression that a new approach has got to be made to building design so that all materials, walls, floors, partitions and everything else help to sustain that building. The savings could be tremendous.

Most code authorities are writing textbooks for colleges instead of writing fundamental things. They are not sticking to performance objectives.

WHITLOCK: In the American way of life, reform takes place and is tried out at the local level before it becomes national. If enough local reforms are accomplished, then nationally the reform is a pushover. But to attempt to reform nationally and force it on the localities is un-American.

All work should be done to get the best thinking we can on code improvements and advocate them for the local communities. Then we should sell it into action rather than have some government bureauocrat say that no building shall be built unless the National Production Administration insists that it conform to the national plumbing code and force it on the locality.

It seems to me that any other method would be violating the very basis of the American way of life. Democracy is a system of compromises. It is a system of checks and balances. There is no group of people, such as we are here, who can sit around a table and say what is good for America.

BRUTSCHY: I think it is the only successful way you will ever sell that code permanently. You may put it across by edict during the emergency, but what do you do after the emergency? We revert back to the fact that you are stumped by legislation. To overcome that legislation, you must start at the local level. I agree with you 100%.



MR. COONLEY: (left) "I have been a standardization crank since World War I and I feel that in your industry you have made less progress than in almost any other industry."

MR. BALLINGER: "I am going to surprise you. We should approach the code question by trying to educate the inspector...."

FIRE PROTECTION: Overly-conservative regulations are gradually being liberalized to allow for new methods of appraising fire loads and for new materials and techniques

NEALE: After listening to this discussion, it ought to be very apparent why a lot more buildings burn down than fall down. You have discussed conservation and construction for a day and a half, and the times that fire protection has been mentioned you could count on the fingers of your two hands.

Let me go back a little bit and start kicking around this subject of building codes.

It is like this: Up to 50 years ago there was nothing at all in the way of standardized building codes. If two cities had similar building codes it was because the second had swiped its building code from the first one.

About that time, the underwriters began to be very seriously concerned with the incidence of conflagrations. We burned up Boston and Baltimore and Chicago and San Francisco, and the underwriters felt that it was time somebody came along with a model building code that would prevent or reduce or restrict conflagrations in downtown areas. Naturally, the underwriters' code was a little bit conservative on that score, and it probably still is.

In recent years there have been several other model building codes adopted, and I am happy to say that the underwriters have cooperated with every one of them.

There has been some discussion of lightweight aggregate, and I think that is a remarkable thing. To be sure, it is not a cure-all. It won't in all cases supplant the individual encasement of members. You can't expect to put a membrane ceiling up for fire protection of the steel members above it and then cut holes for air ducts and light fixtures and fill the intervening space with a whole lot of mechanical equipment without reducing the effectiveness of it as a fire protection. But it does offer a lower cost, lightweight protection that, in many cases, is going to be extremely effective.

I want to call your attention to another thing. It is fundamental and it will be a long time before it is adopted, I am afraid. That is designing the fire resistance of a building to its fire load in the same way that you design the structural strength of a building to take its floor load.

In work that has been done by the Bureau of Standards, and others, we have been able to determine the intensity of a fire that can occur in any building based on the number of pounds of combustible material there is in that building. The Bureau of Standards has surveyed many buildings, and they can tell you pretty well how many pounds of combustible material a hospital or a school building or an office building or a furniture warehouse will be per square foot of floor area.

We know from tests that so many pounds of combustible material per square foot of floor area will develop a fire of such and such intensity. If we have, say, an average of 20 lbs. of combustible per square foot of floor area, we must design that building for a 2-hr. fire. That means this: that we could have a burn-out of that building without causing the collapse of the building and without having to put excessive fire protection on that building.

There are other features in this matter of fire protection that ought to be considered. The British have developed a term that intrigues me very much. They call it "passive fire protection," which is the protection that is built into a building in the fire resistance of its walls, floors, and partitions that will tend to restrict fires if everything else is out. If there is no fire department available, if there is no water supply available for sprinklers, a fire will be held within certain limits by the construction of the building.



MR. NEALE: "It ought to be apparent why more buildings burn down than fall down."

There has been reference here to what fire resistance exterior walls should have and why should you build an exterior wall that has 4-hr. fire resistance and then put a plain glass window in it which doesn't have any fire resistance.

I agree with you entirely that it is ridiculous to have a 4-hr. spandrel and a plate-glass window under it unless the 4-hr. resistance of the spandrel is necessary for the protection of a prime structural member whose failure would result in the collapse of the building.

PRENTICE: The new Chicago code differentiates between the fire resistant properties of a party wall to keep the fire from spreading to the next building and the fire resistant requirements that you have got to have for a free standing wall, so that there is no possibility of another building being built right up against it.

NEALE: That is perfectly logical. As I recall it, our Underwriters' code requires that there be fire protection in an exterior wall when it is within 30' of another building or a lot line that another building can be built on.

All of the more modern codes are, to a very great extent, performance codes. There is one feature of the Underwriters' code that is not performance but is specifications, and it has caused us a good deal of concern. That has to do with ground-supported masonry walls that act as party walls or fire walls.

It calls for greater thickness than would be needed for the thermal installation to keep the extreme or dangerous temperatures from passing through. The reason for that is this: On a wall of that kind, we must have stability. The wall must stand in the event that the building on either side of it collapses.

PRENTICE: These studies that are being made on the fire load strike me as one of the soundest and most intelligent developments that I have heard of in a long time.

Maybe you will talk about sprinklers.

NEALE: I would be delighted to do that. I have had a great deal to do with sprinklers in the last 30 years. For a good part of that time, I was making fire insurance rates, and the rate reduction that we would give for the installation of automatic sprinklers in a great many cases used to pay for the installation of the sprinklers in three years and then go on returning that dollar dividend.

PRENTICE: In what kind of building? Were they office buildings?

NEALE: I am talking about industrial buildings. The insurance saving, of course, has a direct relation to the values involved, and when you get into office buildings, the contents' values are not large and there isn't too much insurance saving involved, but in industrial properties there is.

The records of the National Fire Protection Association show that automatic sprinklers are effective in approximately 96% of fires. The failures are explained by sprinklers being shut off when the fire started or the system was not operating. Maybe it was frozen or the tank was empty or the fire started with an explosion that destroyed the building and the sprinkler system with it.

PRENTICE: I thought sprinklers were practically standard operating procedure in industrial buildings, aren't they?

GIFFELS: In a great many buildings, yes. They don't all have them, but in certain types of buildings they are universal with regard to certain types of occupancy.

I certainly agree with everything that has been said, that they pay for themselves very quickly. SEIDER: That is what they are used for.

BECKET: In our stores (I think this would interest you, Mr. Neale) they have figured it out that sprinklers pay for themselves in a little over five years where the insurance of the contents is considered.

PRENTICE: Aren't most stores sprinklered? BECKET: Because of that reason, yes.



GENERAL BRAGDON: "In an emergency you design solely to meet the needs and purposes of the building."

LABOR PRACTICES: They still raise costs and cause headaches for designers, contractors and owners

SIEDER: Mr. Moderator, there is one thing I see that has been gingerly sidestepped but is a big factor in these things, and that is labor relations.

We are all sympathetic with labor, but I think that if we make recommendations and don't say anything about the cost that is being injected into our building program by union regulations, jurisdictional disputes, by all the different things that crop up that make it so costly I think we are making a mistake.

WEED: Restrictive labor practices in this country, next to codes, affect our cost more than anything else.

BALLINGER: With regard to labor, I have had the same headaches as everyone else. I think it is a bad situation when we have to pay mechanics eight hours pay for seven hours work and allow them a half hour or an hour to travel each way. I think it is proper that a supplemental meeting to this could well be initiated where a few of the leaders in the building unions and the leaders of the professions, such as ourselves and the contractors, could well get together and frankly say to each other. "We are up against an emergency. We have a government program that is under way. If you are stealing an hour's work a day from that government job, you are stealing an hour of your own taxes. You are making it more difficult. You are making it so that you will not have as many jobs in the future."

ASHLEY: You gentlemen have been talking about standardization and prefabricated materials. We have a prefabricated air conditioning unit and what happens? We have three trades all standing around that piece of equipment in order to put it into the building.

We have a job down in Pittsburgh where we have an electrician, a steamfitter, a plumber and a sheet metal man all looking at that thing while they erect it up on the ceiling, and all any one of them has to do is make one little connection to it.

Another thing—in New York when we make a drawing detailing the sheet metal work it has to have a union stamp on it before the mechanics will touch a pound of that metal. That is growing because they are forming a guild to compel us to put those men in our office to do the designing. You know what a sheet metal man will design. If you ever had one working for you, you will know how much they turn out in a day. I think that those things should be thought about,

GIFFELS: One of my pet peeves is high construction costs due to labor restrictions, which cause all manner of waste and delays and jurisdictional strikes. I keep thinking about premium payments, overtime and double time. We know that the privilege of getting time and a half and, under certain conditions, double time, is terrifically abused by the labor unions, and during the last war I used to get so burned up that I couldn't sleep nights seeing those fellows deliberately retard a job in order to come in and work on Sunday. That is the biggest element of waste and inefficiency that I saw during that period.

I hope, if we are going into another one that we can do something about that. We are having dinned into our ears that we are all going to have to make sacrifices and approach England's austerity. I am not in favor of being austere at 40 hours a week. I want to see some longer hours. Overtime is a device for increasing the weekly pay. It was originally set up at a time when we were trying to spread the work. Now we don't have enough people to do the work and we still follow the same scheme.

We used to have hours suit the work load. We worked 40 hours when we weren't very busy and we worked 50 hours when we had more work. Now when you get the least efficiency out of the men you pay them the most for their hours of work. The whole thing is silly.

BECKET: I don't want to whitewash labor, and it may be that we are a little ahead of the rest of the country in California, but at a meeting in my office of men who represented the 11 top contractors in our area I asked them the question. "What is wrong? How can we conserve materials?" and so on, and it was an odd thing that among these men, none of them could put their finger on labor in our area.

There were a few exceptions, little things like the fact that a journeyman can't move material on the job unless he is a journeyman of that union. I think that is a minor thing in the overall picture.

The painters out there can't spray paint. We know a ceiling like this could be sprayed much cheaper, yet if you spray this ceiling in lead it is not a healthy thing. It sounds as though it is ridiculous to paint this ceiling with a brush, and yet you must consider the man working in the room.

Overtime, I think, was the only criticism during the last war. The premium that they had to pay was a factor, and certainly I hope during this emergency that something can be done about that.



MR. BLISS: "Because of code differences some iobs cost us \$100,000 more for the same installation."

SUBSTITUTES: There are few reputable substitutes. Many used in the past caused trouble and high maintenance costs

JELLEY: A good many times in the last war we were forced into the use of alternate materials against our will—such as plumbing materials, for instance, and other substandard quality.

Before the war was over we were beginning to get high maintenance costs and in those structures that we have used since 1945 we have been faced with almost 100% replacement of the light pipe and nongalvanized material.

I quite agree with Mr. Prentice's statement that we are in for an indefinite period. It is liable to be quite long. If we get back into these substandard substitute materials, we are going to find ourselves with an ever increasing maintenance load, both in materials and labor, and it is going to spell a lot of trouble for us four or five or six years from now.

Once again, I think we are going to have to examine every possible avenue in designing our structures to get something that will last reasonably well over 10 or 20 years, that will keep maintenance expenses to a minimum, and which will still meet the industrial need or the military need of the structure.

BRAGDON: During the last war they had many substitutes for substitutes, and they took many lesser grades. BRUTSCHY: We had to use black iron faucets. Of course, they didn't stick because it wasn't economical. I recall one instance where we had a job for the Army. It was a very prominent building. We came to the last section which we had to finish up. We wanted some copper coils for the water heaters. They said, "You can't have them. You have got to take iron."

The Colonel said to me, "How long will they last?"

I said, "Oh, a month or two."

Actually, they lasted only 22 days. Overnight we got an order to hurry up and get the copper coils and put them in as fast as we could.

We do not want to have this thing repeated. There are some substitutes you can use for a job, and others you cannot.

As far as saving money is concerned, or conserving materials and manpower, I don't know how much could be done in fabrication of ventilating ducts without the use of sheet metal. I think that a lot could be done along that line and still maintain all the standards of the fire prevention agencies. You know that sheet metal is on the critical list. It is hard to get. It is expensive. Sheet metal workers are reluctant to install too much in a day; so I think there are possibilities of redesigning duct work and other materials where great savings could be effected, and that would be applicable to the emergency. SIEDER: You remember in the last war we used wood trusses. You are going to have that same condition again. I think we should take advantage of this opportunity to correct a situation we have in this country because we are overdesigning, because unit stresses are so low, because the loads are required to be excessive in the codes.

After you have done that, then you still come back to the fact that you cannot get enough steel and will go to wood trusses. We got so in the last war that we tried to fabricate so many wood trusses and use so many wood materials there wasn't lumber enough. In the latter part of the war, it got to be so that those trusses were made of green lumber, and it was an awful situation. They weren't going to last very long. Some of them were giving way before their temporary purpose was established.

COONLEY: Material shortages are going to be staggering. Now substitution is tremendously important, and the substitutions ought to be worked out by the industries themselves. I think you have got to plan on the basis of your being involved in a 10 or 15 year program, not two or three. Therefore your planning ought to be longtime planning.

I don't think manpower is going to be our greatest problem. Materials will be the No. 1 shortage.

NEEDED: A new organization? Would the building industry benefit from a new top-level group to coordinate progressive ideas? Or could BRAB do the job if it had enough money?

GILLETT: The one thing that is missing in the construction industry is an over-all organization of unification of its activities. How that is going to come about I do not know, but we have the elements of doing these things individually, like the organizations of BRAB, and various trade associations, and some place an over-all organization of the industry should take place.

I am talking about a chamber of commerce of the construction industry—an umbrella organization which can correlate the activities, bring up these problems, go to BRAB and get BRAB to settle the problem, go to NAHB and get NAHB to settle the problem, go to AIA, go to AGC.

It takes several people on a payroll to do that work. Sure, it may need a fairly substantial sum, but it is a sum to which, if it were once organized, I believe, we could get financial support from a large number of people in the construction industry—the contractors, the architects, and especially the materials people, who, after all, gain their basic income from this business. Such an organization might then be able to play the part of a community chest for the industry.

FOLLIN: We don't have enough research money in the construction industry, and yet it is a \$26 billion industry. That is only new construction and when you add maintenance and repairs it goes up to over \$30 billion. It is 10% of all the gross national output and yet the amount which is spent in the things that we are talking about is almost insignificant.

I don't believe that the public would object to paying the price of research and standardization that is going to make building more efficient and to provide a better product at less cost.

I think we ought to find a way, and I think really what we need to put our minds to is to find a way to raise the funds out of that \$26 billion a year. The amount is trivial compared to the total volume that would make it possible to set up a full-grown research and technology organization. I like the idea that Professor Voss raised of trying to direct much of such research through the Building Research Advisory Board, which is set up in the National Research Council, as you know. It parallels the Highway Research Board. It is nongovernmental, but has governmental sanction, being set up under the National Research Act.

VOSS: We were looking at the budget of the Building Research Advisory Board yesterday, and I was terribly set back to see that the Associate General Contractors of the United States had appropriated only \$7,500 for the year's work.

Of the total construction volume last year, if one-hundredth of 1% of the profit (if the profit were, say, a net of 2% or even if it were a gross of 2% that was applied) it would be \$750,000.

Now, they don't want any figure like that at all. Their proposal is to set up a sufficient sum of money, which, as I see it, is in the neighborhood of \$150,000 a year, to have the field men get this information so that the men in the industry won't have to do it. They go right out among the contractors and architects and pass this word around, and they publish these things, just to coordinate and integrate and advise and then to try to set up, through manufacturers and industry in general, those areas of research that will benefit those particular areas of industry.

FOLLIN: Personally, I would like to see this industry work out a way to put a very modest tax on the work that is done in this industry, and I would like to see that built up into a powerful organization which is fundamentally research.

I want it to go 'way beyond what BRAB is thinking, Mr. Voss. It has to go into other lines that BRAB has not thought about. \$150,000 won't start what has to be done. I don't know how much money is collected in building permit fees in this country. Do you know that? VOSS: No.

FOLLIN: If you could increase that 10%, that could go into a building research organization. It is insignificant when you think about it. You pay only a modest amount for a building permit, but you put that into your cost, and if you increase it 10% it wouldn't really amount to anything. We need an automatic way for money to flow into research and improvement of the processes of the industry.



MR. FOLLIN: "We ought to find a way to raise the funds...."

WHITLOCK: I am sympathetic with what Jim said, that if a mechanism for assessing the net return to construction could be worked out there would be funds similar to other industries, such as the automobile industry, but I am certainly sure that it isn't the United States Government that should do it.

I have come to the conclusion, after studying this, that the only place we could find a common board where we could sit around, including labor, is the Chamber of Commerce of the United States. We have in there a Homes Foundation, which has been having reasonable success with the trade associations, and we had groups come there and meet. We had the architects. We meet the architect, the contractor, the builder, the managers of the property and so forth. They were all around a table down there. We have had reasonable success discussing all the problems you have laid out here on the table, and have tried to adopt ways and means of doing that.

The Building Research Advisory Board was conceived at one of those conferences. It was an attempt to coordinate our research efforts. We have tried to finance it. It is financed with the most paltry sum and it is almost appalling how small it is.

CHASTENEY: I think it is very significant that this is a subject which has come up at each Round Table in an individual form. I do not mean that we are repeating ourselves, but each Round Table has ended on a note of need for some form of permanent organization.

I think that considering the fact that representation at the different Round Tables has been of different segments of the industry, it shows there is a very real and urgent need for some action. PRENTICE: Yes, there is real significance in the same conviction coming from each meeting. We should do something about it.

Our magazine has been stepping into this situation because we couldn't find anyone else to invite this kind of industry thinking together.

It is our hope that these meetings will bring about some of the improvements we have discussed.



MR. PRENTICE: "Building is America's greatest industry . . . and we need this kind of thinking together."

Following are 15 pages on how to do something about the weather inside houses—by natural means Although house designers and builders have for some time had a great battery of mechanical gadgets with which to overcome uncomfortable weather, they recently have had clarified even a better method, design, which today is particularly important because it involves no source commodity other than knowledge. These pages concern analysis of the climate and the factors which produce climate, notably the sun its mechanics and its effects; temperature variations in the U.S.;

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by VICTOR G. OLGYAY

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control possibilities and limitations of overhange and natural planting; precise calculating methods; and siting how to design a Temperate House and a Temperate Settlement

THE CLIMATE

is the architect's true adversary . . . as the climate varies, so should the shelter



U. S. home building has always been in a peculiar position in relation to the climate. When each wave of settlers washed up on the shore of the new American continent, it brought with it the watereddown version of a home-style of building. The Pilgrims brought old English building methods to New England (with a Dutch accent). The French settlers brought mansards to the Gulf Coast; the Swedish, the Spanish, the Hollanders, the Germans, the Irish, each had an idea of what a house should look like. But they soon found out that these ideas had to be adapted to radically different climates from the ones in which they had originally flowered: Plymouth, Massachusetts had a far deeper temperature curve than Plymouth, England, so rooms became smaller, clustered around bigger chimneys, with fewer windows; conversely, in the deep moist South, ceilings went higher and galleries were added to the European pattern. This was regionalism—a hand held up to shield the sun.

But several influences confused the further evolution of climate design in the U. S. The first was the re-migration of pioneers from the first settlements to new land, and sometimes new climates. Diversity is striking. See illustrations, left, showing the patterns of average temperature, percent of winter sunshine, degree days, and vapor pressure.



The two most important developments which have emerged nationally in today's housebuilding are the continuous concept of space, epitomized in Mies van der Rohe's Tugendhat house above, and the greater exploitation of industrialized products, specifically large sheets of glass. Neither of these are regional; they are being built into homes all over the country. They both, however, make houses more vulnerable than ever to climate—to heat, wind, humidity, hurricanes, earthquakes, rainfall, and snowfall, and most of all to the *sun*, the most important of today's controllable climactic factors.

The sun energy falling on an area of the earth two square miles in size has been estimated to be the equivalent of that terrible energy released in the explosion of an atomic bomb. If sun energy which falls on an area 10 x 10 miles square could be converted, it would furnish the necessary energy to fuel the U. S.

All this unconverted sun radiation means an immense amount of natural energy for the designer to worry about. His particular problem is to build a shelter which will adjust to the seasonal, daily, and June 21 hourly variation in the intensity of the sun's radiation.

Winter and Summer

As Columbus suspected, the earth is round, and as everyone has been taught recently, it revolves spinning about the sun. The axis of the earth's daily revolution is canted to the plane on which it circles the sun, and that accounts for the seasons. On June 21 in the "top" half of the earth, the northern hemisphere, the sun seems to be high in sky, and is closer than it is to the bottom half. So summer is starting in the northern hemisphere and winter is beginning in the southern. Sketches to the right diagram a house on the earth's surface, showing the solar system, the approximate difference in the angle of the sun's rays in two different seasons, and the effect of this angle of incidence of the sun's rays to any particular house on the earth. When the sun is "low" in the sky, not only is it farther away from the house, and thus weaker, but its rays must also pass a greater distance through the gauze of atmosphere which surrounds the earth, a further subtraction. 294 Btu's per sq. ft. per hour is the maximum we can pick up from the direct radiation of the sun at 90°, on sea level. This increases 1% for every 1,000 ft. we rise toward the sun. Outside the earth's atmosphere the figure is 420 Btu's per hour per sq. ft.

Daily Variation

Charts below to the right show, in Btu's per sq. ft. of surface, the energy hour by hour which each wall and the roof of a house at 40° north latitude picks up from solar radiation, without considering cloud interference or sky reflection. Three days are shown: Sept. 21 (or March 21) when the sun rises at 6 a.m. and sets at 6 p.m., June 21, when the sun rises at 4:30 a.m. and sets at 7:30 p.m., and December 21, when the sun rises at 7:30 a.m. and sets at 4:30 p.m. The diagram below shows totals gained by the different walls and roof of a house on a day in winter (left) and in summer. Each arrow represents 250 Btu's per sq. ft. per day. The axis-line describes the time of maximum daily temperature, which is in the afternoon.

From these two sets of diagrams can be drawn important conclusions for housebuilders: the west wall is the most dangerous so far



Proportionate heat gain on each wall and roof in winter (left) and summer.

as overheating is concerned, for while it picks up no more heat than the east wall in summer, it is being radiated at the time of maximum heat of the day. The south wall is excellent because it picks up a great deal of heat in the winter, and less in the summer, when the sun is high in the sky. The east wall is pleasant in winter, and not so annoying as the west wall in summer. The north wall absorbs no sun heat in winter, and relatively little in summer (early in the morning and late in the afternoon). The roof is exposed to twice as much sun heat as any wall in summer.

The Germicidal Effect

General health-giving properties of the sun are difficult to measure, but germicidal effects have been studied. Five thousand watts of sunlight equal about one watt of germicidal energy, which is enough to disinfect a $15 \ge 18'$ room in about 80 minutes.



Solar Radiation:

Btu's received at different angles of sun altitude









ultraviolet energy from 10° sky zones



room illumination from sky radiation



comparative illumination in sky vault



man originated on 70° line



double house recognized microclimate

Two interesting axioms guide use of the sun as a disinfector. The first is that microorganisms can be destroyed equivalently by a large intensity of rays over a short period, or by a small intensity over a proportionately longer period; moreover it is generally adequate to have this radiation in only part of a room if there is a circulation of air. The second statement of germicidal experts is that the radiation effect of a clear sky is equally efficient to the effect of direct sunlight. Effect does vary, however, with the portion of the sky vault which is radiating; sketch to the left illustrates the ultraviolet energy from various zones of a clear sky incident on a horizontal plane at the earth's surface, excluding direct sunlight.

Conventional glass transmits no ultraviolet energy, and most of the special glass available transmits only 60%, but this situation probably will change in the future. Meanwhile, sliding walls, patios, and window openings deserve some study for their germicidal effects.

The Visible Rays

We are most aware of these, although the great adjustive powers of humans to light for a long time kept people from doing much about natural lighting. Sunlight is almost always bad light for visual tasks, and many devices like louvers exist by which direct sunlight is diffused into rooms. If the problem is not sunlight, then it is getting enough natural light from the diffuse daylight reflected in the sky vault.

The sketch to the left indicates how the intensity varies throughout the sky vault. Readings are in foot-candles at 11 a.m. on a June day. Intensity of light in the room itself can be determined by a calculation indicated roughly by the sketch immediately above the skyvault intensity chart. Foot-candle illumination inside the room varies approximately with the square of the distance from the opening, based upon the amount of the sky vault visible through the wall opening. Efficiency of the lighting is dependent also upon the glass used in the window. Clear glass transmits about 82 to 90% of the visible rays; ribbed glass transmits about 67 to 84%; rough glass transmits about 50 to 88%.

The Heat Waves

These are the waves which annoy us most frequently and which we also miss most frequently. Although there is no specific optimum of temperature for man it is general to take the temperature of the place of his origin as most suitable. Anthropologists say that man originated on the line of the 70° isotherm (see map, left) and as he discovered fire and invented shelter and clothing, moved away fighting nature in both directions from this line.

Man has not changed enough so that the fight can be called won. He still is trying to get back to that 70°. Ancient history is full of instances when brainy citizens used nature itself to h lp roll back the temperature—Xenophon tells of Socrates' perception of sun control (see page 192), and the ancient Chinese philosophers described the protecting effect of trees. The emperor Hadrian built a wall oriented north and south so that he might walk in the shade or shine according to the temperature. In the Renaissance we can see remarkable examples of environment control, such as Vignola's Villa Caprarola. (See plan, left). Here the axis of the building is also the solar axis, and the structure is symmetrically planned on both sides with a very precise purpose. It was a double-dwelling—the southern part was occupied in winter, and the northern part in summer.

The automobile is today's best climate controller for the people who can drive south in winter and north in summer; others have air conditioning, although this is still expensive. But mechanical means are only the last of the four pressures which can be used to push the temperature curve up or down to the 70° line (see diagram next page). In the U. S., as in the world, there are areas (see sketches), where the temperature is almost always under 70°, and nearly all sunlight is needed throughout the year. There is also a great Flattening the temperature curve

 data (meteorology)
environment control (microclimatology, botany)
climate control of building (architecture)
mechanical heating or cooling (engineering)

median range where sun is of benefit part of the time and uncomfortable part of the time; there is finally the area where shading is almost always needed for comfort. Below is a more precise illustration of three cities in the three such temperature areas in the U. S.: Devils Lake, N. D.; Harrisburg, Pa.; and Pensacola, Fla.

Charted under the yearly temperature curve for each of these cities is a record of the 24 hours of the average day in each month. The minuses indicate the hours when the temperature, unshaded, rises above 70°. In Devil's Lake shade would be welcome, from noon until evening, only in July, but the chart shows that in Pensacola there should be almost constant shade from May to October. These observations lead us to reconsider the existing rule of the overhang design, which is determined on the lines of the sun altitude at the summer and winter noon times. Although the rule seems to be generally good, in the case of the Devil's Lake chart any fixed overhang would cause three-times more harm than good from heating point of view. Drawings to the right of the charts suggest basic solutions to the problem-for Devil's Lake, no overhangs, but a tree; for Harrisburg, some overhang, more planting; for Pensacola, extensive overhangs and tree shading. For further discussion of both methods, see following pages.









What an overhang can do for us

If we approach the problem of scientific shades and shadows in our house architecture as carefully as Ammannati studied the same subject esthetically when he designed the balcony (left) at the Palazzo Ruspoli in Italy, a lot of people will be more comfortable in the summer. Part of the approach must be a study of exactly what amount of shade can be thrown by the various lengths of overhangs. Below are a set of time charts similar to those on page 183 showing vertically the hours of the day and horizontally the months of the year. These six charts show the shade which various length overhangs will throw on the same south wall in 40° N. latitude over all months of the year. The darkest part of the chart indicates the full shadow of the overhang; the medium tone indicates 50% shading, and the lightest tone, 25% shading.





Shading by overhangs diminishes in effect as you move away from the equator, as shown by sketch above. The sun is lower in the sky and not so easily shaded; shade, however, becomes less necessary as you move north or south of the equator.

The most important information for housebuilders in these charts is the fact they prove that overhangs alone cannot do an efficient enough job of shading. On these charts the form of the shades (in time and amount) does not correspond with the typical needs for shade as shown on the charts on page 183. If the shaded time does fully cover the time for shading need, it also extends shading effect over too much of the time when shading is not wanted and is indeed a disadvantage. In addition to this dissimilarity in sickness and cure, there is another: the shading effect is symmetrical about the summer solstice line, but the axis of the shading need is delayed about a month. What obviously is necessary is some supplement to overhangs for shading; a natural answer is trees.



Plan and photo above of wonderfully precise garden layouts emphasize again the pains past designers put into achieving esthetic effects, even in rearranging nature. Today in our planting, we should respect their careful attempts, but from the point of view of climate balances. Logical planning should give use to windbrakes, shade trees, and surfaces with favorable reactions to radiation—an arrangement where every tree works for us.



What nature can do for us

Trees and bushes not only make good shade, but they are usually equipped to deliver the shade when it is needed, and only then. Charts below show the shading periods of trees in our three specimen locations in the U. S.: Devil's Lake, Harrisburg, and Pensacola. Although in each case the leaves arrive somewhat early on the branches of these trees for shading, the time of the full bloom period and the shading needs in the given areas correspond very closely. They work elastically with our needs even in their seasons. In cold spring the leaves arrive later, in warm summer last longer—within a variation of six weeks. Vertical scale at left of charts indicates percentage of shade achieved in months designated on horizontal scale.



Pensacola

sugarberry

cottonwood

Devil's Lake

elm

Harrisburg







Left and above, Glass house, San Antonio, Texas J. Glass, designer; immediately below, house for Warren Tremaine, Montecito, California, Richard J. Neutra, Architect; bottom, Moore House, Seattle, Washington, Philip Moore, Architect; bottom, left, apartments in Budapest, Olgyay and Olgyay, Architects.

Julius Shulman

Leonard Delan

Devices against the sun

The biggest impact on contemporary architecture that a consciousness of climate has already made is in designers' emphasis of horizontal planes to shield walls from the sun. (On east and west exposures, the vertical also comes in for emphasis, as in fins in photo, upper right.) At its scientific best, this kind of shading by overhang should be adjustable, for reasons shown on the preceding two pages. The adjustment may be, as above, in a roof surface that can be removed in winter to admit sun to a wind-sheltered porch. Or (below) an overhang can be combined with adjustable awnings so that a shaded wall in summer is also a winter sun trap. The overhang shown in the photograph below right is split between a solid sunshade and louver trellis which will grow vines in summer but shed them in winter. Trees aid the overhang of the handsome California house to the right.







Starting to calculate a temperate house

1. The examination

The first step in closing with this problem is to determine the yearly temperature curve of the house's geographic location, with respect to the 70° line. An example of what that curve might be is shown, right. It is made up of the average of all the typical daily curves and in this particular case shows that from about the middle of July until November the greater part of each day is overheated. The smaller curve superimposed on the yearly temperature curve is an hourly curve for one typical summer day, July 1. It shows that from about eight in the morning until about eight in the evening on July 1 the normal temperature is above 70°, and shade is needed, noted by the red bar drawn above spanning these hours.

2. Diagnosis

The next step is to calculate a full-time chart of just those hours, June through November, when shade is needed. This is done by taking each daily temperature curve and determining the hours of overheating, as was done above for July 1. The hour scale in this chart is now vertical, so the red bar spanning July 1's hours-above-70° is tilted and applied on the new chart. When a similar bar is charted for each day in the summer, the overall overheated hours are represented by the areas enclosed by the red line.

3. The first bandage

Now the problem is to enclose that overheated "shape" with a shade "shape." First we pick out an overhang which will throw shade most of this time, but at the same time will not cast too much shade during those hours which are not overheated. The overhang selected (from a chart such as that on page 184) is shown right.

4. The second bandage

Superimposing this shape over the diagram of the overheated hours, we find that there still are hours left when a shading need exists. But casting shade during these hours by means of an overhang would also cast shade other hours when sun is needed. What to do? The answer: plant some trees which will cast shade on the house when it is needed, augmenting the shade of the overhangs, but not shading during those parts of the year when sun is needed. The effect of the trees selected is shown on the shading diagram by the lined gray area.

5. The patient rests in the shade

In superimposing the shading charts we have to consider the overall heat capacity of the house. There is a time lag between the outside and inside temperature, which is around 2 hours in a usual house. The shading charts usually give the necessary time from the beginning of their effect till the total shading.

The completed shading job shows only a few hours when the temperature will be above 70° and the wall will not be shaded. The plan (right) shows if we do this diagrammatic solution of shading on all the walls, that every time practically throughout the year when the temperature is over 70° we shade the building; and every other time that we are below the comfort range, we let the sun heat our shelter with its rays. In other words: we temperate our house. On the next page we will show a more precise, detailed calculation for a specific example.









On these two pages are the shading calculations for a typical house oriented by compass in the New York-New Jersey area, at 41° north latitude. Calculations are included for all three sun-exposed walls, and the job of shading at the proper time is done using fixed overhangs, trees, shrubs, and also flexible overhangs. This first step is determining the overheated period on a time-chart of the year. This East wall gets early morning sunlight and is not entirely passed by the sun until noon. Shading is particularly necessary here, during summer months late in morning, when heat starts to be really oppressive.



is done as shown on page 187, and the resultant chart for this house is at the top of this page. It is noticeable that overheating persists through the night (hours are shown vertically).

The next step in the calculation is to separate the three walls which the sun strikes in order during the day. The three lower charts on this page show the hours of the day when the sun might augment overheating by shining first on the unshaded wall, approximately between 5:30 a.m. and noon; the south wall, between about 8:00 a.m. and 4:30 p.m.; and the west wall, between about noon and 6:30 p.m. The overlaps in time are of course caused by the fact that the sun shines on corners and reaches two walls directly at some hours in a typically rectangular house. The north wall is omitted because it is of little importance so far as direct sunlight is concerned. On the facing page are the remedies for this excessive gain of sun heat. South wall has longest exposure to sun in all seasons. In summer overheated period may last, as above, nearly nine hours. During most of this time, sun is comparatively high in sky, but there must be protection.



West wall gets low, sinking sun, and gets it at a time when the general heating conditions have gradually risen to their most uncomfortable pitch of the day. Glare of summer sun in western sky can also be unpleasant as sun goes down.



-how to make shade

East wall. Because the sun is generally low in the sky for most of the time it shines on the east wall, an overhang does not accomplish much in shading. It can do some good, however, particularly as the morning wears on and the sun (and the temperature) rises higher. So a 30% overhang (A) is selected for the east wall as one which will be effective in summer time to some degree. But as we can see on the chart it bars some of the needed winter sun too. To the overkang is added the shading effect of a tree (B) whose shade greatly improves the situation in the summer. And when winter sun is desired, the tree will be bare of leaves and will not cast much shade. Total shading effect of the overhang (A) and the tree (B) is shown in (C).

South wall. An overhang will do much more good here, because the sun is so high during most of these hours. A 23% fixed overhang (D) is selected for greatest efficiency. It, however, does not shade the later months well, so a 45% flexible overhang (E) is added. This might be a louvered arrangement or awning. Even this does not give full protection, however, so a tree is added (F) as a sun shield for hot fall afternoons. Total shading effect of fixed overhang (D), flexible overhang (E), and tree (F) on south wall is shown in (G). This example shows how the axis of protection by means of fixed overhangs and the axis of the need for shade fail to agree.

West wall. The sun is now low in the sky again, so an overhang is of diminishing effect for shading. A 30% overhang can accomplish only the shading effect shown in (H). It will do no harm in the winter, however, so it is used. Two trees, however, (1) do a very satisfactory job of shading; and to them can be added the effect of shrubbery which is shown, shading the sun as it goes down, for a total effect on the west wall of (J).





This house uses several devices to shield the sun in summer, and uses them so that they will not interfere with reception of winter sunlight. There is first a measured overhang, calculated as described on previous pages. Added to that there is a flexible overhang whose louvers are adjustable to keep out summer sun, but admit winter sun which will largely heat the house through the large southern area of glass. And then there are the trees, which are placed geometrically to shade not only the windows in summer, but the greater part of the exposed walls as well. Photographs of a model on the opposite page show how these trees will cast their shadows at different hours of the day. The west hedge, shown in plan, which is intended to catch the rays of the low western sun, is hidden in the photographs. It does not take these trees as long to mature to their full usefulness as is often assumed; generally when a fast-growing, five-year tree is planted in a new location, it takes only five more years to grow to 80% of its full shading effect.

According to the heat calculations on a summer day with these devices we can bar nearly 80% (2,625 Btu of every 3,400 Btu) of the radiant heat energy. This would mean 1,900,000 Btu in a day in the house shown here, which energy would otherwise fall on and heat the house. And in the wintertime more than 90% of the sun heat energy would strike the building.

Attempt to diminish heat gain through roof in summer is made here by using adjustable louvers just under overhang which can be opened to prevailing breeze in season. Below are three types of adjustable overhangs.





-in summer shade from dawn to dusk



THE COMMUNITY and climate: history shows how to plan a settlement; microclimatology diagrams the method



Priene, Greece, 350 B.C., and the consistent orientation of Roman castrum





The strict pattern of medieval fortifications

The strict pattern of modern urban life



London's satellite towns: self contained periphery communities

Ebenezer Howard's diagram of 50 years ago for Greenbelt towns



The classic proverb *Mens sana in corpore sano* (a sound mind in a sound body) was reflected in the careful layouts of the ancient towns. Their slow unrestricted development exemplified balanced living conditions and firm city organizations.

Comparatively little precise information about the weather actually was available to their residents, but on the other hand their decisions were not all guided merely by instinct either. The ancients were keen observers. Witness Socrates' lucid sentences about the sun in Xenophon's Memorabilia: "In houses with a south aspect the sun's rays penetrate into the porticos in winter, but in summer the path of the sun is right over our heads and above the roofs, so that there is shade. If, then, this is the best arrangement, we should build the south side loftier, to get the winter sun, and the north side lower, to keep out the cold winds . . . presumably at once the pleasantest and most beautiful."

An examination of the remains of some of their towns does show how careful the ancients were. A good example is Priene, Greece, a town of about 350 B.C. (diagram left). It huddled behind a mountain which blocked the north wind effectively, and yet main streets were carefully pointed south, so the summer southerly would cool more than just the peripheral houses. The diagram beside the map of Priene shows that the Romans too were consistent climatologists. The lines are comparative compass orientations of the main streets of 32 Roman Castrum, and show how close to north-south they all came. But this was in a compartively secure civilization of unworried people.

With the decline of the humanistic period, attention wandered from these considerations; energy had to be poured instead into the methods of defending towns. Vauban's fortifications for Casal, a medieval town (plan left) show the enormous strength and complexity of the military walls. Result of this crowding together was of course, enormous congestion, just the sort of thing we suffer from in our cities today. Pressure more recently has been economic; typical plan of crowded city shows the harsh pattern of specious efficiency.

Planning for People

Today's tendency in planning is back toward humanism. It is more than military expediency that is encouraging the construction of outlying satellite towns for large cities, such as London's satellites shown left. You are no longer alone merely because you are remote — modern communications like telephone, radio, and television can bring the city's benefits to the country. Popularization of automobiles may yet dissolve big cities' concentrations without affecting their functions. Ebenezer Howard's diagram of 50 years ago showing the advantages of the greenbelt towns is today even more eloquent—and emphasized because of the possibilities of our age.

Building of these new "settlements" and building of vast developments of houses is a wonderful opportunity for use of new knowledge in microclimatology as well as in sociology. Land should be picked for these as the Italians go out from a town and pick the best land for growing grapes. Towns and developments are best sited on slopes protected from the wind, just as wineries are, because slopes pick up proportionately more sun radiation in winter and less in summer (a 25% south slope picks up more than twice as much winter radiation as flat land). Grapes and children both grow best on these slopes. Usually a south slope, or east of south, is the best for all year occupancy, but there are many ways in which careful planning can improve any available site.



Which winds to block, which to invite in

The first step in design of a temperate settlement is analysis of wind directions and effects. Here is a typical analysis for a town in the New York, New Jersey area. Months of the year are on the horizontal scale and hours of the typical day for each month are on the vertical scale. Arrows indicate conventional wind directions for the period designated on the chart.

On this chart is next superimposed the overheated period of the year, determined from monthly and daily temperature curves as on page 188. This is shown in red. It follows that the winds within that period are beneficial, since they are a cooling influence at an above 70° temperature. But except for this overheated period from the end of May through September, winds are an undesirable cooling influence -when it is too cool for comfort anyway.

Diagrams (right, above) summarize the chart information, illustrating which winds should be blocked from this settlement and which should be admitted. Nature is on the side of the planner in this matter, since summer and winter winds nearly always come from different parts of the compass.



How to do it

Here the wind research is applied to the settlement plan. This settlement is composed of four residential colonies of about 1,200 people each, grouped around a central area which contains commercial, administrative, cultural, sports, and recreational facilities. Left is a winter wind diagram of the settlement, showing belts of dense evergreens planted to the northwest of residential areas, to block winter winds (within the wind shadows shown on the sketch, wind strength can be cut 35%). Northwest streets are offset, or sheltered to keep them from becoming wind channels. In summer (above) winds are welcomed. The street layouts are slanted to the south and southwest, the origin of the prevailing summer winds, and these are led through the settlement as far as other planning and traffic problems allow. Central section of settlement is given to communal area because winter protection and summer ventilation of the individual houses is considered of primary importance.

The end result of putting today's information in use today





So here is the temperate settlement of temperate houses. By using meteorology, microclimatology, and architectural engineering we can improve the comfort of the small house. How much? The answer can be given two ways.

1. In summer we can bring down the top normal indoor temperature as much as 16° without mechanical equipment. In winter we can increase the normal low temperature as much as 18° without additional mechanical heating equipment.

2. We can design and build settlements which in effect will be commuting between winter resorts and summer resorts. Map, left, shows the geographical slack we can take up. By using all available natural expedients we can have a house in New Jersey which in summer is as comfortable as the normal house in upper New York State. In winter the same house will be as comfortable as the normal house in Virginia. The effort is worthwhile.

Harold C. Munger



Architect Victor G. Olgyay is a gradute of the Royal Hungarian Polytechnical University at Budapest in his native Hungary. He received the Rome Prize and spent several years in Italy studying at the Architettura Superiore. Later he studied on a fellowship at Columbia University. In 1938 he opened an office in Budapest with his architect twin brother Aladar Olgyay, with whom he has always studied and traveled. Their work includes the Hungarian Pavilion at the New York Worlds Fair. Since 1947 both have been teaching at the University of Notre Dame. Sources and data from:

DR. PAUL A. SIPLE, Military Geographer

DR. MARIA TELKES, M.I.T.

HOUSE BEAUTIFUL MAGAZINE

DR. HELMUT E. LANDSBERG, Dir. of Meteorology

A. H. TAYLOR, General Electric Laboratory

DR. JOHN A. JUMP, Prof. Univ. of Notre Dame

S. F. MARKHAM: Climate and the Energy of Nations





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COMPETITION REPORT

(Continued from page 107)

ington, D. C., and home builders Fritz Burns of Los Angeles and Cy Williams of Port Washington, Long Island. The Technical Jury which decided the winners of the special awards were Architects Whitney Smith of Pasadena, Philip Will, Jr., of Chicago, and L. Morgan Post of Kenilworth, Ill.* Seldom had such an outstanding group of industry leaders been called together to decide so important a contest. Had the contestants been privileged to attend the judgment, they surely would have agreed that their interests were in the hands of capable, practical, hard-working men.

Seated around a specially prepared easel, the National-Regional Jury examined all of the entries-region by region-as they were turned over one at a time like the pages of a huge book. Those which aroused the interest of any one juror were set aside for later and closer consideration. Sometimes, when the jury was dissatisfied with the number of entries so selected, they would go through the regional "book" a second time. On the third and fourth days, when the jury was ready to pick the regional and national winners in the final elimination, the entries were spread out on tables for closer comparison (photo page 108), then put on the easel again for group discussion. Meanwhile the Technical Jury studied the entries in the special award contests which were delivered to them as soon as they were discarded by the other jurors.

A new design vocabulary

While there were some differences of opinion, these were usually resolved by discussion. In these discussions the jury developed a whole new vocabulary of terms which quickly expressed their opinion of the lesser architectural accomplishments set before them:

- CONSTIPATED—a floor plan whose elements are so poorly related that it would be difficult to get from one part of the house to another.
- COLONICAL a floor plan whose circulation is complicated to the point of confusion (derived from the word "colon" and not to be confused with "Colonial," examples of which turned up in only about two dozen of the 2,727 entries).

(Continued on page 200)

* Biographical sketches of all the Jury members and examples of their buildings are presented on pages 88, 92 and 96.



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COMPETITION REPORT

- SCHMALTZ genus of applied design detail—such as circular and octagonal windows, inclined trellises, and trick fretwork on front doors (syn: corn).
- SPACE MODULATORS bare sticks of lumber which take off into space to tie together two detached elements of a house—thus an effort to establish a continuity of design which doesn't exist (syn: flying boards).
- CABLETTE a dinky roof gable used to suggest that a rectangular plan is an Lshaped plan.
- ROCK VENEERIAL the over-enthusiastic use of flagstone as a floor finish—frequently extended even to the walls.

If the contestants could have looked over the jury's shoulder while it was deliberating they would also have learned some pointers for future competition work. Most important, they would have learned that drawings whose background and landscaping were over-rendered (some of them with thousands of crow quill lines) made a less favorable impression on the jury than clear, simple statements. The jury was always relieved to see a presentation that could be easily read and tended to dwell on it longer than on a beautifully rendered "picture."

At long last . . .

Mindful of their responsibility the eight jurors worked hard, long and conscientiously at their assignment, finally reached their decision at 2:00 a.m. the fourth day after they had assembled. All told they and their assistants had spent 106 mandays studying, sorting and evaluating the 2,727 designs. As shown elsewhere in this issue, this labor brought forth 63 winners of 84 prizes-and a series of designs which set a new pace for builder homes. Twentytwo winners were present at NAHB's Chicago convention on January 18 when the awards were announced and the prize-winning designs were displayed to the 6,000 assembled housebuilders (see photo).





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JURY REPORT

(Continued from page 109)

ignored the fact that every time a corner is turned in a small house its construction cost is proportionately increased. This seemed to be tantamount to an admission that interesting and attractive envelopes of great variety could not be achieved within a simple rectangle. Nothing could have proved the genius of the profession more and gained it the deep respect of the builders than to show, as it can be shown, that unlimited variety of unusual space arrangement is possible within a simple rectangle.

Whitney R. Smith, Architect: The entries seemed to be almost clearly divided between the "Charm School" and the "Intellectual School," neither of which in its pure form solved the problem posed by the competition. The charm division resorted to the usual trite elements applied as exterior decoration to the same old plan. The intellectuals designed clean boxes which, to the merchant builder, were "sterile" and dangerously monotonous when repeated.

I felt very strongly the lack of emphasis on landscaping. In tract housing this can be almost the entire salvation of the monotony problem. By landscaping I mean not only plants but also any three-dimensional space division of the entire lot.

There were few regional houses. Flat roofs and butterfly roofs were submitted in all regions. No one took the existing tract house of a region and just improved it. No one exploited the pitched roof or the expandable attic.

The majority of houses had too many architectural elements. In general, no house of 1,000 sq. ft. needs clerestories (except for baths), as it is impossible to get farther than 15' from an outside wall.

The square plan *could* provide most of the amenities. The inside bath should be more widely adopted.

Most entries in the Plywood Built-in Features contest showed very little original thinking. Many tried to use plywood where it was not suited (where lumber would have been better) and yet overlooked the qualities in which plywood excels (edge nailing, shear strength, curving, perforating, etc.).

There was little or no attempt to bring charm to the kitchen. Most entrants had apparently taken material from the catalogue and lined equipment around the walls.

(Continued on page 208)



Where space limitations or service needs require an electric dumb waiter installed under a counter . . . in a back bar . . . or in a cabinet — in drug stores, groceries, markets, restaurants, cafeterias, soda fountains -the Sedgwick Under-Counter Roto-Waiter provides the ideal solution. The unique rotodrive principle elim-inates the possibility of overtravel and allows every inch of available height to be used safely. The outfit is self-contained, requiring fastening-but no support at the upper floor level. Its compact machine, occupying but a minimum of space in the basement, is placed at the side of the equipment, where it is easily accessable for inspection and lubrication and where it will not be subject to the service disorders so often caused by accumulated dirt, spillage or drainage.





Car Travels to One Inch Beneath Underside of Counter...Safely! Plan, shown above, shows standard Under-Counter Roto-Waiter with car 24" x 24", 150 lbs. capacity. Also built specially in greater capacities with cars up to 36" x 36". The height of the car is, of course, dependent on the clear height available under the counter.

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In addition to the Sedgwick Under-Counter, and regular two-stop Roto-Waiters, Sedgwick also builds Multi-Stop Electric Traction Dumb Waiters for three or more landings — with a wide selection of specially engineered control equipment and signal systems to suit individual needs. Other Sedgwick Dumb Waiters — including both electrically and manually operated types — are likewise available in a wide range of sizes and capacities. Steel towers and enclosures can be supplied where desirable. Specify, too, Sedgwick Steel Dumb Waiter Doors for complete satisfaction.

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GOLD BOND'S PERFORATED TAPE SYSTEM and Gold Bond Gypsum Wallboard for the walls and ceilings. The job moved along like clockwork. As soon as the wallboard was applied, the "tape crew" took over.

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YORK

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Yes, now you can have—for the same or even less cost than you've been paying—a choice of Load Centers for residential and commercial applications having features you've seen before only in high-priced industrial panelboards.

By means of adroit designing and the adoption of interchangeable components wherever possible, Trumbull has managed to create a superior product and at the same time achieve enough economies, by standardizing manufacturing, to give you more value for *less* cost.

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QUICK-MAKE, QUICK-BREAK Trumbull's new TQL interrupts with a *snap*. No matter how sloppily the handle is operated, the movable contact arm (A) opens or closes *fast* and *clean*...reduces burning or arcing of contacts.

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OTHER FEATURES Pressure-type silverplated copper contacts (E)...arc chute (F) made of special refractory material ... exhaust chamber (G) to cool gases ... completely tamper-proof ... Underwriters Laboratories Inc. approved.

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ATTRACTIVE APPEARANCE The front is fastened to box and interior by means of four screws. 12- through 20circuit Load Centers are designed for sequence phasing adjacent Breakers are on alternate phases. This unique design assures balanced loads. Breaker positioners and circuit numbers embossed on fronts. Note twist-outs.

SEE MORE REASONS why Trumbullite Load Centers give you more for your money



RUGGED BUSBARS AND STABS No porcelain insulators to break. Busbars and stabs are silver-plated copper for positive conductivity. Terminals are heavy-duty, silverplated, solderless.



QUICK-IN, SURE-IN BREAKERS Pressure contacts engage stab assembly firmly. Anchor on back plate grasps recess on breaker. Inserting a breaker is as easy as plugging a lamp cord into a wall receptacle.



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makes an attractive exposed ceiling. It remains

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GRANCO STEEL PRODUCTS CO. (Subsidiary of Granite City Steel)

Granite City, Illinois

JURY REPORT

Cy Williams, Builder: The following points are worthy of note:

1) The amazing number of basically different plans, both good and bad, that can be achieved in 1,000 sq. ft.

2) The ability of some designers to develop usable all-purpose areas as well as three bedrooms within 1,000 sq. ft.

3) The almost complete departure of 2,727 designers from the "Cape Cod cottage" and the number of examples of good, publicly acceptable contemporary exteriors.

4) The indication that our designers are concurring with what I believe our future home-buying public will demand, as particularly exemplified in a freer and more functional use of space.

5) I did not sympathize with the jury's lack of concessions to the "bad taste" so frequently demanded by the public, but I did like the general lack of this sort of detail in the designs.

6) The best designs indicated the contribution architects can make to builders and, at the same time, indicated a growing consciousness of the builders' point of view.

Philip Will, Jr., Architect: With limited floor area in these small houses, it seems to me that the effect of spaciousness possible through varying ceiling heights, sloping ceilings, etc., becomes increasingly important. Adding such variations in vertical dimensions to the spaciousness we are accustomed to achieve through glass walls, we have the means to release people from the tight little boxes in which too many live.

Several of the premiated designs managed by squeezing down bedrooms and other devices to find a few square feet to allocate to multi-purpose family use. This recognizes the importance of such space at the expense of space in which to sleep, and even at the expense of space assigned to the more formal aspects of social life.

I continue to be amazed at the zoning requirement, which is quite general in this country, for wide streets and deep setbacks. Such setback and zoning restrictions force costly services and the uneconomical use of land. They not only waste building materials, but also our greatest natural asset, land. It is also bad design when you consider that the space between houses, which takes in streets, walks and front yards, should have scale and proportion. The relationship of these horizontal dis-*(Continued on page 212)*



King Junior High School, Portland, Maine is equipped throughout with Corbin "900" Series Locks and other fine-quality Corbin Hardware. Architects: John Howard and John Calvin Stevens; Contractor: C. Profenno Company; Hardware supplied by: King & Dexter Company.

Schools are designed and built to serve for many years. So is Corbin Hardware. That's why so many fine new schools, like the King Junior High School in Portland, Maine, rely on Corbin for their hardware needs.

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Fireproof Bestwall Gypsum Wallboard, Plain surface.

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GYPSUM	PLASTER	•	LATH	•	WALLBOAR).	ROOF	DECKS
ASPHALT	ROOFING	•	SHING	LE	s - sidings			

JURY REPORT

tances to the height of houses and the height of trees is important, as is also the "furnishing" in the form of planting that is added to this space. To my knowledge this phase of designing a community has been generally overlooked by planners.

Fritz Burns, Builder: In future architectural contests I think a chapter should be taken from horse shows wherein "working

horses" are judged separately from fancy breeds. The plans most suited to builders should compete in the "working horse" category; the architects' plans in the more refined advancements of the fancy breeds.

Builders and architects cannot hope to think identically-certainly most architects do not want to think in the same channel as builders and builders cannot always afford to think with the architects-not in



Precision manufacture in the modern factory frequently calls for precise control of dust, ventilation, atmospheric pressure and, last but not least—heat and light.

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which necessarily cost more, but rather that architects address their appeal to the more advanced thinking group which does not comprise the popular market. The merchant builder must sacrifice the patronage of the advanced thinkers (most of whom will ultimately insist on a custom-designed house anyhow) in favor of the volume of the popular market.

the sense that most architects prefer houses

That the volume market is somewhat behind advanced architectural thinking is not unusual and hardly calls for an explanation. Even assuming that the layman's mind was equal, artistically, to that of the professional's, the mere difference of the advance which occurs in any subject between the occasional thinker and the constant thinker would account for a considerable disparagement in the progress made and the point reached.

The popular market is further restricted or paced by the natural conservatism of a buyer who is making a life-long purchase; by his reluctance to depart from yearnings established in earlier years; and by the constant impact of the design and style and influence in existing houses which, we must remember, outnumber new homes 50 to 1 and are being bought, sold, lived in, entertained in, and even considered downright desirable in this same market into which we must launch new ideas.

To what extent should the builder and/or the architect assume the mission of advancing public thinking so it will concur with the concentrated thinking and study of men who make building and architecture their business? The builder caters to his public-he interprets his public as wanting something new, but gradually. A builder wishes to keep in the front ranks of advancement because his public enjoys a progressive popular trend, but not to the extent of becoming the vanguard. The vanguard must still be the custom designed house. This not only makes sense, but is the only way a builder can survive or even operate when his financing and business risks are taken into consideration. The backward builder, for whom we have no defense, must content himself with backward customers, second trust deeds and a short life.

Builder (looking at house plan): The public won't like it.

Young architect: They just think they won't like it.

Veteran architect: That's almost the same as not liking it.

(Continued on page 216)

LARGEST

HOW TO BE SURE YOU GET LIGHTING VALUE



What will it do for me? And - what will it cost? Here are Miller's answers to both. Miller lighting equipment - Fluorescent, Incandescent, and Mercury-vapor, covering a wide range of industrial and commercial requirements - will give you high lighting efficiency, and years of service. It is built on an 8-Point QUALITY standard, with rigid "Truss" construction, certified components, Bonderite-treated steel, and long-life finishes. Three elements must be considered in figuring cost first cost, installation cost, maintenance cost - overall cost. Miller lighting equipment has engineering features which make for easy installation and maintenance, which explain its LOW OVERALL COST. You can light with confidence the proven Miller way. Miller field engineers and distributors are conveniently located for nation-wide service.

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The entire floor slab of this home will be insulated with PC Foanglas. The blocks have been laid on a bed of tamped sand, and heating pipes installed. A cover floor will complete the job. Architect: Raymond Viner Hall, Port Allegany, Pennsylvania.



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WHEN YOU INSULATE WITH FOAMGLAS ... THE INSULATION LASTS!

Here, a warm air duct system will be enclosed between a concrete slab on the ground and a finish floor slab. PC Foamglas on the surrounding wall insulates the system against heat loss. Architect: Alden Krider, Kansas City, Missouri.

PC Foamglas Insulation, in these hot air ducts, contributes to more efficient operation of the heating system, helps make finished floors more comfortable for room occupants. Architect: Kenneth R. Vaughn AIA, Hammond, Ind.



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> This diagram shows how a group of glass bubbles which contain still air, can form a continuous, cellular material. The black area is glass, the white space is air. PC Foamglas, the cellular glass insulating material, consists of glass and still air, making an excellent barrier to heat travel. And, being glass, Foamglas has unusually high resistance to moisture, vapor, fumes and acid atmospheres, is noncombustible, odorless and verminproof. In this cellular glass construction lies the secret of the long lasting insulation value of PC Foamglas.



A layer of PC Foamglas is being installed around the perimeter of this floor area. Because Foamglas has unusually high resistance to moisture, no vapor barrier is necessary for these residential applications.



Cold transfer and heat loss are minimized when a border of PC Foamglas—as shown here—is used under a floor slab. Photo Courtesy of National Homes Corporation, Lafayette, Ind.

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JURY REPORT

L. Morgan Yost, Architect: The Jury sought almost in vain for simple solutions and simple drawings. If contestants only realized how much simplicity counted, not only in competitions but also in architectural design in general, they would not fill their sheets full of meaningless pen strokes, shades and shadows, distracting figures, etc.

As to the kitchen competition there was no attempt whatsoever to re-appraise the design of the kitchen for the small house. Even using standard equipment and cabinets there is much to be done in planning usable and efficient work centers.

It is probably safe to say that 90% of the entrants designed with cliché instead of common sense. Clerestorys, vertical spindles, canted walls, overstressed chimneys, all seemingly fashionable in the architectural schools of today, apparently held



the attention of the designers to a much greater extent than did the actual problem of livability and construction.

O'Neil Ford, Architect: It was extraordinary that we were able to give some time to every entry and much time and argument to those showing little or much evidence of resourcefulness and serious purpose.

The great quantity of entries has much bearing on a general evaluation of the whole effort by competitors and sponsors. Let me illustrate the impact of numbers:

1. After one had squinted searchingly at hundreds of well worn plan arrangements with elevations that reflected some super effort at variety and were garnished by various kinds of outrigger boards, perforated overhangs, egg-crate eave projections, the jury developed a rather violent prejudice against these tiresome embellishments. I began to resent them in terms of what they would cost, what the weather would do to them in two or three years, how much better or useful a real roof shelter might have been, but, in particular, what a good look the house would have had without them. Had there been only 20 such designs in every 500, the prejudice would not have grown to such intensity.

2. There were too many examples of a fence or wall that bravely punched through a glass wall and on to a quick stop in the middle of some room. A few such cases might have been overlooked, or might have brought forth a grin, or perhaps someone might have rationalized a defense of them, because of other good qualities in the general scheme, but so many of them made one wonder how much contriving was done to make the location of such an outside fence have equal value in its location inside.

3. There was a great overworking of meaningless devices and clichés, such as: a) indication of various space uses by a space-destroying change in floor material at entirely arbitrary boundary lines; b) too many big expensive glazed rolling doors that denied any need of privacy, presented a real weathering problem and would have been an invitation for a small boy with a hammer; c) dotted or wiggly lines for partitions-that should have been real enclosing walls-to give a look of spaciousness where the room area was just too cramped; d) the amazing number and tricky variety of clerestory windows; e) the number of hung-in-space, free-form fireplaces made of some yet-to-be-invented noncracking "plastic masonry."

(Continued on page 220)

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JURY REPORT

Another significant impression: No one presented any really new or resourceful ideas for a better way to construct a small house. I had believed and hoped that someone would present a good or satisfactory floor plan with an acceptable and "salable" shell that would also make a useful break with traditional construction systems. I am not concerned with the new way just for its newness but I am concerned about the need of a way to put a house together in terms of the various operations of the various trades who do the work and in terms of material use that permits a more flexible building operation. Most of the designs showed that we still draw the shape and look of a house and it is anybody's responsibility to put it together by whatever process or schedule the contractor may contrive.

The search for good floor plans and good



looks always ended on the really simple solutions and it may be pertinent that most of these were supported by a simple and orderly presentation. The complex in over rendered entrys seemed to hint at the probable presence of over zealous professors looking over a shoulder. (I believe all the jurors would agree that because of the great amount of work now being done in almost every architect's office, rather than because of a lack of interest in this important problem, the number of student entrys was disproportionately high.) Many times very good elevations and plans and generally good presentations suffered by the fact that they were very hard to understand and on most of these occasions such work was made less readable by overdramatic and rather deceptive perspectives.

In my opinion one single thing in the very nature of the program that cut short the chances for really significant ideas was the lack of any opportunity to use land as it should be used. There was little or no chance to make any contribution to the elimination of deadly rows of houses that are more deadly because of their "all too obvious" effort to "put on different ties." We need imaginative site planning and an understanding of decent and beautiful use of our land. Therein lies the biggest stumbling block in this new and commendable effort to put the architect and developer into a partnership. Certainly the acres and acres and rows upon rows of humpy little houses are not good to see-variety is superficial and strained, privacy is not there, individual grass areas are so small that play activities for children over 10 must be found in the "parks"-blocks or miles away. Meaninglessly curved streets do not help. The matter of repeating any one of the individual designs (even the best ones) 20 or 30 times-side by side-haunted me all through the judging. The building of 20 or 30 of the best ones, all different, side by side, would be little better.

Many good schemes could not stand up in terms of FHA regulations. The reasoning and purpose behind the FHA regulations are commendable but the inflexibility imposed by them has produced a formula. It is time for revision and revitalizing for progress in planning and design techniques. Perhaps we must accept the fact that lending agencies of all kinds will or should always stand a few years behind accepted and proven progress in architecture but it seems entirely possible that the most important thing this competition can do is to make the need for change very clear.

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Other noteworthy uses of glass are shown in the drawings. You'll find more details and information on this house in the editorial pages of this issue.

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Architect Mattern flanked by his prize-winning plan and elevation.

LONG ISLAND'S LOCAL HOUSE DESIGN CONTEST



Architect-partners Rudolph Mattern and Herman York finish first and second

In conjunction with the NAHB-FORUM House Design Competition, many member associations of the National Association of Home Builders simultaneously conducted local contests. Entries in these auxiliary contests were limited to reproductions of the designs submitted in the National-Regional competition. Prize money was raised locally; judges were selected locally. While neither NAHB nor THE MAGAZINE OF BUILDING WAS responsible for the conduct of these local contests, it was required that the designs submitted meet the requirements of National-Regional competition. It was further stipulated that winners of National and Regional prizes in the major competition would automatically become ineligible for local prizes.

The largest, most successful of the local contests was sponsored by Long Island Home Builders Institute. It offered \$1,500 in prize money (with the aid of the Dime Savings Bank of Brooklyn and General Bronze Corp.'s Alwintite Division) and attracted 268 entries. A jury comprised of three architects, two builders and two mortgage lenders awarded the \$500 first prize to Rudolph A. Mattern, AIA, the \$300 second prize to his partner, Herman H. York, in the Jamaica architectural firm of Mattern & York. The outcome is not the coincidence that it seems to be; for the last few years, this Mattern & York team has probably designed more builders' houses than any other office on the Island.

Mattern's prize-winning house is notable for the economical rectangular shape of its floor plan, the possibility of expanding the living-dining area into a 31 ft. long room, the convenience of the service entry and the interesting packaging of the bathroom fixtures to create a three-passenger bathroom with a minimum of equipment. Tub and lavatory are in a separate room; toilet in another cell; an additional lavatory in an alcove off the hall.

Third prize (\$200) went to John D. Wragg of Brooklyn; fourth (\$100) to Robert B. Marshall of West Hempstead. Eight others received honorable mention (\$50 each).

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REVIEWS

a clearer definition of traffic patterns within the room. In the "conversation circles" and other furniture arrangements, the study provides measurements for space requirements between the furniture. (See diagrams, next page.)

Traffic patterns in the living area have been worked out to avoid the necessity for cutting across rooms—a situation which is too common in American houses. It was largely because of traffic requirements that the Council's study emphasizes the need for a 16' wide living area instead of the usual 12' dimension. The extra space (about 50 sq. ft. in an average living room) makes good logic in providing for better furniture flexibility and also for a better treatment of the front entrance. A 16' width allows for a cloakcloset as a freestanding partition between the foyer and the living-dining area — a commonsense provision which is also lacking in most small houses.

In developing standards for the bathroom-bedroom unit, one important space waster has been



eliminated by the University of Illinois planners. This is the chest of drawers in the bedroom. In every case, the chest has been incorporated into the closet wall. In the children's bedrooms, however, space has been provided in every case for a desk.

There is one serious criticism of the Council's planning of bedrooms and bathrooms. This is the lack of provision for either a split bathroom or a double bathroom in any of its plans. There may be an excuse for eliminating the double bathroom: it is expensive and, perhaps, too extravagant in its use of materials for these austere days.

In the second part of the book, where room units are combined in complete house plans, the Council planners have wisely avoided any attempt to force their rooms into the straightjacket of "traditional" facades. The rooms themselves set the pattern and the result, with a few exceptions, is pleasant to the eye. House design should never be reduced to arranging room-units like so many blocks but this system is certainly a good starting point. By demonstrating that small houses can be made more livable through careful analysis of their component parts, the Small Homes Council has made a significant contribution. This pamphlet will be a handy addition to the reference library of every architect and builder in the small-house field .--- W.D.

BUILDINGS MATERIALS. By Cecil C. Handisyde. The Architectural Press, London. 336 pp. Illus. $5\frac{1}{2} \times 9$. 25 shillings.

If this were an American book instead of British it would be of great value to architects in this country. But since it is about British varieties of concrete, bricks, building blocks, plaster, metals, tiles, floor finishes and other materials an Amercan reader can never be sure that what he is reading about is strictly applicable here.

The author is a practicing architect in England, a college lecturer and a staff member of the Building Research Station. His book is the first of a series of three published at the recommendation of the Royal Institute of British Architects. The other two, now in preparation by other writers, are *Structural Concepts in Building* and *Building Elements*.

Handisyde's book is well organized and illustrated and could serve as a model for a U. S. counterpart. Purpose of Part I is to show fundamentals an architect should keep in mind in choosing materials: movements, adhesion, thermal properties, fire risks, sound transmission and other properties. In Part II the author's purpose is to describe characteristics of individual materials.

The author does both jobs well. He has been able to steer a difficult course between producing a bulky, expensive encyclopedia and writing generalities that everyone in the profession already knows. If there is a fault to find with the book it is that in keeping students and beginning architects in mind as part of his audience the author has had to over-simplify a few sections. But on the whole the book is a solid achievement.

(Continued on page 248)

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24" x 96" -

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standard kitchen counter and sink tops including back splash (30" x 60" for built-in breakfast tables); also commercial counter tops and fronts.

48" x 96" -

exactly right for walls and other large area

(Special sizes also available from mill. Ask for information.) Any carpenter can saw, trim, plane, drill - work and install - these panels, right on the job, using inexpensive hand or power tools.

EDGES can be finished by painting or staining or with "Snap-On" Metal moldings or solid wood moldings. They cannot be Micarta "edge banded".

CONVEX AND CONCAVE CURVED SURFACES may be obtained by curving or bending the panels to a radius as small as 12" after saw-kerfing the back.

FINISHES =

HIGH GLOSS offers a brilliant, lustrous mirror-like surface.

SATIN is a pleasant, subdued finish with a minimum of light reflectivity. It is extremely practical, camouflaging fingers marks, etc. and hence is recommended for all solid colors. Micarta's satin finish is always smooth and uniform because it is produced during the pressing - is not achieved by roughing down the plastic surface.

OFFICIAL APPROVALS

MICARTA equals or exceeds the standards set by the National Electrical Manufacturers Association.

Approved by the New York City Board of Standards and Appeals.

Approved samples of Micarta push plates, armor plates, and kick plates are on file at the National Bureau of Standards, for use by Veterans Administration Hospitals, and the United States Army Corps of Engineers.

Approved by U. S. Coast Guard for Maritime applications when used according to regulations.

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Resists scratching better than any other type of commonly used decorative surfacing material.

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As an Associate Sponsor in the NAHB-Forum House Design Competition, the American Gas Association congratulates every one of you 76 winning contestants. We only wish it were possible to actually shake your hands...particularly those of the national winners: *Bruce Walker*, *Ralph Rapson*, *Wallace Steele and George Matsumoto*.

Mr. Walker's design, which won 1st prize, is shown here. We are reproducing it because it demonstrates so well the principles of modern space-saving, work-saving planning which the American Gas Association has been talking to architects and builders about for years!

In the kitchen, for instance, notice how Mr.

Walker has followed the "Triangle Plan" recommended for all New Freedom Gas Kitchens. It means a saving of several hundred miles of steps a year between the three major workcenters... cooking, refrigeration, sink.

The central location of furnace and waterheater (equi-distant from sink and bath) are two other reasons why this plan is a winner on all points. And when modern Gas appliances are furnished at the key points it will not only be a prize plan but a prize home. Check the essential appliances listed here and you'll see why from your client's viewpoint no plan is perfect unless it specifies automatic Gas appliances. Designing...Building... Remodeling


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CASE CASCO* #2300-A. Vitreous China Straight Front Urinal Stall. CASE WYNGATE* #600 Lavatory. Square basin. Anti-splash rim, heavy wall hanger.

CASE WINDSOR* #720. Lavatory with leg, square basin, anti-splash rim. Made in 2 sizes.

CASE CASCO* #2325-A. Vitreous China Wall Hung Washout Urinal with shields, integral flush spreader and spud.

CASE #1600. Siphon Jet Flush Valve Closet Combination with elongated bowl.



SCHOOLS



FOR THE VERY YOUNG

REVIEWS

SCHOOLS FOR THE VERY YOUNG. By Heinrich H. Waechter and Elisabeth Waechter. Archi-

tectural Record, 119 West 40th St., New York 18, N. Y. 197 pp. Illus. 71/2 x 101/4, \$6.50.

Soon thousands of mothers will be dropping off their children at child care centers on their way to defense plants. Thanks will be due once again to good old Friedrich Froebel who in 1837 invented the "kindergarten" and with it the whole concept of modern pre-school training. In Froe-



bel, an architect turned educator, the very young found their No. 1 good friend. He was a pious and somewhat sentimental German metaphysician. He thought, for example, that a circle was the symbol of perfection, and he loved especially to set up games played in rings. His kindergartens accordingly demanded large empty spaces indoors or out adapted to these games. The small child's friend No. 2 was Maria Montessori. She was an Italian doctor and early functionalist who, by about 1910, had invented a formidable array of little devices on which to train small bodies and young minds. Her kindergarten rooms tended to become tight well-organized little workshops. From then on European thought about young children oscillated between Froebel's ideas and Montessori's.

Those are the two guides that Heinrich and Elisabeth Waechter have chiefly relied on in compiling their own guide for architects and schoolmen on planning Schools for the Very Young. It is perhaps natural that such writers, having come to the U. S. when they were mature and had their guiding ideas fully formed, should conclude that all guiding ideas in the U. S. are really importations from Europe. Their book is written as if the entire pre-school movement in the U. S. derived from German teachers imported around 1856 and English teachers imported around 1910.

This is very much too bad. Although the Waechters are familiar with the work of Americans such as Gesell or Abigail Elliott and others, they try to append this to the European framework. They seem totally unaware that the very young had a third great friend germinating basic ideas for their training. He is none other than John Dewey, the hale American philosopher of freedom now past ninety, without whom no part of present-day American education can be discussed at all.

It was a group of close followers of Dewey-Caroline Pratt, Harriet Johnson, and Jessie Stanton, who chiefly established the critical differences that distinguished the characteristic American pre-school facility from that of Europe. Rather than Froebel's garden of children or Montessori's neat authoritarian little workshop they established an environment more like a children's miniature city-full of the significant confusion of children's building sites, the robust energy of children's enterprises. The mincing Montessori materials had become big generous ones such as oversized building blocks; spaces had to be big; equipment and furniture had to be infinitely combinable; eating, dressing, sleeping, toileting became a direct part of the educational process and had to be thus provided for.

Since the Waechter's do not seem to know what this American slant was all about, and have not found even its crystal clear prototypes their laborious and well-meant compendium of facts and examples is just that and no more. They had better go back to kindergarten and start again. --D.H.

(Continued on page 254)



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REVIEWS

THE BUILDING ESTIMATOR'S REFERENCE BOOK. By Frank R. Walker. Frank R. Walker Company, Chicago, III. 1780 pp. 4½ x 6½ in. IIIus. and THE VEST POCKET ESTIMATOR. By Frank R. Walker. Frank R. Walker Co., Chicago, III. 220 pp. 234 x 5½ in. IIIus. \$12 per set.

It would seem to be almost impossible these days to compile a reference book on cost estimating before building. As Frank Walker, the author of this one, points out, "The upheavals caused by two World Wars—and a third 'Policing Action' now in progress have played havoc with all estimating data—and costs in particular. Construction costs have more than doubled during the past ten years and they are now more than four times as high as at the beginning of World War I."

But, in a respect, cost estimating has always had this quality of impossibility, even when Walker began publishing his book on it 35 years ago. His new edition continues the systematic

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assault ne began then against contractors' traditional back-of-an-old-envelope system of figuring jobs, a system, he points out, which has cost too many clients too much, and even more seriously, has broken a lot of contractors who bid jobs too low.

In the 1,780 meticulous, fact-crammed pages of this 11th edition of "Walker," he breaks down building operations into quantities of materials and hours of labor. He expresses many costs, but also leaves blanks in his equations for insertion of varying local wage scales. And there is more than estimating here; there is, in fact, almost everything. From this book, or its accompanying little vest-pocket estimator, you can find, for instance, the number of nails required to fasten 1,000 sq. ft. of $1'' \ge 3''$ softwood flooring (3,350 nails, wt. 23 lbs.). You can also find a good definition of hand augur drilling, and the cube root of 429 (7.5420). To a diligent man the book can be invaluable.

It is but seldom that this kind of reference volume possesses any personality; few novelists, however, project themselves to the printed page so well as Walker does. The book conveys the image of a dependable man who can be irascible with the loose bookkeeping habits of the contracting brotherhood and is shocked at financial loss. But most of all he has the pleasant good humor of a man who knows he is doing a good job. In his preface he thanks the users of "Walker" (106,000 copies have been issued) and says, "This is my Swan Song-I think this is my last edition-unless a well-equipped younger man can be found to carry on what I have attempted to do during these past 35 years." Mr. Walker has been doing a noble job-that of bringing order.

The dedication of the book reads:

To my wife Who has spent many silent nights that this book might become a reality. W. McQ.

TWENTY PAINTERS AND HOW THEY WORK.

By Ernest W. Watson. Watson Guptill Publications, Inc., 345 Hudson St., New York 14. Illus. 158 pp. 9 x 12. \$10.

Since most architects take keen extracurricular interest in the allied art of painting and since many others actually practice the art in rendering their designs or in filling their spare time, this instructional and inspirational book should receive a warm welcome by the profession.

Another in the series known as the *Creative Arts Library*, the book's 20 chapters originally ran as articles in the magaine *American Artist*. Each chapter is an interesting visit to the studio of a top-flight contemporary painter, during which the reader watches the painter at work, examines his tools and methods, hears an interview conducted by the author and finally views a four-color reproduction of the artists' finished work.—JH.

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PRODUCT NEWS

HERMETIC CENTRIFUGAL WATER CHILLER assures economical, trouble-free service.

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Although the rearmament program prevents unrestricted sale of aluminum, we are ready to help you with the planning required for electrical wiring projects. Get the facts! Write for "Questions & Answers About Aluminum Conductors and Installations".



Operation is so free of vibration that the new refrigeration unit can be installed without special foundations on any floor that will support its dead weight. The CenTraVac placed in the penthouse at the General Railway & Signal Co. in Rochester, N. Y. (left) cannot be heard on the third floor directly below.



trial application. The CenTraVacs proved in both that engineers Lucey and Bernhard had spent years in lab work and experiment to the company's and consumer's advantage. The machine will provide new refrigeration economies in maintenance and operation for the neglected middle-size jobs requiring from 45 to 190 T. of refrigeration. At present, any of the five sizes can be ganged for the largest comfort and processing installations. For next year, however, Trane is planning big things for the CenTraVac—single units up to 400 T. In the unit's design the Trane crew aimed for and achieved three basic characteristics:

Centrifugal design. As in an airplane engine, the smooth revolving motion of a turbine means less noise, vibration and wear, and lower maintenance costs than can be expected from the push-pull action of a piston engine or a reciprocating compressor. Valves, crankshafts and connecting rods—potential trouble spots—are eliminated.

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FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; PHOTOLAMPS; TELEVISION SETS

the NOVA Roller Door

—the silent, fingertip flush door for passage ways and closets

-developed through two years of constant research and field testing

Highest in quality . . . simple and inexpensive to install . . . silently responding to fingertip control . . . here is the roller door as you knew it would one day be perfected.

This is a hollow core, flush door—regularly sold in unselected gum, paint grade—which can be painted or stained for many beautiful effects—Black Walnut, African Mahogany, Birch, Red or White Oak.

Nova Roller Doors are light, strong and warpresistant. They are ideal for closets, basement storage, garage storage, storage walls and removable partitions.

The closet may be one of the standard sizes or extend the width of the room. Two or more doors enclose it entirely. Instead of opening only part of the closet, as with a swinging door, you have full access. And—you don't waste the valuable floor space needed to accommodate a swinging door.

The Nova Roller Door comes cartoned with special side jambs, head and floor tracks and all hardware installed. In less than one hour's time, one man makes the complete installation. *Nine standard opening sizes:* 32", 36", 40", 48", 56", 60", 72", 84", and 96". *Three standard heights:* 6'0", 6'6" and 6'8".

We urge you to write today for the full details.

NOVA SALES





The oak floor track, laid on the finished floor, sets the proper distance between jambs at the bottom. Note rubber bumper on jamb. Revolving roller guides operate in head track; vulcanized rubber rollers in floor track – assuring silent, fingertip control.

O. TRENTON 3, N. J.

Side jamb (left) is routed to receive the door; head track (right) is accurately machined for perfect operation of revolving roller guides,

A NOVASCO® PRODUCT

A wholly owned subsidiary of the Homasote Company, manufacturers of the oldest and strongest insulating-building board, Wood-textured and Striated panels.





FOR HOME OWNERS

MEDUSA PAINTS Create 20% More Living Area

MEDUSA PORTLAND CEMENT COMPANY

228 N. LaSalle St. Chicago 1, Ill.

Architects and builders can create bargain basements for home owners. By bargain basements, we mean basements that give home owners 20% more living area at very little cost . . . basements that make delightful recreation rooms . . . pleasant play rooms . . . clean work shops . . . or bright laundries. Here's the way to do it. Paint the walls with time-tested Medusa Portland Cement Paint, made by a leading cement company with 59 years of concrete experience. Properly applied, it really stays put on concrete block or concrete basement walls. Many beautiful

> 1844 Oliver Bldg Pittsburgh 22, Pa

colors are available. Helps protect basements against dampness.

Then have Medusa Rubber Base Paint put on the concrete floors. This super-tough coating with a thermo-plastic rubber resin base withstands heavy floor traffic . . . resists the action of cleaning compounds, water, and other alkalies. Other Medusa products used in basement construction are Medusa Waterproofed Cements, gray or white and Medusa Waterproofing Powder and Paste, widely used to make lastingly dry basements.

> 230 Park Ave. New York 17, N.Y.

135 W. Wells St.

25 N. George St. York, Pa.

R BASI



Toledo Trust Bldg. Toledo, Ohio

1000 Midland Bldg Cleveland 15, Ohio

Steel pipe is first choice for snow melting

A boy, a dog and a snow shovel are an irresistible combination for loosening heartstrings as well as purse-strings! The first snow brings the tinkling of the doorbell and the piping query, "Want your snow shoveled, mister?" Often a shy companion lurks just out of vision, hoping to share this first youthful adventure in capitalism.

But even so time honored a money making opportunity must some day yield to the march of progress!

More and more, home owners are installing the ultimate snowremoval facilities . . . hot water circulatory systems embedded in the concrete sidewalks, driveways and service areas of their properties.

Steel Pipe is first choice, by far, for such installations ... because Steel Pipe has all the desirable qualities of formability, weldability, durability, and economy required for successful snow melting systems.

Have you seen the new 48-page color booklet, "Radiant Panel Heating with Steel Pipe"? Write for your free copy now.

COMMITTEE ON ST



PIPE RESEARCH



"Aw shucks, he has snow melting"



AMERICAN IRON AND STEEL INSTITUTE 350 Fifth Avenue, New York 1, N. Y.



Mr. Brugger builds slightly unconventional, low-priced homes like this. Electric Water Heaters are standard equipment.

says Mr. John T. Brugger, Jr., builder, of Wayne, Pa.



"The ideal piece of equipment is one that's best for both the builder and the home buyer," says Mr. Brugger. "*Electric* Water Heaters come under that heading."

It stands to reason that the cleanest, most automatic, most trouble-free kind of water heater is the kind that home buyers want. An Electric Water Heater is built for long life. The storage tank is fully insulated. This means economical operation. All-electric, dependable temperature control assures safety.

It pays builders to install Electric Water Heaters because this type is economical for builder and customer alike. There's no flue or vent, so installation can be made anywhere. This shortens hot water lines, cuts piping cost, prevents water waste.

Equip your Homes with electric water heaters THEY'RE WHAT PEOPLE WANT!

ELECTRIC WATER HEATER SECTION

National Electrical Manufacturers Association, 155 East 44th Street, New York 17, N.Y.

ALLCRAFT • BAUER • BRADFORD • CRANE-LINE SELECTRIC • CROSLEY • DEEPFREEZE • FAIRBANKS-MORSE • FOWLER • FRIGIDAIRE • GENERAL ELECTRIC HOTPOINT • HOTSTREAM • JOHN WOOD • KELVINATOR • LAWSON • MERTLAND • MONARCH • NORGE • PEMCO • REX • RHEEM • SEPCO A. O. SMITH • THERMOGRAY • TOASTMASTER • UNIVERSAL • WESIX • WESTINGHOUSE

1818 HOPE'S 1951 CUSTOM WINDOWS



Home for Jewish Aged, Kansas City, Mo. Kivett & Meyers, Architects Frank Quinlan Construction Co., Builders

While a variety of window installation detail was used in the attractive building shown above, the large areas are insulating glass panels glazed directly into Hope's hollow metal subframes. Where ventilation was required, Hope's Intermediate Casement Projected Windows in standard sizes were set into the same subframes and separated from the insulating glass panels by divisional vertical and horizontal members of the subframe.

This method of construction provides great flexibility of design and enjoys the economical advantage of not requiring sash units where insulating glass is used.

Shown in the inset is one of Hope's Custom Doors opening onto the terrace of this building. These doors were also set into Hope's hollow metal subframes which were formed to provide for screen doors on the interior side.

THE FINEST BUILDINGS THROUGHOUT THE WORLD ARE FITTED WITH HOPE'S WINDOWS

HOPE'S WINDOWS, INC., Jamestown, N.Y.



PRODUCT NEWS

thermostat, provides smooth operation from 100% down to 10% of rated capacity. Thus, the ratio of power consumed to the cooling demand is almost constant, as is the temperature of water supplied to the air conditioning system. Under normal conditions, the horsepower required per ton of refrigeration is below the accepted rule of thumb, "one to one."

Evaporator, condenser and motor-compressor are all incorporated in the CenTraVac. The two



stage centrifugal type compressor has deep vaneless diffuser passages for efficient conversion. Radial blade cast impellers (below) are mounted on each end of the motor shaft and are placed back to back to balance the thrust. The condenser, or upper heat exchanger, cools the compressed liquid refrigerant before releasing it to

the evaporator. In the evaporate, or lower heat exchanger, the Freon F-113 boiling outside the coils chills the water circulating through the coils. There are only two bearings in the entire unit, minimizing friction



and wear. All rotating parts are statically and dynamically balanced to insure smooth operation. A purge system separates any non-condensible gasses from the refrigerant and expels them from the unit.

In installation no special foundations are needed for each part. The entire machine is mounted on a flat reinforced concrete slab. The only isolation suggested is a 1" thickness of insulation board (which compresses to about $\frac{1}{2}''$ under the unit's weight). Although operating and maintenance costs are said to be much lower than conventional water chilling refrigeration, the Cen-TraVac's installed price is about the same as other equipment with comparable ratings.

Manufacturer: The Trane Co., La Crosse, Wis.

BUILDING PANELS combine workability of lumber with durability of concrete.

Around Chicago, carpenter unions are taking Bildrok, a prefab concrete wall panel, to their collective bosoms according to the manufacturer. A modular panel made of lightweight aggregate with a Portland cement binder. Bildrok can be sawed, nailed, drilled and handled with ordinary woodworking tools. Yet, one vertical panel is

(Continued on page 272)

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



out front with the finest buildings

venetian blinds with 2 wear-tested features Flexalum wipe-clean plastic tape





†Patented

and spring-tempered aluminum slats

AMAZING WIPE-CLEAN PLASTIC TAPE cuts cleaning time from hours to minutes: a damp cloth sweeps off the stubbornest stains. The wisest choice in any climate: Flexalum tape won't fade, shrink, or mildew. Careless up-and-down tugging won't stretch or fray it. Windows greet guests looking their best always . . . because Flexalum tape takes abuse beautifully!



EXCLUSIVE SNAP-BACK SLATS!

Supple aluminum slats slash maintenance and repair costs to a minimum: they're spring-tempered by an exclusive Hunter Douglas process to snap back to shape when bent to a 90° angle! Mar-proof finish is baked-on, won't chip, peel, crack, rust or change color. Dirt bounces right off. Only Flexalum slats with the "invisible" trademark give you all these features.

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You can confidently recommend one-story schools of wood to School Boards and parents for their community's increasing school population. These structures are economical to erect and maintain...safe because with all doors at ground level students can be evacuated quickly...flexible because they permit easy expansion for future needs. And the pleasant functional design possible with wood gives you a wide latitude of expression.

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You will be interested in seeing a copy of "Today's Better Schools Are Built of Wood." Send for free copies for yourself and your associates. There's a RIGHT WAY to do everything...Build RIGHT with



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Zone

State

Which is the most important room in the home?

Kitchen...Utility Room...Bathroom... or is it the room where the boiler is?

Nothing adds more to the comfort and value of homes than plenty of healthy heat...so the room *where heat is made* is vitally important.

And for the heat-making system there can be no healthier heart than the Kewanee Steel Boiler.

1

radiation 530 to 1440 SqFt water.

951

STEEL BOILERS FOR HOMES

Kewanee Cottage Boiler

A vertical tube jacketed steel boiler for hot water heat in smaller homes. For 510 SqFt water radiation with oil or gas or 77,000 Btu hourly.



There is a Kewanee steel boiler just right for homes of every size . . . from 4, 5 or 6 room cottages to the largest mansions. And that is true regardless of the fuel used or the method employed to distribute the heat.

Although priced to meet modest budgets, *Kewanee Boilers for Homes* are built of the same staunch steel plate and in the same faultless manner as those larger sizes which for over 80 years have heated America's most important buildings.

KEWANEE BOILER CORPORATION

Division of AMERICAN RADIATOR & Standard Sanitary

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AMERICAN-STANDARD + AMERICAN BLOWER + CHURCH SEATS + DETROIT LUBRICATOR + KEWANEE BOILERS + ROSS HEATER + TONAWANDA IRON

LERMAKERS



more beautiful exteriors more beautiful interiors

with this better steel window

Interesting architectural and decorating effects are open to the architect and builder in the handsome qualities of Truscon Intermediate Combination Windows, as in the Lima Memorial Hospital, Lima, Ohio.

> Credit: McLaughlin & Keil, Architects Chas. H. Shook, Inc., Contractor

The open-in sill-vent affords unusual flexibility of ventilation control during cold or inclement weather. Incoming air is deflected upward to mix with the warmer air in the upper portion of the room. In warmer weather, when maximum ventilation is a much desired luxury, the casement vents may also be opened, admitting ventilation to the full height and width of the opening.

Collateral window equipment, including screens and shades, are simply installed and conveniently operated. All exterior glass may easily be washed from the room side.

See Truscon's complete catalog in "SWEET'S" for full information on all Truscon Mark of Merit Products.

TRUSCON MARK OF MERIT

PRODUCTS



TRUSCON® STEEL COMPANY YOUNGSTOWN 1, OHIO Subsidiary of Republic Steel Corporation







Who Makes a **COMPLETE** Freon Reciprocating System?

A completely integrated and bal-

anced system—all manufactured, not just assembled, by the one manufacturer—that's Worthington.

No other company makes a wider variety of complete Freon reciprocating systems.

No other company offers more perfectly balanced operation of inter-related components—for lowest costs, longest life.

Worthington Freon-12 Compressors and Refrigeration Units. One basic compressor design covers a size range from 2 to 125 tons, with three cylinder sizes. Simplified construction. Lightweight automotive pistons. Worthington Feather* Valves—simplest, lightest, quietest ever made. Internal manifold. Renewable cylinder liners and leakproof, continually-cleanable forcefeed lubrication in larger sizes. Positive manual or automatic capacity control. Available in self-contained compressor-condenser units.

Worthington Air-Handling Units. Perform complete air conditioning functions. Water cooling or direct expansion. Five sizes: 4 to 60 tons, 4000 to 13,500 cfm. Horizontal or vertical. Sectional design.

Worthington Evaporative Condensers. All parts exposed to moisture made of zinc-coated steel, bonderized and coated with rubber-base enamel containing special rust inhibitor. Prime surface—no fins to clog. Staggered coils permit air deflection and complete wetting. Six sizes from 2000 to 27,000 cfm.

Also: Worthington Evaporative Coolers in same range.

*Reg. U. S. Pat. Off. Bulletins containing complete information are available



First Completely Air-Conditioned Apartment House in New England



Beacon Towers Apartments, Brookline, Mass. is the first building of its type in New England to be 100% air-conditioned.

E. A. Berman Company of Boston, under the direction of M. L. Cail, installed a three-zone cooling water system for the 34 apartments. Individual room units are served by a refrigeration unit consisting of a Worthington Freon-12 compressor, evaporative condenser and water chiller.

The system is designed and operated for automatic heating in winter and cooling in summer.

Experience of the owners has been that the air conditioning helped to lease the apartments for 3-year periods.





Worthington also manufactures a complete line of *centrifugal* refrigeration.

When the W. Harrison Hightower Textile Engineering Building was built at the Georgia Institute of Technology, Atlanta, to house its textile school, Worthington refrigeration for air conditioning was installed to provide the proper temperature and relative humidity required for textile processing.

Fourteen separate rooms are individually air-conditioned, through a chilled water system, from a 150-ton Worthington centrifugal refrigeration system, electricallydriven. This machine is equipped to shut off automatically in the event of trouble anywhere in the system.

Installed by Engineering Contractors, Atlanta, Ga.

INVESTIGATE MORE WORTH WITH WORTHINGTON

Consult Classified Telephone Directory for nearest Worthington distributor. Worthington Pump and Machinery Corporation, Air Conditioning and Refrigeration Division, Harrison, N. J., specialists in air conditioning and refrigeration for more than 50 years.

PRODUCT NEWS

claimed to be strong enough to support the entire roof of an average house. Bildrok combines in a single load-bearing material, insulation, protection against rot and vermin, and exterior surface which requires no treatment except painting. Because of the pilot plant's present capacity of 400 panels a day (enough for five 5-room houses) present usage is limited to residential and small commercial structures in the Midwest. However other plants are being planned throughout the country, and so this low cost versatile fireproof





FUEL	FLOOR SUSPENDED	CEILING SUSPENDED
COAL	250,000	150,000
GAS	300,000	200,000
OIL	500,000	450,000

Write today for valuable architects specification sheets and Underwriters' report giving complete data on installation and operation of the Van-Packer Flue.

Uan-Packer CORPORATION Room 1749, 137 S. LA SALLE ST. CHICAGO 3, ILLINOIS



Three men can set enough of the precast Bildrok panels in place for an average house in a single day.

material will be available for large projects and factories.

A big factor contributing to Bildrok's economy is its easy erection. Channels of 16 gauge steel are fastened to the foundation wall or floor slab to provide a template and channel for securing the panels. A corner section is inserted and then



standard panels placed in position on either side. No studs, furring strips or permanent bracing is required. In one day three men can put up enough panels for an average size house, Bildrok's total erected cost of \$1.15 per sq. ft, is competitive with frame wall and concrete block construction, and substantially under other types of masonry. By engineering the production of Bildrok on a portable basis, the company hopes to put up plants right on the sites of building projects, saving time and transportation costs. For instance, one carload of perlite ore (one of the lightweight aggregates used in Bildrok's manufacture) shipped to the job can be expanded with the portable equipment to 10 carloads of processed aggregate. The finished panels are V-jointed and measure 8' long, 16" wide and 4" thick. A 12' section is made for industrial buildings. Although reinforced with steel rods, the panels weigh only 50 lbs. per cu. ft. They can be cast in any color with individual patterns,



curved or flat, to architect's specifications. If desired for entrance, bathroom and garage applications the panels can be formed with glass block already set in place.

Manujacturer: American Bildrok Co., 2001 W. Pershing Rd., Chicago 9, Ill.

(Continued on page 278)



For best dir circulation, odor and fume removal . . . use adequate vents on storage locker doors, recessed exhaust vents high on the wall.

Ventilation planning

can make or break a modern washroom



In large washrooms, recessed wall vents near each toilet remove odors quickly. Correct positioning is important for best results.



Combination of recessed ceiling vents and wall vents close to urinals—a successful arrangement for smaller, heavily used washrooms.



Trade Marks "ScotTissue," "Washroom Advisory Service" Reg. U. S. Pat. Off.

WASHROOM VENTILATION has a noticeable effect on the health and morale of employees. When a washroom has a fresh clean smell about it, you can be sure it has correctly positioned, properly functioning vents. Look for good production records, less illness and absenteeism, too.

In your next building plans, make allowances for correct washroom ventilation. It's a wonderful opportunity to give your client good employee relations for years to come—built right into bis plant!

QUESTIONS? Call in your Scott Washroom Advisory consultant. He's one of a group of trained specialists who have gained real know-how from servicing over 500,000 washrooms. And he's ready to give you the answers to any of thousands of questions on modern washrooms.

Contact Washroom Advisory Service, Scott Paper Company, Chester, Penn.

Send for FREE Leaflet "Plant Washroom Designing"	The summer of the
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At no cost or obligation, please send me your study of traffic and maintenance problems, "Plant Wasbroom	2
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f personnel, Designing." Can't we use the same efficient acoustical materials that broadcasting studios use?

> Good! We'll specify TRANSITE* Acoustical Panels. They're made of non-critical materials, too.

You'll find Transite Acoustical Panels among the most efficient and versatile noise-quieting ceilings developed by Johns-Manville. Yet they do not depend on critical war materials . . .



These are 24 x 24-inch Transite Acoustical Panels. Notice how precisely the beveled units come together to form a ceiling that is exceptionally flat and true. Transite Panels may also be obtained with square edges when it is desired to minimize tile lines and promote the appearance of an unbroken perforated area.

• MADE OF ASBESTOS, Transite Acoustical Panels are particularly resistant to fire and moisture, and provide noise-quieting ceilings that are exceptionally flat and true. They are architecturally desirable for use in offices, hospitals, homes-and of course in kitchens and cafeterias, chemical laboratories, broadcasting studios, etc.

The panels consist of a perforated asbestos-cement Transite facing, 316" thick, backed up with a soundabsorbing element which is available in several thicknesses and types depending on acoustical requirements.

Six hundred perforations per square foot help to give Transite Panels extremely high sound-absorbing efficiency. The Panels are extremely durable, can be washed, painted and repainted.

Other J-M Acoustical Ceilings include Fibretone*, a drilled fibreboard; and Sanacoustic* Units, perforated metal panels backed up with a noncombustible, soundabsorbing element. Write today for our free brochure, "Sound Control." Johns-Manville, Box 158, Dept. MB, New York 16, New York. *Reg. U.S. Pat. Off.





J-M Acoustical Materials include Sanacoustic* Units, Transite* Acoustical Panels, and drilled Fibretone*

PRODUCTION EXECUTIVES, TOO,

ASBESTOS

"Our Asbestos Movable Walls are just as practical out in the plant as in the main office," say management men. And the "Universal" type require no critical war materials in their fabrication or erection.

IF YOU HAVE a problem concerning rapid industrial expansion for military defense or to meet civilian demand, investigate the time-saving, money-saving advantages of Johns-Manville Asbestos Movable Walls.

In this time of national emergency, we call particular attention to the Universal type of J-M Transite® Movable Wall. It uses no critical war materials, thus gives you more freedom to plan your construction schedule with confidence. Take advantage of prompt installation, no shortage delays.

The flush-type, asbestos-faced panels of the Universal walls are hard-to-mar, resist shock and abuse, are easily maintained, and possess a pleasing surface texture that enhances their attractive appearance. They go up fast, too. The sections are light, easy to locate. The "dry wall" method of erection assures speed and neatness. You can remodel occupied quarters with little or no interruption to normal routine. *Universal* type movable walls may be erected as ceiling-high or free-standing partitions and railings, either solid or with glass.

ESE

FLEXIBLE INTERIORS

The complete Johns-Manville wall, including doors, windows, and hardware, is installed by Johns-Manville; 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.

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

For details about J-M Movable Walls, consult your Sweet's Architectural File, or write Johns-Manville, Box 158, Dept. MB, New York 16, N. Y.

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THOROSEALING gives to the architect and builder, aside from masonry protection, distinctive textures and the opportunity to present finish coats of QUICKSEAL, in sixteen beautiful tints, without reflection or glare.

1.5.1

ACTUAL PHOTOGRAPHS OF THOROSEAL TEXTURES

With very little effort, many distinctive textures can be produced by the workman with THOROSEAL.



Mercy Hospital, Miami, Florida. Commencing of THOROSEAL applications. Architect—Steward and Skinner, Miami, Florida. Contractor—J. Y. Gooch Co., Miami, Florida. The finished THOROSEAL job is shown at the top of the page.

Complete Masonry Protection

Can be secured from foundation to roof with THOROSEAL. Beautiful finish coats of QUICKSEAL can be secured without hiding the THOROSEAL texture.

WATERPLUG To Stop Leaks THOROSEAL To Seal Surface OUICKSEAL For Beautiful Finish

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Write today for our new 20 page brochure 17-A and designer's wall chart.

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Easy to install! Appealing to tenants! Porcelain for permanence!

DWYER KITCHENS

Formerly called Murphy-Cabranette Kitchens

Same product. Same manufacturer. Same distributor. Merely a name change for simplicity.

The only kitchens of their kind in all the world

Complete, *practical* unit kitchens of proven durability . . . manufactured by an organization which has specialized in compact kitchens for over 25 years.

Genuine vitreous porcelain fronts, sink and work tops. Permanently beautiful ... easily cleaned with soap and water.

Modern ranges (gas or electric) have heavy Fiberglas insulation, efficient burners and oven heat regulators. Approved by A.G.A. and Underwriters' Laboratories.

Capacious refrigerators . . . Fiberglas insulation, push-button doors, stainless steel freezer compartments for ice cubes and frozen foods. Quiet, trouble-free mechanism never needs oiling.

Every working part can be serviced or replaced without moving any section of the assembly. Durability and efficiency proven by tens of thousands of these kitchens now in the grueling service of rental properties.

Four sizes, 39 to 69 inches wide. Write for literature.



WYER PRODUCTS CORPORATION

Dept. MB3-51

MICHIGAN CITY, INDIANA

PRODUCT NEWS

A flexible waterproofing sheeting, Nervastral Seal-Pruf maintains its effectiveness under extreme weather stress. It is highly resistant to strong alkalis and so is not attacked by laitance of Portland cement.

RUBBERIZER ASPHALT SHEETING performs job of metal flashing at fraction of cost.

Even if war production were not steering copper and other metal products away from builders. Nervastral Seal-Pruf synthetic rubber sheeting would still be an important new construction item. Blended with highly oxidized asphalt to a homogenous mass, the material is free from any organic fibers such as felt, fabric or paper. It has limitless potentialities as waterproofing. Already







accepted by the FHA Underwriting Division for spandrel beam waterproofing and approved by the New York City Board of Standards and Appeals for window and door flashing and spandrel waterproofing, the new sheeting is pliable, extremely durable, unaffected by extreme weather temperatures, and mildew, rot, alkali and acid resistant. Tests conducted by independent laboratories reveal Seal-Pruf has very low moisture transmisson-.00175 grams psi in 24 hrs. for the .027" thickness. A sheet of the same gauge was applied on a concrete slab and tested for 24 hrs. under a direct water pressure of 40 psi without any penetration. Seal-Pruf is made in a heavier .054 in. gauge for parapet, chimney, and gutter flashing. Both thicknesses come in rolls 3' wide and 6' long. Prices range from about 71/2 to 13 cents per sq. ft., depending on gauge and quantity purchased. Some other applications suggested by the manufacturer are shower bath walls, under the concrete bed in shower floors, under wooden floors, and between concrete slab and linoleum or asphalt tile flooring. Where adhesive is required, either asphalt or Nerva-stral (basically the same compound as Seal-Pruf but with a lower melting point for proper spreading consistency) are recommended.

Manujacturer: Rubber & Plastics Compound Co., Inc., 30 Rockefeller Pl., New York, N. Y.

RUST STOPPER can be applied without elaborate preparation.

Rustorize, a metal primer and protective enamel, can be painted on rusty metal surfaces without extensive sandblasting or other costly cleaning methods. It is only necessary to wirebrush the loose rusty scale before applying the primer and top coat. The pigment penetrates the surface, providing a waterproof airtight elastic film which inhibits further rust. Made in several colors, the coatings may be sprayed or brushed on. The primer also can be used as an undercoat on new interior and exterior metal surfaces as a rust preventative.

Another paint product manufactured by the same firm is O-Dor-Less. This paint is useful for renovation work in places where paint fumes are undersirable, such as hospitals and restaurants. Prices range from \$6.95 per gal. for the high gloss to \$3.75 for the flat finish. O-Dor-Less thinner is \$1.29 per gal.

Manufacturer: McCormack Medl Corp., Front and Kaighn Ave., Camden 3, N. J. (Continued on page 284)

YESTERDAY **TODAY** and TOMORROW

STEEL DOORS AND FRAMES, SLIDING CLOSET DOOR UNITS THE FAVORITE OF HOMEMAKERS AND ARCHITECTS

... And the reasons - they cut building costs, provide lasting beauty with trouble-free service, meet today's construction standards, blend with all types of construction, and require less installation time.

330 DIETZ ROAD

K-D UNITS TOO Sliding Closet Door Units are also available in packaged, knocked-down form, complete with header, jambs, track and hardware. Suitable for new construction and particularly adaptable for remodeling.

BUILDING PRODUCTS DIVISION

THE AMERICAN WELDING & MANUFACTURING CO.

WARREN, OHIO

278 architectural FORUM march 1951



portland cement that meets ASTM and Federal specifications. Trinity Division, General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles; 305 Morgan St., Tampa; Volunteer Building, Chattanooga.

as white



as snow

PLAIN OR WATERPROOFED

the whitest white comment.

another monument to smooth performance

the new CHRYSLER BUILDING EAST

to be equipped with smoothly performing Venetians made with LEVOLOR heads, slats, bottom bars



Here are features that set LEVOLOR-built blinds apart; smart, enclosed head that houses finest precision hardware; durable, springy plastic-coated metal slats; tape ends disappear in the sleek bottom bar. All are chip-, mar- and stain-resistant. And one gentle pull makes tilt-cords even, thanks to the LEVOLOR patented tilter mechanism.

See our catalog in Sweet's Architectural File, 19D-3A, and Sweet's File for Builders, 3E-5.

CHRYSLER BUILDING EAST

Reinhard, Hofmeister & Walquist Architects for Chrysler Building East

CHRYSLER BUILDING

Send for your free copy of the LEVOLOR Architects Manual for Venetian Blinds (AIA 35-P-3)...16 pages giving you all the factual and visual assistance you need for any installation. Specify **LEVELOR** Trade Mork

Time-proven Products for Venetians

COPYRIGHT 1951 LEVOLOR LORENTZEN, INC., New York 12, N.Y.
NEW TRANE COMPRESSOR... Completely modern design



Quieter Operation...Longer Life... Greater Efficiency

Brand new, all new, the Trane Reciprocating Compressor is designed to set a new high in refrigerating efficiency, performance and endurance.

This trim and compact unit has a completely new, completely enclosed automatic capacity control system that cuts power consumption under reduced loads — a real power saver.

Direct drive, constant speed design—with unloaded starting—permits use of standard general purpose motors. Exclusive Trane "foam breaker" prevents loss of oil at start up, assures adequate lubrication at all times.

Built for extra years of trouble-free service: specially treated suction and discharge valves are designed for *nine* times normal life – test units needed no attention after continuous operation equivalent to eight air conditioning seasons. Enclosed forced-feed lubrication system multiplies bearing life. Quiet. Smooth running. Vibration-free. Special Trane-designed valves are cushioned to muffle noise at its source.

Available in six compact models, with 4, 6 or 8 cylinders. Capacities up to 50 tons.

This new, improved refrigeration equipment makes it easier than ever to build a complete air conditioning system around Trane products. Designed together and built together for use together, Trane equipment is your assurance of high efficiency, undivided responsibility.

Data on the new Trane Compressors is available at your nearest Trane Sales Office, or at the main office in La Crosse, Wisconsin. Bulletin DS-361.

THE TRANE COMPANY, LA CROSSE, WIS. EASTERN MFG. DIVISION, SCRANTON, PA.

Air Conditioners, Unit Heaters, Convector-radiators, Unit Ventilators, Special Heat Exchange Equipment, Steam and Hot Water Heating Specialties — IN CANADA, TRANE COMPANY OF CANADA, LTD., TORONTO.



The New CenTraVac, a complete hermetically-sealed water chilling system, brings centrifugal refrigeration economies to a new and wider range of jobs. Hermetically sealed direct direct. High efficiency-power automatically reduced as load is reduced. Capacities starting at 45 tons. Bulletin DS-399.



The 1951 Trane Self-Contained Air Conditioner supplies year-around comfort for stores, restaurants, offices. Uses less floor space. Delivers comfort directly or through ducts. Accessible hermetic compressors. Unit capacities up from 3 tons. Bulletin DS-362,



MANUFACTURING ENGINEERS OF HEATING AND AIR CONDITIONING EQUIPMENT . OFFICES IN 80 CITIES

Now, it makes more sense than ever to use ...



• The use of Revere Copper in the vital spots in the construction of homes and commercial buildings has always made common sense. Now, with copper restricted for some uses and limited for others, it becomes even more important to use "Copper Where It Counts!"

One place where it counts most is in flashing. Revere Roll and Strip Copper for flashing is still available. Quantities, of course, must of necessity be limited. But, whether you are architect, builder, engineer or contractor, it will pay you to specify and use what copper you *can* get where it will do you and your clients the most good. That means in the vital spots where other materials can't stand the gaff.

Revere Copper is non-rusting, easy to work, endures for years and years and in most cases costs no more to install, than other short-lived materials. Also, the use of copper in the vital spots protects your reputation, results in a quality, trouble-free job. So, to maintain your high standards, while metals remain short, use Revere Copper wherever you can. The Revere Technical Advisory Service will be glad to help in every way possible. You can avail yourself of this service through your Revere Distributor. Better get in touch with him right away.



CHICAGO GIANT has 740 apartments-

is equipped throughout with compact Frigidaire Refrigerators

LOCATION: Chicago, Ill. LOEBL, SCHLOSSMAN & BENNETT, Architects S. N. NIELSEN CO., General Contractor

A striking new Chicago landmark has replaced an old one at 1350 Lake Shore Drive-former site of Chicago's historic Potter Palmer mansion.

The new landmark's two towers -21 stories high – comprise one of the largest and most modern apartment structures in the city. The buildings hold a total of 740 apartments. And it is significant that the refrigerator chosen for each compact, well-planned kitchen is a Frigidaire.

One reason for this choice is probably the fact that the name Frigidaire is welcomed by tenants as a hallmark of high quality.

But an even more important factor is economy of operation. And the greater the number of apartments, the greater its importance. So the choice made by Draper and Kramer, Incorporated, managing agents, is convincing testimony to Frigidaire's record for low-cost, trouble-free service.

Most important reason for that record is the fact that Frigidaire refrigerators are powered by the simplest cold-making unit ever built. Frigidaire calls this unit the Meter-Miser and backs it with a special 5-year warranty.

In addition to its refrigerators, Frigidaire manufactures a complete line of other household appliances. For full information, 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

Refrigerators • Electric Ranges • Food Freezers • Water Coolers Home Laundry Equipment • Electric Water Heaters Electric Dehumidifier • Kitchen Cabinets and Sinks







Typical floor plans for 2-room and 5-room apartments are shown here. Other apartment sizes are 2½-room and 3½-room. Apartments are so designed and arranged that virtually all of them will have a view of Lake Michigan.

PRODUCT NEWS

STRIATED CEDAR is attractive, moderately priced sidewall material.

The latest factory prepared and stained wood product to be introduced by Olympic is *Texterior*. Made of ³/₄" thick knotty red cedar, this versatile siding material is ribbed to give an overall linear effect without noticeable seams. It may be used on interior surfaces, counter drops and for fences as well as outside wall surfaces. Sanded and stained before it reaches the building site,



Stained and etched at the plant this knotty cedar makes effective surfacing for walls and interiors.

HALLS AND WALLS and Real Clay, Tile!

It is not mere coincidence that so many new school corridors, so many hospital walls and halls, are today lined with ROMANY Real Clay Tile. Architects know the answer ROMANY is "wallprotection" at its best. Attractive, of course, with more than twenty different colors to select, but definitely unsurpassed for its hard glazed sanitary surface. Not only greater wear protection, but easier to clean and keep clean. No wonder so many miles of tiles in public buildings today are ROMANY Tiles. There's an interesting set of miniature tile samples for your file if you will Write for Sample Chart No. 6



Texterior saves labor and time on the job. It comes in 6 and 8" widths in random lengths and is tongued and grooved for snug fit. For exterior applications the wall is stripped on 24" centers and Texterior nailed in the same manner as any T & G material. It is available in a variety of stain colors at about 27 cents per sq. ft. *Manujacturer:* Olympic Stained Products Co., 1118 Leary Way, Seattle 7, Wash.

DRAIN FOR REVOLVING DOORS prevents water from accumulating inside foyer.

No slush is sloshed through the hallowed revolving doors at the United Nations Secretariat, thanks to Josam drains. These revolving door drains fabricated especially for the UN project are now available to the construction industry. By draining off excess water of heavy rains or snow, the drains prevent unsightly and dangerous



pools from forming inside the entrance. The 9" wide drain body is made of cast iron and has a 90° frame and 6" wide grate of non-skid

material. The grate is screw attached to the frame and its double flange can be used for attaching waterproofing material or as an anchor in concrete construction. The model with 9" wide



The model with 9" wide top, 6" grate and 3' 3" radius sells for \$340.

Manufacturer: Josam Manufacturing Co., Dept. AF, Josam Bldg., Cleveland 13, Ohio.



CROSS TEST LEVEL can be read in two directions without shifting instrument.

In checking refrigeration coils and other technical installations where leveling is required in two directions, this compact cross test level should be practical. Measuring only 4" long, $1\frac{1}{4}$ " wide and $\frac{1}{2}$ " high, the tool can be used without changing its position to determine levels at (Continued on page 290)

VIRGIL PARTCH FAMOUS COLLIER'S CARTOONIST

"--- and don't tell ME

EVERYTHING HINGES ON HAGER !"



HAGER BB 1193 FBT BRASS BUTTON TIP BALL BEARING BUTT For added beauty and permanent trim appearance, specify all-weather non-corrosive solid brass butts.

The WEIGHT Swings on HARDENED STEEL...Not BRASS!

Knuckle weight is functionally engineered on Hager Ball Bearing Butts to lie against special hardened steel top races. The brass cup, which contains the races and the ball bearings, supports no weight... is subject to no errosive friction that may later wear out or impair performance.

Highest quality chrome steel balls allow the knuckle to glide smoothly and evenly over tempered steel races. Leaves are beveled at the joint. Trim, square outer edges are finely milled sharp and clean.

Specify Hager "BB" Butts on jobs calling for average frequency door service. Hager Frictionless ball bearing gliding action permits even the heaviest doors to silently float back and forth.

C. Hager & Sons Hinge Mfg. Co. • St. Louis, Mo. Founded 1849—Every Hoger Hinge Swings on 100 Years of Experience



For both small and large homes — Radiant Heating with Chase Copper Tube!



This photo shows how long lengths of Chase Copper Water Tube cut down the number of connections needed in a small home radiant heating installation.

A^{RCHITECTS} and builders agree that Chase Copper Water Tube is ideal for radiant heating installations in either the floor slab or ceiling.

Why? Chase Copper Water Tube is flexible, easy to bend by hand, needs no fittings at bends. Its long lengths—60 and 100 feet—cut number of connections. The few needed joints are quickly made with solder-joint fittings.

Chase Copper Tube is light, easy to handle. Its small diameter means ceiling installations without extra plaster depth. Its resistance to corrosion means long service life.



FREE BOOKLET

Just mail the coupon for free book, packed with helpful design information and data tables on radiant heating design.

	Chase Brass & Copper Co., Dept. Mb-331 Waterbury 20, Conn. Gentlemen: Please send your "Suggestions for Designing Radiant Panel Heating with Copper
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DELCO-HEAT Units

give home buyers the value, dependability and features they want

Check the specifications of these outstanding General Motors products!

"GA" series Gas-fired Conditionairs. These forced warm air furnaces feature multi-section heat transfer systems, with electrically welded Multi-Rad radiators that completely enclose the flames of

double ribbon-type burners . . . insuring the extraction of maximum heat from the fuel. Delco Rigidframe motors on blowers. AGA-approved for all gases and for high altitude installations.

Model (Available with		Dimension		Blower AGA-Approv Btu per Hour (i			ved Ratings in thousands)		
aither 12 or 16 gauge heat	Height	Width	Depth	RPM	CFM	Nat., Mf	g., Mixed Air Gas	LP-	Gas
exchangers)	Inches Inches	Inches	Inches Max	Max.	Input	Output	Input	Output	
GA 63 GA 90 GA 120 GA 150 GA 210	55 55 55 55 55	22 22 28½ 35 48	26 26 26 26 26	550 650 660 620 600	550 800 1050 1300 1600	62.5 90 120 150 210	50 72 96 120 168	60 90 120 150 210	48 72 96 120 168

"S" series Steel Oil-fired Boilers. Here are the perfect units for radiant heating systems in small homes-and for conventional steam and hot water systems, too, Have famous Delco-Heat

pressure atomizing burner, powered by *Rigidframe* motor. Provide year-'round hot water for household use. Available in both de luxe and round-jacket models. Also larger capacity, cast iron boilers.

	Capacity			Oil Burner		Dimensi	ons	
	Btu per Hour Output	1		Norria	and all and the	Height Inches	Width Inches	Depth Inches
		E.D.R.	Net	GPH	Round Jacket	491/2	24%	373/4
Steam Hot Water	95,200 95,200	396 635	300 480	1.0 1.0	Deluxe Cabinet	49	24	38½





*On basement installations add 15% duct loss to net heat loss—compensate for unusual conditions. †Maximum watts allowable on motor.



New homes sell better when they're equipped with Delco-Heat!

Delco-Heat manufactures a complete line of Delco-Heat manufactures a complete line of automatic home heating products-for all fuels, all heating systems, and all sizes of homes. And our engineering and sales departments will be glad to serve you in any way possible. Also manufacturers of electric water systems for domestic water supply. For information about Delco-Heat products, write to Delco Appliance Division, Dept. MB-23 General Motors Corporation, Rochester 1, New York.

Oil	Gas	Oil Condi	tionairs for	Coal	Wellmaste
Burners	Burners	homes o	f all sizes	Stokers	Pumps
	Ø			-	de la

EDWARD H. FAIRBANK, ARCHITECT

Good telephone planning starts here



Layout shown includes outlets for portable telephone

One of the first signs of thoughtful planning is the triangular telephone symbol. It marks the spots for conveniently placed telephone outlets and permits concealed telephone wiring—two features planned to please clients and make houses you design and build more salable.

PORCH

ROOM

FIRST FLOOR

KITCHEN

DINING

ROOM

Translated, the triangles simply mean a few outlet boxes and connecting lengths of pipe or flexible tubing placed in the walls during construction. The cost is low; the beauty and convenience value, high.

Your Bell Telephone Company will be glad to help you in planning efficient, economical conduit layouts. For this free service, call your local Business Office

BELL TELEPHONE SYSTEM



APEELLE MOTORSTAIRS part of basic planning in this modern store



Architects and Engineers: Davis and Wilson, Lincoln, Nebraska



J. C. Penney store is a model for customers' comfort and convenience

The Lincoln, Nebraska, Penney Store was planned with thoughtful consideration for the customer. And smooth, safe vertical transportation is a prominent part of the plan. Four Peelle Motorstairs carry customers between floors without crowding and in relaxed comfort.

Never before have moving stairways been designed and built to give the long, continuous service that Peelle Motorstairs deliver. Never in the entire history of the moving stairway industry have such low maintenance costs been achieved. Week after week and month after month, Peelle Motorstairs are proving their superiority in scores of well planned buildings.

For complete details and information about the application of advanced operational concepts to Peelle Motorstairs, write for new folder PM-502.



PRODUCT NEWS

right angels. It is said to register a $\frac{1}{2}^{\circ}$ discrepancy by moving the bubble $\frac{1}{8}''$. Both level glasses are set in round openings with beveled rims to provide clear vision from almost any angle. The block is aluminum, carefully finished on its bottom surface. At the present time the levels are expected to be available for at least several months. Retail price is \$3.00, f.o.b. Pittsburgh.

Manufacturer: Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh 8, Pa.



Use concrete made with Waylite aggregate for roof or floor fills. Reduces deadweight. Has high thermal insulation and sound-deadening values. Incombustible. Easily placed, especially around pipes and conduits.

Waylite is a lightweight air-cell aggregate made by processing molten blast furnace slag. It is a uniform material that comes properly graded. Recommendations for its use are supported by a wealth of technical data and by widespread, successful use on various types of structures. Approved by Board of Standards and Appeals, New York City.

In addition to fills, Waylite aggregate makes lightweight structural concrete that saves as much as 35% deadweight and can be designed up to 4000 psi. See Sweet's for engineering data. For further information and quotations, address the Waylite Co., 105 W. Madison St., Chicago 2, or Box 30, Bethlehem, Pa.

GGREGATE

lightweight concrete

for



Three practical design features of the new Philco ranges are the panel of glass beneath the broiler which prevents grease from spattering, color indicators of various degrees of heat on the control knobs, and a two-in-one broiler that also acts as a supplemental cooking surface.



ELECTRIC RANGES have broilers that double as griddles on topside.

Life at the range can be beautiful seems to be the sales cry of the appliance manufacturers. Replete with useful gadgets and gaily colored control dials, Philco's new models do not shirk the current philosophy.

Several of the eight new Philco electric ranges feature a broiler which glides out of the oven on metal tracks to double as a griddle on its topside. A large cast aluminum tray over the 3,000 W. broiler element makes this area, equal in cooking space to two surface units, ideal for grilling foods. The griddle is turned on with the oven thermostat. A splash guard keeps spatter off the range front and a detachable cup catches excess grease. Six of the models provide "broiling under glass" by means of a tempered glass shield suspended beneath the broiler. Permitting infra-red heat rays to pass through to the food below, the glass prevents grease from hitting the hot coils above, thereby preventing smoke and soot in the kitchen. The glass panels slide out and are easily cleaned.

Most of the new Philco ranges include a "banquet" oven, said to be the largest in any full-size residential range. A few of these models also have a smaller second oven for fast, casserole cooking. The surface cooking units on all ranges have a flat top which brings a large heating area into contact with cooking utensils. Retail prices start at \$169.95 for the 21 in. apartment range and go up to \$499.95 for the 40 in. *deluxe* range which will start the morning coffee perking automatically before anyone is brave enough to get out of bed and shut a window.

Manufacturer: Philco Corp., Philadelphia, Pa.

AUTOMATIC CLOTHES DRYER does not discharge moisture into room.

Marking a significant advance in automatic clothes dryer design, Hotpoint's model LD-3 condenses moisture from the heated air and expels it through a drain instead of discharging water vapor into the room. It can be installed anywhere in the house without expensive venting and piping. (Conventional dryers often cause a temperature rise of as much as 10° in a room and give off more 6 pts. of water vapor for each clothes load.) In operation, air is heated as it passes (Continued on page 298)

Beauty ...

and the Small Home Budget

Builders, Architects, Contractors, Jobbers, are looking to GERBER for quality, beauty, *economy* in plumbing fixtures for the small home.

GERBER'S five conveniently located factories serve the building industry with a complete line of plumbing fixtures including brass fixtures, vitreous chinaware, shower cabinets and steel enamelware. Shown above, the Mt. Vernon Closet, the Monticello Lavatory and the Gerber Shower Cabinet, are but a few of the literally hundreds of Gerber fixtures available ... every finished piece carefully tested, fully guaranteed.

Alert Builders are using the GERBER line to get additional "small homes" business. It will pay you to get full information ... NOW!

GERBER ENTERPRISES 232 North Clark Street, Chicago 1, U.S.A.

New York Office: Empire State Bldg., Suite 7322, 350 Fifth Avenue KOKOMO, INDIANA • WOODBRIDGE, NEW JERSEY DELPHI, INDIANA • PLYMOUTH, INDIANA



For Your Convenience, the Wholesale Jobber has GERBER Fixtures

GERBER ENTERPRISES, 232 N. Clark Stre	eet, Chicago 1, Illinois
Gentlemen: I am interested in BEAUT Home, Rush catalogs to me.	Y and ECONOMY for the Small
GERBER Plumbing Fixtures	GERBER Rough-ins
GERBER Replacement Parts	

Name____

Company_____

HOW TO AIR CONDITION



Architects and Engineers: SCHMIDT, GARDEN & ERIKSON

You are looking at the George M. Moffett Research Laboratories at Argo, Illinois. Here is centered the research and development activities of the Corn Products Refining Company. This building and the neighboring Pilot Plant are both air conditioned by Carrier.

These were the factors that influenced the design of the air conditioning system:

- 1. Efficient working quarters must be provided for research chemists and development engineers.
- 2. Temperature and humidity must be controlled.
- 3. Provision must be made for fluctuations in internal heat loads and exhaust air.
- 4. Independent control of room temperature for each laboratory or office space must be provided

This wasn't as hard as it sounds. Both heating and cooling are provided for by the Carrier Conduit Weathermaster system. A total of 131 individual Weathermaster units permits individual temperature control. A separate Weathermaker system provides supplementary conditioned air to laboratory spaces where exhaust requirements are high. Refrigeration is supplied by two Carrier Centrifugal Refrigerating Machines. Carrier Corporation, Syracuse 1, New York.



AIR CONDITIONING . REFRIGERATION . INDUSTRIAL HEATING



KNAPP Access Panels offer you 2 basic advantages



S. Pat. Off.

1. Built-in plaster flange (at no extra cost) for faster, easier, neater installation. These Knapp Access Panels are equipped with builtin plaster flanges all around.



2. Full 150° door opening for complete, unobstructed accessability all Knapp Access Panels swing open a full 150°

PLUS these exclusive "extra value" features ...

- Each panel is bonderized for full rust protection . . . special primer is then baked on.
- ★ Entire door may be readily removed.

You can get a Knapp Access Panel to fit any installation. There is a full range of standard sizes. Special size panels are available on request. There are two standard types of panels, the Knapp 400, which has the built-in plaster flange for use in plastered walls; and

- Special "Knapplok" device permits positive closing and self-opening.
- Reinforced door panel prevents sagging or warping and assures easy operation.

the Knapp 401, which has a face flange, for use in masonry or tile wall construction. Specify and order Knapp metal trim products on your next job. See details in Sweet's Catalog . . . or write for complete specifications and special data sheets for your use.

"America's Oldest Manufacturer of Steel Access Panels"

KNAPP BROTHERS MANUFACTURING COMPANY, CINCINNATI 36, OHIO "Metal Trim Building Products since 1905"



You'll be hearing more about these great new YALE locks

Get acquainted—look over the newly developed advantages YALE engineers have built into this competitively priced, residential tubular lock. You'll see speed of installation, strength of assembly, security, styling and YALE's traditional quality. For all the facts, write Dept. S63.

New YALE Ideas for faster, easier installation



Pre-assembled into 5 Components

Only 5 parts to handle—and every one designed to slide into its proper place with unbeatable ease. YALE does most of the assembly work for you—reduces the final installation job to three simple steps!

Triplex Spindle

First time in a lock of this kind! Triplex spindle with ingenious wedging action holds inside knob firmly, permanently in place.

Bridge Girder Construction

Automatically places roses and latch case in precise alignment and holds them there, rigidly, an exclusive feature of the H11. (Latch bolt can be reversed, simply by rotating.)







YALE "Twin-Bar" Cylinder for extra security

Here is YALE's latest development for improving tubular lock security—the 'Twin-Bar", a disctype cylinder with double side bars. Any attempt to pick this lock causes the side bars to lock tighter than ever.





FOUR

Entrance doors	H11
Descare doors	H33
Passage doors	H34
Bathroom doors	H35
[HII is self-aligning, bras	strim—al lated]

Luxury Styling at a competitive price

As in all YALE hardware, the quality in this residential lock goes far beyond its smartly styled surface. The lockset knobs and roses are brass. The girders are steel, zinc plated and dichromated; the latchcase is steel. Every part, in fact, is built for easier operation and longer wear.



THE YALE & TOWNE MANUFACTURING COMPANY Stamford, Conn. In Canada, St. Catharines, Ontario



In their beautiful simplicity of line, Kno-Draft Adjustable Air Diffusers are grace notes for any decorative theme. But unless you just happened to look ceilingward, you might not ever notice them in the modern lounge above. Nor would they be more obtrusive in period surroundings.

Certainly, Kno-Draft Adjustable Air Diffusers will never call attention to themselves by discomforting the occupants of any room. All that their name implies, Kno-Draft Adjustable Air Diffusers circulate air gently and *without draft* . . . keep temperature uniform throughout the conditioned area. Air volume and flow pattern are adjustable *after* installation

TRADE MARK "KNO-DRAFT" REG. U. S. PAT. OFF.

W. B. CONNOR ENGINEERING CORP. Danbury, Connecticut

Air Diffusion • Air Purification • Air Recovery In Canada: Douglas Engineering Co., Ltd., 190 Murray Street, Montreal 3, P. Q.



Lounge and exterior, Veterans Memorial Building, Detroit, Mich. Architects and Engineers: Harley, Ellington & Day, Inc., Detroit, Mich. General Contractors: Kuhne-Simmons Co., Inc., Detroit Air Conditioning Contractors: American Refrigerating Co., Detroit

... thus simplifying the engineering of the job as well as providing flexible control to meet both present and future conditions.

You'll find Kno-Draft Adjustable Air Diffusers in many of America's notable and architecturally significant buildings. Whatever the air conditioning requirements, there are types and sizes to meet them. Write us for detailed information.

KNO-DRAFT DATA BOOK: Complete specifications, engineering and installation data on Kno-Draft *Adjustable* Air Diffusers. To get your copy, simply fill in and mail the coupon. No obligation, of course.

W. B. CONNOR ENGINEERING CORP. Dept. D-31, Danbury, Connecticut	
Please send me, without obligation, my copy of the Kno-Draft Air Diffuser Data Book.	
Name	
Position	
Company	
Street	
CityZone	State

ANNOUNCING THE G-E RESIDENTIAL WIRING SERVICE Designed to help you plan for G-E Remote-Control Wiring

FREE FOLDER DESCRIBES THIS NEW SERVICE

 Tells how to take advantage of the General Electric Residential Wiring Service.

- Explains how G-E wiring specialists will custom-plan a remote-control wiring layout to your specifications.
- Describes how you can get complete installation details for your electrical contractors.

ELECTRIC

Interest in G-E remote-control wiring is increasing every day. Home planners see in this new wiring system features and advantages that they want and need.

Because G-E remote-control wiring can contribute so much to comfort . . . because it makes electricity a more useful servant in any type of home . . . you'll want to offer the advantages of this new type of wiring system to your clients.

A SERVICE TO ARCHITECTS AND ENGINEERS

To assist you in planning a remote-control wiring system, the General Electric Construction Materials Department has established the "G-E Residential Wiring Service." Through this free service, architects and engineers can obtain complete information and assistance on remotecontrol wiring for any residential building. You'll find the service a source of useful ideas . . . helpful in making electricity do a better job in the residences you design.

Write on your letterhead for this helpful "G-E Residential Wiring Service" folder. Address: Section D51-34, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

You can put your confidence in_

GENERAL (SE) ELECTRIC

the magazine of BUILDING 297



- Easy-to-install and simple-to-clean.
- Years of lasting beauty.
- Economical, durable and resilient.

PARQUETRY is winning wider favor with architects and builders everywhere. In office buildings, housing units, and homes, it's always in good taste with any surrounding. It's different-it's new-and it's the hardwood floor effect at the cost of asphalt tile. PARQUETRY has universal appeal-an appeal that adds dignity to any room with modern or period furnishings. The rich natural oak appearance will match any architecture with no fear of color-clashing. You give home owners an inexpensive luxury when you specify PARQUETRY for an extensive renovation or a complete new home. This PARQUETRY asphalt tile is factory-waxed for lasting beauty and accurately sized for effortless installation. Make the switch to PARQUETRY, when hardwood effect is desired at the cost of asphalt tile.

Write for information and portfolio A1A-23D



PRODUCT NEWS



over electric units similar to those on the cooking surface of a range. As the heated air is circulated by the rotating motion of the clothes drum it passes through a fine jet of cold water which condenses the warm water vapor from the air and also washes out lint. Moisture and lint are then pumped from the appliance through a rubber hose to the nearest sink or drain outlet.

The machine is controlled by two simple dials: one, an automatic time setter regulated from 15 to 60 min.; the other a selector for high, medium and low heat. The machine shuts itself off when the drying cycle is completed. Retail price for the LD-3, which has a capacity of 8 lbs., is \$279.95. Operating cost is about 10 cents per load, including electricity and water for the jet spray. Manufacturer: Hotpoint, Inc., 5600 W. Taylor St., Chicago 44, Ill.

GAS FIRED UNIT HEATER engineered for complete air diffusion throughout room.

Distributing heat in a complete circle, the Norman Three-Sixty overhead convection heater is a neatly styled practical unit for commercial in-

stallations. Its shallow depth (1' 1/2") permits ample headroom even in rooms with low ceilings. A low velocity impeller quietly distributes a



large volume of warm air through seven diffuser rings. The air travels across the ceiling in a 360° radius, down the walls, blankets the floor area and then rises and is drawn into the return air intake in the bottom of the heater. This aspiration scheme is said to equalize temperature throughout the room and eliminate stratification and stagnant air pockets. Gas fired, the Three-Sixty is rated at 100,000 Btu and sells to the building trade for about \$279, not installed. The single port self-piloting burner assures efficient and quiet combustion. Forced exhaust of combustion products is said to eliminate venting problems and air contamination. Controls include a safety device which shuts off the heater in event of an excessive downdraft or blocked

(Continued on page 304)





Every architect and builder will want to see these ingenious, efficient, low-cost ideas awarded top honors by The Technical Jury of the NAHB-FORUM House Design Competition.

CONGRATULATIONS

to the NAHB-FORUM House Design Competition (Kitchen Planning) winners whose excellent plans are included in free brochure:

FIRST PRIZE: James M. Chase · SECOND PRIZE: Fred C. Nagel · THIRD PRIZE: Lawrence G. Evanoff . FOURTH PRIZE: Guy G. Rothenstein, Arthur Hinden · HONORABLE **MENTIONS: J. P. Ligonnet** Eric R. Bancroft . Ching C. Cheng · Edward D. Dart George Matsumoto · Kazumi Adachi • Dike Nagano Robert W. Blachnk · Lucille B. Raport • Roland H. Lane • Joseph N. Laborde · Richard B. Pollman Robert A. Little & Associates E. M. Hodgman . R. P. Madison Chalmer Grimm, Jr.

MULLINS MANUFACTURING CORPORATION

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TILE FLOORING

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To guard your priceless asset—the confidence and good will of your clients—MATICO maintains a constant control over quality. Every few minutes, production samples of MATICO are sent to the MATICO laboratory where they are subjected to the exhaustive tests shown here. Any sample that fails to "measure up" is immediately rejected, along with the entire lot from which it came. If necessary, production is halted completely until the cause can be corrected.

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Protect your priceless asset. Always specify MATICO Asphalt Tile Flooring and assure satisfaction for your clients.

GET TO KNOW MATICO

See our insert in Sweet's File Architectural, section 13 g/Mas. For free samples, write us on your business stationery.

INDENTATION

Testing MATICO production samples with the McBurney indentation tester. Tiles are first brought to a temperature of 77° F. by keeping them in water for ¼ to ½ hour.





FLEXURE

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IMPACT

Determining resistance of MATICO tile to impact on specially designed testing equipment. Tile must withstand a weight dropped from a height of $4\frac{1}{2}$ " to 6" without cracking.



MASTIC TILE CORPORATION OF AMERICA MEMBER: ASPHALT TILE INSTITUTE

1-R38





Bar front, Hotel Taft, New York, by United States Plywood Corporation, 55 W. 44th St., New York, N.Y.



"Kalistron" wainscoting in corridors of New Britain General Hospital, New Britain, Conn.

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New Cape Cod Development PICKS <u>CORROSION-PROOF</u> SCREEN CLOTH



Mashnee Village on Buzzards Bay, new low-cost 100-unit housing project in Bourne, Mass., is Lumite-screened throughout. Lumite screen cloth was chosen because Cape Cod's high humidity and corrosive salt air can't harm it, and because of its low cost. Builder: Ellis G. Williams. Architect: Lloyd M. Hendrick.

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PRODUCT NEWS

flue; when the proper draft is reestablished the unit resumes operation automatically. The 1/6 h.p. motor and controls are readily accessible for servicing. The unit has a dark green crackle-baked enamel coat.

Manufacturer: Norman Products Co., 1150 Chesapeake Ave., Columbus, Ohio.

PORTABLE SAW GUIDES extend usefulness of small portable saws.

Crosscutting, mitering, beveling and ripping are performed quickly and precisely with a standard portable electric saw and either of two new saw guides. Universal's saw guide consists of a rigid clamping device for attachment to the front member of a wooden miter box and a locking quadrant to which either crosscutting or ripping cradles are affixed. These cradles have adjust-



able sidebars to accommodate any standard 6 to 12" saw, Extension rods are available for panel cutting. The saws also may be inverted to form a table saw complete with guide fence. For easy handling, all castings in the Universal are aluminum alloy. Steel parts are cadmium plated against corrosion. The unit's shipping weight is 30 lb. Price f.o.b. San Francisco is \$68.50.

The new Skil saw guide, which sells for \$49.50, also quickly converts a portable electric saw into a portable radial saw. Weighing 26 lbs., it is



easily attached to a small platform on two saw horses. Made for use with Skil saw models 77, 825, 87 and other popular makes with a base width 4 13/16 to 5 $\frac{1}{8}$ in., the guide has a radial range of 120° (60° right or left) and a bevel capacity of 45°. Maximum cut-off is about 17 in. and ripping width approximately 28 in. Both new guides save time and labor on many types of construction jobs and make available many benefits of larger and more expensive equipment.

Manujacturers: Universal Saw Guide 1080J Howard St., San Francisco, Calif. Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill.

(Technical Literature, page 310)

New: INSULITE' SHINGLE-BACKER Saves Labor...Saves Material...Speeds Completions

INSULITE SHINGLE-BACKER provides a smooth, uniform, insulating undercourse that gives you better looking shingled sidewalls . . . faster and easier!

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• Adding protection against rot and termites to the many other advantages of wood (resistance to rust, corrosion, crumbling, spalling) greatly influences its practical and economical use. But, to get full rot and termite protection, be *sure* that the lumber you specify or use is *pressure-treated*.

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TECHNICAL LITERATURE



TILE. Tile Handbook. Tile Council of America, 10 E. 40th St., New York 16, N. Y. 48 pp. 81/2 x 11 in,

When the top men in an entire industry-manufacturers and users-sit down for an afternoon and agree on 10 or 12 definitions of terms, it is news. When they spend a few years collaborating and call in a man-about-efficiency like Don Graf to put it all together, the result is a rare piece of building literature. Short and easy to take, the Tile Handbook represents the thought of the tile industry on what is good tilework practice. Although its size belies its comprehensiveness, nothing is squeezed; text and drawings have enough air around them for comfort. Not only does the publication revise and integrate data formerly covered in Basic Specifications for Tilework K-300 and Tile Handbook T-1 (both of which it supercedes), it also contains much other information valuable to the contractor, the architect and the tilesetter. It is applicable to any size or kind of job-from wall facing to sink counter, in new construction or remodelling. Uniquely, the book combines specification paragraphs with explanatory notes and drawings. Specifications, as written in the Handbook, are readable. (As an experiment Graf once counted all the "shall's" in an ordinary building contract and found that they added up to 230 lineal feet of typing. "Shall" does not appear in the text.)

The book consists of three main sections: 1) the specification itself — contractual and legal considerations, scope of work, materials, preparation and setting on vertical and horizontal surfaces, special construction, and results; 2) related work—items not included in the specification such as demolition, wood floor framing, subflooring and paper, wood studs, furring exterior masonry and wood trim meeting tilework; and 3) appendix—a glossary, a note on thin setting bed methods, Bureau of Standards SPR 61-44,



and construction details. All illustrations, in the Graf tradition, are lucid and intelligent.

PLUMBING. Lead in Modern Plumbing. Lead Industries Assn., 420 Lexington Ave., New York 17, N. Y. 20 pp. $8\frac{1}{2} \times 11$ in.

This new book contains much practical information about the use of lead in plumbing installations. It includes standard specifications for lead plumbing products and installation drawings. (Continued on page 316)

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TECHNICAL LITERATURE

STAINLESS STEEL. Architectural Uses of Stainless Steels. Committee of Stainless Steel Producers, American Iron and Steel Institute, 350 Fifth Aye., New York, N. Y. 32 pp. 81/2 x 11 in.

Prepared to familiarize architects, builders and construction engineers with the rapidly growing fund of technical data on stainless steel, the two-color booklet has many good photos of successful applications. It shows some of the stock parts available and features design details in ten

Ludowici Roofing Tiles...

Beautiful and Permanent

for the small home

pages of drawings. Metallurgy of stainless and the forms in which the steel is supplied commercially are covered briefly.

ACOUSTICAL CEILINGS. Nelson Quick Clips. Nelson Stud Welding Div., Morton Gregory Corp., Lorain, Ohio. 4 pp. 81/2 x 11 in.

Short form specifications and comparative cost data for installing acoustical tile and board with Nelson Quick Clips are covered in this bulletin.

EDRICH BLES

This contemporary home, designed as a two or three bedroom house by architects Travelletti and Suter of Chicago, is beautifully roofed with Ludowici Light-Weight interlocking shingle tiles. Illustration shows the interesting texture of several patterns available in a range of red, black, brown, gray, and green colors.

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Using this mechanical suspension method — described as low cost, fast, self-leveling and sagproof — one man is said to be able to install 90 sq. ft. of ceiling tile in an hour,

CORRUGATED PLASTIC. Corrugated Plexiglas for Architecture. Rohm & Haas Co., Washington Square, Philadelphia 5, Pa. 24 pp. 81/2 x 11 in.

This recent brochure presents 19 picture histories which illustrate how corrugated Plexiglas can be used in interior architecture for homes and offices, in signs and store fronts, in lighting and glazing. Nine pages are devoted to excellent installation details for connecting acrylic sheets and attaching them to other flat, shaped and corrugated structural materials. Fabrication techniques listed for this material include cutting, drilling, polishing and cementing. Also covered are the types, colors, sizes and thicknesses of Plexiglas sheets and a complete tabulation of the material's physical properties such as strength, specific gravity, impact resistance, and thermal conductivity.

HEATING. Low Level Convector Radiators, Catalogue No. 4150. Young Radiator Co., 709 S. Marquette St., Racine, Wis. 8 pp. 8½ x 11 in.

A new low level convector for use with hot water and two pipe steam heating systems is the subject of this brochure. Full design details on the unit, engineered especially for installation beneath picture windows, are given as well as roughing-in data, ratings and architect's specifications.

INDUSTRIAL FLOORING. Tri-Lok Open Steel Flooring. Bulletin 1103. Dravo Corp., Machinery Div., National Dept., Fifth & Liberty, Pittsburgh 22, Pa. 16 pp. 81/2 x 11 in.

The bulletin describes various types of open steel flooring and armoring for industrial, bridge and sidewalk construction. It discusses the manufacturer's Tri-Lok flooring ("no weld, no rivet, no bolt") and safety treads, and contains specification data, safe load tables, and installation methods. Also included is information on T-Tri-Lok, an assembly of Tee bars. When filled with concrete, T-Tri-Lok may be used instead of heavy concrete flooring to reduce the dead load and thus permit a lighter weight structure.

DUST CONTROL. Industrial Dust Control Through Exhaust Systems. Pangborn Corp., Hagerstown, Md. 50 pp. 5 x 71/4 in.

Detailed selection, operation and maintenance data on dust control exhaust systems are contained in the digest-size book. Illustrated with photographs and line drawings, the publication treats thoroughly three main topics: exhaust hoods and piping systems; dust collecting equipment; and exhausters and drives. It lists basic methods of accomplishing dust control and gives reasons why improperly planned installations do not perform their function fully. A problem sheet is attached on which the reader can enter information about any particular case.

(Continued on page 324)
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TECHNICAL LITERATURE



COLOR. Descriptive Color Names Dictionary. Container Corp. of America, 38 S. Dearborn St., Chicago 3, III. 64 pp. $6\frac{1}{2} \times 7\frac{1}{2}$ in.

A key to the kaliedescopic doggeral that serves as color nomenclature (i.e., bisque, butterscotch, beaver, persimmon, dusty aqua, rose mist, etc.), the dictionary is a useful supplement to the company's Color Harmony Manual on the Ostwald system. The booklet contains 775 names arranged so that the user (who has access to the \$125



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Manual) can translate descriptive terms to colors and vice versa. Names commonly applied to colors of merchandise sold in mass markets are covered; fad and invented brand words are not included. Colorists Helen D. Taylor and Lucille Knoche collaborated with Walter C. Granville for six years in preparing the dictionary. With it, merchandisers can describe product colors in terms the public will understand and, conversely, purchasers can identify colors described in ads and promotional literature by referring to the Manual.

SHOWER CABINETS AND TOILET COMPART-

MENTS. Fiat Shower Cabinets. Fiat Metal Toilet Compartments. Fiat Metal Mfg. Co., 9301 Belmont Ave., Franklin Park, III. 16 pp. 8 pp. 81/2 x 11 in.

The company's complete line of shower cabinets, shower doors and receptors are presented in the first of these two catalogues. All models are pictured in typical bathroom settings. A page of bathroom layouts offers helpful suggestions to architects and contractors for the use of shower cabinets in bathroom arrangements. A diagram shows how to install Fiat's new built-in Cadet shower. Also found in the catalogue are simple drawings of construction details, roughing-in dimensions, and descriptions of accessories.

The second publication illustrates and describes the firm's metal toilet compartments, including both ceiling hung and floor braced models. The partitions are said to be made of highest quality steel and constructed to withstand long hard use. Specifications are given for each type.

WALLS AND COUNTER TOPS. Nevamar High Pressure Laminates. The Nevamar Co., 1224 Wicomico St., Baltimore 30, Md. 8 pp. 8½ x 11 in.

A versatile and durable high pressure laminate, *Nevamar* is depicted in this full color brochure in a variety of applications ranging from wallpaneling to furniture tops. Several attractive patterns are illustrated and standard sizes and thicknesses are listed.

WIRING. Home Wiring Handbook. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. 135 pp. 6 x 8 in. \$1.

Home wiring not only should be safe and efficient, the new Handbook points out, it also should provide flexibility that can match progress made on electrical appliances and equipment. In line with this approach the guide goes beyond previous editions which stressed minimum safety requirements established by codes, and adds the factor of function: designs which permit full use of present and future equipment. Describing four degrees or levels of "electrical living," the book lists essentials in electrical equipment for the home as the first degree and then adds further refinements for the second, third and fourth levels. Every phase of house wiring for each stage is covered including minimum outlet requirements for each room, selection of number and type of circuits, circuit protection and communication systems.

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