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SHELL OIL COMPANY
INCORPORATED

909 EAST 22ND STREET
BALTIMORE 18, MARYLAND

August 3, 1945

Dear Mr. Eccles:

Attached is a reprint of "To Market Tomorrow to Buy a New Home", the latest of a series of postwar planning articles currently appearing in our house magazine, SHELL PROGRESS. As the title suggests, the article deals with some of the prospects of private housing in the years immediately ahead, and discusses what the building of new homes can mean to the business people of the average American community.

We shall be happy to send you future reprints of this nature, if you would like to receive them.

Sincerely yours,

W. M. Barley

Division Manager

TO MARKET TOMORROW TO BUY A NEW HOME

SIXTH IN A SERIES OF POST-WAR STUDIES

FREDERIC LEWIS

The prefabrication industry isn't a youngster, but in these war years it has obtained much-needed large-scale experience, likely to pay off with improvements for future construction. Above: prefabricated units built by American Homes.

TO MARKET TOMORROW TO BUY A NEW HOME

America will wind up the war way behind in housing. Catching up on construction of new homes can keep industry and citizens at work for years

By P. V. LAMBDIN

GIVE A MAN shelter—just a roof over his head—and he still may not have a home. Put some grass around it, though, and set it in the sun. See that it's easy on the eyes, comfortable, convenient. Make it possible for him to pay for it, and don't bankrupt him in the business. That's more like it—more like the home that everyone wants. For a home has to do more than keep the rain out: it has to offer security and satisfaction to those living inside. It has to be something the owner is proud of. A home like this is the one that pays off the owner with health, inspiration, and honest joy in living.

Building homes of just this sort is one of the great jobs for Americans when Victory in World War II is final. It's not a job that can be done in one year, two, or even ten. Decades must be dedicated to the Nation's home-building task. Peak year for U. S. construction was 1925, when $5,400,000,000 was spent for this purpose—most of this staggering sum going for urban home building and remodeling. Even in that plush year, however, the housing slack wasn't taken up. The year when the war ends, there will be another huge annual demand for houses *plus* a colossal deficit accumulated since the war began and home-building ended. America will need new houses not only to replace those that have burned down, worn out, or otherwise passed out of use, but also for new families; for people who have been bunking in with their relatives for the duration; for veterans and their brides. Finally, there must be building for the people who have little more than shelter: slum dwellers, residents in blighted areas, tenants of substandard houses in rural districts. Millions of Americans will be in the market tomorrow for new homes.

Filling the need will do more than make a lot of citizens satisfied; it will make them wage-earners, too. The call is out for 60 million jobs in post-war America. But the call is out, too, for from one to two million houses each year of the post-war decade. That means the construction industry—second largest industry in the United States—will be giving work to many of the millions who will need it. Post-war housing is big business: for architects and contractors, masons and landscapers, plumbers, electricians, those who make furniture and fixtures. There's work ahead, too, for all those who supply the construction industry. Shell, for example, furnishes a long line of petroleum products for home building, among them: asphalts for roofs, shingles and sidings; lubricants and fuels for the machinery that makes brick and cement, stucco, glass and fixtures, or that cuts lumber; thinners and solvents for paints, lacquers and varnishes; Diesel fuel, gasoline, and lubricants for construction equipment and for

the trains and trucks that take logs, sand and other construction materials on their many journeys. Plus all those who process oil are the men who fell timber, mine copper, draw steel, cut stone. Who isn't in on post-war housing!

At the market place tomorrow: a long line of people ready to buy, a long line of people to buy from. Money, though? Buying a house takes more of it than almost any other purchase that Americans ever make. Well, many thousands will bring along war savings and War Bond investments. Veterans will have savings, too, plus loans made under the GI Bill of Rights, by which the Veterans' Administration guarantees 50 per cent of any borrowing for a home, up to a $4,000 limit. The bank pays money to whomever the veteran buys from, and the veteran repays the bank over a 20-to-25-year period. Federal agencies will undoubtedly continue to subsidize certain low-income groups, and there is a possibility that they will help people in higher brackets with loans over easy-payment periods. Private industry is cost-conscious, too; for example, 91.2 per cent of 1,214 representative lumber dealers surveyed by the *American Lumberman* announced that they plan to offer financing assistance as part of their service.

Whatever arrangement is made for buying a house, no one wants an unsound investment. The average man can afford just one house in his lifetime; if he gets a bargain that turns out to be a financial burden, he's usually stuck with it. So Americans are going to buy carefully after the war. They're not in the market for mansions, or for completely mechanical domiciles where one does housekeeping by pressing electric buttons. Judging by surveys that have been made in the past few years, the prospective home owner is conservative in the sense that he doesn't want to buy a house that devours dollars for upkeep, or a house of such unusual design that the neighbors think he's eccentric, or a house that's experimental—one that *might* work out. The residence that looks as if it came out of a World's Fair 1,000 years from now—it's out.

What takes its place? Two hundred thousand home owners and prospective home owners, canvassed for their opinions by the

Architect George F. Keck (left) and E. W. Green, president of Green's Ready-Built Homes, display model of a Solar Home, designed to be sun-warmed in winter; sun-shy in summertime.

PIX INC

Here's a house in Midland, Mich. that won the Prix de Paris in 1937 for architect Alden Dow. Note the large glassed-in areas—an important feature of new-type residential buildings.

Crane Company in 1943, gave the following leads. They expect to buy the 1941 home—improved in construction and produced at lower cost. They've borne out the fact found in other surveys that they're interested in fine equipment, particularly in the kitchen and the bathroom. They want the work space in a house divorced from living space. For instance, 74 per cent of those reporting in the Crane survey want the kitchen separate from the dining or living room. They want extra conveniences like powder rooms—like showers in the basement.

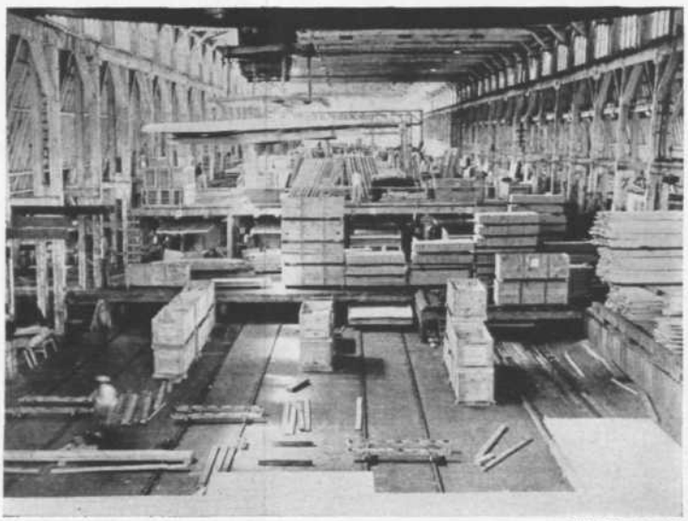
From other sources and from past experience, manufacturers also know that Americans like colorful homes. And they want houses that are different from their neighbors'; not startling or unconventional designs, but with some feature—perhaps a red door, a rock garden out front, a side chimney—that will distinguish their homes. They want durable materials, easy on the upkeep. And when Americans come out of the dismal tunnel of war, they'll be looking for homes that are bright, cheerful.

The construction industry has the preferences of prospective home buyers in mind; it's had its sights on the trends of public opinion; it has made many surveys. Comes the time now for canvassing the construction industry itself. What can it offer to meet the demand for improved construction at reasonable cost?

Prefabrication is one of the first things that come to mind, as America looks over the horizon at the post-war home. This method of mass production of houses by factory methods is not so new as some people think. It dates back to the depression. It has had friends and foes, success and failure. But for a long time it suffered from lack of experience. Then World War II came along and gave prefabrication a chance for large-scale trial: fast production of dwelling units for war workers, barracks for soldiers, shelter for Allied civilians bombed out by the enemy. Here again, there has been both good and bad prefabrication. Some critics look at the latter, shake their heads, and say "no thanks." But prefabricators weren't out to prove themselves in this war; they were out to do a war job. They're looking at their mistakes now, and learning from them. Their experience may result in a type of construction that appeals to an increasing number of people.

A number of young architects and industrialists are showing interest in joining the prefabrication industry after the war. And there are proposals that the United States convert most of its air-frame assembly plants to the building of units for low-cost prefabricated homes. One estimate concludes that such conversion would employ three million workers.

There's a certain similarity between the manufacture of houses and planes by mass-production methods. Both aircraft and prefabrication workers rely strongly on the



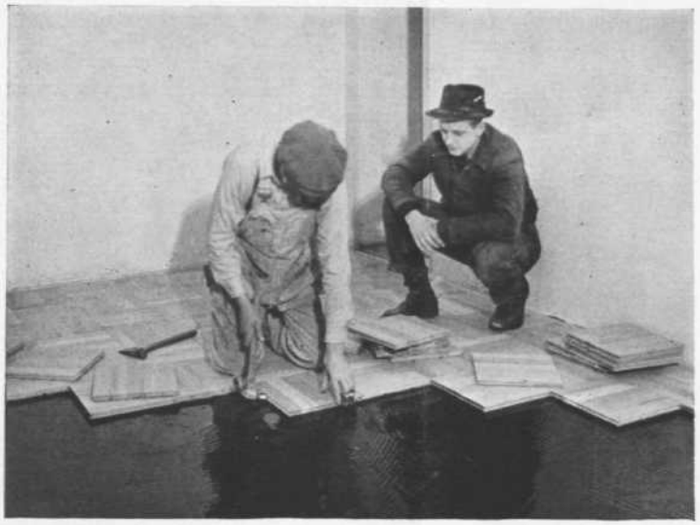
Assembly-line manufacture of houses—seen here at the Prefabrication Engineering Co., Ohio—reduces cost *if* finished units don't have to be shipped too far from factory to home site.

WIDE WORLD PHOTO

Speedy assembly is one means of reducing building costs. Here the house posts are sunk in concrete so that structural frame carries all weight. Thus the placement of wall panels is easy.

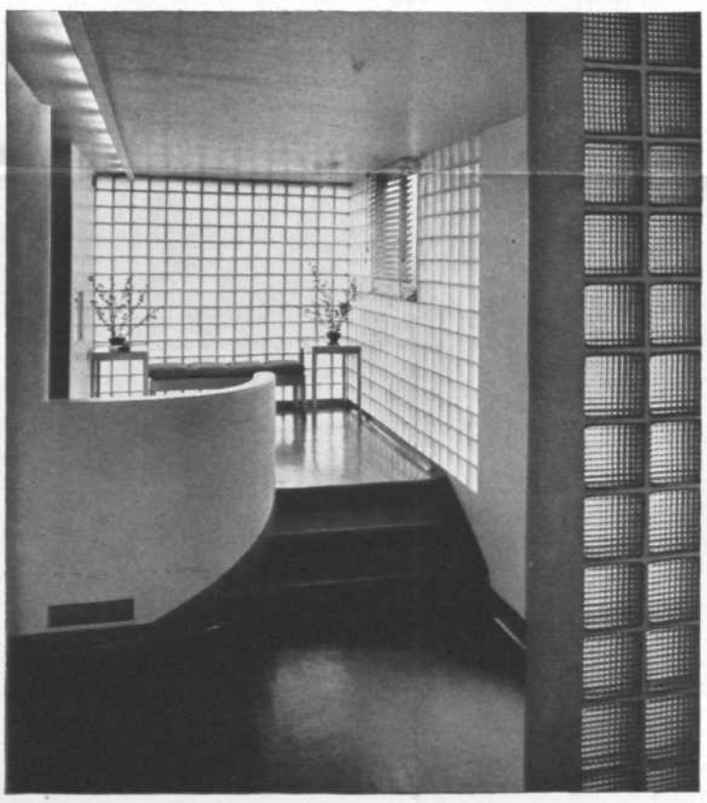
WIDE WORLD PHOTO

Insulation is increasingly used in home construction; cuts fuel costs in winter; keeps a house cool in summer. Right: worker applies rock wool bats made by Flintkote Company.



Asphalt tile has durability; in addition it comes in various shades, and there's a swing toward more color in house interiors. The floor here is being laid with tiles by Flintkote.

A post-war essential is easy, inexpensive upkeep of the home—largely dependent on building materials. Fireproof panels of Johns-Manville Flexboard line kitchen walls: left.



There's a healthy trend toward getting more light into homes. One means is glass block. Owens-Illinois makes the Insulux glass block handsomely used in the hallway seen here.

principle of "skin tension" as a construction technique. Skin tension is the amazing strength that results from bonding thin sheets of plywood (with glue or some medium other than nails) on either side of a light wood frame. This process is used in building the famous Mosquito bomber; and sturdy, easy-to-move panels in prefabricated houses are also made in this way. For instance, Simon Breines, New York architect, has used the principle of skin tension in designing a standard panel for home construction. Four of these panels would make a bathroom, plus one for the floor. Twelve would make a bedroom.

In building houses, prefabricators depend on materials of standard size. These fall into three broad categories. The first one includes small elements of standard size like strength members (roof and wall supports), doors and sash. The second one includes standard panels; the third, large units of standard size, which are made up from the first two. When joined together, the units make up a complete house. Obviously, standardization of construction elements saves time in manufacture and assembly of a house, and so results in lower costs.

These are great advantages, but there are cons as well as pros concerning prefabrication. Ship a finished house very far, and the costs of transporting it may cancel out previous economies. Suppose, too, that department stores generally stocked houses as part of their merchandise—as some people anticipate. Would they guarantee the product; would they continually carry replacement parts? These are two of the problems that prefabricators face.

Even so, the designers are going ahead. Norman Bel Geddes comes forth with a design for a house to be assembled from 27 basic units. It would rest on concrete piers, and thus eliminate the expense of excavation and foundation work. Closets in the house would do more than store household goods; they would form interior partitions and also support the roof. Another economical feature concerns the installation of plumbing fixtures: a wall between kitchen and bathroom would be stamped out as a car body is, so that kitchen plumbing could be fitted on one side, and bath fixtures on the other. As the idea is worked out by Geddes, six men could set up the house in one eight-hour day. Moreover, the set of 27 units could be shaped into any one of 11 designs.

Despite the promise of prefabrication, it's extremely unlikely that the major share of post-war houses will be built in this way. Custom building—using various crafts and their experts to assemble a house—has its own advantages. Besides, conventional building methods offer a certain pleasure to the individual buying a home—a pleasure not always allied with prefabrication. The home buyer has more of a chance to carry out some of his own ideas; to decide where the hall closet should be or whether the roof should be covered with slate or shingles—

More people are voting yes for air-conditioned homes, and after the war Carrier Corporation, Syracuse, N. Y., will be among those making necessary equipment. A pre-war air-conditioning unit made by this firm is seen here, installed below the window.

Concealed fluorescent lighting, like that in the cove and bookshelves of this living room, is one of the improved lighting arrangements for tomorrow's home. General Electric provided the fluorescent and other lights for the fixtures in this interior.

mighty important decisions, since he's the one who's going to live in the house. So here's the interesting compromise: semi-prefabrication. Increasingly the construction industry has been using standardized elements in lumber, pipe fittings, sash and other interchangeable units. This phase of prefabrication will be extensively used by all builders in the future.

Along with this trend are others that seem certain. In the matter of land, for instance: there's going to be more ground around homes in the future; the two-by-four yard is no good for gardening, no fun to play in, no pleasure to view. Moreover, as plane traffic becomes heavier, city residents may move out to the country and commute to town by air. There'll be some people, perhaps, who'll pilot their own aircraft; they'll need a place to land them. Here's something else about property tomorrow: the goal is to make house and grounds go together—to adapt the residence to its natural surroundings. If there's a waterfall by the house, why not build a window wall so the family can see it? Don't think it hasn't been done. Frank Lloyd Wright made architectural history by building a country lodge over a beautiful stream in Bear Run, Pa. Group land purchase is another possibility for some people; they'll buy up a desirable piece of ground, and design their homes to harmonize with the landscape and with each other.

But look around inside the house of tomorrow. The floor plan is more open. In contrast with older houses, there are fewer structural members to support the walls and ceilings—fewer because they're made of modern materials, like new metal alloys, which provide greater strength with less bulk and weight. Result: large unbroken wall spaces, a feeling of roominess, freedom to arrange furnishings in a variety of ways. However, though there may be fewer walls in the modern house, there's a trend to give them more work to do: to make partitions that can be moved to desirable places for space division; to make closet walls for storage of books, clothing and other household goods.

Look for extensive glassed-in areas in the post-war house. There will be more windows, some of them made of Thermopane: two panes of glass with dehydrated air space sealed between them. This combination has insulation value. And since moisture has been removed from the intervening air, the panes will not fog up. Researchers at Libbey-Owens-Ford Glass Company developed the essential metal-to-glass bond that seals Thermopane windows. Walls built of glass block are also booked up for increasing use. As made by the Insulux Products Division of Owens-Illinois Glass Co., glass block can diffuse light in a room, unlike clear glass which just transmits it. Light going through Insulux directional glass blocks is diverted to the ceiling, which in turn acts as a reflector and sends the rays down-

ward, flooding the room with brightness. Glass block requires no painting, is easy to clean; so minimum maintenance is another one of its great appeals to the home owner. Moreover Insulux glass blocks have insulating value equal to that of an eight-inch brick wall. Glass will also go to market in the form of fabrics—fire-proof, of course.

Look, too, for improved materials for roofings, sidings, insulations, floorings. Industry knows that the public wants these elements to have minimum upkeep expense, permanence, and resistance to hazards. Flintkote Company, one of the largest suppliers of these materials, looks forward to manufacturing increased quantities of asphalt roofing, which doesn't need painting or staining, is fire-proof, comes plain or in colorful blends; asbestos sidings, also fire-resistant; asphalt tiles for floors in kitchens, game rooms and other quarters of modern homes.

To the public, insulation was once a luxury. Now it's a utility, an essential construction element, a leader on the list of materials for post-war homes. As made by Flintkote, Johns-Manville and other companies, insulating board now does a double job: it is insulative and structural at the same time. Having a decorative finish, it looks well in interiors. Kitchens designed by Johns-Manville have walls lined with asbestos-cement sheets, which come in attractive colors, are easy to apply, easy to clean. Aluminum trim is effective on these walls, and after the war this attractive metal should be reduced in cost.

Insulation of the post-war house will reduce heating expense. But industry is also going to offer better heating units—oil burners, among them. Key to efficient combustion in this type of unit is thorough mixture of fuel and air, so that there is no excess smoke carrying off non-combusted elements—and heat. Manufacturers studying this problem include the General Electric Company, maker of a compact oil furnace in which combustion is increased by turning the flame downward and sending a jet of air upwards. Caught between these two forces, fuel tends to be thoroughly consumed. Shell, too, has done research on the problem of proper fuel-and-air mixture; at its Burner Testing Laboratories in Sewaren, N. J., Shell has made design improvements for oil burners that promise 25 per cent more efficient combustion of fuel.

A sun-warmed house is something else again. One variety is the Solar Home, to be marketed after the war by Green's Ready-Built Homes, Rockford, Ill. Designed by architect George Fred Keck, the Solar Home is a one-story building that faces south. All main living quarters are on the sunny side, and the wall here is made up of large double-paned windows with a dehydrated air space between. This special glass insulates against heat loss. And the heat source? Partially the sun itself; for a roof extension of approximately three feet at the south side directs the rays of the low winter sun into the house.

This kitchen demonstrates the improvements wrought in the working spaces of a house in recent years. It's compact—and just as important, it's cheerful. Installations here—sink and base cabinets—are manufactured by Crane Company, Chicago.

The Solar Home also has radiant heating from a gas, coal or oil unit, which forces warm air up through ducts in the tile floor. But the manufacturers claim that this building can keep cool, too. In summer, when the sun is high, the roof extension keeps the warm rays outside. Moreover, on the flat roof is a thin layer of water; as it evaporates, it cools off the house just as a wet bathing suit cools off a swimmer.

Air-conditioning is another way to prevent a house from running a fever in summer or suffering from chills in winter. It appeals to thousands of prospective home buyers who live in areas where the mercury goes to one extreme or another. As soon as conditions permit, Carrier Corporation will resume manufacture of the latest type of air-conditioning units it made before the war. Self-contained, electrically operated, they're for year-round use; can be installed at any window.

Other equipment destined for the post-war housing market includes quick-freeze units for food—Carrier Corporation plans to make them. And there'll be improved lighting, too: fluorescent lamps made by General Electric Company, and health lamps that destroy air-borne bacteria.

It's in the kitchen that most people count on having modern equipment. Crane Company, one of the leading manufacturers of kitchen installations, has this to say about them: how they look is important, but how they will last is even more important. So this company plans continued use of time-tested materials, like acid-resisting porcelain enamel on cast iron, and Duraclay. Crane sinks will have durable chromium-plated brass fixtures, and most designs of sinks will have base cabinets. Since women spend much of their time in the kitchen at the sink, manufacturers are planning to make sinks of varying heights, adapting them to the size of the women who will work at them. In addition, kitchen sinks will generally be placed in front of windows, so that the persons there can look outside as they work—also can keep an eye on the children at play outdoors.

The bathroom is another place where Crane emphasizes installations that are durable and of refined design: bathtubs that are lower—easier to get in and out of; that have flatter bottoms and so are safer. For lavatories, there'll be such conveniences as the integral soap dish, shelf space, quick draining, and non-splash rims. Toilets will be streamlined as much as possible, be compact, have improved flushing mechanisms.

There's a long inventory of improved products for the housing market tomorrow—merchandise that can convert four walls into a satisfying home. That's the job of industry. . . .

And to every businessman, whether he depends immediately or ultimately on the buying and selling that takes place on Main Street, post-war housing is profitable. The home—a man's great investment. Millions of them—America's great investment tomorrow.

This article, reprinted from the March-April 1945 issue of Shell Progress, is one of a series on post-war community planning subjects

Shell Oil Company, Inc.
50 West 50th St.
New York 20, N. Y.