ENGINEERING

Assembly-Line Homes

Prefabricated houses are now mass-produced like wartime ships and planes. Construction engineers believe this type may soon dominate the smaller-home field.

By A. C. MONAHAN

➤ THE FACTORY mass-production methods that so successfully produced giant airplanes, ships and fighting tanks for war are now turning out ready-made homes in increasing numbers for veterans and other home-lovers. This type of house, many construction engineers believe, will perhaps soon dominate the smaller-home field and largely replace the conventional on-the-spot constructed house.

Prefabricated homes, they are called. Many were in use long before the war, but additional thousands were erected during the war to house workers in war industries and servicemen at or near camps. The public now knows what factory-built homes are. Also the public now has faith in mass-production methods because during the war people learned their value in the rapid and efficient production of war goods.

The public seems to be in a frame of mind to think that these methods can be applied in the building industry to help meet the present pressing need for more homes. Industrialists are of the same mind, too, for many additional companies have entered the prefabricated homes field. Factory buildings where wartime equipment was made are now, in certain cases, being converted for the construction of peacetime homes.

Prefabricated homes, which are shipped in sections to the sites where they will be erected, are not necessarily built entirely in the same plant. Various sections can be made in different parts of the country near the sources of materials to be used; but they are precision-made, so that they fit the sections made elsewhere.

A metal roof, for example, can be made in a metal-working region to fit a building of wood made where timber abounds. During the war large sections of ocean vessels were fabricated far inland and shipped and assembled in shipyards on the coast. Shipyards were largely assembly plants.

Prefabricated homes of the present should not be confused with the ready-cut homes of the past. There will probably always be a place for both. The ready-cut house is erected on the spot with lumber and other material cut to exact dimensions by machinery in the factory. The prefabricated type is built in sections which, at the erection site, are quickly put together permanently with the help of bolts and other fastening devices.

Come in Sections

These sections may be an entire sidewall, end wall, half roof or interior partition in a single piece for a very small house, but usually each is made up of several pieces to be joined on the job. Even plumbing, heating, kitchen and similar equipment is fabricated in the factory, and shipped to the site with the sections of the building itself, ready to be set in place and connected by simple joining devices.

The erection of a completely prefabricated home is a matter of but a few days after the foundation has been laid and outside connections for water, gas, electricity installed exactly where required. The heating, kitchen and bathroom sets can be installed and used before the roof is on the house.

The erection of homes of factory-prefabricated parts is not a new idea. Thousands of such homes were in use long before the war. A well-established industry had been organized, but it greatly expanded to meet war needs, and now is expanding again.

Some of these companies made what was known as removable or sectional buildings. They were built particularly for movable schools, temporary churches, assembly halls and other one-room structures. When no longer needed at one site they could be unbolted and moved elsewhere. Thousands were used in city schoolyards to care for overflow school attendance.

The American prefabricated homes industry is now so well established, and includes so many different manufacturers, that a monthly journal is published in its interests. The journal is not only a "booster" for the industry but a source of information for architects, builders and the public about newer developments in factory-built homes.

War-developed building materials, and others developed during recent years, lend themselves to the prefabrication of houses particularly because of their lightness and strength, and are contributing to the present boom in this type of construction. Included are giant slabs of laminated wood large enough for a one-piece sidewall, new fiberboards, plastics, glass, cement composition ingredients, and the light metals now available and usable because of improvements in the art of welding. Metal houses are popular with many.

The lightness of these materials is an important factor in the construction of sections that must be shipped and handled in transportation and during erection. Lightness alone would be of little value unless strength is combined with it. Many of the newer materials have both, and also have other properties essential in home building, such as heat insulation, and resistance to deterioration from weather, corrosion, fire and vermin.

Laminated wood is of especial interest. Plywood has been used for years for many purposes, but the development of new resins and glues for bonding the thin sheets of wood together, and of an efficient electronic heating method to set the adhesives, makes it now possible to build up boards and beams of almost any size, thickness and shape. These laminated woods may be used for outside walls exposed to the weather.

A recently developed featherweight material of great strength promises to make a substantial contribution to the prefabricated industry. It is a "sandwich" board with a "honeycomb" of cloth or paper between, and firmly bonded to two thin sheets of wood, or between sheets of aluminum, stainless steel or plastics. A practical method of bonding the sheets to the wrinkled honeycomb makes the new material possible. It is claimed to have far greater strength than anything of the same weight now being manufactured.

Nylon hosiery and transparent raincoats are well-known uses of plastics, but far more important, perhaps, are the plastic building materials, even though these are less familiar. There is now a plastic suitable for almost every household

DEMOUNTABLE—Complete roof panels can be placed or removed from a prefabricated demountable house such as the one of the National Housing Agency shown here.

use, including faucets for the water system, inside partitions, outside walls, roofing, and transparent materials to replace ordinary window panes. Some have practically every property required in building and are light in weight as well.

A glass fiber-reinforced plastic deserves particular mention because, in addition to great strength, it can be formed into large pieces of various shapes by powered presses. The manufacturers suggest its use in one-piece rowboats, or as the whole top of a railroad car. The glass fiber reinforcing gives its strength just as steel rods reinforce concrete.

While many of the prefabricated homes shown in catalogs are box-like structures, the greater demand will probably be for those of more conventional appearance, perhaps of the favorite Cape Cod type. A house is not a home to many Americans if it varies too far from the familiar structure. The box-type prefabricated home is economical to build. It fits in well with surroundings in some parts of the country, but a house with the familiar pitched roof is still the favorite.

Something very unusual as a modern home is under development in one of the great war aircraft factories, but it has not yet reached the stage of perfection which warrants advertising. Economy will be its strongest sales point, it is claimed. The sales price may be only 50% to 60% that of prefabricated homes of conventional types.

This house, the Dymaxion, it is called, is round in shape, with a domed roof. It is made of aluminum and has a window of a transparent plastic running in a strip all the way around it. Insulation will keep the inside warm in winter and cool in summer. Ventilation is provided by means of the domed top. It is a two-bedroom affair, with two baths, and will have the so-called unit equipment in its kitchen and bathroom.

Built-in furnishings seem to feature most of the new prefabricated homes. They include heating units, kitchen units, bathroom and laundry units, closets, bookcases, and even beds that store away in the walls during the day.

Typical is a kitchen unit mounted on a base less than eight feet long and narrow enough to be rolled through a door. When set in place, it is fastened to the wall. A few turns of a stillson wrench connects it to the utility outlets, and it is ready for use. It contains a stove, refrigerator, sink, work table and, overhead, cabinets for kitchen utensils. It is the modern prefabricated kitchen for the modern prefabricated home.

Science News Letter, March 23, 1946

PHYSICS

Atomic Scientist Warns Against Misinterpretation

➤ WARNING AGAINST misinterpretation of the experimental atomic bombing of Navy ships at Bikini atoll this spring and summer, Dr. Norris E. Bradbury, director of the Los Alamos Laboratory of the Manhattan Engineer District, said, "The test is not designed to determine conclusively the extent or character of our future naval construction, or to detract from the already fearful potentiality of the bomb as it might be used in another war."

Fearing that too much emphasis has been placed on the number of ships to be used in the operation, Dr. Bradbury explained that many of the ships used will not receive serious damage.

"Many are to carry important instruments which will record data necessary to interpret properly the results of the test," he pointed out.

"The aim of the test," he declared, "should not be to see how many ships can be destroyed and sunk, but to obtain objective and factual information from ships at varying distances with all degrees of damage."

Dr. Bradbury said two difficulties in the test will be the danger of fires that might normally be put out by personnel aboard a ship, and the fact that the ships will be closer together than in a tactical formation.

The atomic scientist warned against misinterpretation of the results of the bombing damage, pointing out that the important effects of radioactivity and radiation can only be determined by technical measurements.

"Only by the most careful, unbiased and technical interpretation in military and naval circles, in the offices of overall military strategy and in the public press can the test be given its proper weight and meaning," declared Dr. Bradbury.

"Nor," he added, "should the people of this country ever forget the appearance of Hiroshima and Nagasaki after only one atomic bomb."

Science News Letter, March 23, 1946

Approximately 50 American *agricultural crops* depend upon honeybees for pollination.

Spectrographs, which determine elements in kind and amount by measuring ultraviolet ray lengths, have been found particularly useful in plant and poison analysis by agricultural chemists; samples are burned to emit the rays.