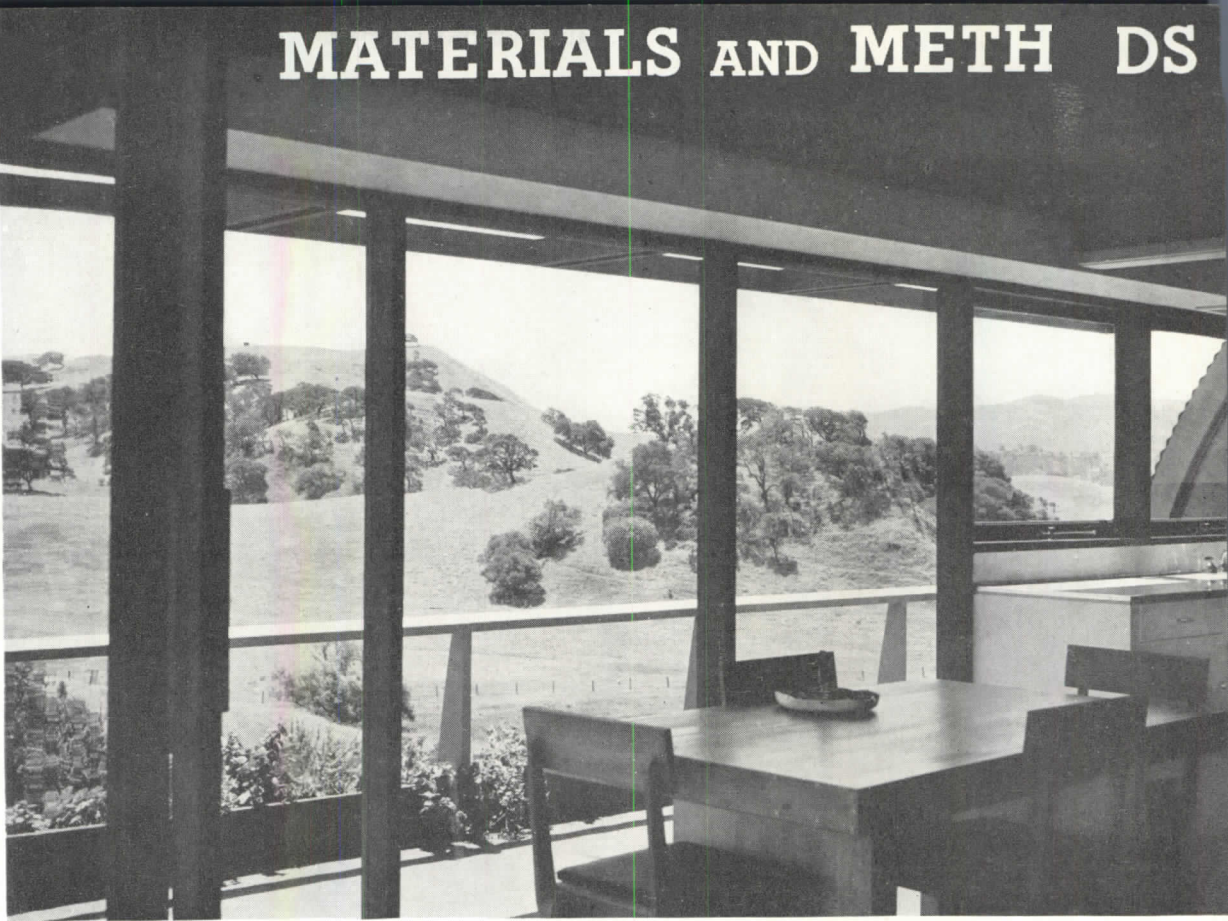


G. Grover

The Gary Grover house at Acalanes, Calif. (Campbell & Wong, architects), can be discussed on the basis of its success as a residence, quite apart from its satisfying adaptation of the mass-produced, light steel Quonset. Beautifully related to the site, the round form recalling rounded hills, its glazed walls are an entirely natural means of emphasizing the delicate yet strong curve of the arch. The shape of the living porch was determined by a large tree which has since been cut down.



MASS PRODUCTION + LIGHT STEEL

THE QUONSET PROVIDES A WORKING EXAMPLE OF TWO INTERESTING DEVELOPMENTS.

By FRANK G. LOPEZ

To a certain extent interest in mass-produced buildings has continued since the recent war, and the search for rational ways of using the less familiar materials has intensified. The wood, heavy steel, masonry, and reinforced concrete upon which we principally depend are all high in cost; perhaps we can get as good—or better—buildings at less cost by using something else.

Some months ago the American Iron and Steel Institute published specifications for design in light steel shapes. Now the average designer has a reliable basis for checking his work in this unfamiliar medium. The effect upon American building could be substantial. Light steel construction would

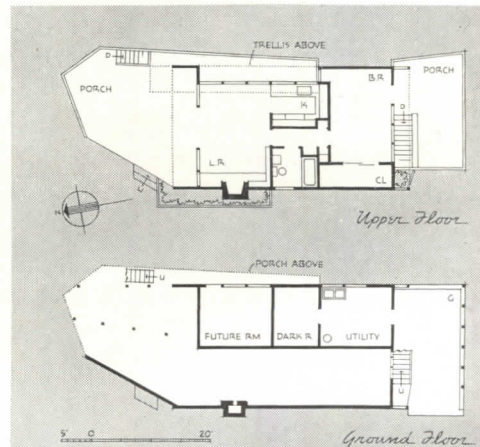
seem more suitable for industrialized production than for custom tailoring at the job because the material is less easy to work by hand in our traditional manner than, for instance, wood; and because substantially larger units than, say, masonry can be shipped economically.

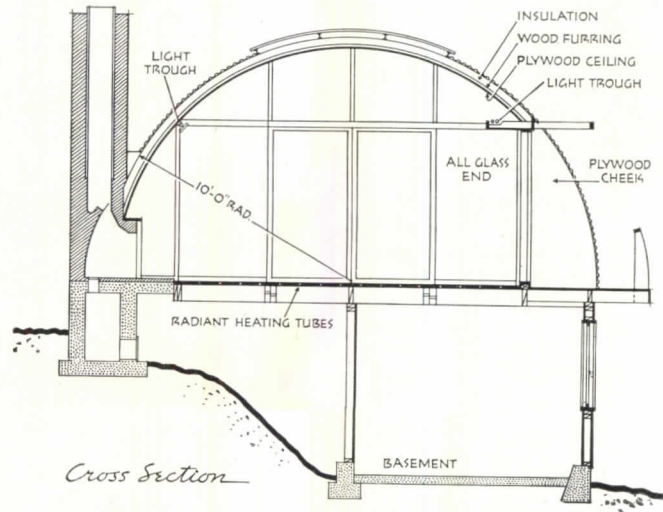
Mass production, industrialized production, prefabrication—what do such phrases really mean in relation to building construction? "Prefab," the most familiar term, has acquired a host of different connotations, from precutting of framing members to assembly of building units in factories either centralized and permanent or set up temporarily at the building site. The term

has been limited almost entirely to housing. Most of our building materials are mass-produced by industrial methods, and are mass-distributed. Wood, clay, stone, metallic ores, sand, etc., are processed in centralized plants into standard shapes, sizes, or small assemblies suitable for handling in distribution and on the job, and are then shipped in quantity to local distribution points. How far can these industrial methods be applied to complete structures?

The Quonset building, manufactured by the Stran-Steel Division of Great Lakes Steel Corporation, is a structurally complete unit produced by industrial methods; it is mass-distributed. To the

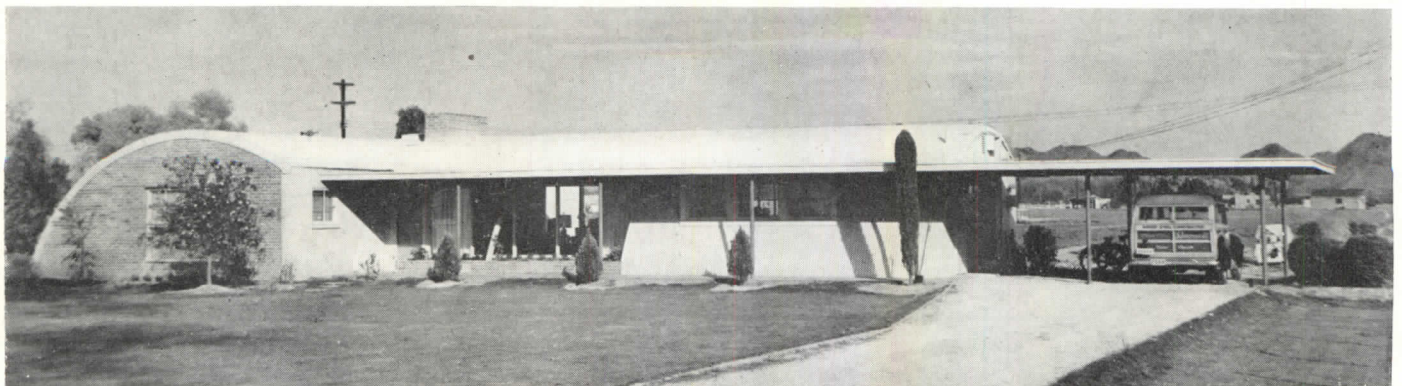
Sonya Noskowiak





Further details of the Grover house: the standard Quonset "20" is modified at the longitudinal glass wall by omitting several normal framing members, a deviation for which the designers take structural responsibility (see text). Note the living room light troughs, which make the most of the curved "ceiling" as a light reflector without rendering it obtrusive. Heating: hot water from the utility room tank circulates through radiant tubing laid between rough floor boards above, to heat both upstairs and down. The round holes of the perforated metal hood, which reduces sky glare and will act eventually as a vine trellis, cast shadows which harmonize with the curved form. Corrugated steel is painted grayed moss green; sash trim and metal trellis, golden yellow; exposed wood, dark green stain.

Sonya Noskewiak photos



Bishop house, Phoenix, Ariz. (T. Lawrence Milligan, architect), has three bedrooms. Two Quonset "24"s are used in a T-plan.

best of our knowledge it is the only premanufactured structure that is at present obtainable with reasonable ease anywhere in the country. As an example of what a truly industrialized segment of the building industry can provide, it merits close examination. What does the Quonset do to design? What can we get out of it? What is likely to be its future?

Familiar to all of us, the Quonset resulted from restudy of the British Nissen Hut, in the course of which Stran-Steel's nailable light steel structural members were incorporated in the building. Its semicircular framing members are shipped in sections; these and the bracing, corrugated sheet steel covering, standard openings, accessories, lugs, etc., are "packaged," so that the buyer receives the complete structural frame and exterior surfacing in units as large as can be handled satisfactorily, ready for job-assembly with nails, screws, and bolts. Along with the materials come standard assembly drawings. Foundations, insulation, interior surfacing, special trim and openings, equipment of any kind, all must be supplied by others. As long as the standard form is adhered to, the manufacturer is prepared to guarantee his product in any reasonable way. As soon as the basic form is substantially altered, the structural guarantee becomes the responsibility of the individual designer or builder.

The manufacturer encourages experimentation; he will furnish complete structural data, for instance, to those who wish to make some unorthodox adaptation and must have load tables, stress diagrams, etc., in order to engineer the adaptation soundly. Certain deviations which do not unduly affect the structure are considered standard; for example, wider-than-normal openings in the curved side walls if they do not necessitate cutting off more than two of the arched Stran-Steel studs. Since these are 4 ft on centers, the normal maximum width of clear side opening is a nominal 12 ft. The buildings are available in four models: Quonset "20" (20 ft wide by 24 ft long, increasing in length by multiples of 12 ft); the "24" (24 ft wide with one vertical side wall, same lengths as the "20"); the "36" (36 ft wide, same lengths as the "40"); and the "40" (40 ft wide, semicircular in section, in any multiple of a 20-ft length). Another type, the "Multiple," has repeating arched roof sections supported on interior columns and beams.

So far there has been only one recorded difficulty with labor, and that rather foolish. In a single case the builder encountered a situation in which ceilings could be sprayed though walls must be brush-painted. (Nobody could tell where walls stopped and ceiling began!) Wide experience has not yet revealed materials which cannot be used in conjunction with Quonsets. It is feasible to employ with them foundations, floors, insulation, interior finish, heating, lighting, and other equipment of any type desired. Dry interior surfacing (plywood, wallboards, etc.) has been successfully used; so have tile or lath and plaster. In discussing costs one must remember their wide variation from place to place, even in the same community under different circumstances, particularly in today's situation; and also the fact that the building frame and shell together constitute only a fraction of the

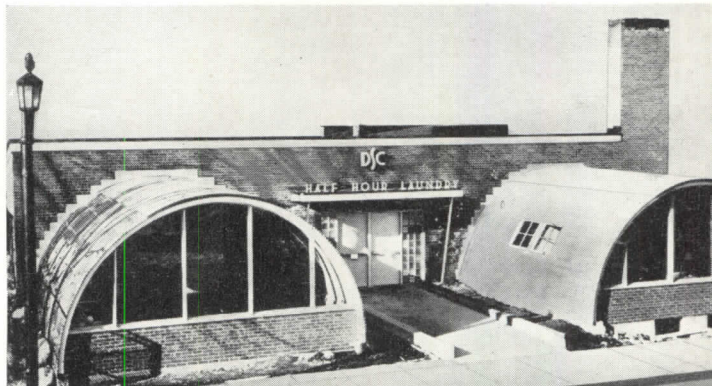
Quonset Village Motel, Colfax, Calif., has 21 Quonset "20" guest houses, Quonset "40" clubhouse 100 ft long.



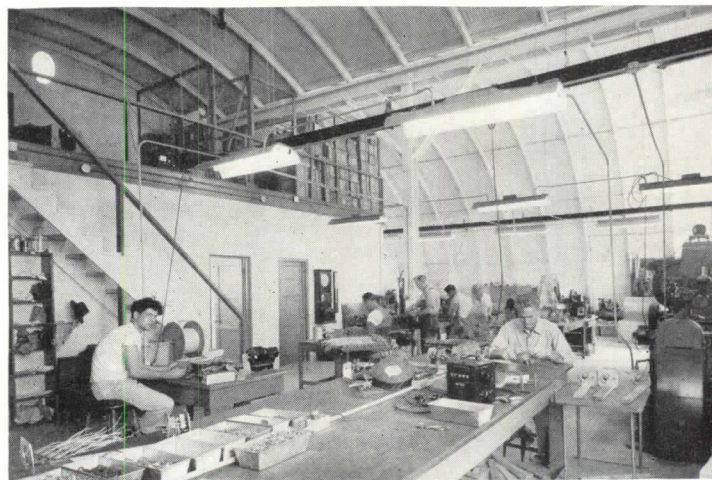
Quonset Inn, Silver Springs, Md., is a "40" with special side entrance.



DSC Laundry, Burlington, Vt. (Freeman, French, Freeman, architects), has, in addition to the two Quonset "20"s visible, a "24" set behind the masonry wall. One front unit houses an office; the other, waiting room and nursery; rear unit, automatic washers.

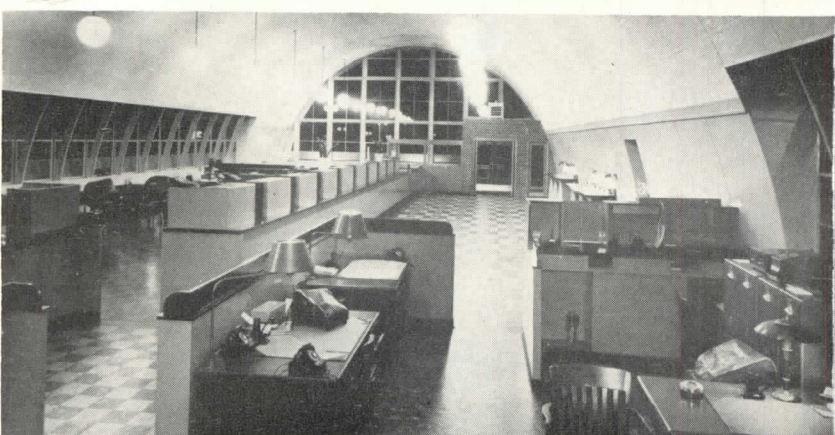


Shop interior, Veterans' Guild of America, a G. I. rehabilitation project, shows adaptability to modern industrial lighting and equipment.



Processing room of a frozen-food locker plant in New Jersey has aluminum interior sheathing to reduce deterioration and maintenance. Note dormer and preparation-counter space so organized that arched ribs do not interfere.

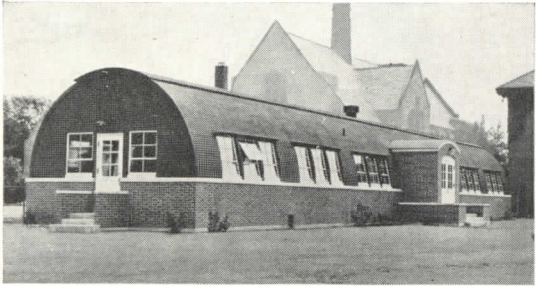




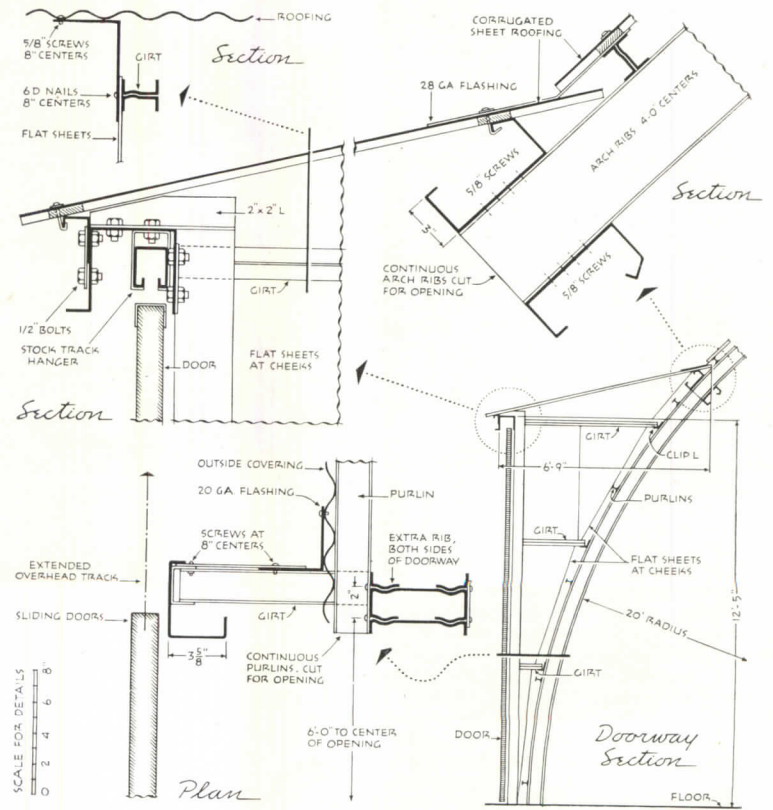
First National Bank, Uptown Branch, Portland, Ore. (Barrett & Logan, architects), is a 40 x 140 ft Quonset. Shell was erected in 4 days, building completed in a few weeks at a total cost of about \$31,400. Interior finish: rubber tile floors over concrete; walls, asbestos board to 8 ft, acoustic board above. Insulation: 2-in. glass wool. Exterior: exposed steel painted in eye-catching stripes, henna, peach, and lime.



The pleasant offices of the Kraftile Co., Niles, Calif.



Nursery school near Detroit, Mich., has a classroom at either end; entry, office, etc., in the center.



Adapted from standard Quonset details, these drawings show how a 12-ft sliding door is attached to the Quonset's curved side wall. Two adjoining arched ribs are cut for this—the maximum structural deviation for which the manufacturer assumes responsibility. Note that structural potentialities of the corrugated steel skin are not fully exploited; structurally the ribs carry the principal load.

total building operation. Stran-Steel has available several "packaged" standard residential models; one of these, known as the *Brighton*, was the subject of a detailed cost breakdown by a reliable contractor in the Detroit area. The *Brighton* is 20 x 36 ft, and is a two-bedroom house with living room, bath, and a utility kitchen containing the heating plant; it has no basement. In March, 1947, for that building erected in that locality, the total cost of a single Quonset ready for occupancy was under \$4,700; for projects of 25 or more, under \$4,400 per house. Of this, \$884.00 per house was the cost of the Quonset shell in both cases. The remainder was accounted for by all the usual items, ranging from permits, surveys, and grading to foundations, flooring, interior finish, heating plant, etc. Cost of land was *not* included, nor was any profit or overhead; these were rock-bottom figures.

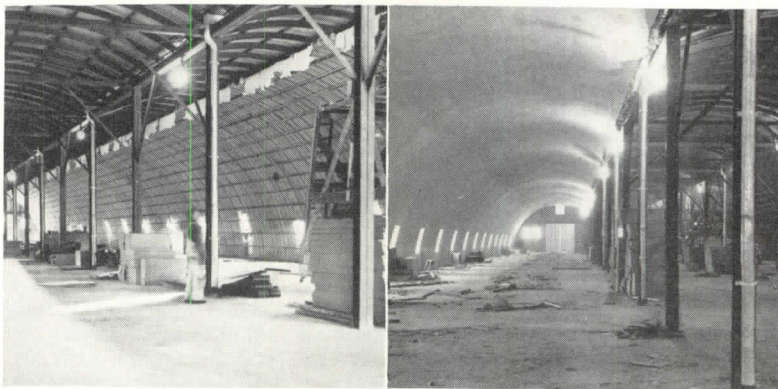
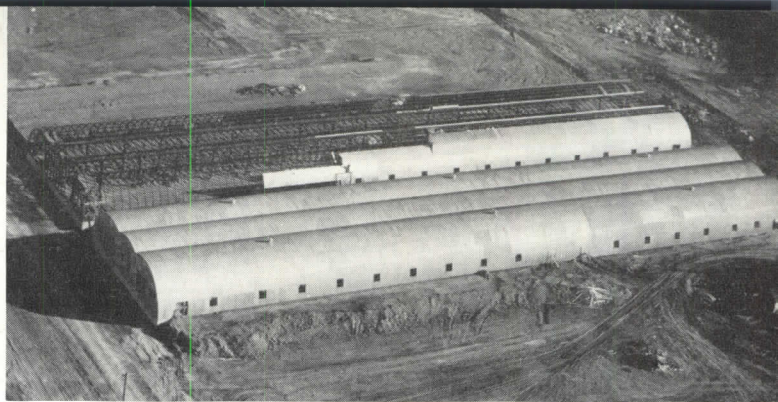
A glance at the accompanying illustrations will reveal only a few of the many different uses to which Quonsets have been put. It is difficult to estimate to what extent their apparent popularity is due to availability and reasonable cost in a time of great demand. However, we know personally of many cases of great enthusiasm, enough at least to balance the indifference of others.

Thus far we have discussed only the practical problems this particular mass-produced light steel building introduces. Esthetically the form is as old as the hills; any student knows the history of the barrel vault which, developed from the simple arch, flowered into the traditional Romanesque. Some know that the indigenous American buildings, at least along the Atlantic Coast, were framed of saplings, brought together and tied at the top, and covered with bark or thatch—the whole very much like a modern Quonset set up on vertical walls. How many know that the British, after they first landed here, lived for years in huts of wattles and thatch, of almost the same design? (The log house came much later, with Scandinavian immigration.)

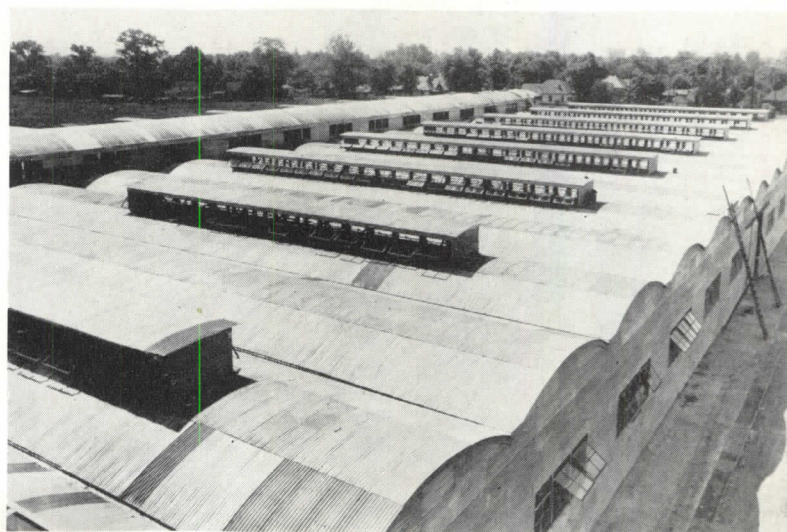
The firm of Campbell & Wong, architects of two houses shown in this issue, prefer not to apply dormers to Quonsets, in order to retain all the simplicity of the barrel form. They are not averse to vertical walls inside the curved plane, and they freely use light horizontal trelliswork and other devices to blend the form with its surroundings, or to accent it without overwhelming it. Theirs is not the only approach; Professor Bruce Goff, now of the University of Oklahoma, combined the Quonset barrel freely with masonry masses, expanses of glass, and delicate horizontals in his famous chapel for the Sea Bees. He has other Quonset projects under way; in one he proposes to join the rib sections so that, instead of continuing the arch to the ground, the roof sweeps upward in an S-curve whose high point, almost twice the usual Quonset height, is held up by mullions that also support a wall of glass.

Between such imaginative concepts and thoughtless slapping up of false fronts to conceal the barrel form there can be all the degrees of excellence one would expect from any architectural material. Thorough knowledge of it, respect for its limitations, and imagination should produce good architecture from the Quonset.

Multiple Quonset plant of York-Shipley, Inc., York, Pa., completed early in 1947. Photos show two triple-bay units; mineral wool insulation being installed; insulating board interior surfacing. F. J. Rempp, Archt.



Special adaptation of Multiple Quonsets; Great Lakes Steel Corp., Terre Haute, Ind.



Three adaptations to farm needs: Quonset set on vertical lower walls forms a barn that is highly satisfactory; interior of a stock barn showing interior metal sheathing, special windows, etc.; a "24" used for implement storage, etc.

