

## AERONAUTICS

# Million-Pound Planes

**Glass and plastics seen as new structural materials. Development of beryllium alloy would be major step in aviation progress. Glider trains to be used for freight.**

► ESTIMATES OF one-and-a-third million pounds as the ceiling on aircraft size were called conservative by H. D. Hoekstra of the Civil Aeronautics Administration in addressing the Air Cargo Engineering meeting of the Society of Automotive Engineers in Chicago.

Factors other than structural limitations will determine size, Mr. Hoekstra stated. Availability of large enough powerplants and development of power-plant drives was called one of the main limitations at present.

New structural materials for aircraft, such as glass and plastics, may well be uncovered by research now under way. Glass fabric has already been used experimentally as a wing covering material. An almost utopian material for planes would result, Mr. Hoekstra maintained, if present properties of glass fibers could be combined into a usable material, possibly through the use of plastics as a bonding agent.

"A tantalizing dream" is all that can be said at present of the metal beryllium, as a direct structural material, he reported. A beryllium alloy with aluminum or magnesium is the most likely development and would be a major step in aviation progress. It would not only have superior strength but would reduce the weight of a plane, such as the Douglas DC-3, by more than a ton.

Recently developed plastics for aircraft have direct military significance and appear to compare favorably with the best in structural metal alloys.

"Aluminum alloy will probably continue as a leader," Mr. Hoekstra admitted, "because of its good strength to weight ratio and the vast accumulation of know-how in manufacturing and in operational maintenance."

Stainless steel is a definite contender, however, where operation involves severe corrosive effects and where the simplicity of spot welding reduces bulk of members and attachment fittings.

Taking issue with some enthusiastic advocates of wood construction, Mr. Hoekstra placed wood in a somewhat lower rank. Modern plywood construction has overcome most past difficulties, he admitted, and is satisfactory in air-

craft up to about 5,000 pounds gross weight. Beyond this value much greater attention must be paid to design and fabrication problems, he warned.

*Science News Letter, December 19, 1942*

## Better Stowing Urged

► MOST MILITARY freight to such out-of-the-way places as Iceland and Alaska is moving by air, and more efficient use of the planes could be obtained by increased adoption of better loading methods, Col. E. S. Evans, president of the Evans Products Company, told the Air Cargo Engineering meeting of the Society of Automotive Engineers.

Until now there has been no scientific method of stowing cargo in freight planes, he declared. The nature of an airplane makes it difficult to fasten heavy objects so that they will not tear through the aluminum sheeting.

"Packing materials must be used that will insure a tight and resilient fastening that will not stretch under impact," Col. Evans recommended.

If cargo is insecure and the plane should wobble, the whole cargo is thrown off center and the plane may crash.

Crates and boxes are also often unnecessarily heavy, he pointed out. If proper loading materials are used, the weight and space occupied by heavy crates and boxes can be replaced with unboxed or very lightly boxed commodities and the payload greatly increased.

Several types of air cargo loading devices were described which have already proven practical in improving efficiency of air freight service.

*Science News Letter, December 19, 1942*

## More Use of Cargo Gliders

► CARGO GLIDERS will not only become increasingly important for military transport but promise to be one of the cheapest methods of post-war freight transportation, Maj. L. B. Barringer, Chief of the Glider Unit, Directorate of Air Support, U. S. Army Air Forces,

predicted at the Air Cargo Engineering meeting.

Use of gliders is now limited to tactical and training purposes in this country, but Maj. Barringer maintains that there is no reason why these silent sky ships will not be practical freight carriers for short-range operations.

We should build up our fleet of cargo planes for military transport, one group of engineers argues; use gliders if they can be designed efficiently for the job, another group proposes. But while the controversy continues, we must go to work on the job at hand, Maj. Barringer urged.

"We must build gliders, if possible," he declared, "that can be used with the planes we already have, to increase our cargo-carrying capacity."

Sky freight trains of several gliders and a tow plane will prove practical for ranges up to a thousand miles or so, Maj. Barringer reported, but probably will not be used for overseas transport.

One gliderful of supplies can be dropped off such a train at a military camp or town. Then by the newly developed pick-up method, the train can swoop low over another station to hook on another glider.

Experiments are continuing to solve the problems involved, Maj. Barringer stated.

*Science News Letter, December 19, 1942*

## AGRICULTURE

## Seed from U. S. Goes To Russian Farms

► RUSSIAN confidence in the ability of the Red armies to retake territory overrun by the Nazi hordes was mirrored in a request received by the U. S. Department of Agriculture as early as last April, for seed "to sow land plowed by German tanks." Tons of seed are now on the way, to grow up as next year's crops.

Seed shipments, agricultural scientists point out, are the most effective kind of lend-lease aid that it is possible to send. Mere ounces of cargo weight grow into hundreds of pounds of food. Moreover, seed symbolizes the will and ability of peoples in the war-pressed lands to help themselves.

In becoming a seed-growing and seed-exporting nation, the United States is reversing the pre-war setup, when we were heavy importers of seed from Europe, especially from Denmark, the Netherlands and France.

*Science News Letter, December 19, 1942*