

AERONAUTICS

Great Circle Route

War developed aircraft equipment makes northern ocean routes usable, enabling transports to fly from New York to Chungking via the Arctic.

► THE "GREAT CIRCLE" route from Seattle to Tokyo, which Army transports will fly on scheduled trips, is but one of several Arctic or near-Arctic routes that will be followed in the future by both commercial and military planes. Distance-saving is the reason; war-developed aircraft equipment makes these northern trans-oceanic flights possible.

The announced Army short route to Japan skims the south-central bulge of the Aleutian islands that stretch from Alaska mainland to Siberian Kamchatka peninsula. Between Seattle and Tokyo planes will make one stop, at Adak, a halfway point. This route is a little more than 4,700 miles, while the present regular route from California to Japan by way of Hawaii and Guam is nearly 8,000 miles.

From New York to Tokyo, following the Great Circle route, planes would travel about 6,700 miles, and would pass over northern Alaska, eastern Siberia and Kamchatka, and the Kurile islands. From Chicago planes would cross Alaska at about the central college city of Fairbanks.

Transatlantic planes now follow Great

Circle routes, or nearly so, in some instances. These are the planes that cross Labrador, and pass just south of Greenland and Iceland. From New York to Moscow by this path, the distance is roughly 4,700 miles, approximately 1,000 miles less than by way of Spain.

Great Circle routes from important American centers to certain Asiatic cities pass close to the North Pole. The route from New York to Chungking, the war capital of China, is one, for example. To reach one of these two cities from the other by air, planes would pass close to the Pole, would travel approximately 7,600 miles as compared with between 11,000 and 12,000 miles via Hawaii. Also from California to Tehran, the capital of Iran, aircraft would cross the Pole, but the air distance is only some 7,400 miles.

The cold weather encountered on these "top-of-the-world" routes no longer is a serious handicap to airplane traffic because of wartime developments. Included are de-icers to keep wings and body free of ice, static dischargers to eliminate troublesome electric charges, accurate altimeters, radar equipment, and loran, by which planes may know their geographical positions at all times.

Science News Letter, September 7, 1946

MEDICINE

Malaria from Transfusion

Blood of a malaria carrier given in transfusion can cause the disease. Two rules are given to avoid transmission of malaria by this method.

► THE DANGER of getting malaria from a blood transfusion has become a real possibility with the return from overseas of sailors and soldiers and a host of non-combatant men and women who were exposed to the disease, two Mayo Clinic physicians warn.

The case of a man who had never been in a malarial region and who developed malaria in December when the temperature was below zero, when it was most unlikely he could have got it in the usual way from a mosquito bite, is reported by Dr. Gerald H. Teasley.

The man had been injured in an automobile accident while away from home and was given three blood transfusions. One of the donors, it was found, was a soldier who had served in the Pacific area for 13 months, taking atabrine daily during that time.

The soldier did not have malaria while overseas, but after his return when he stopped taking atabrine he had five or six attacks. The hospital personnel who examined his blood when he served as a donor did not ask any questions about malaria. A thin smear of his blood

taken after the patient developed malaria showed no malaria germs.

A blood smear with no malaria germs, however, is not proof that a person is free from the parasites, Dr. Teasley points out. No diagnostic test is known which will definitely rule out malaria in a carrier who has been free of symptoms for a long time.

Putting quinine into stored blood at a strength of one to one thousand will not prevent the occurrence of malaria after transfusion, and some scientists have reported that the malarial parasites can live for weeks in blood stored at almost freezing temperature.

Two rules that may help to avoid transmission of malaria by transfusion

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are given by Dr. Thomas B. Magath. These are: "1. If the prospective donor has been in a malarial area and has had an attack of malaria, he should not be used as a donor for at least two years after leaving the zone, provided he discontinued suppressive treatment (atabrine or quinine) then and has not had any recurrences of malaria for at least two years previous to his donation. Before donation a thick smear of blood

should be examined and found to be negative.

"2. If the prospective donor has been in a malarial area and has not had any attack of malaria and for the past year has not taken any suppressive treatment, he may be used as a donor, provided a thick smear of blood does not reveal any parasites. The history of undiagnosed fever or a questionable history should cause the application of rule 1."

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METALLURGY

U. S. Makes Manganese

An electrolytic method developed by the Bureau of Mines may enable steel industry to make its own manganese, eliminating need for imports.

► ANOTHER lesson of the war is that America can produce its own manganese, a number-one essential in making steel. However, it cannot do it yet at a cost low enough to compete with ore from foreign countries. A low-cost method would mean independence from importation.

An electrolytic method, developed by the U. S. Bureau of Mines, details of which have been released recently, may be the answer. During the three years that its Boulder City plant has been in operation, it has produced over a million pounds of electrolytic manganese. This is only a small part of the requirements, however.

Despite the fact that the United States has large deposits of manganese ore, nearly all the manganese requirements of the steel industry before the war were imported, the Bureau states, because most of the domestic ores are low-grade and have proved difficult, and in some instances impossible, to concentrate to ferro-grade by ore-dressing methods.

The Bureau feels, however, that it has successfully demonstrated the technical and commercial feasibility of electrolysis in beneficiating low-grade manganese ores, particularly where the raw materials and electricity are available. It has just issued a publication reporting the process.

For every ton of steel produced in the United States, an average of over 13 pounds of manganese is used. Most of it is in the form of ferromanganese. During 1940, nearly 45,000 tons of manganese were produced in the United States, but over 1,400,000 tons were imported. In 1944, domestic production was

five times as great as in 1940, and importation had decreased slightly.

In the production of ferromanganese, and other usable manganese compounds, America does better. The home production is about four times the imports. Imports of both manganese ore and ferromanganese come in normal times from Brazil, Chile, Cuba and Mexico, in the Western Hemisphere, and from Africa, India and Russia. The Soviet Union occupies a favorable position in steel production because it has, in the Ukraine, iron ore, manganese, limestone and coal all relatively close to each other.

In the steel industry in the United States, open-hearth operations are the greatest users of manganese. The manganese is added to the open-hearth melt as an alloying agent to increase tensile strength, and to remove surplus oxygen and sulfur. Manganese in pig iron is desirable in removing sulfur.

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INVENTION

Automatic Phonograph Holds Records Upright

► AN AUTOMATIC phonograph that holds records up edgewise while it plays them, instead of laying them flat, is the unique invention on which U. S. patent 2,406,355 has been awarded to Joseph A. Darwin of East Orange, N. J., and Robert Robertson of Kearny, N. J.

Instead of one tone arm this instrument has two, with oppositely placed needles. First the record is turned in one direction while the left side is being played, then the direction is reversed, the right-hand needle is set in the playing

groove until that side is finished. Then both tone arms are disengaged, and at the same time the pivot-bearing arms that have held and rotated the record release it and move on to pick up the next.

The records stand on edge with separating sheets between them, more or less like the long-familiar record volumes; the automatic selecting mechanism flips them open at the desired spot and stands up the record to be played so that the mechanism can engage it. If no particular selection is indicated by pushing buttons, the machine will play one record after another all down the row, then start back and play them all again in reverse order. It can, however, be stopped at any point.

It looks as if juke-boxes equipped with this mechanism ought to rake in the nickels faster than ever, since less time is required for changing records. By the same token home-concert enthusiasts bent on a solid evening of Beethoven will find the program flowing more smoothly and with fewer interruptions filled with the noises of clicking machinery.

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GENERAL SCIENCE

Judges Named for Science Writing Award

► SEVEN JUDGES for the first annual George Westinghouse Science Writing Award, sponsored by the American Association for the Advancement of Science, have been announced by Dr. Willard L. Valentine, chairman of the awards managing committee and editor of the journal *Science*.

The judges are: Dr. Morris Meister, director of the National Science Teachers Association and principal of the Bronx High School of Science, New York, chairman; Wilbur Forrest, assistant editor of the New York Herald-Tribune and president of the American Society of Newspaper Editors; W. S. Gilmore, editor-in-chief of the Detroit News; Dr. James B. Conant, president of Harvard University and president of the AAAS; Anton J. Carlson, professor emeritus in physiology, University of Chicago; Miss Sally Butler, Indianapolis, Ind., president of the National Federation of Business and Professional Women's Clubs; and Senator Elbert D. Thomas of Utah.

The \$1,000 award winner for the best newspaper science story of the year will be announced late in December.

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