

# NOTES

## The Norwegian-Swedish-British Antarctic Expedition

This expedition, the financial backing of which has now been secured, is planned to leave Norway in November 1949 for the Western parts of Queen Maud Land, in about long.  $0^{\circ}$ , to spend two winters there and return to Europe in 1952. As this district was claimed by Norway in January 1939, and recognized as a dependency of that country in June 1948, and as Norway is paying far more towards the expedition than either of the other countries, the expedition will sail under the Norwegian flag, and its leader will be Professor H. U. SVERDRUP, the Director of "Norsk Polarinstitut". The wintering group will consist of 14 men, of whom 6 are scientific experts, 2 from each country. This expedition was first proposed by me in Oslo and London in May 1946, and committees appointed for that purpose by the three countries have since been cooperating in working out the plans.

The part of the interior of Queen Maud Land situated between long.  $10^{\circ}$  W and  $20^{\circ}$  E and lat.  $70^{\circ}$ — $73^{\circ}$  S, was preliminarily surveyed from the air by the German "Schwabland" Expedition in 1938—39. The resulting photographs and reports in "Deutsche Antarktische Expedition 1938—39" (Bd. I—II, Leipzig 1942) indicate that this district is extremely interesting, especially from the glaciological and climatological points of view. Areas free of ice and snow at the feet of high mountain massifs form "oases" in the ice desert, surrounded by the inland ice. Into these areas flow local glaciers of various sizes and morphological types, which have left terminal moraines there from recent stages of greater extension than now. Similar conditions occur in the mountain districts E. of  $20^{\circ}$  E, which were air photographed on U. S. A.

operation Highjump in 1946—47. There are also high mountain massifs W. of  $10^{\circ}$  W., seen from long distances by the German expedition, but as yet unknown.

The expedition is exclusively scientific. It is no voyage of discovery. Its object is to increase, primarily by geophysical methods, our knowledge of the ice, atmosphere, and bare parts of the earth's crust, which is of importance to a true understanding not only of local, but also — and particularly — of world-wide conditions. The object is in other words strictly specialized in order to attain generic results.

The Expedition's program of scientific work will be divided into the following three main parts: 1) Glaciology, for which Sweden will be responsible, 2) Meteorology, for which Norway will be responsible, and 3) Geology, for which England will be responsible.

The glaciological work will be done at Headquarters, by flights over the mountain districts, and by excursions with them on dog sleds and weasels.

The most important Base Station task will be to study the physical properties of the inland ice, which is of the high polar type, i. e. its temperature is below melting point to a considerable depth. For that purpose we want to record its temperatures, at different depths down to about 100 m, during a period of at least  $1\frac{1}{2}$  years by electrical resistance thermometers. Our knowledge of the thermal conditions of the inland and shelf ice is inadequate but our knowledge of their crystallographic structures is even more deficient. We shall therefore try to obtain, through drilling an undisturbed, about 150 m long core. Technically, the most difficult problem is to remove the cuttings from the deep hole. A.

U. G. Straitline boring machine from the Canadian Longyear Co. will be used. The structure of the upper parts of the frozen firm will also be carefully examined in open shafts. Besides these more specific investigations, the amounts and different kinds of accumulation material (direct precipitation and snow drift) will be determined, as well as the ablation quantity (melting, evaporation, and wind corrosion).

The wintering party will have one full summer, two springs, and at least one autumn at its disposal for investigating the mountain areas, which will be photographed from the air as soon as possible for comparison with the photos still extant from the German expedition. The most important object of these regional studies is to ascertain whether the recent climatic fluctuation, which has proved of so great importance in the Arctic, also includes the Antarctic or not. Thorough and detailed study would be devoted to the most interesting districts and their local glaciers, surrounded by the open inland ice or its more or less broad arms.

The meteorological program includes not only the usual recordings of temperatures, humidity, and wind at ground level as well as at various heights on a ten meters high mast, but also all determinations of incoming and outgoing radiation, necessary for a calculation of the heat economy of the snow and ice surfaces. We attach special value to the daily launching of radiosondes and radar-wind measurements in anticipating suitable cooperation with other stations in the Antarctic and adjacent continents to facilitate the interpretation of the data from our own station.

In addition the Base Stations activities listed above regular observations will be made of earth magnetism, cosmic radiation, the ozone layer, and the aurora borealis.

As already said, Great Britain will be responsible for the geology. No man has yet set foot on the large snow- and ice-bare regions of Queen Maud Land. Judging by the German photographs, widely different kinds of rocks and complicated tectonics must be expected there. Both crystalline and sedimentary rocks obviously occur there, the former including both schists and diabases. It also seems as though these would to a greater extent than the other kinds be associated with a more placid and even topography. What is most startling is the violent acuity of the alpine topography characterizing the mountain massifs in general and especially those in the area enclosed by long.  $0^{\circ}$ — $10^{\circ}$  E and lat.  $72^{\circ}$ — $72^{\circ} 30'$  S. The highest, acutely pyramidal peak has rightly been called "Matterhorn"; it would perhaps be even better characterized by the name "Kinchinjunga". These mountains accentuate still more the new and essential problems associated with a full appreciation of the Antarctic and the world's Ice Age, which are presented by Queen Maud Land. In any case it is of the greatest importance to a full understanding of the geological, tectonic, and topographical character of the Antarctic and its relations to the general structure of the southern hemisphere that these areas should be examined as extensively as possible by modern methods and from modern points of view.

HANS W:SON AHLMANN

## Swedish Meteorological Research 1939—1948<sup>1</sup>

To a considerable extent the scientific meteorological activities in Sweden during the war suffered from the competition with the practical meteorological work made necessary by the war conditions. Nevertheless a number of investigations of a more general bearing have been carried through and published.

<sup>1</sup> Based on a report to the meeting of U. G. G. I. at Oslo in 1948.

A brief survey of the essentials of these researches will be given below.

*Aerology.* A detailed examination of a cyclonic disturbance passing over north-western Europe 17—18 October 1935 has been made by A. NYBERG 1942 and E. PALMÉN with due regard to all available upper air data. Among the results may be mentioned that the upper tropical air was moving ahead of