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THE GERMAN SPITZBERGEN EXPEDITION IN 1962

by W. Pillewizer

- East Germany -

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Following is a translation of an article by W. Pillewizer in the German-language periodical Petermanns Geographische Mitteilungen (Petermanns Geographical Reports), Vol 106, No 4, Gotha, 15 December 1962, page 286.7

In the second number of this volume was a report on a glaciological expedition to Spitzbergen sponsored by the National Committee for Geodesy and Geophysics of the German Democratic Republic (Nationalkomitee fuer Geodasie und Geophysik der DDR). At the end of August, the exploration party was brought back by the exploration ship "Professor Penck" provided by the Institute for Oceanography (Institut fuer Meereskunde) in Warnemuende.

which was the same ship on which they had left.

Unfortunately, unusually unfavorable ice conditions, such as had last been seen in 1929, were encountered before the coast of Spitzbergen. The entire west coast from the southern tip to 79°N, was still blocked with thick fields, from 50 to 80 kilometers wide, of two year old sea ice on the twelfth of July, so that even entrance into the ice fjord for freighters and passenger ships was impossible. The drift ice fields before the southwest coast lay especially thick and blocked the Horn Sound for the entire summer. Despite three attempts and despite the reconnaissance of the ice by a Soviet helicopter from Barentsburg, the "Professor Penck" did not succeed in approaching the Horn Sound, which had been the expected territory of exploration, so that in northwest Spitzbergen a new territory to work in, ice-free Kings Bay, had to be sought for.

In the time from June 24th to August 15th extensive cartographic photography was carried out, the most important glaciers were thoroughly investigated, geomorphological and ecological studies in the periglacial area were undertaken, and the anticipated ionospheric investigation program was successfully carried out. An area of 350 square kilometers was photogrammetrically

recorded at a scale of 1:25,000; this area includes all of the large glaciers of Kings Bay, on which motion studies by photogrammetric methods were carried out. Especially significant are the measurements on the four kilometer wide Kongsvegn, the main outlet of the Kongsbre (Kings Glacier). The author found a daily speed of two to four meters and block movement for the glacier in 1938, which is still no doubt present, as the surface of this glacier, which in 1962 appeared even more torn up than in 1938, reveals. In order to apprehend the massive calves of this glacier, which thrusts off an estimated one million cubic meters of ice daily into Kings Bay, the fifty meter high front was photogrammetrically measured twelve times from the same position. Similar measurements were also carried out on the other large glaciers; they revealed rich material on the motion of calving glaciers, which however must first be evaluated.

A small glacier terminating on the land, the middle Loventre, was photogrammetrically recorded with great precision at a scale of 1:10,000 in order to obtain cartographic bases for the study of the quantity of ice present. On this glacier, which is only five kilometers long, motion measurements in two profiles and ablation measurements on eighteen gauge rods were undertaken; in

addition, the total runoff of the glacier was determined at two gauge rod stations by the salt dilution method. In order to understand the heat balance on the surface of the glacier, a meteorological station was installed on the ice of Lovenbre. From the readings recorded there, the most important components of the energy balance, namely the amount of radiation, heat conduction and evaporation can be obtained, from which there results the quantity of heat available for ablation. The direct measurements and the calculated values of the ablation are to be compared with the quantities of runoff in the glacier basins. The ice balance investigations will produce insight into the present condition of the glacier of the territory of exploration, the general retreat of which to be sure is evident. This nevertheless does not exclude the fact that some individual glaciers on the north side of Kings Bay are plainly in the process of advancing. The evaluation of the maps, when compared with the representations of the maps of earlier expeditions (1906, 1936) will presumably provide information on this.

The geographical investigations of the expedition do not stand in direct connection with the complex investigations on present glaciers; they concern the foreground of the present glaciation. It is in essence a

question of periglacial morphological investigations and of the exploration of the ecological relations of typical forms. On the Love island of Leirholm, which supposedly first became free of the ice of Kongsvegn in the last century, especially favorable conditions for these studies were found. For comparison, the differently composed Love island of Midtholm as also the terrain on Oasian Sarsfjell were brought into the investigation. For the purpose of soil scientific studies, extensive excavations were undertaken, and soil temperature and moisture measurements together with grain size determinations were carried out as well. A plant geographical survey sheet was prepared on the well grown over island of Midtholm. The geographical territory of investigation was topographically recorded using a very large scale, in order to create the most exact base for the preparation of a survey sheet of the soil, and of geomorphological and vegetation conditions.

The ionospheric investigation program was carried out in a station especially constructed for this purpose in the vicinity of the settlement of Ny Alesund. In this location were available not only electricity from the mine installation but also especially favorable possibilities for the attachment of long antennas on a 35

meter high airship mast, which is still standing there from the time of the polar flights of Amundsen and Nobile. The ionospheric investigations in these high latitudes aided the study of the propagation conditions of long and medium waves during the polar day.

The evaluation of the extensive scientific material which the expedition brought back will still require more time. The topographic and glaciological results which can be expected will not only significantly extend our knowledge of the glaciation of this part of Spitzbergen, but will also presumably yield new material on the theory of the motion of glaciers.

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