STUDIES IN GLACIER PHYSICS ON THE PENNY ICE CAP, BAFFIN ISLAND, 1953

Introduction

Studies in glacier physics formed a major part of the work of the Baffin Island Expedition, 1953, the second expedition of the Arctic Institute of North America to Baffin. This work will be reported in a series of articles in this journal ; the first (Part I) appears below ; further parts will follow in due course.

It was decided to visit the Penny Ice Cap of the Cumberland Peninsula as a sequel to our work on the Barnes Ice Cap in 1950, since it is the only other large area of glaciation in Baffin Island and because our knowledge of the glaciation of the eastern Canadian Arctic is still very limited.

From a study of the aerial photographs taken by the Royal Canadian Air Force in 1948 and the map, together with a consideration of the general resources of the expedition, it was planned to land a glacio-meteorological camp (Camp A1) by means of a Norseman aircraft on a high dome of the ice cap and another camp in the region of the firn line of one of the more accessible glaciers (now called Highway Glacier) flowing into the head of the Pangnirtung Pass (see Figs. 1 and 3, pp. 343 and 347). Here there are two lakes, which were considered to be suitable for spring and autumn aircraft landings and for a base camp. From the two glacier camps it was planned to assess the particular regimen of the glaciation and to couple with this studies of some more general problems in glacier physics.

This plan was duly carried out. Base Camp was established on the shore of Summit Lake at the head of Pangnirtung Pass on 16 May by the late W. R. B. Battle and B. Bonnlander, who maintained regular weather observations, and later the same day Svenn Orvig and the authors set up Camp A1 at an altitude of 2080 m. A few days later the Swiss seismic sounding group, headed by Hans Röthlisberger, were landed at Camp A2 and worked down Highway Glacier to Base Camp in the course of the summer. Camp A2 was not occupied permanently after early June, and for convenience a new permanent camp (A3) was put up at a lower level adjacent to a delightful "Concordia Platz" on Highway Glacier (see Fig. 3).

Camp A1 was the first to be evacuated. On 10–13 August four of us man-hauled 800 lb. of equipment down Coronation Glacier, probably the largest valley glacier in Baffin, and from the ice-infested head of Coronation Fjord the party was transferred to Base Camp by a Canso flying-boat of the Royal Canadian Air Force. The other glacier camps were evacuated down Highway Glacier, which was last visited on 22 August when fresh snow up to a week old covered the surface above 750 m.

W. H. W.

Part I: A DESCRIPTION OF THE PENNY ICE CAP, ITS ACCUMULATION AND ABLATION

By W. H. Ward *and* P. D. Baird

Abstract. The Penny Ice Cap on the Cumberland Peninsula of Baffin Island, N.W.T., Canada, was studied during the summer of 1953. This ice cap has an area of some 5900 sq. km. and rests on a 2000 m. high mountain range. It has ten major outflowing glaciers, three of which reach the sea in fjords. The progress of snow accumulation and ablation and the net annual loss or gain of water at various altitudes on the ice cap are recorded. The firn line is at about 1550 m. and the outflowing glaciers are noticeably retreating.

Résumé. Nous avons étudié pendant l'été 1953 la calotte de glace dite "Penny" à Baffin Island, Canada. Cette calotte, d'une superficie de 5900 km carrés environ, reste sur un massif dont l'hauteur est 2000 m environ. De cette calotte découlent dix grands glaciers dont trois atteignent jusqu'à la mer dans des fjords. On a étudié l'accumulation et l'ablation de neige dans la calotte et on a également noté la crue ou décrue annuelle nette d'eau aux l'altitudes diverses. La ligne du névé est située à 1550 m environ et il est clair que les glaciers sont en retrait.