

REVIEWS

GLACIAIRE ET PÉRIGLACIAIRE DE L'ATA SUND NORD-ORIENTAL GROENLAND.

MARC BOYÉ. *Expéditions Polaires Françaises. Missions Paul-Émile Victor. I.* Paris, 1950. 176 pages, 37 plates, 26 text-figures, a morphological map. (English summary 2½ pages.)

THE expeditions to Greenland under the leadership of Monsieur Victor have already achieved widespread interest and acclaim. Their programme of scientific work represents as ambitious and as exacting a project as almost any that has ever been attempted in Greenland. Monsieur Marc Boyé's paper is the first detailed account of one of the many aspects of this programme. It is based on a part of the investigations, under the general direction of Monsieur André Cailleux, in the fields of Natural Science and Physical Geography. It embodies the results of morphological survey of the area around the base in Ata Sound from which the major ice cap operations were launched. The area chosen for investigation might thus seem to be random and incidental, but, even if the reviewer can testify that it is neither entirely representative of the West Greenland coastal areas, nor adequate to demonstrate their glacial or periglacial features and phenomena as a whole, it has amply justified the detailed study to which the author has subjected it. Apart from these considerations, it must have been of obvious and complementary importance that the area should be closely examined if only to obtain all evidence relevant to the glaciological investigations on the adjacent ice cap.

Immediately to the north of the base in de Quervains Havn, there are two large glaciers, Kangilerngata Sermia and Eqip Sermia; but no detailed glaciological investigation of them appears to have been attempted. An outline of the Precambrian lithology and structure, which is given in the text, might have been more illuminating had it been presented on a map; and the excellent morphological map is not entirely satisfactory without reference to a topographical one. Gravitric measurements, by J. Martin, of the thickness of the ice cap at various points near the margin, are quoted. They reveal irregularity in the sub-ice cap surface. The problem of pre-glacial topography is carefully examined.

Throughout, the presentation is leisurely but systematic and persuasive. The diagrams and photographs are mainly good. Two very diagrammatic and oversimplified versions of extrusion flow seem to serve, in relation to such an important and controversial hypothesis, no useful purpose whatever. There is no reference to the important work in Greenland of Max Demorest; nor is there any mention of the recent work of M. F. Perutz, which seems conclusively to disprove the hypothesis of increased velocity at depth (*Journal of Glaciology*, Vol. 1, No. 5, 1949, p. 249 and No. 7, 1950, p. 382).

The author's chief interest appears to have been the manifold effects of frost-action (frost-heaving, solifluction, etc.), and, impressed by the manifestation of its power in the investigated area, particularly (by inference) during the periglacial phase immediately preceding the advance of the ice cap to the sea, he has postulated that ice sheets and glaciers erode mainly by pushing and transporting already frost-riven material rather than by deep excavation. A considerable amount of evidence is adduced in support of this contention.

This paper, indeed, represents the most detailed work of its kind hitherto attempted in Greenland. In addition, through his examination of an area from which an ice sheet has only recently retreated, the author has convincingly demonstrated that the morphogenetic approach to the problem of glaciation by ice sheets can be very rewarding. One can now look forward with augmented interest to the results of the more empirical investigations on the ice cap.

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