

from established photo stations that had been occupied at various times during the last 50 years by Moffett and Péwé.

Structure. The structural studies were directed mainly toward the mapping of foliation. Dips and strikes of the folia were mapped in detail with Brunton compass and fixed by bearings taken from known points. An arc pattern of foliation is displayed between the ice falls and the terminus; the dip of the folia becomes in general less steep down-glacier. In the main ice stream on the east an indistinct half-arc is present. Near the margin of the glacier, and adjacent to moraines the foliation is dense, with very steep dips.

Transverse, en echelon, splaying, and chevron crevasses were plotted with the aid of air photographs. Forbe's bands and sedimentary layers also occur and were plotted. A series of faults is present in the terminus and was mapped by plane table.

Geophysical measurements. Gravity measurements were taken along two controlled transverse sections by Rex Allen of the Branch of Geophysics, U. S. Geological Survey through the co-operation of David F. Barnes, Geophysicist. *Glacial geology.* Moraines of at least two recent advances were mapped. Lichenology was used exclusively for relative dating inasmuch as the area is above tree line. It is expected that the advances can be correlated with those in 1750 and 1850 of the Canwell, Castner, and Black Rapids glaciers to the north, where both lichen and tree-ring studies have been made.

TROY L. PÉWÉ

A STUDY OF GLACIAL GEOMORPHOLOGY IN THE NORTHERN TORNGAT MOUNTAINS, LABRADOR

This study was begun in 1959 and continued during the field season of 1960, when my wife Inger-Marie acted as assistant and we spent a little over 9 weeks in the field from early July to mid-September.

Base camp was set up at the northern end of Eclipse Channel and from there several journeys of 3- to 8-day duration

were made. North Aulatsivik Island and the area to the north toward Telliaosilk Fiord were studied. Lack of a canoe prevented the crossing of Eclipse River, and the area to the south of it could therefore not be visited.

Study of the post-glacial emergence shows a discontinuous displacement of the strand-line. Three well-developed strand-lines were found at 40 to 56, 26 to 36, and 15.5 metres above sea-level. The two higher ones slope to N. 25° E. at a gradient of 1:1000 and 1:1650 respectively for the higher and lower. Isobase-directions for these two levels are found to be approximately 115—295°, and a map with contour lines showing the former sea-levels has been prepared. The lowest strand-line shows no tilt and is regarded as horizontal.

An equal-distance diagram has been plotted and shows that a major transgression took place in northern Labrador prior to the formation of the lowest strand-line. At Port Burwell the sea-level rose some 12 metres above the level it had during the formation of the next higher strand-line.

Fossil marine molluscs were found in the base-camp area up to 32 metres above sea-level. A shell sample taken at 29 metres has been submitted for radio-carbon dating through the Geographical Branch, Department of Mines and Technical Surveys. The result will provide the first absolute date for any late- or post-glacial event on the Labrador coast.

Mr. V. Conde of the Redpath Museum, McGill University has kindly determined the molluscs and found a boreal-arctic fauna. *Mya truncata*, *Hiatella arctica*, and *Astarte borealis* are the dominant species.

Several terminal moraines were located, e.g., along Telliaosilk and Noodleook fiords, on North Aulatsivik Island, in the base-camp area, and Eclipse Valley. The study of strand-lines has made a correlation between them possible.

The maximum extent of the (last?) glaciation was studied and the upper trim-line and kame-terrace levels that have been found farther south¹ were

found also in this area. On the southern side of Telliaosilk Fiord they lay approximately 500 feet lower than at Kan-galaksiorvik Lakes.

The results of the two field seasons will be worked up and presented as Ph. D. thesis at McGill University in 1961.

Financial support for the field work was provided by a grant from the Banting Fund through the Arctic Institute of North America and by the McGill-Carnegie Arctic Research Program. Air transport from Nain to the Torngat Mountains and back to Goose Bay was generously provided by the British Newfoundland Exploration Company, and I am much indebted to Dr. A. P. Bevan and Mr. Piloski for their help.

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¹ Ives, J. D. Glacial geomorphology of the Torngat Mountains, northern Labrador. *Geo. Bull. No. 12:47-75. 1958.*

COMMENTS ON "CARNIVOROUS WALRUS AND SOME ARCTIC ZOONoses"

In this interesting paper (*Arctic* 13: 111-22) F. H. Fay suggests that polar bears and walrus contract trichinosis primarily from the flesh of ringed and bearded seals. I do not necessarily dispute this, but I do suggest that Fay unduly discounts other sources of infection.

Bears are omnivorous scavengers and at times will eat, or try to eat, the most unlikely substances. Armstrong¹ gives the stomach contents of a bear shot in Prince of Wales Strait as a few raisins, small pieces of pork fat, some tobacco leaves, and two pieces of common adhesive plaster. I have known them to chew into cans of engine oil. They walk long distances overland and along the shore and must frequently find carcasses of foxes, small mammals, and occasionally of other bears. That polar bears do not hesitate to eat the flesh of their own species is well known. Cases are mentioned by Edvard Bay² and by Stefansson³, and I have had caches of bear meat broken into and partly eaten by other bears. Occasionally cubs may be killed deliberately and eaten^{4,5}.

In 1958-9 the Eskimos at Resolute reported that bears were eating trapped

foxes, and during the same season five out of 25 fox diaphragms examined were infected with *Trichinella*⁶. In 1949 on Prince Charles Island we saw places where bears had turned over stones, presumably in search of lemmings. (cf. Ref. 4, p. 110). When lemmings are really abundant it would be possible for a bear to obtain considerable numbers with very little effort. In the areas where ground squirrels are common it is not unlikely that these are also sometimes eaten. In the past when Eskimos abandoned their dead or gave them a very perfunctory burial, even humans may have been a source of infection.

Fay dismisses a bear — walrus — bear cycle as altogether untenable, for, he says, bears rarely eat walrus and there is no evidence that walrus ever eat bears. I do not wish to suggest that a bear — walrus — bear cycle is the main cause of trichinosis in either species, but it cannot at present be dismissed as an insignificant factor. Admittedly, direct evidence that walrus eat bear meat is lacking, but according to Fay (Table 1) only 201 walrus stomachs containing food have been examined, and the incidence of trichinosis in bears is so high that the eating of bear meat by walrus could be a most unusual occurrence and yet be an important factor in the cycle.

According to the Southampton Eskimos and my own observations, there is usually a live bear on Walrus Island and not infrequently one or two dead ones. The Eskimos consider that the latter die after having been wounded by walrus. Freuchen (Ref. 4, p. 109) also found a bear that had been killed by a walrus, and Giaever⁷ gives a graphic though secondhand account of a herd of walrus killing a bear in the water. It is reasonable to suppose that pieces were eaten by those walrus that were carnivorously inclined. That walrus will eat large animals other than seals is attested by Pond Inlet Eskimos, who observed one feeding on a live Greenland shark⁸. On the other hand, if bears are attracted to Walrus Island by the walrus, it is probable that they occasionally succeed in killing one⁹. They also must frequently find walrus carcasses washed up on shore or floating