CORRESPONDENCE

The Editor,

Journal of Glaciology

SIR, *Note on the paper "Flexure of a floating ice tongue"*

It has come to my notice that one of the analyses presented in my paper (Holdsworth, 1969) for the bending of an elastic model ice tongue is essentially the same as one given by Robin (1958). The works are independent but Robin's work takes precedence and I regret that his work was overlooked.

There is also a drafting error in Figure 4 (p. 390) of my paper where the distance $w_a - w(x)$ should refer to the vertical height of the top surface of the ice tongue above the hydrostatic equilibrium position which corresponds to the "depressed position" at a large distance from the hinge line.

Inland Waters Branch,
Department of Energy, Mines and Resources,
Ottawa, Ontario, Canada
15 October 1970

G. HOLDSWORTH

REFERENCES

Holdsworth, G. 1969. Flexure of a floating ice tongue. *Journal of Glaciology*, Vol. 8, No. 54, p. 385–97.
Robin, G. de Q. 1958. Glaciology. III. Seismic shooting and related investigations. *Norwegian-British-Swedish Antarctic Expedition, 1949–52. Scientific Results*, Vol. 5.

SIR, *Flexure of a floating ice tongue: comments on Dr G. Holdsworth's letter*

I would like to express appreciation of Dr Holdsworth's letter. May I point out that Robin (1958) also presented some relevant observational data, which possibly remain the only relevant observational material available. The observations indicated that there was rough quantitative agreement between the elastic theory of bending and the position of tension cracks, the amount of surface stretching and the observed bending of the surface near the grounding line. There also appeared to be some non-elastic yielding of the ice to which attention was drawn and Holdsworth's paper contributes some new relevant theory on this point.

Scott Polar Research Institute,
Cambridge CB2 1ER, England
11 January 1971

G. DE Q. ROBIN

REFERENCE

Robin, G. de Q. 1958. Glaciology. III. Seismic shooting and related investigations. *Norwegian-British-Swedish Antarctic Expedition, 1949–52. Scientific Results*, Vol. 5.

SIR, *Cold glaciers in the central Transantarctic Mountains, Antarctica: dry ablation areas and subglacial erosion*

In the course of glacial geological work in the central Transantarctic Mountains in 1964–65 and 1969–70 (Mercer, 1968, in press), I have observed some properties and activities of cold glaciers that may be of glaciological interest.

At high elevations, independent glaciers with permanently dry ablation areas occur; ablation is solely by sublimation, except perhaps for a small amount of mechanical deflation. An example of such a glacier (Fig. 1) is on the north-west side of Heathcock Peak, in the Caloplaca Hills adjacent to Reedy Glacier (lat. 86° 06′ S., long. 130° 40′ W.; snout elevation about 1 800 m). No measurements were made on this glacier but, on a blue-ice distributary lobe of Reedy Glacier at a similar elevation, sublimation averaged 7.5 mm of ice/week between mid-November 1964 and mid-January 1965. Because of the complete absence of run-off or surface melting, this is a more extreme type of polar glacier than Meserve Glacier in the Transantarctic Mountains of south Victoria Land (lat. 77° 35′ S., long. 162° 23′ W.; snout elevation 440 m), where about 55% of the ablation is by sublimation (Bull and Carnein, 1970).

No basal ice movement was measured on Meserve Glacier. However, there is evidence that in the same climatic environment (average annual air temperature about —40°C), as with the small cold glaciers with dry ablation areas, large glaciers can both pluck and abrade their beds. These glaciers are probably, but not certainly, cold at their bases.

Fig. 1. Cold glacier with a dry ablation area; Heathcock Peak (lat. 86° 06′ S., long. 130° 40′ W.).

Plucking is shown by englacial rock debris that reaches the surface of McCarthy Glacier, a tributary of Reedy Glacier, in a blue-ice area of net ablation, adjacent to Mims Spur (lat. 86° 03′ S., long. 125° 40′ W., elevation 1 900 m). The material consists of fresh and unweathered granitic fragments of all sizes from gravel to boulders 3 m in diameter. McCarthy Glacier is a local glacier that originates on the nearby Wisconsin Plateau, and the granitic debris must have been quarried beneath the glacier, probably where the ice descends steeply from the plateau.

Abrasion is shown by abundant striated clasts in the modern and recent (ice-cored) moraines on the east side of Buckley Island, a nunatak in upper Beardmore Glacier (lat. 84° 55′ S., long. 164° 30′ E.; elevation 1 800 m). Probably the abrasion occurs a short distance up-glacier beneath the Shackleton Icefalls. At the sampling point, chosen at random, more than half the clasts, of cobble size and larger, on the surface (excluding those of sandstone and shale) were striated; this would be an unusually high proportion even for till from a temperate glacier. The abrasion is evidently the result of exceptional local factors, perhaps fast-moving ice, because elsewhere alongside Beardmore Glacier—for instance, in the Dominion Range or on The Cloudmaker—no striated clasts were found.

J. H. Mercer

Institute of Polar Studies,
Ohio State University,
125 South Oval Drive,
Columbus, Ohio 43210, U.S.A.
8 November 1970

REFERENCES

Bull, C. B. B., *and* Carnein, C. R. 1970. The mass balance of a cold glacier: Meserve Glacier, south Victoria Land, Antarctica. [*Union Géodésique et Géophysique Internationale. Association Internationale d'Hydrologie Scientifique.*] [*International Council of Scientific Unions. Scientific Committee on Antarctic Research. International Association of Scientific Hydrology. Commission of Snow and Ice.*] *International Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, New Hampshire, U.S.A., 3–7 September 1968*, p. 429–46.

Mercer, J. H. 1968. Glacial geology of the Reedy Glacier area, Antarctica. *Geological Society of America. Bulletin*, Vol. 79, No. 4, p. 471–85.

Mercer, J. H. In press. Some observations on the glacial geology of the Beardmore Glacier area. (*In* Adie, R. J., *ed. Antarctic geology and geophysics*. Oslo, Universitetsforlaget.)