

ABSTRACTS OF PAPERS ACCEPTED FOR THE SYMPOSIUM BUT NOT PRESENTED

THE MASS BUDGET OF THE LAMBERT GLACIER DRAINAGE BASIN, ANTARCTICA

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ABSTRACT. Estimates have been made of the mass budget of the total drainage basin of Lambert Glacier. These show a small but significant positive state of balance for the interior basin (the accumulation area up-stream of the major ice streams) and strongly suggest a positive balance for the Lambert Glacier system (the region of major ice streams, between the Amery Ice Shelf and the interior basin). The total mass flux into the interior basin is estimated as 60 Gt a^{-1} . Results are presented from a number of ice movement stations established between 1972 and 1974 around the perimeter of the southern Prince Charles Mountains. These results, together with ice thicknesses from radio echo-sounding in the area, give a total mass outflux through the 2 000 m contour of 30 Gt a^{-1} , implying a budget excess of a further 30 Gt a^{-1} over the whole interior basin. Results from velocity and ice-thickness measurements give a mass discharge through a section near the junction of Lambert Glacier and the Amery Ice Shelf of 11 Gt a^{-1} . Losses within the Lambert Glacier system proper account for a further 7 Gt a^{-1} and an overall mass excess of 12 Gt a^{-1} is estimated for the Lambert Glacier system. This present positive state of balance contrasts with geomorphological evidence from the southern Prince Charles Mountains of a large drop in ice level in recent geological time, and the ice surface in the area may now be building up after a major recession.

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SURFACE CONTOURS AND FLOW PATTERN OF A PERFECTLY PLASTIC THREE-DIMENSIONAL ICE SHEET WITH ARBITRARY BOTTOM AND EDGE TOPOGRAPHY

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ABSTRACT. The differential equation determining the elevations of a perfectly plastic three-dimensional steady-state ice sheet is set up. Analytical solutions of the equation are obtained in two simple cases, viz. (1) an ice sheet on a horizontal base with an arbitrary curve as edge and (2) an ice sheet on a plane but sloping bed, with an edge composed of straight-line segments. The solutions are discussed in particular with reference to the development of ice divides and ice streams.