LATE CAINOZOIC GLACIATION
AND
MOUNTAIN GEOMORPHOLOGY
IN THE
CENTRAL HIGHLANDS OF TASMANIA.

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(source unknown)

" Among all of nature's phenomena, not a single one seems to me to be more worthy of the interest and curiosity of the naturalist than glaciers."

-L. Agassiz, 1840

Etudes sur Les Glaciers : 2.

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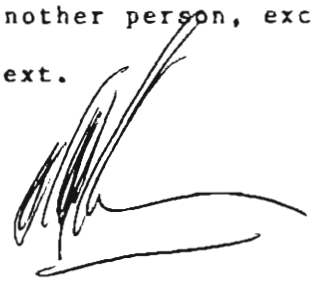
DECLARATION

This thesis contains no material which has been accepted for the award of any degree or diploma in any university and, to the best of my knowledge and belief, contains no copy or paraphrase of material previously published or written by another person, except where due reference is made in the text.



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ABSTRACT

The broad topographic framework and erosion surface morphology of west central Tasmania predates the early Pleistocene. The valley systems, however, have been emphasised by glacial erosion which has played a major role in shaping the detailed geomorphology of the mountains.

Part of an extensive ice cap that developed in the Tasmanian Central Highlands during the late Cainozoic discharged southwards via a major outlet glacier that occupied the valley of the Derwent River.

The heart of the Central Tasmanian ice cap probably lay west of the Du Cane Range. When the ice cover was most extensive the Derwent Glacier was up to 500 metres thick. It may have extended to as low as 230 metres above sea level, 70 kilometres downstream from its source in the cirques of the Du Cane Range. Two diffluent lobes of this glacier spread eastwards to merge with other glaciers in the Nive Valley. Other diffluent lobes extended southwards into the upper Gordon Valley, and westwards into the upper Franklin and Alma valleys. At the maximum phase the Franklin and Alma glaciers were confluent around Mt. Alma, near the present junction of the Collingwood and Franklin rivers.

The more westerly glaciers displayed the highest rates of mass throughput hence glacial landforms are more abundant and better developed in the west.

Analysis of the post-depositional modification of the glacial landforms and sediments suggests that at least three glaciations took place. The first glaciation was probably early Pleistocene or late Pliocene in age while the most recent and smallest occurred during the late Last Glacial Stage.

Glaciation would have demanded colder temperatures and an increased solid precipitation budget, but no major shift in the direction of snow bearing winds is neccessitated. At no stage was the mean annual air temperature likely to have been more than 9^{o} C less than present.

The glaciations were probably broadly contemporaneous with those at similar southern latitudes in Andean Patagonia and South Island New Zealand. Like the glaciers of those areas the ice masses of west central Tasmania were mainly of temperate maritime character.

The glaciations were accompanied by periglacial activity beyond the limits of the ice. The development of rock glaciers suggests that localised areas of permafrost existed during the Last Glaciation.

The glacial oversteepening has greatly facilitated slope retreat in areas of high structural anisotropy, particularly under periglacial conditions. Interglacial weathering and erosion was comparatively innocuous, although the presence of a substantial vegetation cover seems to have been critical to the maintenance of slope stabilty, particularly

in steeper and more elevated terrain. The geomorphic evidence does not demand any climate deterioration during the Holocene. The most active geomorphological agent of the Holocene interglacial is humankind.

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