

RE-EXAMINATION OF THE FJORD THEORY OF PORT DAVEY, TASMANIA

By

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(With 4 Text Figures)

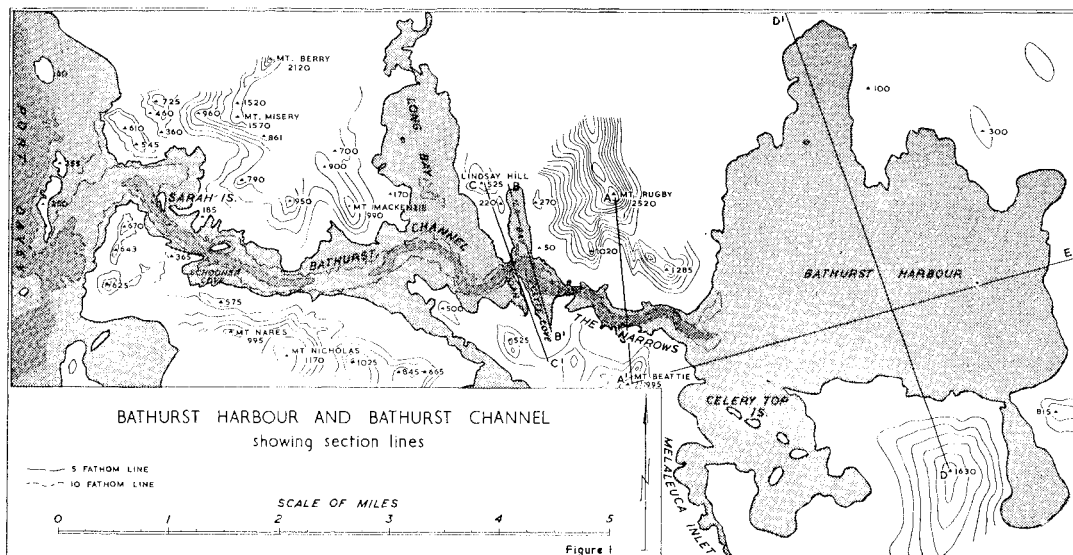
Port Davey, a large drowned inlet in the extreme south-west of Tasmania, has been considered by Lewis (1924, 1928 and 1945) to be a fjord, the result of Pleistocene glaciation to below sea-level followed by post-glacial drowning. As such it has been cited as the only example of a fjord in Australia, and has been widely quoted not only in Australia but in international reviews (e.g., Flint, 1947; David, 1950; Valentin, 1954; Charlesworth, 1957). Nye, (1930) on the other hand, had described Port Davey at a drowned river estuary.

In the course of recent work for the Mines Department of Tasmania during which we spent six weeks together in the area, the authors were afforded the opportunity of examining the region around Port Davey in some detail. One of us (W.E.B.) had previously spent several weeks in the area. As a result of these studies we support the view of Nye (1930).

The statement by Lewis (1945) is as follows: "The most impressive feature of the Malanna

glaciation is Port Davey, a glacial fjord, the only one in the Australian region—not in the same category as the fjords of Norway or New Zealand, but, nevertheless, a true example, with white cliffs rising to sharp tinds some 3,200 feet above the deep sinuous channels."

The authors have found no evidence of glaciation at sea level around the shoreline of Port Davey. Not one example of a polished, faceted or striated pebble was found amongst the large number of superficial boulder deposits exposed around the shoreline, nor have any striated or plucked rock surfaces been found, nor any other forms characteristic of ice sculpture. Stereoscopic examination of aerial photographs of the region reveals no sign of glaciation near Port Davey. Clear examples of glacial erosion and deposition are evident in the Norold Mountains although the position of the terminal moraines shows that the limit of glaciation was some 15 miles to the north-east of Bathurst Harbour.



Bathurst Channel, the alleged fjord, has none of the attributes of a glacial valley. There are no truncated spurs. There are no parallel walls dropping steeply to a flat floor, no valley shoulders. The plan has numerous jagged promontories and inlets, quite typical of that of a drowned river valley, and unlike that of a fjord. Whilst a glacial valley may retain a sinuous course during its development, the highly sinuous nature of Bathurst Channel, particularly through the relatively soft rocks of Long Bay (Figure 1), would not have persisted under the conditions of glacial erosion. Angular projections such as Eve Point and Joan Point would have been truncated. The cross section of the valley, whether taken between opposing mountains (Figure 2, Section A-A) or opposed inlets (Figure 2, Section C-C) reveals the normal "V" shape of the river valley. Tributary valleys join at normal valley level (Figure 2, Section B-B) and there is no suggestion of the hanging valleys to be expected at the junction of minor tributary glaciers with the trunk glacier.

Figure 3 is an echo-sounding run up Port Davey. This has a gross exaggeration of the vertical scale with respect to the horizontal, and in addition the line of steaming does not follow faithfully the sinuous course of the deepest part of the channel, so care is necessary in interpreting the echogram. Nevertheless, it does show that the lateral spurs continue down normally (for river erosion) below the water and show no signs of truncation as would have occurred in a fjord.

Characteristic of fjords is the threshold, and "skerryguard" islands are common features (Charlesworth, 1957, p. 343). Breaksea Islands could fit the latter role admirably, and there are bar-like shoalings of each channel at the mouth which could be a low threshold. The water shoals to five fathoms in the north channel and to seven fathoms in the south channel (the maximum interior depth is 22 fathoms). But bars of these dimensions are equally characteristic of estuary

mouths. There is a substantial catchment of high rainfall country draining through Bathurst Channel, and although the coarse sediments are largely dropped in Bathurst Harbour, suspended material tends to be flocculated at the estuary mouth. The mouth then is compatible with the fjord theory, but is equally compatible with drowning.

Finally, the fjord-making glacier, if it existed, can only have come from Bathurst Harbour. This is a broad flat-floored pan several miles across at sea level (see Figure 4). To feed the fjord glacier, this would have to have been filled by an ice-cap. Now, this ice-cap would have had equally easy outlet via Melaleuca Inlet to Cox's Bight. This, too, would have been occupied by a tributary glacier of at least comparable dimensions to that in Bathurst Channel. There is no evidence to suggest a glacial valley or fjord here, and much to the contrary.

Conclusions

Since Lewis did not, to our knowledge, publish any evidence to support his view, there is no existing case to be answered. As a result of the total absence of positive evidence of glaciation, and the strength of the evidence presented above inconsistent with glaciation, the authors do not agree with Lewis's view, now generally accepted, that Port Davey is a fjord. We conclude that Port Davey, Bathurst Channel and Bathurst Harbour are a drowned river estuary, the drowning having caused dismemberment of a fairly large river system.

Acknowledgements

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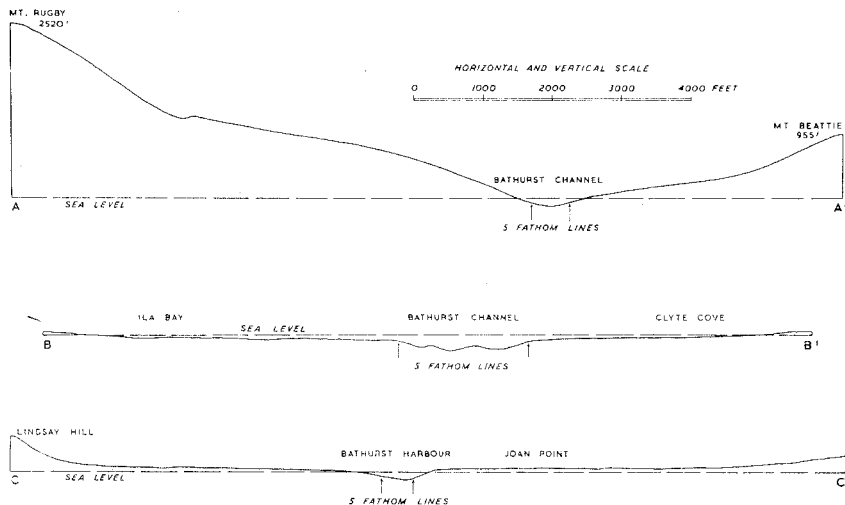


Figure 2
CROSS SECTIONS OF BATHURST CHANNEL AND ADJACENT TOPOGRAPHY

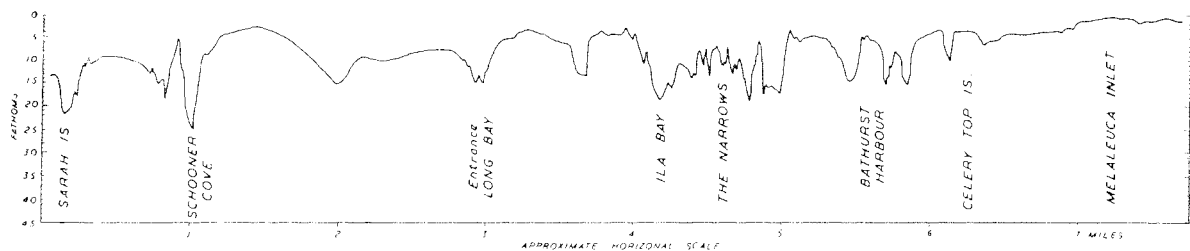


Figure 3

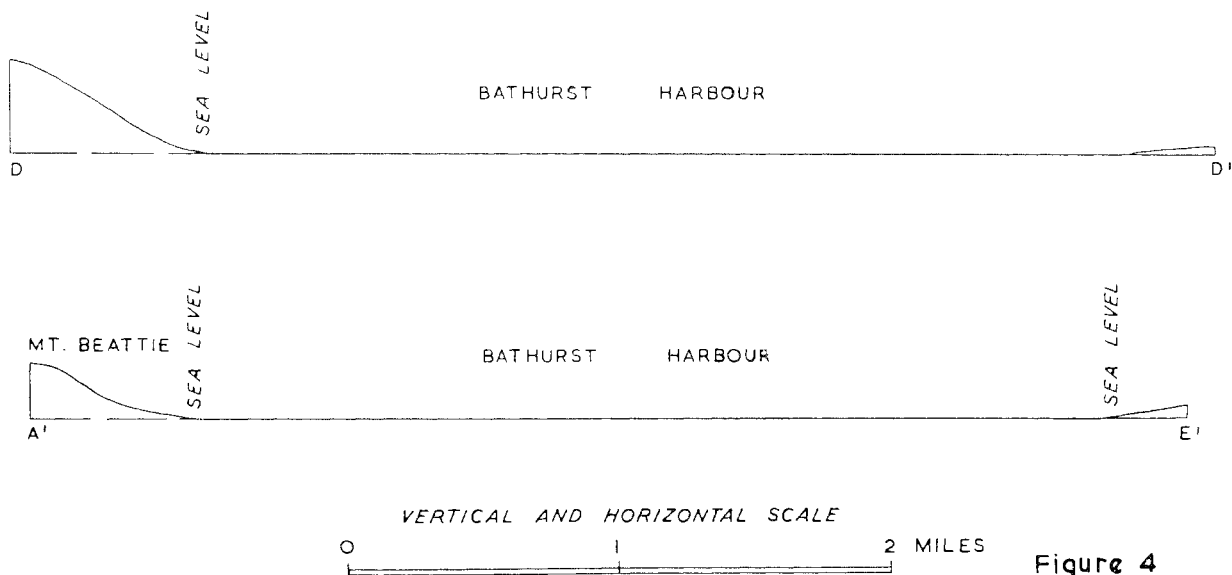


Figure 4

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