

THE LATE QUATERNARY CHRONOLOGY OF THE TAYLOR GLACIER

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Abstract: Carbonate rich lacustrine and deltaic deposits, containing thin beds of finely laminated carbonates and thick beds of silt, outcrop at several sites in the Taylor Valley, and have been encountered in cores obtained by the Dry Valley Drilling Project (DVDP). Fragments of the more indurated carbonate beds have widespread occurrence as part of the desert "lag gravel" which covers much of the valley floor. Analysis of the carbonates suggest that they were deposited as algal limestones from waters, some derived from the East Antarctic ice sheet via the Taylor Glacier and others from local alpine glaciers, at times which correspond to the previous three global interglacial periods, as evidenced by the ice volumes deduced from oxygen isotopic analysis of oceanic cores. The lacustrine carbonates of Taylor Glacier origin have been found up to 30 km beyond the present snout of the Taylor Glacier, and up to 100 m above the level of Lake Bonney, into which the Taylor Glacier at present discharges and in an 80 m thick portion of the DVDP 12 core. It is concluded that the Taylor Glacier has advanced during each of the previous three interglacials and it is suggested that this has been caused by a thickening of the East Antarctic ice sheet during Interglacials.

Fig. 1. Isotopic measurements of carbonates from DVDP core 12.
 Column A: Depositional environment (CHAPMAN-SMITH, 1975)
 Column B: Lithostratigraphic sequence (POWELL, 1976)
 Column C: $^{234}\text{U}/^{230}\text{Th}$ dates (HENDY, in press)
 Column D: $^{18}\text{O}/^{16}\text{O}$ ratios of lacustrine carbonates (HENDY, in press)
 Column E: Possible correlation with Taylor Valley glaciations recorded elsewhere (HENDY et al., in press)

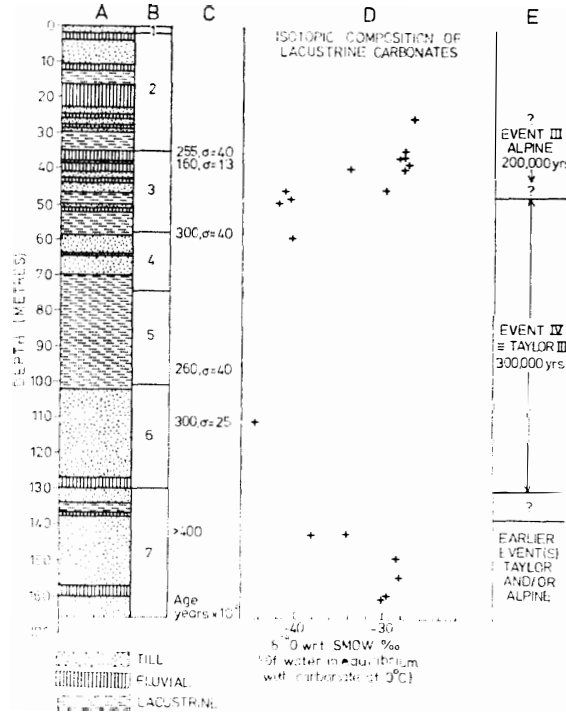
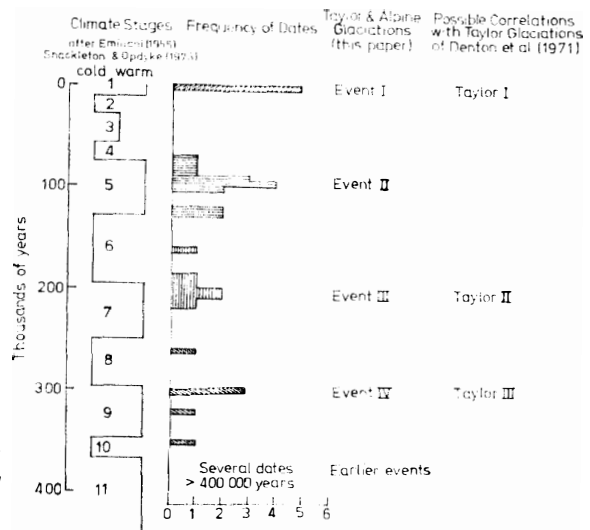


Fig. 2. Nomogram of all U/Th dates on Taylor Valley proglacial lakes and related sediments; in intervals of 5000 years.



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