

***The Wisconsinan Glaciation, of the southeast Canadian Continental Shelf***

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A major ice sheet advanced across the Maritime Provinces, the Gulf of Maine, the Scotian Shelf and the Grand Banks of Newfoundland (with the exception of the Tail of the Banks) during Early-Middle Wisconsinan time approximately 65,000 years ago. Surficial sediments previously deposited on the continental shelf were eroded during this advance and were reworked and incorporated into the glacial debris of the ice sheet. At 46,000 years B.P. (radiocarbon years before present) the ice sheet began to lift off the ground surface in the region of the deep basinal depression of the central shelf area. A succession of parallel discrete narrow ridges of till, herein termed lift-off moraines were deposited during the initial stages of ice flotation. During the subsequent 12,000 years the ice remained locked in position by the topography of the bedrock surface and grounded on the outer

banks and inner shelf area but was floating, in a manner similar to present day ice shelves, over the basinal areas and troughs.

Sequences of rhythmically banded subglacial sediments up to 80 m in thickness were deposited over the basal till beneath the floating ice. At the grounding line of the ice shelves which encircled the basinal and trough areas, wedge shaped deposits of till, herein termed till tongues, were developed. These deposits of till were interbedded with the subglacial sediments at the same seismostratigraphic horizons on the flanks of the basins across distances of over a hundred kilometres. Local changes in ice thickness, coupled with relative changes in sea level brought about by isostatic and eustatic fluctuations, produced complex sequences of till and glaciomarine sediment. These sediment sequences were formed as a result of vertical changes ac-

accompanied by little or no horizontal movement within the ice shelves.

By approximately 30,000 years B.P. the ice shelves had degarded by melting and proglacial marine sediments were deposited across vast areas of the shelf. The previously deposited till was heavily furrowed by floating icebergs in shallow areas. This environmental setting prevailed on the Scotian Shelf and Grand Banks until 16,000 years B.P. (23,000 years B.P. in the Laurentian Channel) at which point in time the ice had completely receded from the entire shelf area.

Sea level lowering to -110 m below present sea level and subsequent marine transgression during Late Wisconsinan and Holocene time have modified the glacial sediments within the zone of transgression. The present distribution pattern of well sorted sands and rounded gravels reflects this sorting. In the deeper basins and troughs of the shelf the glacial sediments were partially covered by post glacial silty clay eroded from the transgressed bank and shallow areas.