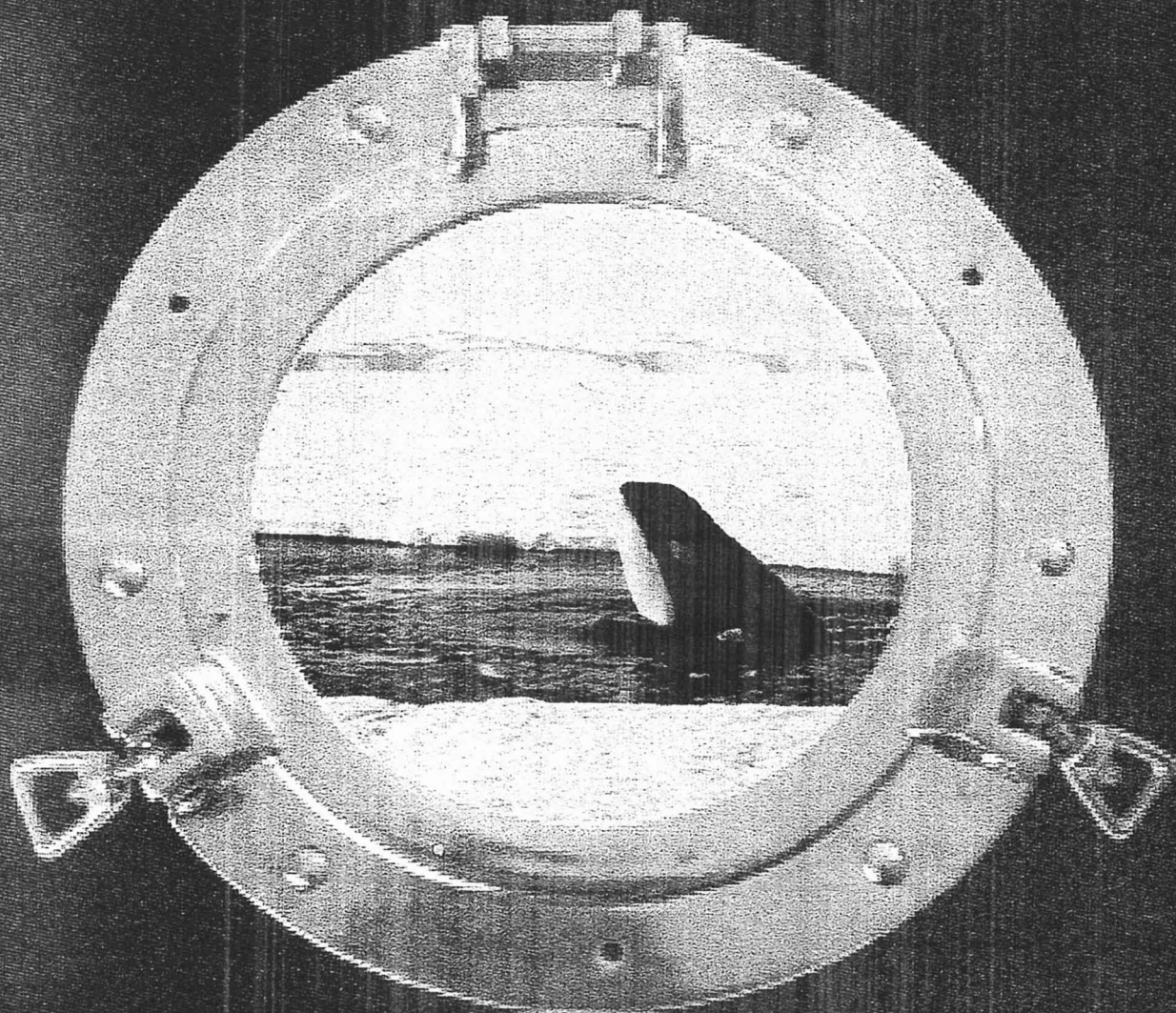


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TERTIARY GLACIAL SEDIMENTATION IN KING GEORGE ISLAND, SOUTH SHETLAND ISLANDS, WEST ANTARCTICA

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The glacially-influenced sediments on King George Island are considered as a record of four glacial episodes encompassing the Early Eocene-Early Miocene interval (to about 30 Ma), which are known, in order, as: Kraków, Polonez, Legru and Melville.

The Kraków glaciation is represented by a thin (3.6 m) isolated outcrop of glacial marine diamictite at Magda Nunatak. It contains long-ranging Tertiary bivalves and scaphopods, as well as coccoliths of Cretaceous and, rarely, Tertiary age. Discoasters of mid-Paleocene to Early Eocene ages were obtained from a related basaltic breccia, from which a single K-Ar determination of 49.4 ± 5 Ma (Middle Eocene) has been obtained. The diamictite is interpreted as related to local mountain glaciation.

In the > 50 m thick Polonez Cove Formation, which crops out between Low Head and Lions Rump, in King George Bay, the Krakowiak Glacier Member (5 – 15 m thick) is described as representing lodgement tillite and glacial fluvial deposits containing faceted and striated clasts of local or continental Antarctic provenance up to 2 m in diameter.

The glacial strata rest disconformably on an irregular substrate of lavas of the Mazurek Point Formation, which at its type locality yielded a K-Ar age of about 74 Ma (late Cretaceous).

The Krakowiak Glacier Member is overlain by glacial marine sediments and basaltic flows and breccias containing large, dispersed clasts of exotic lithologies, including many ice-rafted dropstones up to 1.5 m in diameter. The whole sequence is disconformably overlain by andesite-dacite lavas (Boy Point Formation) which yielded K-Ar ages of 22.4 – 23.6 Ma, although these are probably minimum ages.

Terrestrial, subglacial tillites over 100 m thick, which fill valleys cut into subaerial andesitic lavas, and lahar-type debris flows (the Legru Bay Group) crop out at Admiralty Bay and make up the record of the Legru glaciation. Striae on the underlying volcanic rocks and pseudomorphs of ice wedges in the diamictites, which contain clasts of local provenance, testify to mountain glaciation of restricted extent. K-Ar dates of 26 Ma at the top and 30 Ma at the base of the lava flows suggest a Late Oligocene age for this event.

The youngest Tertiary glacial interval in King George Island is recorded by the glacial marine deposits of the Cape Melville Formation (Melville glaciation). This unit forms a 200 m thick sequence of alternating fine bathyal and outer shelf sediments with abundant, exotic ice-rafted clasts up to 2 m in diameter.

Fluvial and debris flow sediment found between the Polonez Cove Formation and the Legru Bay Groups are interpreted as indicating climatic amelioration, or "interglacial" conditions. Similarly, plant-bearing (*Notofagus* – *podocarp* assemblage) beds intercalated between the Legru Bay Group and the Cape Melville Formation also represent "interglacial" conditions.