

THE GEOLOGY OF WARDANG ISLAND,  
YORKE PENINSULA, SOUTH AUSTRALIA

by

Yvonne Bone, B.Sc.

This thesis is submitted as partial fulfilment of the requirements  
for the Degree of Bachelor of Science with Honours in Geology  
at the University of Adelaide.

November, 1978.

Frontispiece : Aerial Views of Wardang Island looking to the south,  
east and north.

ABSTRACT

The crystalline Basement consists of porphyritic rhyo-dacite, with minor latite, conglomerates and metasediments. Geochemistry indicates possible affinities with the Gawler Range Volcanics and the Moonta Porphyry. The sequence is intruded by amphibolite dykes. Metamorphic and tectonic events have modified the rocks, destroying primary textures. These events may be related to the Olarian orogeny. The figure of 1735 m.y. obtained on the rhyo-dacite probably represents a re-setting event.

Permian glaciogene sediments unconformably overlie the acid volcanics. These sediments consist of mottled clays and quartz arenites, and contain heavy mineral grains the surfaces of which show well-defined chattermark trails. Erratics are numerous. Grooved bedrock surfaces indicate a 340° ice movement direction, as does the Cape Willoughby source for the largest granite erratic.

A richly-fossiliferous Pliocene sequence - the Hallett Cove Sandstone - overlies the Permian and the Basement. The 4 m thick sequence shows ten distinct horizons, reflecting differing environmental conditions.

The Quaternary cover shows evidence of Holocene sea-level changes in the form of stranded shingle beach ridges, aeolianite wave-cut platforms and undersea calcrete reefs. These also record palaeoclimatic changes, as do the fossil soils, calcretes and aeolianite dunes. The geochemistry of the calcretes reflects that of the underlying bedrock, and places constraints on the calcrete-formation model postulated.

A salt-marsh-prograding barrier beach couplet shows the classic features of such an environment. Palaeontological analyses of the Recent sands indicates a diverse death assemblage, the dominance differences probably resulting from life-assemblage environmental differences, particularly depth and bottom. The presence of *Marginopera vertebralis* in the tidal

detritus between Wardang Island and Goose Island indicates that this species may still be extant in this locality.  $\text{MgCO}_3$  analyses support this hypothesis.

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