

THE GEOLOGY OF THE DEPOT CREEK AREAFLINDERS RANGES, SOUTH AUSTRALIA

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A B S T R A C T

A sequence of Late Precambrian sedimentary rocks, reaching a total thickness of 7,000 ft., was mapped at Depot Creek, on the western scarp of the Southern Flinders Ranges, South Australia.

A review of studies on or near the area by previous authors is presented.

Ten formations were recognized and mapped. Formations (4) to (10) have been placed in the Adelaide Supergroup, formations (7) to (9) belonging to the Sturt Group, and formation (10) belonging to the Marino Group. From the oldest to the youngest, these are:-

(1) Pre-Adelaide Supergroup Redbed Sequence

A shallow water deposit with minor dolomite sedimentation.

(2) Dolerite

Intrudes (1), but upper age limit is uncertain. Extensively altered, possibly by reactions during cooling.

(3) Depot Creek Volcanics

Subaerial trachytic lavas, which have undergone extensive post-depositional alteration. The origin of amygdales and tuffaceous rocks is discussed.

(4) Emeroo Quartzite

A transgressive shallow marine sand body unconformably overlying the volcanics.

(5) Dolomite-Magnesite Sequence

Continuous dolomite sedimentation with minor magnesite conglomerates and clastics, probably deposited in a lagoonal environment.

(6) Dolomitic Sandstone

Possibly also lagoonal, but with a more constant influx of arkosic sand.

(7) Tillitic Sequence

Overlies (6) with possible disconformity, and comprises thin tillite overlain by fluvio-glacial sandstones and conglomerates.

- (8) "Tapley Hill" Formation  
A relatively uniform body of laminated siltstones deposited in quiet water.
- (9) "Brighton Limestone"  
A dolomitic limestone with numerous beds composed largely of stromatolites. Gradational contacts with underlying and overlying formation.
- (10) Willochra Formation  
Shallow water redbeds - siltstones, gritty sandstones and shales.

The area is structurally simple, the fold style being concentric. The region contains a culmination of fold axes. Fold axes and cleavages in the Adelaide Supergroup differ in orientation from those below it, and this may be due to folding prior to deposition of the Adelaide Supergroup. The present day western margin of the ranges is considered to be a fault scarp, perhaps on the site of a reactivated Palaeozoic fault.

Comparison with the Adelaide region shows that marked similarities exist in the sequences above the tillites of the respective areas, and this justifies the terms Sturt and Marino Groups.

No economic mineral deposits are known, although creek gravel has been used for railway ballast.