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Summary

The region surrounding Mt. Compass is in South Australia, 50 km South of Adelaide. The continuation towards the S of the Mt. Lofty Ranges stretches across the region with a SW-NE orientation. It is thus bordered by two plains.

The Archaean outcrops in anticlinal cores. Gneisses have been retromorphosed to sericite and chlorite schists during lower Palaeozoic orogenic phases.

The Proterozoic sedimentary mantle is known as the Adelaide System, caracterised by a glacial sequence. The units are:

1) The Torrensian: detrital formations in the Mt. Compass area, mostly precipitated calcareous rock-types further N in the sedimentary basin.

2) The Sturtian: a) Lower glacial (tillites and conglomerates of marine and glacial origin); b) Interglacial (detrital with calcareous developments). Limestones and boulders beds are related. A possible explanation is that increase of temperature caused calcareous precipitation and sudden melting of ice cap.

3) The Marinoan: a) Upper glacial at the base, and b) a molassic facies at the summit.

The Cambrian is predominantly calcareous, locally fossiliferous.

Towards the E, a great thickness of detrital rocks are found: the Kanmantoo. It is a more geosynclinal Cambrian equivalent and transgressif on the Adelaide System. In this region, changes of facies also affect the Adelaide System. Orogenic movements ended during the Lower Palaeozoic.

The style of folding is complex, thrusts are frequent in older rock-types. There are fold axis oriented NE-SW, crossed by others, oriented N-S. The first form an overterned anticline that buts against the shield, thus moulding itself to it.

Permian glaciers have overdeepened broad valleys and filled them with moraine. This material has been considerably reworked since.

Next deposits are glazed iron pizoliths which pre-date the Oligo-Miocene transgression. Tertiary seas advanced into old Permian valleys from the W.

Continental conditions prevailed during the Pliocene. It is a laterized surface, depressed on top of Permian valleys.

An epeirogenic phase had a time of paroxism after Pliocene laterite formation. It determines broad arched folds, the anticlinal domes are collapsed, producing small grabens.

The faults that determined the horst and grabens are oriented NE-SW, in this region. They are thus parallel to those of the Lower Palaeozoic folds that mould themselves to the shield. A zig-zag in recent fault-lines might be due to this adaptation.

The distribution of Quaternary deposits is controled by horst-graben disposition and by rejuvenated old Permian glacial valleys. Pleistocene deposits are encrusted by calcareous material, whilst late Quaternary deposits are not.