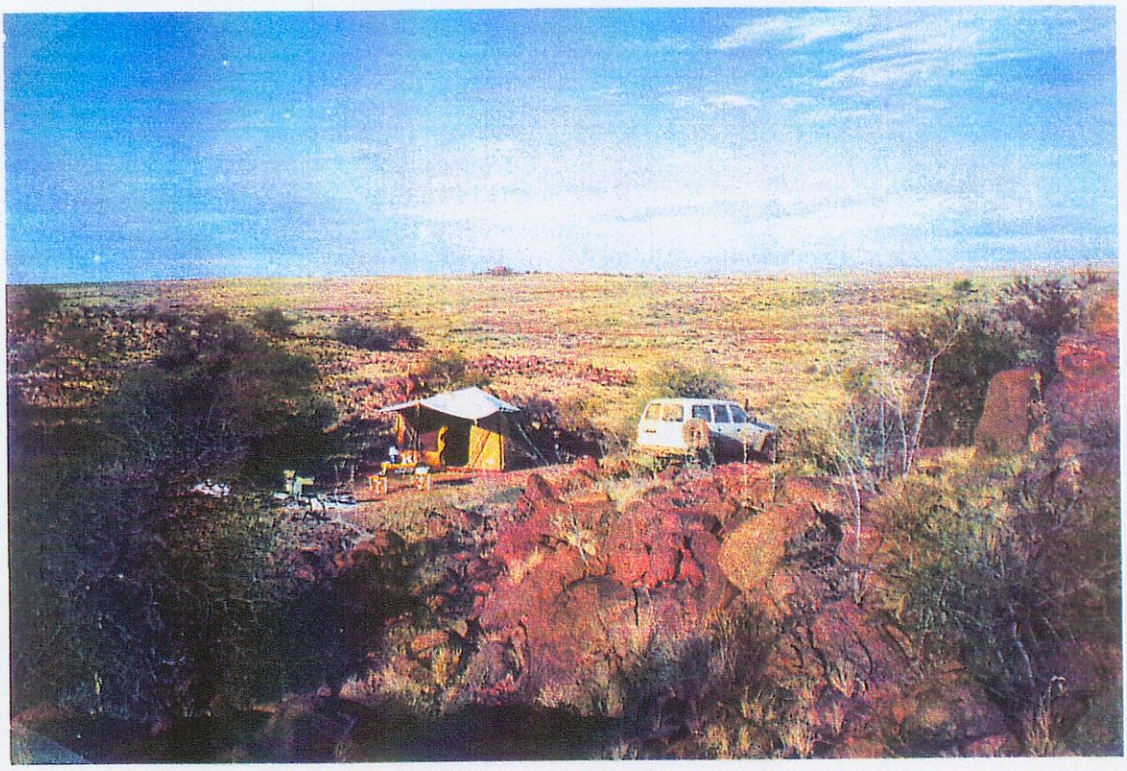
STRUCTURAL INTERPRETATION IN THE MOUNT WOODS INLIER



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ABSTRACT

The Mount Woods Inlier (MWI) is an Early to Mid-Proterozoic terrane represented by numerous small scattered outcrops of metasediments and granitoids, located approximately 100 km southeast of Coober Pedy, north-central South Australia.

Field mapping of three outcrops reveal the following deformation history:

1. D_1/M_1 was a high T, low P event that produced an S_1 foliation defined by sillimanite, cordierite ± almandine garnet (Flint and Benbow, 1977).

2. D_2 produced folding on scales from microscopic crenulations of S_1 to macroscopic folding of metasedimentary units over tens of km. Steep fold axes and variations in fold orientations throughout the MWI appeal to fold interference (ie re-folding), which probably occurred during the subsequent D_3 shearing event.

3. D_3 was a shearing (+ folding) event that produced discrete zones (100's m long) and a large scale shear zone (≥ 7 km) in the Spire Hills-Skylark Hills area. Kinematic indicators such as Type I S-C mylonite fabrics suggest movement was predominantly strike-slip. The discrete shear zones appear to be the result of strain caused by dextral movement on the large scale shear zone.

Dating of a foliated granitoid interpreted as syn-D_1/M_1 at ~1700 Ma and a granite interpreted as post-D_2 and pre- to early syn-D_3 at ~1580 Ma has constrained the timing of tectonism to within these dates. This deformation is synchronous with D_3 of the Kimban Orogeny, the Olarian Orogeny, the Ernabellan deformation of the Musgrave Block, D_1 of the Peake-Denison Inlier and deformation and metamorphism in the Karari Fault Zone.

The early high T, low P metamorphism, syn-D_1 intrusion of I-type granitoid and subsequent folding show many similarities with the tectonic model of Etheridge et al (1987), in which this sequence of events is produced by rifting-resulting from small scale mantle convection and magmatic underplating-followed by compression due to thermal subsidence and crustal delamination.

Large scale geophysical analysis infers the early granitoid is more widespread than indicated from outcrop and has locally affected F_2 fold geometry. Fold interference patterns have been interpreted as the result of D_3 shear and refolding. Two broad anomalies have been interpreted as late (1580 Ma) plutons at 1 - 3 km depth. A large east-west shear zone along the northern boundary of the MWI appears related to the ~1700 Ma Karari Fault Zone, however the D_3 shear event (1580 Ma) suggests subsequent movement on the shear zone.

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