

## **PALEOMAGNETIC CONSTRAINTS ON THE PROTEROZOIC EVOLUTION OF AUSTRALIA**

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Whether Proterozoic Australia was assembled by plate tectonic processes that involved large-scale horizontal motions, or whether it evolved as an essentially intact block of crust, modified by mainly intracratonic rifting and vertical tectonics, remains a subject of contention. Recent geological models suggest that Proterozoic Australia consisted of three main cratonic areas: the North, South, and West Australian cratons. Each contains blocks of Archean crust separated by Paleo- to Mesoproterozoic mobile belts and may have formed independently, although the amount of separation between them remains unknown. The three cratons are thought to have been united during late Mesoproterozoic assembly of Rodinia. Sedimentation in the continent-wide Centralian Superbasin and initial rifting along eastern Australia commenced at ~830 Ma. Supporting the 'single-continent' alternative has been the observation that a single apparent polar wander path can be constructed for almost all Proterozoic paleomagnetic data for Australia even though they are derived from different tectonic units. Recent paleomagnetic results from different cratons fall on the previously-defined pole path, and continue to contradict geological interpretations. The updated data set suggests that the North and West Australian cratons may have been in their present relative positions since at least ~1.7 Ga, and were joined by the South Australian craton since at least ~1.5 Ga. Thus the hypothesis that the Proterozoic cratons of Australia evolved in essentially their present relative positions cannot be discarded. This analysis remains inadequate, however, because there are few results of the same age from different cratons and because most paleopoles are poorly dated.