

Paleozoic terranes of eastern Australia and the drift history of Gondwana

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Abstract

Critical assessment of Paleozoic paleomagnetic results from Australia show that paleopoles from locations on the main craton and in the various terranes of the Tasman Fold Belt of eastern Australia follow the same path since 400 Ma for the Lachlan and Thomson superterrane, but not until 250 Ma or younger for the New England superterrane. Most of the paleopoles from the Tasman Fold Belt are derived from the Lolworth-Ravenswood terrane of the Thomson superterrane and the Molong-Monaro terrane of the Lachlan superterrane. Consideration of the paleomagnetic data and geological constraints suggest that these terranes were amalgamated with cratonic Australia by the late Early Devonian. The Lolworth-Ravenswood terrane is interpreted to have undergone a 90° clockwise rotation between 425 and 400 Ma. Although the Tamworth terrane of the western New England superterrane is thought to have amalgamated with the Lachlan superterrane by the Late Carboniferous, geological syntheses suggest that movements between these regions may have persisted until the Middle Triassic. This view is supported by the available paleomagnetic data. With these constraints, an apparent polar wander path for Gondwana during the Paleozoic has been constructed after review of the Gondwana paleomagnetic data. The drift history of Gondwana with respect to Laurentia and Baltica during the Paleozoic is shown in a series of paleogeographic maps.

Keywords: Paleozoic, paleomagnetism, Australia, Gondwana, Tasman Fold Belt.

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