

PALAEOMAGNETIC AND STRUCTURAL CONSTRAINTS ON MESOZOIC-RECENT THRUST SHEET ROTATION IN THE PRECORDILLERA OF NORTHERN CHILE

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Resume

Palaeomagnetic results are reported from two red bed sequences of late Cretaceous to Miocene age from the Precordillera (Cordillera de Domeyko) of northern Chile. Comparison of isolated primary NRM components from the late Cretaceous-Palaeocene Purilactis Formation with the APWP for cratonic South America indicate that significant post-Palaeocene clockwise rotation ( $33\pm 12.5$ ) has taken place. Resolved primary NRM components from the Oligo-Miocene Paciencia Group which unconformably overlies the Purilactis Formation also indicate significant clockwise rotation but of considerably smaller magnitude ( $22\pm 14.5$ ) when compared to the present day pole position.

Detailed structural mapping of the area utilising the line balanced section technique has revealed the presence of a series of thrust sheets which have been periodically active during late Mesozoic to Holocene times. The above data coupled with stratigraphical information indicate that following deposition of the Purilactis Formation, lower Eocene deformation (the Incaic Orogeny) resulted in the folding and clockwise rotation of the Formation in response to the eastward propagation of a major thrust front (the Frontal Domeyko Thrust). Deposition of the Paciencia Group occurred after the Incaic Orogeny during a period of relative tectonic quiescence in the Oligocene and Lower Miocene. Late Miocene reactivation along the Frontal Domeyko Thrust resulted in uplift folding and clockwise rotation of both the Paciencia Group and the Purilactis Formation. Subsequent Quaternary and Holocene deformation

involved foreland directed thrust front propagation with little or no significant rotation of the Purilactis Formation or Paciencia Group.

This study demonstrates that palaeomagnetically detected rotation in the Precordillera of northern Chile, 200 km inland from the Peru-Chile trench, is due to thrust front propagation associated with a compressional tectonic regime, and not related to oroclinal bending, strike-slip faulting or fault block rotation.