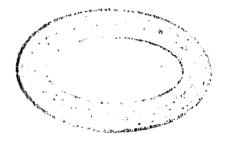
METAMORPHIC AND GEOCHRONOLOGICAL CONSTRAINTS ON THE KIMBAN OROGENY, SOUTHERN EYRE PENINSULA.

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This thesis is submitted as partial fulfilment for the Honours Degree of Bachelor of Science.

November 1994



The University of Adelaide
The Department of Geology and Geophysics

Australian National Grid Reference Lincoln Sheet (SI 53-11) 1:250 000

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ACKNOWLEDGMENTS

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ABSTRACT

The Palaeoproterozoic Kimban Orogeny is responsible for widespread deformation throughout the Gawler Craton, but is best recorded in Hutchison Group metasediments and Lincoln Complex granitoids located near the east coast of southern Eyre Peninsula. Garnet-bearing granulite facies metabasic dykes of the Tournefort Dyke Swarm, emplaced during or prior to orogenesis, have been used to constrain the timing of peak metamorphism attributed to the Kimban Orogeny, via Sm-Nd mineral isochrons, at 1716 ± 14 Ma, approximately 100 Ma younger than previously believed. Estimates of P-T conditions recorded by the rocks were also calculated, in order to reconstruct a baric section across the Kimban Orogen. The dykes generally consist of the assemblages garnet-hornblende-plagioclase-ilmenite and garnethornblende-plagioclase-clinopyroxene-ilmenite. Peak assemblages involve garnetorthopyroxene-clinopyroxene-plagioclase-homblende-ilmenite. P-T estimates suggest a baric section across the Kimban Orogen is asymmetrical, and centred on the Kalinjala Mylonite Zone with metamorphic conditions of 840 \pm 95°C and 10.1 \pm 1.2 kbar adjacent to and within the Kalinjala Mylonite Zone, declining shallowly to the east to about 600° C and 5.4 ± 1.7 kbar about 24 kms across strike. This data in concert with structural evidence, suggests that the Kimban Orogen may have developed in an environment of oblique convergence, with associated strains partitioned between strike-slip movement along the Kalinjala Mylonite Zone, and a strike-normal component away from the zone, leading to the differential exhumation of granulite facies Lincoln Complex rocks east of the KMZ, and their juxtaposition against amphibolite-greenschist facies Hutchison Group rocks to the west.