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CONTRASTING RAYNER STRUCTURAL EPISODE METAMORPHISM IN KEMP AND MACROBERTSON LANDS: EVIDENCE FOR A NEOPROTEROZOIC TERRANE BOUNDARY?

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Parts of Kemp Land in the Rayner Complex, east Antarctica, largely include Archaean cratonic material equivalent to the Napier Complex, tectonically reworked by the Rayner Structural Episode (RSE) *ca.*940Ma. Younger additions to this cratonic fragment include extensive *ca.*1600Ma charnockitic intrusions in the Stillwell Hills that consolidate tectonic evidence for Palaeoproterozoic amalgamation of Kemp Land and the Eastern Ghats province (now in India). Quantitative forward modelling of metapelites indicate peak metamorphic conditions during the RSE reached *P*=7.6-8.9kbar, *T*=870–930°C (Stillwell Hills), increasing westward *P*=8.8-10kbar and *T*=920-990°C (Oygarden Group). Evidence from the relatively rare equilibrium assemblage corundum-orthopyroxene, together with several stages of sapphirine growth are consistent with a clockwise *P-T* trajectory involving a decompression-cooling path to *P*≈7.5kbar and *T*≈840°C for rocks from the Stillwell Hills. Neighbouring Proterozoic rocks from MacRobertson Land preserve evidence of lower pressure conditions (*P*=5.5-7kbar, *T*=800-900°C at Cape Bruce and Forbes Glacier). Modelling of metapelitic textures from those rocks indicates a *ca.*990Ma anti-clockwise cooling-dominated *P-T* path at *P*≈6 kbar to *T*≈750°C. This contrast in timing of orogenesis, peak metamorphic conditions and *P-T* trajectory indicates MacRobertson Land records an earlier phase of the RSE, incompatible with conditions in Kemp Land at that time. Tectonic implications are marked if indeed a Neoproterozoic collisional boundary is interpreted to separate these terranes, implying that Kemp Land (along with the Napier Complex and Eastern Ghats) was not part of the east Antarctic continent prior to *ca.*940Ma.