210

EVIDENCE FOR THE ARCHAEAN JUXAPOSITION OF THE NAPIER, VESTFOLD, RAUER AND RUKER BLOCKS THROUGH U-TH-PB DETRITAL GEOCHRONOLOGY

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Laser ablation-inductively coupled mass spectrometry (LA-ICPMS) U-Th-Pb detrital geochronology on zircon crystals from three packages of Archaean (c. 3200-2500 Ma) metasedimentary rock from the southern Prince Charles Mountains (Ruker Province) have identified three prominent age groupings – c. 3200, 2800 and 2500 Ma. Age frequency histograms from the oldest package of rocks, the Menzies Group, are dominated by c. 3200 Ma signatures, with a small component of c. 3200-3400 Ma zircon grains. These ages correlate with U-Pb SHRIMP ages for magmatic zircon from the dominant Archaean felsic orthogneiss in the Ruker Province (Mawson Orthogneiss), and suggest erosion of the basement resulted in the localised deposition of a clastic sedimentary sequence. Age frequency histograms from the Stinear Group are dominated by c. 2800 Ma signatures that correlate with U-Pb SHRIMP ages from metamorphic zircon encased within leucosomes and partial melts from the basement orthogneiss. Orogenesis responsible for the partial melting of the crust is suggested to be the precursor for the deposition of the Stinear Group. Age histograms from the youngest package of Archaean metasedimentary rocks, the Ruker Group, are dominated by c. 2500 Ma U-Pb age signatures, with minor components of c. 2800 and 3200 Ma. The occurrence of the c. 3200, 2800 and 2500 Ma signatures within a distinct package of rocks has important implications concerning the possible juxtaposition of Archaean crustal blocks exposed in the Prydz Bay region. The two older signatures (c. 3200 and c. 2800 Ma) can be attributed to erosion and recycling from the underlying Menzies and Stinear metasedimentary groups. The c. 2500 Ma signature could indicate either: (1) a magmatic or metamorphic complex of this age is located in the southern Prince Charles Mountains; (2) juxtaposition with the Vestfold Hills block and or Napier Complex that preserves this isotopic age, or (3) both. Past reconstructions of Prydz Bay have suggested the juxtaposition of the Archaean fragments did not occur until the late Proterozoic-Cambrian. New evidence could indicate a much older, possibly Archaean affinity for the these blocks.