Ordovician Sedimentation in the Shackleton Range: Post-Orogenic Basin Development in the East Antarctic Sector of Gondwana

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The Blaiklock Glacier Group (BGG) is a relatively undeformed sedimentary succession overlying "Pan-African" age (c. 500 Ma) metamorphic basement in the Shackleton Range, the East Antarctic sector of the early Paleozoic margin of Gondwana. New stratigraphic and sedimentological data presented here enable the reconstruction of depositional environments, evaluation of basin models, and clarification of possible regional correlations.

The BGG is a texturally and compositionally immature siliciclastic succession ("recycled orogen" type provenance), >4 km thick, directly overlying amphibolite facies metamorphic rocks with high-relief ('landscape') unconformity. A range of terrestrial and near-shore paleoenvironments is represented, dominated by alluvial fan to braided stream and coastal plain to tidal clastic systems. Depocenters were small, with complex sediment dispersal patterns, but overall vertical trends show upward cleaning, upward fining and inferred upward deepening. Rare rhyolite clasts provide indirect indication of silicic volcanism.

The BGG is a classic 'molasse' succession, derived from denudation of a collision mountain belt, and corresponds to a series of remarkably similar depositional systems developed in an array of basins across a vast area of the Pan-African—Antarctic Orogen. Similarities between the BGG and lower levels of the Table Mountain Group (South Africa) and parts of the Neptune Group (Pensacola Mountains, Antarctica) are particularly striking. For the BGG, exposure limitations make determination of basin type and tectonic setting problematic, but basement-cover relationships and subsidence—filling styles are most consistent with a broad, relatively shallow, rift system associated with limited silicic volcanism. Hence we envisage basin development through core-complex style extension of orogenically thickened crust.