

then prolonged due to the effects of indentation of the Meta Incognita microcraton. Sub-horizontal ductile fabrics preserved in the block are interpreted to have formed during mid-crustal flow between 1840–1810 Ma, causing weakening of the middle crust and juxtaposition of two levels of crust. Following terminal collision of the Superior Province, the RBb was then uplifted by lateral tectonic escape to the west along the Lyon Inlet Boundary Zone.

A model for the Paleoproterozoic metamorphism, crustal residence, and exhumation of the Repulse Bay block, Melville Peninsula, Nunavut

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The Repulse Bay block (RBb), Nunavut, is composed of a 2.9–2.7 Ga TTG magmatic suite, with minor ca. 1.91 Ga metasedimentary slivers, that was subsequently deformed and metamorphosed at upper amphibolite to granulite facies during the Trans-Hudson Orogeny (THO). The block demonstrates features that have not been widely documented in the THO: (1) high pressure kyanite-bearing metasedimentary rocks, (2) lack of steeply dipping shear zones, and (3) prolonged exhumation below 650°C. Thermobarometry combined with in-situ LA-ICPMS accessory mineral geochronology elucidate almost 400 million years of Paleoproterozoic evolution of the block. The granulite-facies rocks of the RBb underwent HP/HT (9.5 kbar/800°C) metamorphism that originated with zircon recrystallization at ca. 1.88 Ga. Prograde metamorphism in pelitic gneiss is recorded by the growth of garnet at ca. 1858 Ma, muscovite dehydration at ca. 1844 Ma, and the growth of a second generation of garnet at the expense of biotite at ca. 1815 Ma. Propagation of melts from lower crustal pelitic units into the middle crust caused water assisted melting and the development of widespread migmatites, metatexites and diatexites. The final stage of HT-metamorphism is recorded by cordierite-spinel coronas surrounding garnet, indicative of near-isothermal decompression at ca. 1791 Ma. Based on titanite, rutile and apatite geochronology, cooling of the RBb occurs at a rate of 2°C/million years.

The results suggest that the RBb was likely buried by an allochthonous package of rocks displaced during the Snowbird Orogeny at ca. 1.88 Ga. Crustal residence was