Geophysical Research Abstracts
Vol. 13, EGU2011-2484, 2011
EGU General Assembly 2011

Neoproterozoic sedimentation and orogenesis in NE Laurentia

Peter Cawood (1), Rob Strachan (2), and Sergei Pisarevsky (3)

(1) Department of Earth Sciences, University of St Andrews, North St. St Andrews, Fife KY16 9AL, UK (peter.cawood@st-andrews.ac.uk), (2) School of Earth & Environmental Sciences, University of Portsmouth, Portsmouth, PO1 3QL, UK, (3) School of Earth and Environment, University of Western Australia, WA, 6009, Australia

Latest Mesoproterozoic to mid-Neoproterozoic (1030-710 Ma) sedimentation and orogenic activity that developed on northeast Laurentian substrate around the North Atlantic borderlands and presently exposed in Scotland, Shetland, East Greenland, Svalbard and Norway constitute the Valhalla Orogen. The site for the orogen was initiated by some 95o of clockwise rotation of Baltica with respect to Laurentia at the end of the Mesoproterozoic. This created a triangular ocean basin, the Asgard Sea, which received orogenic detritus from the Grenville-Sveconorwegian-Sunsas Orogen. Sedimentary successions within the orogen accumulated during two cycles at 1030-980 Ma and 910-870 Ma, with each cycle terminated and the successions stabilized during tectonothermal episodes involving crustal thickening and igneous activity, some of calc-alkaline affinity, associated with the Renlandian (980-910 Ma) and Knoydartian (830-710 Ma) orogenic events. The Valhalla orogen represents an exterior accretionary orogen that developed along the margin of Laurentia and the Asgard Sea. The early stages of the Valhalla Orogen are coeval with the final stages of the Grenville-Sveconorwegian-Sunsas Orogen that lies to the south but are tectonically discrete as they constitute part of an exterior orogen that is entirely distinct from the interior orogen formed between collision of Laurentia, Baltica and Amazonia. Evidence for latest Mesoproterozoic to Neoproterozoic rock units and events are scattered across North Laurentia from north Greenland to Arctic Alaska, and they show similarities to those within Valhalla Orogen suggesting continuity of tectonic elements across northern Laurentia.