



Transgressive-regressive events and facies through the Upper Ordovician – Lower Silurian of Peary Land, North Greenland

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Key sections through the Upper Ordovician (Katian-Hirnantian) and Lower Silurian (Rhuddanian) in Peary Land, North Greenland, demonstrate a succession of events related to the waxing and waning of contemporary glaciation on the far-off supercontinent of Gondwana. The Børglum River Formation was deposited in the palaeoequatorial marginal seas of Laurentia during the Katian. The upper Børglum River Formation contains a thick (130 m) unit of thick-bedded carbonate with pervasive Thalassinoides ichnofacies, which is also typical of the Selkirk Member (c. 40 m) of the Red River Formation in Canada and coeval rocks in Nevada. In addition to these ichnofossils, the shelly faunas are also similar, emphasized by the dominance of giant nautiloids, relatively abundant stromatoporoids and receptaculitids, and large gastropods. The Thalassinoides ichnofacies points to a remarkable palaeogeographic extension from an intracratonic basin to a pericratonic shelf over a distance of 11,000 km. This facies consistency implies a near homogeneous and stable depositional environment along the palaeoequator of Laurentia during the Late Ordovician. The succeeding Turesø Formation is more variable and less laterally extensive, characterized in its lower part by mud mounds, shelly coquinas and peritidal, cyclical deposits in a regressive sequence. These shallower-water facies are associated with a marked positive carbon isotope excursion that elsewhere is associated with the end Ordovician extinction. Following a probable hiatus, transgression is associated with the sequential development of Viridita and Virgiana dominated coquinas during the Rhudannian, taxa with widespread distributions across the rest of Laurentia and beyond.