

The Millstone Grit of northern England: a response to tectonic evolution of a northern sourceland

Andrew C. Morton^{1,2} and Andrew G. Whitham³

¹ HM Research Associates, 100 Main Street, Woodhouse Eaves, Leics LE12 8RZ, UK

² Department of Geology & Petroleum Geology, University of Aberdeen, King's College, Aberdeen AB24 3UE, UK

³ CASP, Department of Earth Sciences, University of Cambridge, West Building, 181a Huntingdon Road, Cambridge CB3 0DH, UK

ABSTRACT

The Carboniferous succession of East Greenland is dominated by sandstones that were deposited by a major northward-flowing fluvial system. The succession is divided into two parts by a major unconformity that spans late Visean to early Westphalian A time. This time interval corresponds to the development of the Millstone Grit of the Pennine Basin, which was deposited by a southward-flowing fluvial system. Heavy mineral analysis indicates that there are common elements to the provenance of Late Westphalian A sandstones in East Greenland and the Namurian Millstone Grit. It therefore appears that the southward extension of clastic facies that took place during the Namurian of the Pennine Basin occurred when uplift in the Norwegian-Greenland Sea region diverted the northward-flowing fluvial system southwards to the Pennine Basin. Supply of sediment from the northern sourceland diminished when rifting during the Westphalian allowed the northward fluvial system in East Greenland to be re-established.

Key words: Carboniferous, East Greenland, Pennine Basin, heavy minerals