Testing Lower Palaeozoic palaeogeography using fossils

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Fossils are information-rich. They facilitate a wide range of decipherable signatures, from age and climate to bathymetry and palaeogeography (e.g., Fortey & Mellish 1992). Their non-repeatable fossil record and geographic distribution represent a unique succession of events that can be used to independently test for the presence and global position of continents and oceans. As a test case we show how the endemicity (‘faunal provinciality’) of selected marine invertebrate animals signals the palaeocontinents (e.g., Laurentia, Baltica, Avalonia) and adjacent oceans (Iapetus, Rheic) of the North Atlantic Region during the early Palaeozoic (e.g., Fortey & Cocks, 1992). Such fossils cannot be used indiscriminately; account must be taken of their ontogeny and lifestyle, life habitat, climatic preference and also sea level changes before their possible use as palaeogeographic indicators. Trilobites, brachiopods and ostracods (Schallreuter & Siveter 1985, Vannier et al. 1989, Siveter et al. 2003, Meidla et al. 2013, Perrier & Siveter 2013) are key groups used to define early Palaeozoic palaeogeography. Pilot studies are currently yielding new ostracod assemblages from Lower Palaeozoic terranes of Japan. These will be used to elucidate faunal affinities and their utility in determining reconstructions of Asian palaeogeography (e.g., those of Torsvik & Cocks 2013a, 2013b; Cocks & Torsvik 2013).

References