The Permian red beds of south-west Scotland

Introduction

In south-west Scotland, the Permian red beds are preserved on the island of Arran and in the Mauchline Basin, just south of Glasgow, and the Thornhill, Moffat, Lochmaben, Dumfries, and Stranraer basins in Dumfries and Galloway (Figure 1.7) and (Figure 2.1). The succession in each occurrence begins with a breccia unit, above which are red- and yellow-coloured sandstones overlain, in some cases, by further breccias and water-laid sandstones (Smith *et al.,* 1974). On Arran, the succession is overlain, without a clear break, by Triassic strata (see Chapter 3), while, in the other basins, the Permian red beds are capped by Quaternary sediments. In the Mauch-line Basin the basal breccia is associated with volcanic tuffs and rare basaltic lavas; similarly the basal part of the Permian succession in the Thornhill Basin is associated with basalt flows.

The age of the south-west Scottish 'New Red Sandstone' deposits has long been debated. Harkness (1850) assigned them to the Triassic System, but Murchison and Harkness (1864) preferred an Early Permian age. Sherlock (1926) reverted to a Triassic assignment, but evidence has since accumulated to support an Early to Mid Permian age. The Arran succession may span the whole Permian System, but the breccias and sandstones at the other localities are mostly tentatively assigned to the Lower and Middle Permian series (Smith *et al.,* 1974). This assignment is based on the fossil plants from the basal units of the Mauchline Basin succession that indicate a latest Carboniferous to, probable, Early Permian age (Wagner, 1983). Radiometric dates of 286 ± 7 Ma from the Mauchline Basin tuffs are not satisfactory because of the condition of the sampled rock, the analytical technique, and the poor biostratigraphy (De Souza, 1982, cited in Forster and Warrington, 1985). The breccias and conglomerates at the base of the Permian successions elsewhere in southwest Scotland are then correlated, on broad lithological comparisons, with the Mauchline succession. Fossil footprints from the higher sandstone units around Dumfries give a general indication of an Early to Mid Permian age.

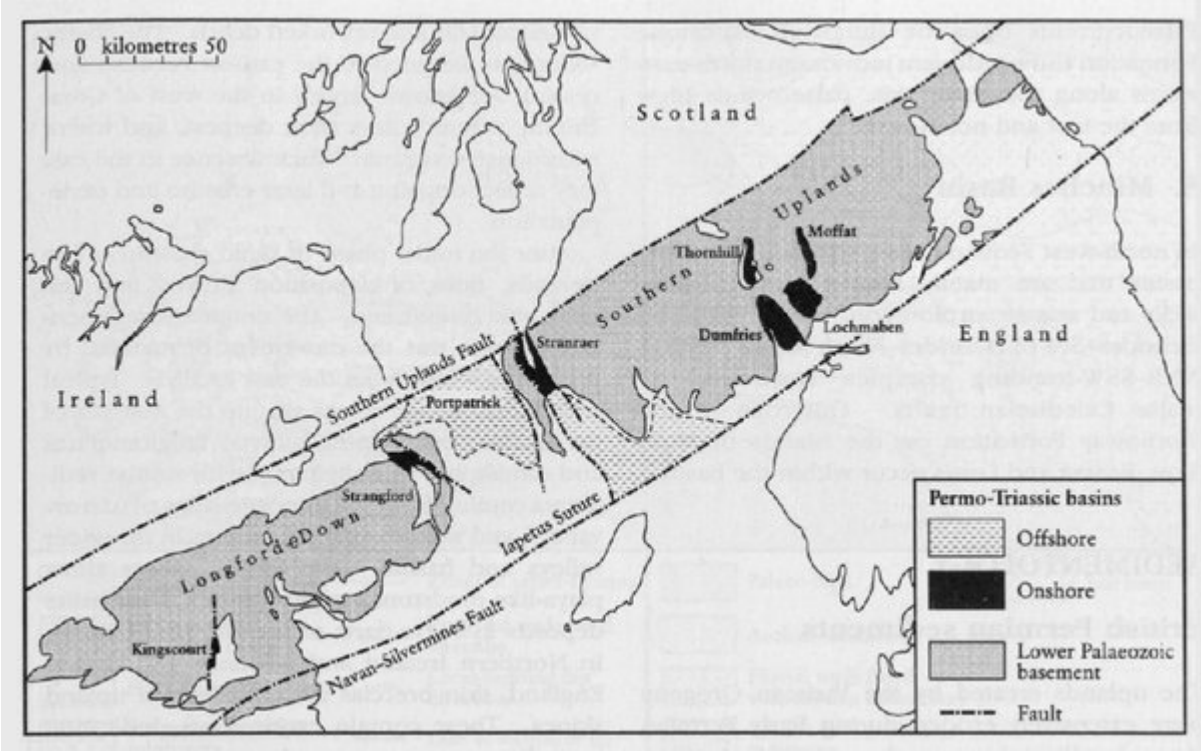
Three GCR sites have been selected to represent the Permian red beds of south-west Scotland: the Corrie Shore on Arran, Hapland Burn in the Thornhill Basin, and Locharbriggs North Quarry in the Dumfries Basin.

Corrie Shore to Brodick, Isle of Arran

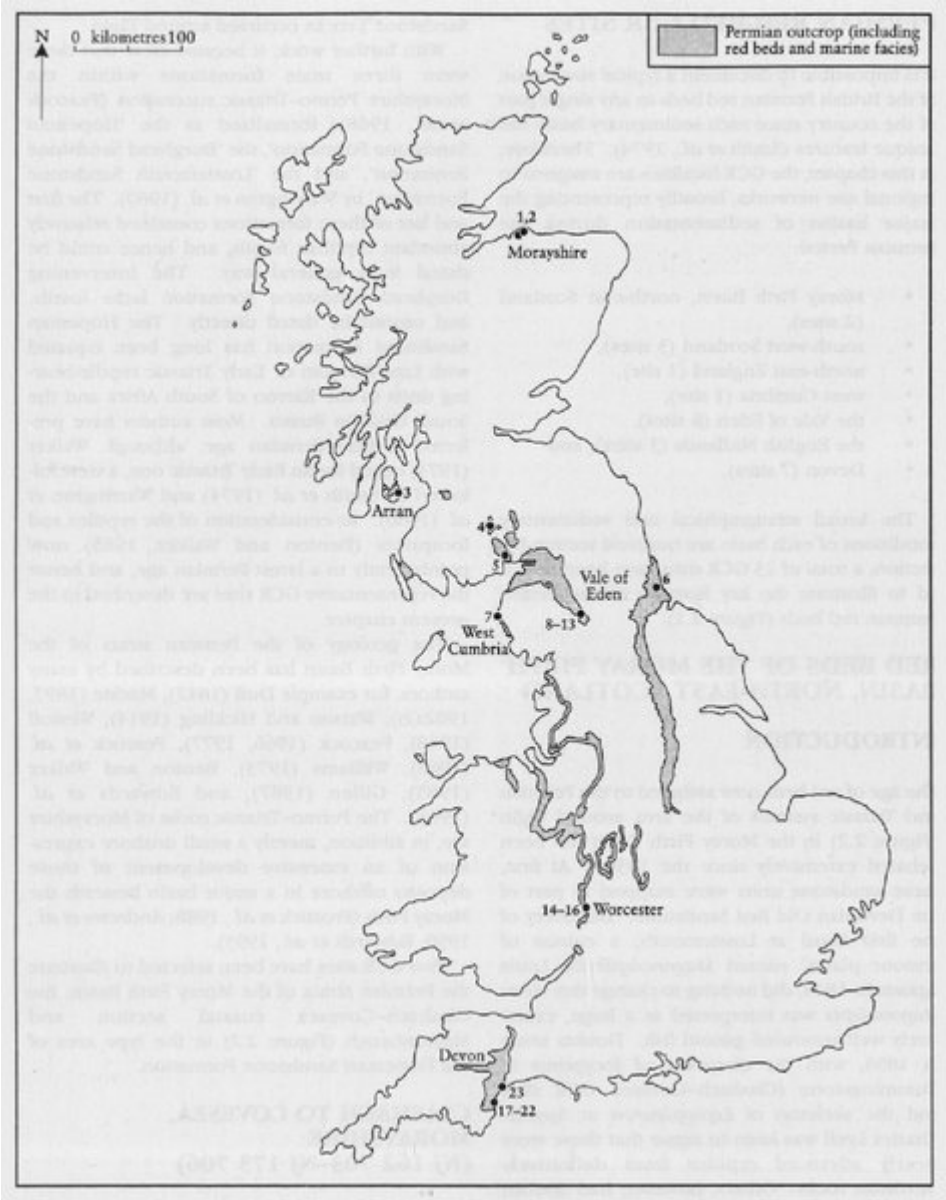
Hapland Burn, Dumfries and Galloway

Locharbriggs North Quarry, Dumfries and Galloway

References



(Figure 1.7) The Permo-Triassic basins in the Southern Uplands of Scotland and the Longford–Down region of Ireland. The Permian outcrop north-west of the Southern Uplands Fault and south-east of the Iapetus Suture are not shown — see <a href="gcr24_02_01.html (Figure 2.1). (After Anderson et al., 1995.)



(Figure 2.1) Map showing the outcrop of Permian rocks in Great Britain. Some major basinal areas are indicated. GCR Permian red-bed sites are numbered as follows: (1) Clashach–Covesea; (2) Masonshaugh Quarries; (3) Corrie Shore; (4) Hapland Burn; (5) Locharbriggs North Quarry; (6) Crime Rigg Quarry; (7) Saltom Bay; (8) Burrells Quarry; (9) Cowraik Quarry; (10) George Gill; (11) Hilton Beck; (12) Stenkrith Beck; (13) River Belah; (14) Sling Common; (15) Osebury Rock; (16) Kinver Edge; (17) Shoalstone; (18) Saltern Cove; (19) Roundham Head; (20) Oddicombe Beach; (21) Coryton's Cove; (22) Dawlish; (23) Orcombe Rocks.