Treffgarne Bridge

[SM 959 228]

Introduction

This site, the type locality of the Treffgarne Bridge Beds (see (Figure 8.1)), contains trilobites of the *Olenus* Zone of the Merioneth Series (Upper Cambrian) and is biostratigraphically the best constrained locality in the 'Lingula Flags' of south-west Wales. It complements the coastal section seen at Porth-y-rhaw, and correlation with the Maentwrog Formation in North Wales suggests the diachronous occurrence of shallow-water facies from South to North Wales.

The 'Lingula Flags' were recorded in the Haverfordwest area by Marr and Roberts (1885, p. 477, pl. 15, fig. 2), and corresponding beds were described in several other areas of south-west Wales (see Rushton, 1974, p. 90). On Ramsey Island they were named the 'Ogof Velvet Formation' by Kokelaar *et al.* (1985), and that term may prove applicable across the whole area for the sandier facies. The rocks near Treffgarne Bridge occur in a faulted area bounded by Precambrian and Arenig volcanic rocks and they assumed importance when fossils diagnostic of age were discovered there (Lake, 1906–1946, pp. 10, 58). The local name 'Treffgarne Bridge Beds' was proposed for these strata by Cowie *et al.* (1972), and the general geology of the area is described by Thomas and Cox (1924).

Description

Exposures occur in cuttings along the roadside and in the quarry, described by Marr and Roberts (1885), about 20 m of strata being intermittently exposed. They are well-bedded flaggy mudstones and sandstones dipping north at about 45°. The sequence is predominantly of grey, silty mudstones, which may be structureless or finely interlaminated with dark-grey, finer-grained mudstones. Hard, fine-grained siliceous sand stone occurs in laminae and thin beds, generally 1 mm to 5 cm in thickness; these are often lenticular, especially when only a few millimetres thick, and finely interlaminated with silty mudstones. Some of the thicker beds show ripple cross-lamination and structures resembling convolute laminations. Fossils include the brachiopod *Lingulella davisii* (M'Coy) and the trilobites *Homagnostus obesus* (Belt), *Olenus cataractes* Salter and *Olenus mundus* Lake, the latter two of which Rushton (1983) considered to be conspecific.

Interpretation

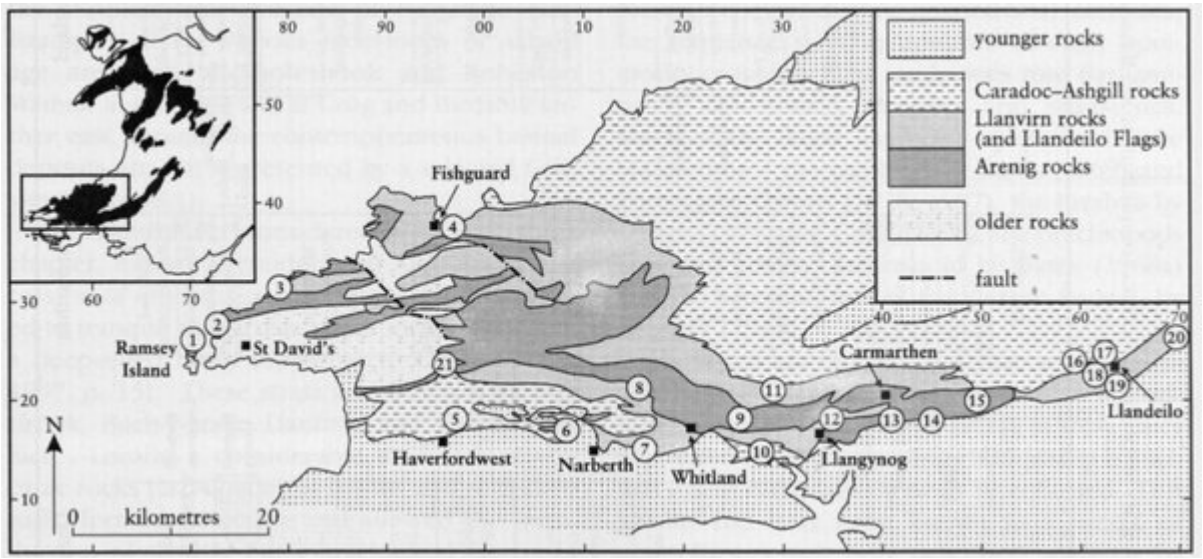
The 'Lingula Flags' facies exposed at this locality is more argillaceous than elsewhere in South Wales, such as at Porth-y-rhaw (see site report). In other areas, sandstones can reach 50 cm in thickness, and Cox (1915) recorded conglomeratic beds 15 cm thick. Trace fossils and sedimentary structures are very common (Crimes, 1970a) and include convolute and current-bedding, symmetric, asymmetric, linguoid and interference ripples (e.g. at Porth-y-rhaw). These all indicate rapid deposition in shallow water, often above wave base, from currents directed from the south or south-west. The beds at Treffgarne Bridge generally lack these structures and may represent more distal deposits from similar currents.

Fossils are not common in the 'Lingula Flags', so the presence of fossils diagnostic of the *Olenus* Zone (*cataractes* Subzone) at Treffgarne Bridge allows correlation of these deposits with the upper part of the Maentwrog Formation of the Harlech Dome (see site report for Nant y Graean). As in the Harlech Dome, the faunas indicate that the 'Lingula Flags' facies of Pembrokeshire spans horizons from late St David's or early Merioneth Series (at Porth-y-rhaw) to the upper part of the *Olenus* Zone (Treffgarne Bridge). There is no conclusive evidence for beds of Ffestiniog age in the area, but the typical species *Lingulella davisii* is present with *Olenus* and may therefore occur earlier in South Wales than in North Wales. These beds of Maentwrog age thus suggest that the onset of shallow-water deposition (above wave base) occurred earlier in South Wales than in North Wales, where rippled beds are restricted to the Ffestiniog Flags Formation.

Conclusions

The site near Treffgarne Bridge yields fossils of the *Olenus* Zone that enable the Treffgarne Bridge Beds to be correlated with other deposits of similar age in Britain. The Treffgarne Bridge Beds were deposited in a shallow sea with periodic currents. They are more muddy than rocks of the same age elsewhere in South Wales, but they reveal that shallowing occurred earlier in South Wales than in North Wales.

References



(Figure 8.1) Distribution of Ordovician (Arenig to Ashgill) rocks in south-west Wales, after British Geological Survey (1994c). Locations of GCR localities as follows: 1, Ogof Hên and Road Uchaf; 2, Pwlluog; 3, Abereiddi Bay; 4, Abergwaun; 5, Sholeshook; 6, Robeston Wathen; 7, Bryn-banc; 8, Llanfallteg; 9, Pontyfenni; 10, Mylet Road; 11, Meidrim; 12, Dan-lan-y-castell; 13, Glan Pibwr; 14, Allt Pen-y-coed; 15, Cwm yr Abbey; 16, Birdshill; 17, Crag; 18, Dynevor Park; 19, Ffairfâch; 20, Talar Wen. Also 21, Treffgarne Bridge (Upper Cambrian, see Chapter 4).