Pontyfenni, Whitland

[SN 2379 1690]–[SN 2381 1693]

Introduction

The dark, blocky mudstones exposed at Pontyfenni are the type development of the Pontyfenni Formation of late Arenig (Fennian) age, and this locality is internationally important, having yielded by far the richest Fennian fauna. Prolonged collecting has yielded a diverse, though not abundant, fauna, chiefly of trilobites and graptolites. The trilobites are palaeontologically significant: they include the earliest known representatives of several genera. Many specimens are well preserved, and a high proportion are articulated. It is on the basis offossils recovered from Pontyfenni that Fortey and Owens (1987, p. 107) recognized the cyclopygid biofacies and atheloptic trilobite association.

This locality was noted by Evans (1906, p. 612) and by Strahan *et al.* (1909, p. 20) as exposing the 'Tetragraptus Beds', and both gave brief faunal lists that included graptolites and cyclopygid trilobites. However, extensive collections made by Fortey and Owens in the late 1970s greatly increased the number of taxa present, particularly among the trilobites, and Pontyfenni has become the source of some of the most diverse and well-preserved late Arenig faunas from Britain. It is one of the few localities that demonstrate the peripheral position of Wales on the edge of the palaeocontinent Gondwana.

Description

A long-disused quarry on the east bank of Afon Fenni, immediately east of Pontyfenni, shows strata dipping NNW at about 60°; these lie either on the northern limb of a subsidiary fold of the anticlinal area to the north of Whitland (Fortey and Owens, 1987) or on an overturned southern limb of the latter. This is effectively the type locality for the Pontyfenni Formation and the best at which to examine its typical development, which is a sequence of dark-grey, blocky mudstones that break conchoidally rather than along the bedding. Exposed surfaces exhibit a dark-brown film, and a weathering pattern of concentric rings is typically developed. Black siliceous nodules, usually up to 3–4 cm across, occur sporadically throughout the succession, and some enclose well-preserved fossils (Fortey and Owens, 1987, p. 81).

Fossils are rather sparse but are well preserved and undistorted, and hours of patient collecting is required to acquire a representative fauna. The commonest fossils are the extensiform graptolites *Didymograptus* (*Expansograptus?*) *uniformis lepidus* Ni and *D.* (*E.*) *hirundo* Salter, cyclopygid trilobites such as *Pricyclopyge binodosa eurycephala* Fortey and Owens, phyllocarid crustaceans (*Caryocaris*) and hyolithids, but many further taxa are known from this locality. Other graptolites include *Pseudotrigonograptus ensiformis* (Hall) and *Undulograptus cumbrensis* (Bulman). Among the trilobites are cyclopygids such as *Cyclopyge grandis brevirbachis* Fortey and Owens, *Degamella evansi* Fortey and Owens, *Microparia* (*M.*) *broeggeri* (Holub), and other inferred pelagic forms (*Bohemilla* (*Fenniops*) *sabulon* Fortey and Owens, *Girvanopyge* sp.), as well as a series of small-eyed and blind species such as *Shumardia* (*Conophrys*) *crossi* Fortey and Owens, *Dindymene saron* Fortey and Owens, *Placoparia cambriensis* Hicks, *Illaenopsis harrisoni* (Postlethwaite and Goodchild), *Bergamaia rusbtoni* Fortey and Owens (Figure 8.4)e, *Ampyx linleyoides* Fortey and Owens, *Colpocoryphe taylorum* Fortey and Owens and *Ormathops nicholsoni* (Salter). The remainder of the fauna includes hyolithids (Figure 8.4)d, orthoconic nautiloids, bivalves, gastropods, calcichordates, ostracods and small lingulate brachiopods.

Interpretation

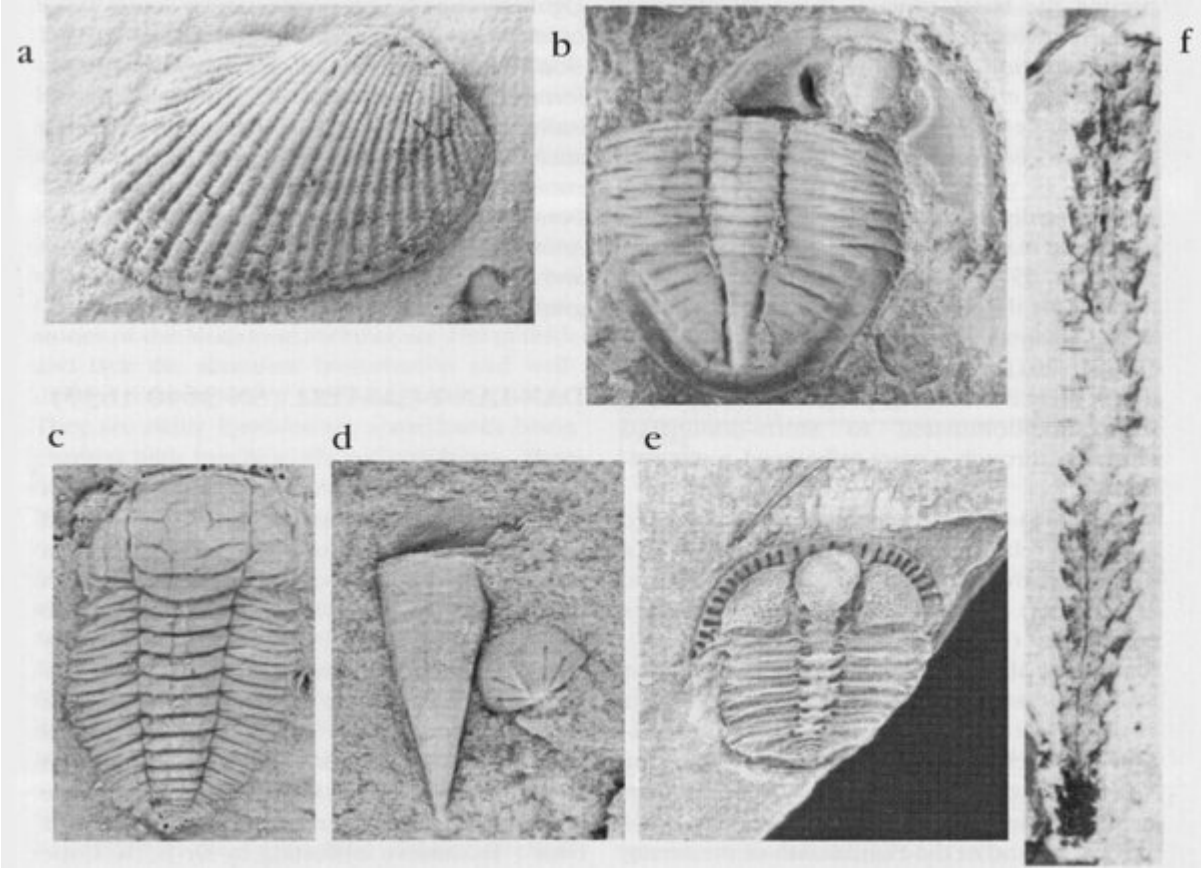
On the basis of the graptolite fauna, the age of the mudstones at Pontyfenni is late Arenig. *Undulograptus cumbrensis* ('*Glyptograptus*' *dentatus* of Fortey and Owens, 1987), the oldest diplograptoidean recorded from Wales (Mitchell and Maletz, 1995, p. 324), indicates the presence of the *U. sinicus* Subzone of the *U. austrodentatus* Biozone and falls within the uppermost part of the range of *D.* (*E.*) *hirundo,* which also occurs here. *Pseudotrigonograptus ensiformis* is another late-Arenig indicator. Trilobites such as *Placoparia cambriensis* and *Selenopeltis buchii macrophthalma* also support a late-Arenig age and are taxa that range upwards into the Llanvirn.

That Pontyfenni occupied a peripheral position on the margin of the Gondwanan palaeo-continent is inferred from both its palaeogeographical occurrence and the fauna, which is made up of pelagic organisms (graptolites and cyclopygid trilobites) and a benthic fauna adapted to conditions of low illumination, such as might be expected on a continental margin. The occurrence here of pelagic trilobites and graptolites with the atheloptic association of small-eyed and blind trilobites led Fortey and Owens (1987, p. 106) to suggest accumulation at a water depth of 300 m or more, perhaps just below the critical depth for the penetration of light.

Conclusions

The site at Pontyfenni is the most important exposure of the Upper Arenig Pontyfenni Formation and is palaeontologically of international significance. It has yielded a large fossil fauna and is the type locality for many of the species that characterize the Fennian Stage, the upper division of the Arenig Series.

References



(Figure 8.4) Fossils from Arenig and Llanvirn sites in South Wales. (a) Falcatodonta costata Cope, x4.5, from the Bolahaul Member (Moridunian) at Dan-lan-y-castell. (b) Merlinia selwynii (Salter), x2.5, Pibwr Member (Moridunian), Glan Pibwr. (c) Portedieldia punctata (Crosfield and Skeat), x8, Cwm yr Abbey Member (Moridunian), Cwm yr Abbey. (d) Hyolithid conch and operculum, x 5, and (e) Bergarnia rushtoni Fortey and Owens, x 3.5, both from the Pontyfenni Formation (Fennian), Pontyfenni. (I) Undulograptus austrodentatus (Harris and Keble), x6, Llanfallteg Formation (basal Abereiddian), Llanfallteg.