
Ogof Hên and Road Uchaf

[SM 7060 2508]–[SM 7085 2522] and [SM 7052 2434]

Introduction

The coastal section around Ogof Hên includes the type locality for the early Arenig Ogof Hên Formation and is the best representation in South Wales of the transgressive base to the Arenig Series. The fauna from Ogof Hên was described by Hicks (1873), who recognized new species of trilobite, bivalve, hyolithid, crinoid and asteroid. He believed it to be of Tremadoc age. Pringle (1911) demonstrated that the fauna was of Arenig age and later (Pringle, 1930) subdivided the Arenig rocks at Ogof Hên, employing divisions first described by Cox (1915) at Abercastle on the north side of the St David's peninsula, namely the Abercastle Beds (beneath) and Porth Gain Beds (above). Bates (1969) was unable to recognize these divisions, however, and introduced the term Ogof Hên Formation for the entire early Arenig sequence. Kokelaar *et al.* (1985), like Pringle, distinguished two units: a lower Sandstone Member and an upper Mudstone Member, which correspond lithologically to the Abercastle and Porth Gain Beds but are not correlatives of those units at Abercastle. Traynor (1988, p. 280) analysed and described the sedimentary facies, the basal sandstone member comprising fine grained tidal laminates, the sequence passing upwards through hummocky cross-stratified sandstones into flat laminated sandstones, siltstones and mudstones. Much of the fauna has been redescribed since Hicks' time — the trilobites by Bates (1969) and Fortey and Owens (1978, 1987), the bivalves by Carter (1971) and Cope (1996), the brachiopods by Bates (1969), the crinoid by Gates (1968a) and the asteroid, one of the earliest known, by Spencer (1918).

About 0.8 km farther south, the small, steep-sided inlet of Road Uchaf is one of the few localities in the upper part of the Arenig in west Wales where the cleavage–bedding relationship is such that fossils can relatively easily be collected. This locality has long been known as a source of graptolites, which were described originally by Hopkinson and Lapworth (1875), and is the type locality for several of Hopkinson's species, of both graptoloids and dendroids. Some of these have been revised subsequently by Elles and Wood (1901), Bulman (1927–1967), Jenkins (1982) and Fortey and Owens (1987). Comparatively deep-water conditions have been inferred for the deposition of the Road Uchaf Formation, typically developed here; it is one of the few horizons in the Arenig of Wales to have yielded isograptid graptolites, which are valuable for long-distance correlation.

Description

The Ogof Hên Formation crops out extensively on the cliff-tops of the north-east tip of Ramsey Island (Figure 8.3). The sequence is 190 m thick and is predominantly of siltstones and fine sandstones with silty mudstones and shales that dip between 60° and 80° to the north-west; the lower part comprises laminated fine sandstones and silty mudstones, the upper, silty mudstones and dark mudstones. It overlies the 'Lingula Flags' (Ogof Velvet Formation of Kokelaar *et al.*, 1985) with a slight angular unconformity around [SM 7085 2518]. At the base of the Ogof Hên Formation a discontinuous pebbly sandstone up to 20 cm thick contains whole and fragmented phosphatic oncoliths (formerly described as the bryozoan *Bolopora undosu* Lewis). The Sandstone Member comprises laminated, well-sorted fine sandstones and silty mudstones with cross-lamination, burrows and *Cruziana*-type trails. The blue-grey silty mudstones of the Mudstone Member are 100 m thick and lack the abundant bioturbation and well-defined lamination of the Sandstone Member. They are richly fossiliferous, some bands being charged with brachiopods and trilobites. Most of the fossils have suffered such distortion that Hicks discriminated several species that are now considered synonyms. According to Bates (1969, p. 6), most of the fauna occurs between about 15 m and 25 m above the base of the Mudstone Member, with the brachiopod *Paralenorthis alata* (J. de C. Sowerby) ranging throughout much of the succession. This species, the trilobites *Merlinia murchisoniae* (Murchison) and *Neseuretus ramseyensis* Hicks and the crinoid *Ramseyocrinus cambriensis* Hicks are also known from the Ogof Hên Formation in the Carmarthen district, although the fauna is not as diverse as that at Dan-lan-y-castell (see site report).

At Road Uchaf (Figure 8.3) the Ogof Hên Formation is overlain by black, strongly cleaved mudstones of the Road Uchaf Formation, whose fauna indicates an early Fennian age. The absence on Ramsey Island of any intervening late Moridunian and Whitlandian strata has been explained through their removal by penecontemporaneous (Llanvirn) wet-sediment sliding (Kokelaar *et al.*, 1985, p. 594). In the outcrops in Road Uchaf, cleavage and bedding are more or less coincident, and an extensive fauna of graptolites has been obtained; this is the type locality for the following of Hopkinson's species: *Didymograptus (Expansograptus) sparsus*, *Pseudisograptus stella*, *Ptilograptus hicksii*, *P. cristula*, *Dendrograptus flexuosus*, *D. arbusculus*, *D. divergens*, *D. diffusus*, *Dictyonema homfrayi* and *Callograptus radicans*.

Interpretation

On Ramsey Island, as elsewhere, the Ogof Hên Formation represents a shallow-water transgressive sequence, and the present site is valuable for showing the unconformable base on the underlying Cambrian. Care is needed in interpreting the basal contact: Bates (1969) erroneously included the lowest 40 m of the Ogof Hên Formation, that is, the Sandstone Member of Kokelaar *et al.* (1985), in the 'Lingula Flags' (Kokelaar *et al.*, 1985, p. 594), and his 'Bolopora' horizon was identified by the latter authors as weathered-out carbonate nodules. The upwardly fining sequence suggests deepening of the marine environment (Kokelaar *et al.*, 1985, p. 594), although no great depth is implied for the whole succession. On the basis of his analysis of the sedimentology, Traynor (1988, p.281) reached a similar conclusion, with the sequence indicating progressive deepening from tide-dominated to storm-dominated deposits, through a wave-influenced water column.

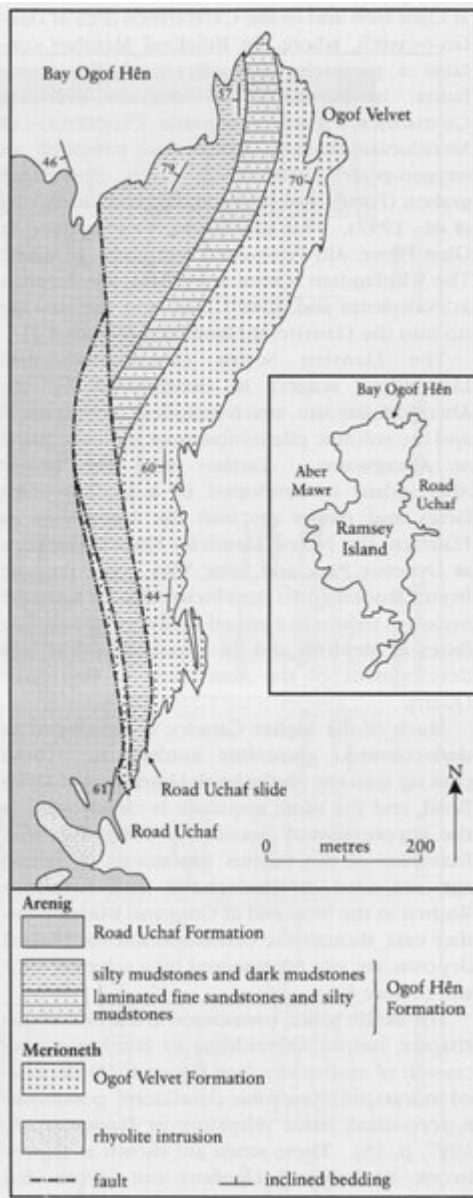
The fauna is of early Arenig (Moridunian) age and is correlated with the Bolahaul Member of the Carmarthen Formation (Fortey and Owens, 1987, p. 93). It represents a typical *Neseuretus* community (Fortey and Owens, 1978, p. 238), though the absence of many of the taxa found at Dan-lan-y-castell may reflect a slightly different environment or, alternatively, poorer preservation and less intensive collecting. Similar *Neseuretus* community faunas of Moridunian age occur in the Mytton Flags Formation of Shropshire and in the Henllan Ash of the Arenig district, but different species are present, because of differences in either age, or environment, or both.

The Road Uchaf Formation represents a significantly deeper-water environment, and the presence of the isograptid graptolites *Pseudisograptus stella* and *Isograptus caduceus* (Salter) indicates the presence of the offshore isograptid biofacies. The association of *Pseudisograptus* and *I. caduceus* is restricted to the Upper Castlemainian (Ca3) and Yapeenian of Australia (Cooper, 1973) and thus affords a valuable intercontinental correlation datum. The total graptolite fauna shows that the Road Uchaf Formation is of late Arenig (Fennian) age. It probably belongs to the earlier part of the stage, for higher strata on the west side of Ramsey Island, at Aber Mawr (Kokelaar *et al.*, 1985, p. 595), have yielded a fauna similar to that of the Fennian at Pontyfenni (see site report for Pontyfenni).

Conclusions

Ogof Hên has the best exposure in South Wales of the transgressive base of the Arenig succession. The Ogof Hên Formation rests unconformably on the Cambrian and contains a historically and stratigraphically important fauna of shelly fossils that allow correlation with the succession in the Carmarthen area. The Road Uchaf Formation is the only known example in the Arenig of South Wales of the isograptid biofacies and is thus important from a palaeobiogeographical point of view.

[References](#)



(Figure 8.3) Geological map of Ogor Hên and Road Uchaf, including the type section of the Ogor Hên Formation, after Kokelaar et al. (1985).