
Fuaran Mor

[NG 980 653]

Introduction

The site at Fuaran Mor exposes the most important trilobite locality in the Fucoïd Beds Member of the An t-Sròn Formation. Olenellid trilobites there show affinities with species from Greenland, Spitsbergen and Arctic Canada and indicate the *Bonnia–Olenellus* Zone of Lower Cambrian age. This gives the best indication of the age of the Cambrian sequence in the northwest Highlands of Scotland. Fuaran Mor is the type locality for several species.

In 1891 Macconochie collected the first Scottish example of the trilobite *Olenellus* in the Fucoïd Beds near Loch an Nid, Dundonnell Forest, and this led to the discovery of the same form at several Fucoïd Beds localities, of which Fuaran Mor is the most notable. The trilobites were described by Peach and Horne (1892) and Peach (1894) and have been revised by Lake (1906–1946) and Cowie and McNamara (1978) (see also the Loch Awe Quarry site report, below).

Description

The site Fuaran Mor is named after a shoulder on the northern slopes of Meal a'Ghiubhais, north-west of Kinlochewe and on the south side of Loch Maree. An undisturbed sequence is exposed, ascending from the Precambrian Torridonian Sandstone Group, across the basal Cambrian unconformity and into the arenaceous parts of the Cambrian succession up to the Salterella Grit. The Cambrian succession is truncated by the Kinlochewe Thrust Plane, which brings in the Torridonian Sandstones, the unit that forms the summit of Meall a'Ghiubhais. The thrust plane is almost horizontal and can be traced right around the hilltop (Figure 12.10).

The lower parts of the hill-slopes are formed of red Torridonian sandstones and conglomerates that dip south-east at about 3°. Higher up, the False Bedded Quartzite forms a white escarpment consisting of coarse-grained, thick- to medium-bedded quartzites, with a few pebbly beds dipping to the east at 25°. Many units show cross-stratification, especially in the lower part of the sequence. Above this escarpment, the Pipe Rock Member is exposed as flat bedding planes showing *Skolithos* burrows. Uphill these quartzites form a series of waterfalls in a large stream and show the vertical burrows of both *Skolithos* and *Monocraterion* ('trumpet pipes').

Above the stream another escarpment shows white quartzites at its base and the Fucoïd Beds at the top. These consist of brown, earthy-weathering dolomitic siltstones, sandstones and shales. The sandstones form beds up to 10 cm thick (although usually less), are medium- to coarse-grained and often show cross- and parallel lamination, with muddy drapes and shaly partings (Figure 12.11). The mudstones are darker-grey and generally structureless. Further outcrops of these beds can be found in other stream sections nearby. Above these exposures is the Kinlochewe Thrust Plane, which introduces the Torridonian Sandstone that caps the hill (Figure 12.10). In places, white quartzites of the Salterella Grit occur above the Fucoïd Beds and below the thrust, although elsewhere it cuts them out.

A stream section at about [NG 9795 6515] is the most important fossil locality within the Fucoïd Beds. It is 7 m in extent; Macconochie (in Peach *et al.*, 1907, p. 414) described the several subdivisions. Despite the proximity of the thrust plane, the fossils are barely distorted. They include lingulate brachiopods and hyolithids, but most significant are the olenellid trilobites. These were recorded from several levels, but most interesting are those from the lowest unit, the '*Olenellus* Layer', in which some species are represented by complete dorsal shields — otherwise almost unknown in the Cambrian of Scotland. *Olenellus lapworthi* Peach and Horne is the commonest form, with slightly fewer *O. reticulatus* Peach and rare *O. intermedius* Peach; all these were revised by Cowie and McNamara (1978). This is the type locality for the latter two taxa, as well as for two others, *O. lapworthi elongatus* Peach and *O. gigas* Peach, which are respectively regarded as synonyms of *O. lapworthi* and *O. reticulatus* (Cowie and McNamara, 1978). The remarkable *O. (Olenelloides) armatus* Peach, originally described from the basal layer at this locality, was revised by McNamara (1978).

Interpretation

The Fucoïd Beds are interpreted as storm deposits laid down in a shallow shelf sea (McKie, 1990b; see the site report for An t-Sròn). Although the biota of the Fucoïd Beds is assembled from material from several localities (Peach *et al.*, 1907, p. 628), that found at Fuaran Mor typifies the development of the trilobite-bearing horizons. The trilobites are of Laurentian type and indicate the *Bonnia–Olenellus* Zone of the Lower Cambrian (Cowie and McNamara, 1978), allowing correlation with sequences in the North American 'Pacific Province' in areas such as Greenland, Spitsbergen and Arctic Canada. The absence of similar faunas in England and Wales signifies a palaeobiogeographical barrier between Scotland and southern Britain and implies the existence of the Iapetus Ocean during the Early Cambrian (Conway Morris and Rushton, 1988).

McNamara (1978) suggested that *O. lapworthi* was adapted to benthic life in relatively deep, poorly oxygenated water. His morphological study of the other *Olenellus* in the Fucoïd Beds led him to postulate that they might all be paedomorphic developments from the *lapworthi* stock (McNamara, 1978, p. 652), variously adapted to different conditions of depth, temperature and oxygen, and that *Olenelloides armatus* was the smallest, possibly planktonic, offshoot.

Conclusions

This site exposes an internationally important fossiliferous horizon, with the greatest variety of Cambrian trilobites and almost all the complete examples known in Scotland. The trilobites are closely related to forms found in the Lower Cambrian of Greenland, Spitsbergen and Arctic Canada but are unknown from equivalent strata in England and Wales, indicating that a barrier to migration existed, i.e. the Iapetus (proto-Atlantic) Ocean.

References



(Figure 12.10) Summit of Meall a' Ghiubhais viewed from the south-west, showing the Kinlochewe thrust plane (K–K). Above the thrust is a nappe of deformed Lewisian, Torridonian and Cambrian rocks. Below it, Torridonian rocks are overlain unconformably by the Eriboll and An t-Sròn formations. (Photo: British Geological Survey photographic collection, C30.)



(Figure 12.11) Furoid Beds Member in the stream section at Fuaran Mor, Meall a' Ghiubhais. (Photo: J.K. Prigmore.)