Hodge Clough

Highlights

The shales above the Beacon Hill Sandstone yield a more brackish assemblage, restricted to inarticulate brachiopods (*Lingula, Orbiculoidea*). By comparing them with the sequence in nearby Ramsden Clough, Bisat (1920) argued that the shales probably belong to the *Bilinguites superbilinguis* Zone.

Interpretation

This is one of the best exposed sections through the Marsdenian Stage in Britain, and includes fossil faunas representing two of the three included zones. It is also in what Bisat (1924, 1928) regarded as the type area for the stage. Ramsbottom (1969a) went further, to propose Rake Dike as a potential stratotype, but it is not an ideal candidate, as the level which would have defined the stage base (the marine shale yielding *B. gracilis* Bisat) is not well exposed. Consequently, the section at Park Clough, although not showing such a complete section, was chosen by the ICCS as the officially recognized Marsdenian stratotype (Ramsbottom, 1981).

There is some comparison with sections in South Wales, particularly on the north crop of the coalfield (e.g. Vale of Neath, see Chapter 4). Both have similar sequences of marine bands, and have sandstones representing similar southwards prograding deltas. However, they were formed in quite different palaeogeographical settings, and represent sediments with totally different provenances the Wales–Brabant Barrier for South Wales and a positive area somewhere to the north for the Pennines.

Although much of the section consists of marine shales, there are three sandstone bands, which probably represent sheet delta deposits. They are Hodge Clough provides the most complete and fossiliferous sequence through the upper Marsdenian Stage in western and central Europe, and has yielded fossil faunas representing all of the known biostratigraphical units in this interval.

Introduction

A typical sequence through the upper Marsdenian of the Rossendale Basin is exposed along a small tributary of the River Irwell [SD 785 193], about 4 km SSE of Haslingden, Lancashire (Figure 9.13). The geology is described by Wright *et al.* (1927) and Ramsbottom (1969a).

Description

Lithostratigraphy

The exposed sequence here is 50 m thick. At the base are 20 m of fine-grained sandstone, capped by a seat earth and thin coal. It is known as the Helmshore Grit Formation, and is a good example of deposits formed in a sheet delta environment as described by Collinson (1988).

The coal above the Helmshore Grit is in turn overlain by about 25 m of mainly argillaceous strata, and includes several marine bands (see below). Towards the top of this part of the sequence, the beds become more silty and include hard ribs of what Wright *et al* (1927) called siliceous ironstones.

The rest of the sequence is rather poorly exposed, but includes some thin ganister-like sandstones which may correlate with the Hazel Greave Grit Formation further east, and shales which include two marine bands.

Biostratigraphy

This site has yielded marine animal fossils from four discrete marine bands. The lowest band, a short distance above the Helmshore Grit Formation, has yielded *Bilinguites bilinguis* (Salter) (*Reticuloceras reticulatum* mut. β *sensu* Wright *et al.,* 1927) and *B. eometabilinguis* (Ramsbottom), and thus the lower subzone of the *B. bilinguis* Zone. Fourteen metres above this, Ramsbottom (1969a) records ammonoids including *B. metabilinguis,* which this time indicate the upper subzone of the *B. bilinguis* Zone.

In the poorly exposed shales at the very top of the section, Ramsbottom (1969a) has reported two closely-spaced marine bands containing fossil faunas belonging to the *Bilinguites superbilinguis* and *Verneuilites sigma* subzones.

Interpretation

This site should be seen in conjunction with Rake Dike (see above), since together they provide an almost complete section through the Marsdenian Stage of the Central Province. As pointed out by Ramsbottom (1969a), no other site shows such a complete and fossiliferous section through the upper Marsdenian as Hodge Clough. Only the topmost Marsdenian is absent, and this does not include any significant marine horizons. Nowhere in Britain can all the major marine bands be seen at a single locality (cf. Tenby–Saundersfoot, Vale of Neath, see Chapter 4), while sections in western and central Europe suffer from much poorer exposure.

Conclusions

Hodge Clough is the best exposure of fossiliferous upper Marsdenian rocks in western and central Europe (just over 316 million years old).

References

(Figure 9.13) Hodge Clough. Reproduced by permission of the Director, British Geological Survey: NERC copyright reserved (A2523).