Stairfoot Brickworks

Highlights

Stairfoot Brickworks is the best exposure of the Aegiranum Marine Band in the Pennine Basin.

Introduction

Stairfoot Brickworks [SE 381 050] lies about 3 km ESE of Barnsley, South Yorkshire. Exposed here is the Aegiranum Marine Band, which is an index to the Duckmantian–Bolsovian stage boundary. The site was at one time proposed as the international stratotype for this stage boundary (Calver and Owens, 1977), although River Doe Lea subsequently became the designated site (see Chapter 2 for further details). The only description of the exposed section is in Ramsbottom (1981), although Spears (1967) gave a measured log of the same strata exposed in another part of the quarry (now no longer visible).

Description

Lithostratigraphy

When the quarry was active (up until the early 1980s), a considerable sequence above the sandstone known locally as the Oaks Rock could be seen here. However, only the marine band and its immediately adjacent strata can now be seen. The exposed marine band is 4 m thick, and consists mainly of black and blue-grey shales and mudstones. These overlie a thin, unnamed coal and its seat earth. Ramsbottom *et al.* (1974) state that this coal immediately underlying the marine band has a thin tonstein, but no mention of it was made by Ramsbottom (1981).

Biostratigraphy

Marine band

The upper and lower parts of the marine band only yield fish fragments and *Naiadites* bivalves. However, the middle part of the band has yielded an assemblage of ammonoids (including the index *Donetzoceras aegiranum* (Schmidt)), nautiloids, pectinoid bivalves, gastropods and crinoids. Although the stratigraphical context of these marine strata cannot now be seen, the presence of *D. aegiranum* makes it almost certain that this is the Aegiranum Marine Band, which is used to mark the Duckmantian–Bolsovian stage boundary.

Palynology

Thirty-two species of palynomorph were listed from this exposure in Ramsbottom (1981), and belong to the *Microreticulatisporites nobilis–Florinites junior* miospore zone. As pointed out by Riley *et al.* (1985), the Duckmantian–Bolsovian boundary does not correspond to a significant palynological change.

Interpretation

This is the best available exposure of the Aegiranum Marine Band (Figure 10.28) in the Pennine Basin, and is probably the best exposure of the band containing the index ammonoid anywhere in the world. It is one of the most widely occurring of the Westphalian marine bands of north-western Europe, occurring in Britain both north and south of the Wales–Brabant Barrier, as well as in Belgium, The Netherlands, northern France and northern Germany (a more detailed discussion on the distribution of this band can be found in Chapter 2). Its presence in any basin is important, as it allows the accurate placement of the Duckmantian–Bolsovian stage boundary.

Stairfoot Brickworks was at one time a candidate site for the international stratotype of the Duckmantian–Bolsovian stage boundary. It was eventually rejected as a stratotype because it was thought (in the middle 1980s) that there would be problems with its long-term conservation. However, the owners of the site (Yorkshire Brick Company) have now ensured that the site has a long-term future, making it the basis of a 'geological conservation site and teaching facility'. The conservation future of this site is now far better than it is for the formal stage boundary stratotype at Doe Lea, but it is probably unlikely that any move will be made to change the location of the official stratotype, at least in the immediate future.

The site is particularly good for the index ammonoid of the Aegiranum Marine Band. It was originally assigned to *Anthracoceras* by Schmidt (1925), a genus more typically found in the Namurian. Following a detailed study of the juvenile stages, however, Saunders *et al.* (1979) transferred the species to the more typically Westphalian genus *Donetzoceras.* Although this genus is also known from the Ukraine and North Africa, *D. aegiranum* itself is only known from the Aegiranum Marine Band in Europe.

Conclusions

Stairfoot Brickworks is the best exposure of the Aegiranum Marine Band in the Pennine Basin. It is an important stratigraphical marker horizon, representing the boundary between the Duckmantian and Bolsovian Stages. It was formed about 311 million years ago, when the river delta on which the coal swamps were formed was flooded by seawater.

References

(Figure 10.28) Stairfoot Brickworks GCR site. Original exposure of Aegiranum Marine Band. Photographed during the visit to the site by the IUGS Subcommission on Carboniferous Stratigraphy, August 1981. (Photo: W. A. Wimbledon.)