
Bradgate Brickworks

Highlights

Bradgate Brickworks is one of the best exposures of typical Productive Coal Formation of the Pennine Basin (Figure 10.23) and the best site in Britain for yielding non-marine bivalves of the middle *A. modiolaris* Zone.

Introduction

The remains of this disused quarry [SK 413 935], on the west side of Fenton Road, Bradgate, Rotherham, South Yorkshire, shows part of the middle Productive Coal Formation in the Pennine Basin. The site is mentioned by Mitchell *et al.* (1947), and the field geology as still visible is described by Spears (1967).

Description

Lithostratigraphy

The exposed sequence here is about 32 m thick (Figure 10.24). The base of the sequence is marked by the Joan Coal which, although not well seen now, was originally 45 cm thick. It is immediately overlain by about 1 m of black marine shales, now poorly exposed. The remaining 30 m or so consist mainly of shales, siltstones and thin sandstones. They are mostly distal or medial crevasse-splay deposits, although some of the shales are lacustrine, with non-marine bivalves (see below). There are also several minor coals representing emergent conditions. The thickest seam is at the top of the section, and is 35 cm thick. It is known as the Lidgett Coal, and occurs widely in the Yorkshire Coalfield (Ramsbottom *et al.*, 1978). No clear evidence of cyclicity in the sequence is present.

Biostratigraphy

Marine bands

Only one marine band is present in the sequence, immediately overlying the Joan Coal. It has only yielded inarticulate brachiopods (*Lingula*). However, the only marine band known to occur in this part of the Productive Coal Formation is the Vanderbeckei Marine Band (traditionally known in this region as the Clay Cross Marine Band) and is normally in the *Lingula* or at best pectinoid facies (Calver, 1968). It thus marks the junction between the Langsettian and Duckmantian stages.

Non-marine bivalves

As presently exposed, non-marine bivalves can be found at two horizons in this sequence: immediately above and 17 m above the Vanderbeckei Marine Band. Both horizons yield *Anthracosia aquilina* (Sowerby), *A. regularis* (Trueman) *sensu lato* and *Naiadites triangularis* (Sowerby). *A. regularis* in particular indicates the subzone of that name in the middle *A. modiolaris* Zone, i.e. topmost Langsettian to lowermost Duckmantian.

Spears (1967) mentions that assemblages of bivalves of similar composition had also been found from 3.3–6.4 m above the Lidgett Coal.

Interpretation

This is one of the best exposures of the middle part of the Productive Coal Formation in the Pennine Basin. The argillaceous nature of the strata tends to result in little natural outcrop being produced, and most man-made exposures tend to be infilled. In this particular case, however, part of the face has been retained after the quarry was restored (Figure 10.25).

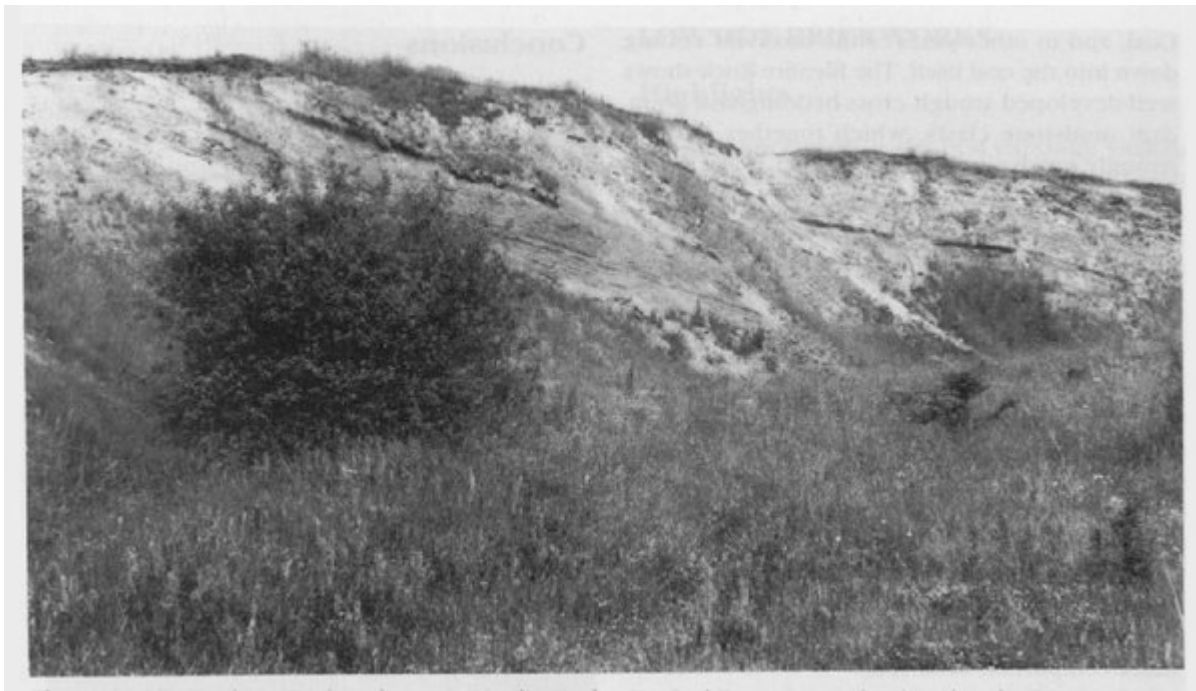
The sequence here, dominated by shales and siltstones, with subsidiary thin, sheet sandstones, is typical of distal crevasse-splay deposits in an upper delta-plain setting (Fielding, 1984a). It is characteristic of the middle and upper Productive Coal Formation in the Pennine Basin, and thus of the economically most important coal-bearing strata in Britain. In contrast, the lower Langsettian deposits of the Pennine Basin (e.g. Goyt's Moss, Honley Station Cutting, Ravenhead Brickworks) were formed in a lower delta-plain setting, and show far clearer cyclicity between marine and non-marine strata (i.e. the classic cyclothem).

The non-marine bivalves from here have not been studied in detail, but the lists provided by Spears (1967) suggest that they are characteristic of the middle *A. modiolaris* Zone. If this interpretation is correct, this is the best British exposure for yielding this fauna.

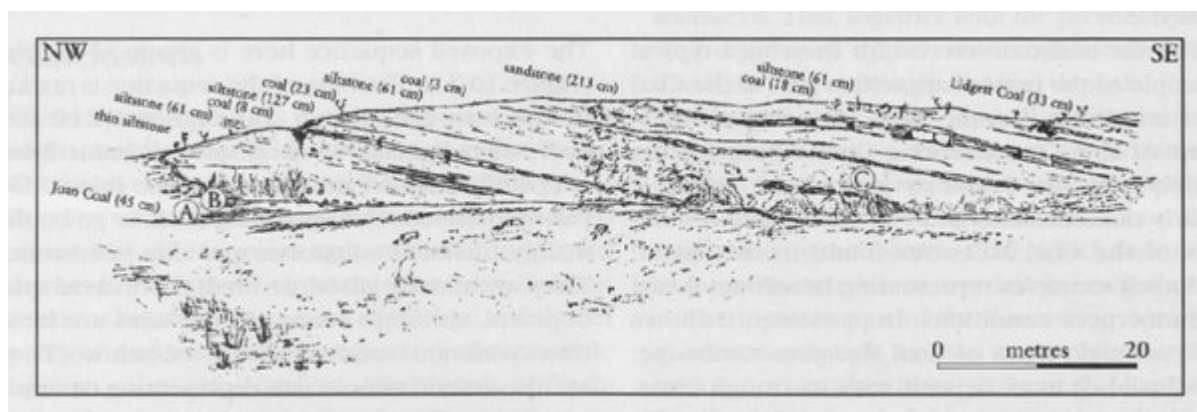
Conclusions

Bradgate Brickworks is one of the best exposures of typical Late Carboniferous coal-bearing rocks in the Pennine Basin. It is also the best British site for fossil shells of freshwater bivalves, which belong to the middle *A. modiolaris* Zone, and indicate an age somewhere near the junction of the Langsettian and Duckmantian ages (i.e. between 305 and 310 million years old).

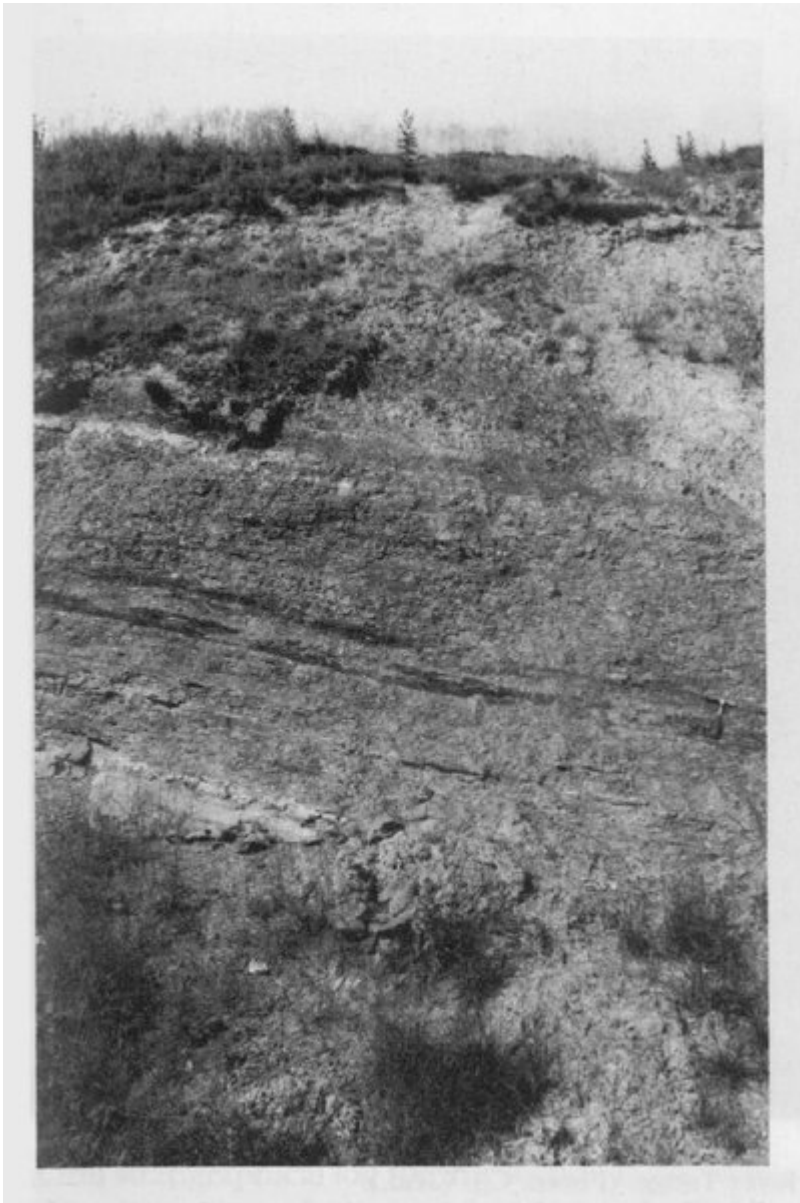
References



(Figure 10.23) Bradgate Brickworks, exposing the Productive Coal Formation as developed in the Pennine Basin. (Photo: C.J. Cleal.)



(Figure 10.24) Sketch of face at Bradgate Brickworks, as recorded by Spears (1967, fig. 19.2).



(Figure 10.25) Bradgate Brickworks GCR site. Close up of face, with hammer for scale. (Photo: C.J. Cleal.)