

---

# Nostell Brickyard Quarry

## Highlights

Nostell Brickyard Quarry is the best exposure in Britain of the Shafton Marine Band, an important marker horizon in the middle Bolsovian of northern Europe (Figure 10.29). It is also the best surface exposure for middle Westphalian plant fossils in the Pennine Basin.

## Introduction

This quarry [SE 403 170] south of Nostell Priory, between Ackworth Moor Top and Crofton, 8 km ESE of Wakefield, West Yorkshire, shows shales and mudstones of the middle Productive Coal Formation in the Pennine Basin. The site was first mentioned by Culpin (1910), and an account of the stratigraphy and palaeontology provided by Edwards *et al.* (1940) and Barker and Whittle (1944).

## Description

### Lithostratigraphy

The exposed sequence here consists of 7.5 m of grey-blue mudstones. The lowest 2 m are brackish deposits, representing the upper part of the Shafton Marine Band. The remainder of the sequence are non-marine, presumably flood-plain deposits.

### Biostratigraphy

#### Marine bands

The mudstones at the base of the sequence yield a shallow marine to brackish assemblage of fossils, including inarticulate brachiopods *Orbiculoidea* and *Lingula*, and fish scales such as *Rhizodopsis* (Barker and Whittle, 1944). Although not seen in this quarry, Edwards *et al.* (1940) report that in this area, these mudstones are immediately underlain by black shales, and include *Pterinopecten*, *Dunbarella* and occasional *Anthracoceras*. This is the Shafton Marine Band in an *Anthracoceras*/Pectinoid Facies, which is the typical development of this marine band in this part of the Yorkshire Coalfield (Calver, 1968).

#### Plant fossils

Barker *in* Barker and Whittle (1944) lists a diverse assemblage of plant fossils from the mudstones overlying the Shafton Marine Band. A fuller account of the palaeobotanical significance of this band is given in the 'Palaeozoic Palaeobotany' GCR volume. From a biostratigraphical standpoint, however, significant species include *Laveineopteris loshii* (Brongniart) Cleal *et al.*, *Alethopteris lonchitica* Sternberg, *Mariopteris sauveurii* (Brongniart) Zeiller, *Lobatopteris miltoni* (Artis) Wagner, *Sphenophyllum cuneifolium* Sternberg and *Annularia sphenophylloides* (Zenker) Gutbier. The assemblage clearly belongs to the middle or upper parts of the *Paripteris linguaefolia* Zone, and most likely to the *Laveineopteris rarinervis* Subzone as defined in Cleal (1991). This therefore suggests the middle Bolsovian.

## Interpretation

This is the best exposure in Britain of the Shafton Marine Band, one of the key lithostratigraphical marker horizons in the Productive Coal Formation of northern Europe. It represents the penultimate marine incursion into the Pennine Basin in the Westphalian, and is a useful indication of the middle Bolsovian. According to Calver (1968), it is mainly restricted to the southern and central parts of the Pennine Basin, such as the Lancashire, Yorkshire, East Midland, North and South Staffordshire coalfields. Its fullest development is in the southern part of the Yorkshire Coalfield, such as here at Nostell,

where it is in the *Anthracoceras/Pectinoid* Facies. According to Edwards *et al.* (1940), the band can reach a thickness of 7.9 m in this area, although in this quarry it is only about 3.5 m in total, the base not being seen.

The site is also of interest because of the plant fossils. The middle Productive Coal Formation of the Pennine Basin yields some of the most characteristic mid-Westphalian plant fossil assemblages in Britain, perhaps best exemplified by the so-called 'Barnsley Seam Flora' summarized by Kidston (1923–1925) and Crookall (1955–1975). There are currently no good surface exposures from where plant fossils can be collected from the mudstones associated with the Barnsley Seam. While the plant fossils from Nostell are marginally higher, stratigraphically, they include many of the characteristic taxa found near the Barnsley Seam.

## Conclusions

Nostell Brickyard Quarry is the best British exposure of shales of the Shafton Marine Band. This is an important marker horizon in the middle Bolsovian (rocks about 311 million years old) of northern Europe. It is also the best place for plant fossils of this age in the Pennine Basin.

## [References](#)



(Figure 10.29) Nostell Brickyard Quarry, as visible in the mid-1980s. (Photo: C.J. Cleal.)