
Neepsend Railway Cutting

Highlights

Neepsend Railway Cutting provides the most complete succession of lower Langsettian strata in the Pennine Basin, and demonstrates its lower delta-plain character.

Introduction

This cutting [SK 344 896] along old Sheffield to Stocksbridge railway, between Parkwood Springs and Shirecliffe, 2 km north of the centre of Sheffield, shows the lower Langsettian sequence immediately above the Crawshaw Sandstone in the South Yorkshire area. The only detailed account of the geology is by Eden *et al.* (1957), although the site is also mentioned briefly by Love (1967).

Description

Lithostratigraphy

Over 100 m of lower Langsettian can be seen here (Fig. 10.19). The lowermost strata are sandstones from the upper part of the Crawshaw Formation. These are overlain by about 1 m of siltstone, followed by a seat earth and thin coal. This seam is locally known as the Coking Coal, although it is almost certainly the same as the Soft Bed Coal recognized elsewhere in Yorkshire.

The next highest coal seam in this area is that known locally as the Clay Coal (elsewhere known as the Middle Bed Coal). It cannot be seen in the cutting (Eden *et al.*, 1957 claim that it has been identified in other exposures in the immediate vicinity), but it is assumed that a ganister 9 m above the Coking Coal is its seat earth. Over much of the Pennine Basin, the sequence between the Coking and Clay coals (i.e. the Soft Bed and Middle Bed) can be divided into three coarsening-upwards cycles with a marine band at the base of each (cf. Honley Railway Cutting, Goyt's Moss). A similar cyclicity can also be recognized at Neepsend, although it is not as completely developed. The base of the lowest cycle is considered to be brackish, while the mudstones at the base of each of the upper two cycles are in fact fresh water, with non-marine bivalves (see below).

Above the level of the Clay Coal is another coarsening-upwards cycle, some 10 m thick. The top part of the cycle is marked by a thick ganister, which has been worked commercially in quarries very close to the cutting. It forms the seat earth of a 0.45 m thick coal (the Ganister Coal) which is a lateral equivalent of the Halifax Hard Bed of the Yorkshire Coalfield and the Union Seam of the Lancashire Coalfield. As well as being a useful stratigraphical marker, this seam is of interest in that elsewhere in the Pennine Basin it contains coal balls, that yield finely-preserved plant fossils. So far, no coal balls have been reported from this part of South Yorkshire. However, in the nearby ganister quarries, the shales immediately overlying the coal have yielded bullions containing marine shells.

The 50 m above this marine band can be divided into two coarsening-upwards cycles. The lower one is predominantly mudstone, with a 3 m thick sandstone and ganister at the top. In nearby quarries, the second cycle has been found to start with a brackish mudstone, but this has not yet been identified at Neepsend. It passes up through non-marine mudstones, and is capped by 9 m of sandstone. The latter is a widely-occurring interval unit over this part of the Pennine, and is known as the Loxley Edge Sandstone.

For about 5 m above the Loxley Edge Sandstone, exposure is not good here, except for some ribs of ganister. The next part of the succession to be well exposed is a fireclay, thin ganister and a coal smut, thought to be the Forty Yards Coal, and which Eden *et al.* (1957) estimate to be 4.8 m above the Loxley Edge Sandstone. The coal is overlain by a thin, pyritic mudstone and then dark shales. Elsewhere in the vicinity the shales in this position are black, and near Beauchief Hall have yielded fish fragments. However, no fossils have yet been found at Neepsend.

The marine band is overlain by siltstones, and then by a ganister, which is the highest bed exposed here and is thought to be the seat earth of the Norton Coal.

Biostratigraphy

Marine bands

Most of the levels assumed to be marine bands in the Neepsend sequence have produced no fossils or only fish fragments. Nevertheless, from their position in the sequence, the levels of the Holbrook, Parkhouse and Meadow Farm marine bands can be identified with reasonable certainty (see Fig. 10.19).

The only marine band to have been unequivocally identified here is the Listeri Marine Band, adjacent to the Ganister Coal. Eden *et al.* (1957) merely record 'traces of marine shells' from the cutting itself. However, from the tips of the nearby Parkwood Ganister Mine they obtained *Gastrioceras listeri* (Sowerby), *Dunbarella papyraceae* (Sowerby), *Caneyella multirugata* (Jackson) and *Anthracoceras* sp.

Non-marine bivalves

Eden *et al.* (1957) mention that bivalves could be found from two mudstones above the Coking Coal (in fact, these mudstones are probably lateral equivalents of the Springwood and Honley marine bands). However, they only provide a species list for the upper of the two mudstones: *Carbonicola* aff. *fallax* Wright, *C. cf. cristagalli* Wright, *Anthraconauta* spp. and *Naiadites* sp. This would seem to belong to the *C. fallax*–*C. protea* Subzone, indicating the basal Langsettian.

Interpretation

This is the most complete succession of lower Langsettian strata in the Pennine Basin, ranging from not far above the Subcrenatum Marine Band to above the Meadow Farm Marine Band. Parts of the succession are better exposed elsewhere (e.g. between the Coking and Clay coals — Honley Railway Cutting, between the Clay Coal and the Listeri Marine Band — Ravenhead Brickworks). However, nowhere else can the full sequence be seen as a whole.

The exposed sequence, consists of a set of coarsening-upwards cycles, with intervening 'marine' bands (in fact, often representing brackish or even fresh water conditions). In many cases, the coarse part of the cycle may only be siltstone, and just represent delta-front deposits. However, there are also examples of thicker sandstones, such as the Crawshaw and Loxley Edge sandstone, where the delta prograded more fully over the area. The whole sequence is typical of the type of lower delta-plain deposits that characterize the lower Langsettian of the Pennine Basin.

Conclusions

Neepsend Railway Cutting has the most complete sequence of rocks of early Langsettian age (about 312 million years old) in the Pennine Basin. It is possible to demonstrate here that these rocks were laid down in the lower part of a river-delta, which was subjected to periodic floodings by sea-water.

[References](#)