

---

# Brynmawr road cutting

## Highlights

Brynmawr Road Cutting is the best exposure of the lower Langsettian on the east crop of the South Wales Coalfield, and provides important data for determining the basin-shape and controls on sedimentation in South Wales.

## Introduction

This site refers to exposures on the south side of the 'Heads of the Valleys' road (A465 (T)), 1 km east of Brynmawr, Gwent, Wales [SO 197 121]–[SO 206 122], (Figure 4.26). It is one of the classic exposures of lower Langsettian in South Wales, clearly showing the nature of the sequence on the east crop. The geology here was described by Robertson (1927) and Leitch *et al.* (1958). However, the exposures were enhanced considerably by the construction of the Heads of the Valleys road in the early 1960s, and the geology as now seen is briefly outlined by Jones *in Owen et al.* (1966) and Barclay (1989).

## Description

### Lithostratigraphy

The sequence as described by Leitch *et al.* (1958) is 38 m thick, and its base is marked by a fault (see (Figure 4.18)(c)). The lower 10 m consists predominantly of mudstones, and belongs to the Middle Shales Formation. A 28 cm thick coal seam in this part of the sequence was identified by Leitch *et al.* as the Engine Seam (probably the same as the Sun Seam further south on the east crop).

The overlying 19 m are more arenaceous, and include both fluvial channel deposits and ganister palaeosols. Traditionally, this has been referred to as the Farewell Rock. It occupies a significantly higher position than the type Farewell Rock on the north crop, such as seen at Nant Llech and Cwm Gwrelych (see earlier in this chapter), indicating that it is a diachronous unit (Leitch *et al.* 1958, fig. 5). As is typical for the Farewell Rock in other parts of the coalfield, the base is marked by a basal *mélange*, probably the result of reworking of previously deposited sediments by fluvial processes (Kelling, 1974). Palaeocurrent vectors are to the west or north-west (Bluck, 1961; Bluck and Kelling, 1963), suggesting the uplifting Usk Axis is the major source of sediment here.

The Farewell Rock here is overlain by a 75 cm thick coal known here as the Garw Seam, which occurs widely throughout the South Wales Coalfield (sometimes given the alternative names Cnapiog or Rhasfach coal). On the east crop, this coal marks the base of the Productive Coal Formation, to which the rest of the Brynmawr sequence belongs.

### Biostratigraphy

#### Marine bands

Leitch *et al.* (1958) identified three mudstones at Brynmawr as marine bands, although they contain little more than *Lingula* and fish scales. The lowest occurs at the very base of the section, in the Middle Shales Formation, and was taken by Leitch *et al.* to be the M<sub>1</sub> band recognized elsewhere in the coalfield. If correct, then the Subcrenatum Marine Band, which marks the base of the Westphalian Series, is absent here. The M<sub>2</sub> band is thought to have been removed by a scour at the base of the Farewell Rock, but M<sub>1</sub> and M<sub>4</sub> have been identified as thin mudstone intercalations within the otherwise mainly arenaceous Farewell Rock.

Above the Garw Coal occurs a fifth mudstone containing fish scales, teeth and spines; and *Planolites*. However, this cannot be the M<sub>5</sub> band recognized elsewhere in the coalfield, which lies some distance below this coal.

## Non-marine bivalves

Leitch *et al.* record *Naiadites flexuosus* Dix and Trueman from a 'papery' (?lacustrine) shale at the top of the section. From comments made by Trueman and Weir (1956, p. 256), however, this is unlikely to be the true *N. flexuosus*, which is an index for part of the upper Langsettian, but one of the so far unnamed, related forms found in the upper Namurian and lower Langsettian, which Trueman and Weir describe as 'untypical, dwarfish and infrequent'.

## Plant macrofossils

Leitch *et al.* record *Asterophyllites* sp., *Calamites* sp., *Lepidophloios* sp., *Lyginopteris hoeninghausii* (Brongniart) Gothan and *Neuralethopteris schlehanii* (Stur) Laveine from the roof-shales of the Engine Seam. However, the last of these is probably a misidentification, as this level is below the normal range of *N. schlehanii*. It is more likely to be *Neuralethopteris jongmansii* Laveine, which is the species normally found in strata of this age (Laveine, 1967). If this is the case, then the assemblage belongs to the *N. jongmansii* Subzone (lower *L. hoeninghausii* Zone).

## Interpretation

This is easily the best site for showing the lower Langsettian of the east crop of the South Wales Coalfield. Waun Fawr Quarry near Caerphilly used to show part of the succession, from just above  $M_1$  to the lower Farewell Rock (George and Squirrell *in* Owen, 1971d), but the site has recently been filled-in. Otherwise, these strata can only be seen in small, isolated outcrops showing small parts of the succession (Robertson, 1927; Squirrell and Downing, 1969).

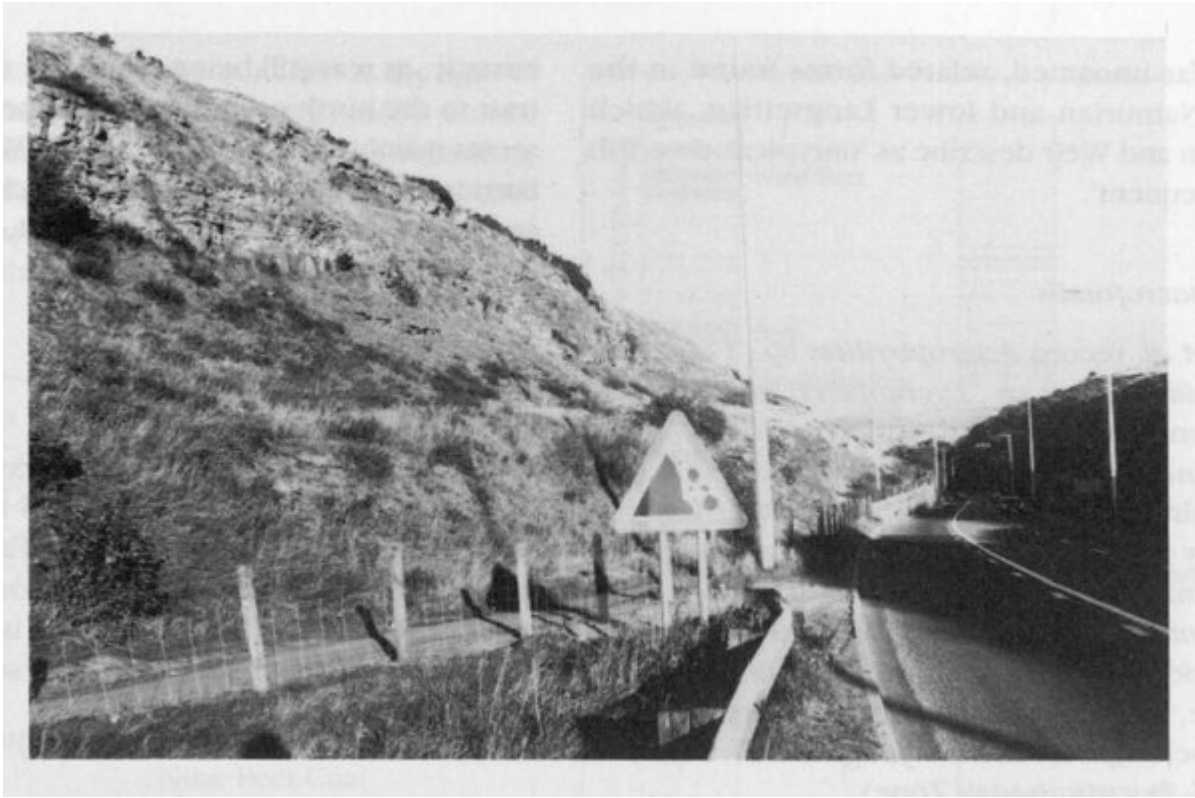
Leitch *et al.* (1958) in identifying the marine bands, provided a useful means of making detailed comparisons with sequences elsewhere in the coalfield. Perhaps surprisingly, there is little significant attenuation of this part of the east crop succession compared with sites in the middle part of the north crop; at Nant Llech the  $M_1$ – $M_4$  thickness is 15 m compared with 23 m at Brynmawr. Further west, in the Ammanford area, however, the same interval is 46 m thick (Archer, 1968), while in the Pontypridd area it is 90 m thick (Woodland and Evans, 1964). These comparisons are important for determining the configuration of the South Wales Basin during the lower Westphalian.

The Brynmawr section can be used in conjunction with the exposures on the north crop to demonstrate the complex and diachronous form of the sandstone interval known as the Farewell Rock Formation. As pointed out by Kelling (1974), this demonstrates that the major control on sedimentation was tectonic and possibly climatic, rather than eustatic, as was still being argued by some. In contrast to the north crop, where sediment derivation seems mainly to have been from the Wales–Brabant Barrier to the north, the Farewell Rock sands of the east crop originated from the east, presumably from the uplifting Usk Axis.

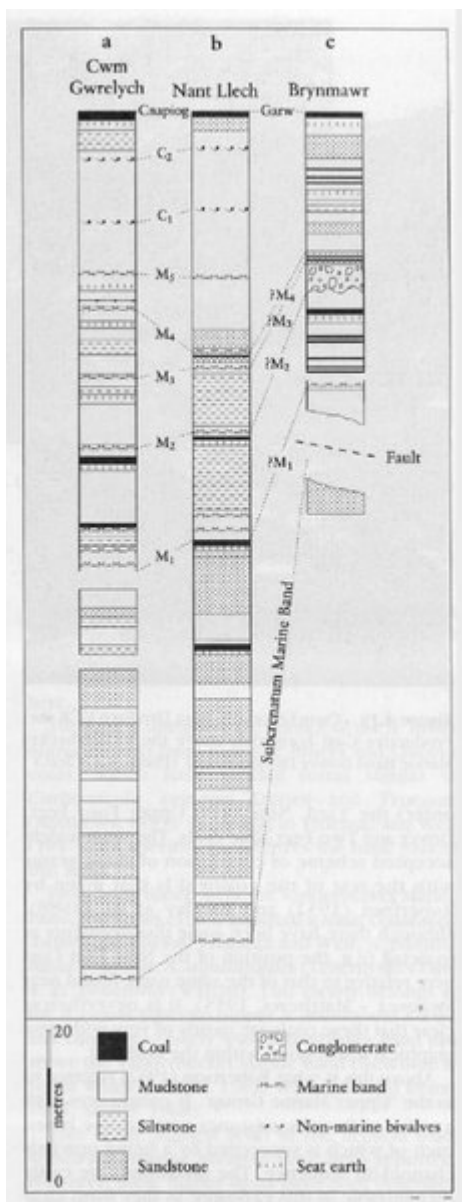
## Conclusions

Brynmawr Road Cutting is the best exposure of the of early Langsettian age (about 315 million years old) on the east crop of the South Wales Coalfield. By comparing this sequence with rocks of similar age elsewhere in South Wales, it is possible to determine details of the shape and sedimentation within the South Wales Basin.

## [References](#)



*(Figure 4.26) Exposures of lower Coal Measures seen at Brynmawr Road Cutting. (Photo: C.J. Cleal.)*



(Figure 4.18) Lower Westphalian successions in South Wales. (a) Cwm Gwrelych; (b) Nant Llech; (c) Brynmawr. Based on Leitch et al. (1958).