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# Llammarch Dingle

## Highlights

Llammarch Dingle is the best exposure of Millstone Grit on the east crop of the coalfield, showing a condensed succession of mainly alluvial deposits.

## Introduction

The entire Millstone Grit sequence of the east crop of the coalfield is exposed along this stream, on east side of Daran-felen to Blaenavon road, 3 km east of Brynmawr, Gwent, Wales [SO 218 122]. The geology here is mentioned by Robertson (1927), Jones (1971, 1974), and Barclay (1989), but the most complete account is by Jones and Owen (1967).

## Description

### Lithostratigraphy

The sequence here is summarized in (Figure 4.7)(c). It consists of about 25 m of mainly arenaceous strata of the Millstone Grit, lying unconformably on Carboniferous Limestone. The sandstones are mainly massive with an erosive base, and often show pronounced channelling. They were probably formed as part of an alluvial complex, dispersing sediment to the south-west, into the so-called 'Pontypridd–Margam Trough' (Kelling, 1974).

In between the sandstones are shales and mudstones. The lowest (c. 3.5 m above the unconformity) is a seat earth overlain by plant-bearing shales, representing emergent conditions (Jones and Owen, 1967). Jones and Owen also mention plant fossils from a shale some 5 m above the seat earth. The upper three of the mudstone bands have yielded marine fossil assemblages, and are regarded as being the Cancellatum, Cumbriense and Subcrenatum marine bands (see below).

### Biostratigraphy

#### Marine bands

Jones and Owen (1967) give species lists for three marine bands exposed here. In the lower of the bands, juvenile specimens of *Cancelloceras cancellatum* (Bisat) are found, together with productid and chonetid brachiopods; the middle band has yielded *Cancelloceras cumbriense* (Bisat), *Nucula* sp. and *Productus* sp. and nuculoid shells; and the top band yields abundant *Gastrioceras subcrenatum* (Frech). It is clear that they represent the Cancellatum, Cumbriense and Subcrenatum marine bands, respectively.

#### Plant macrofossils

Plant fossils are not particularly abundant or well preserved in this exposure. The most diverse assemblage occurs in the shale 3.5 m above the base of the Millstone Grit, from which Jones and Owen (1967) record *Alethopteris* cf. *lonchitica* Sternberg, *Neuralethopteris* cf. *naechstebreckiana* (Leggewie and Schonenfeld) Josten and *Mariopteris* sp. The presence of foliage of the *A. lonchitica*-type tends to indicate a position no lower than the *Neuralethopteris larischii* Subzone (upper *Pecopteris aspera* Zone) indicating the middle Marsdenian or Yeadonian.

Jones and Owen (1967) record *Paripteris gigantea* (Sternberg) Gothan from the shale 9 m above the unconformity. This again suggests a position no lower than the *N. larischii* Subzone.

## Interpretation

Llammarch Dingle clearly demonstrates both the thickness and the style of sedimentation of the Millstone Grit on the east crop of the coalfield. The sequence is evidently very incomplete, with only the upper Marsdenian and Yeadonian being present. Furthermore, what is present is condensed compared with sequences further west. For instance, the Yeadonian here is only 10 m thick, compared with 51 m in the Vale of Neath, 45 m at Marros Sands and 73 m at Tenby–Saundersfoot.

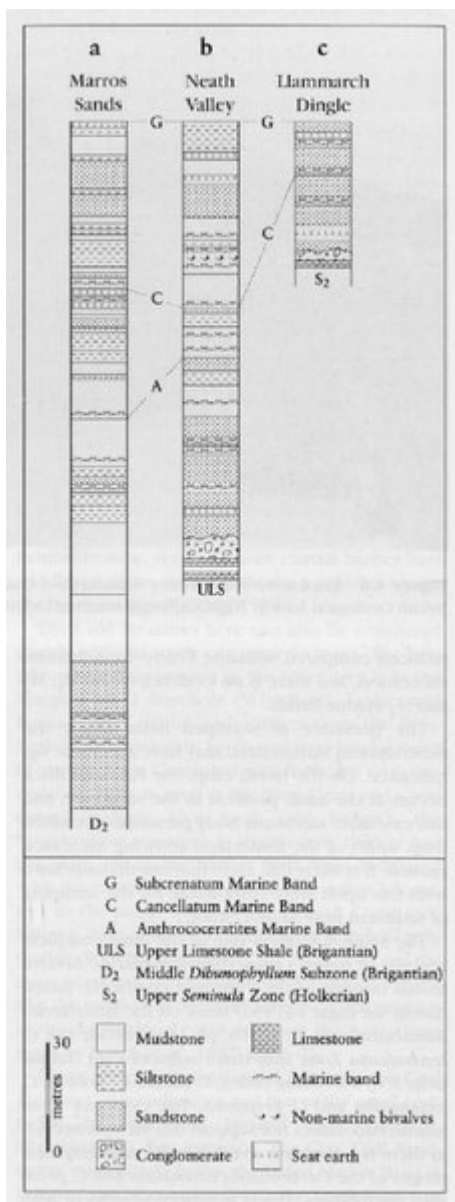
Only about 5 km further east, at Bloreng Mountain, the Namurian is totally missing, with Westphalian strata lying directly on Carboniferous Limestone (Jones, 1971).

The reduced development of Millstone Grit in this part of the coalfield is assumed to be a result of uplift of the Usk Axis, which lay just to the east (George, 1956). The proximity of this positive area also affected the nature of the sedimentation, with alluvial deposits predominating, in contrast to the fluvio-deltaic and marginal marine deposits found further west.

## **Conclusions**

Llammarch Dingle is the best site for showing the Millstone Grit on the eastern margins of the South Wales Basin. This sequence of rocks, which is about 316 million years old, is much thinner than the same-aged successions in the main part of the basin, such as near Swansea and Neath. It is also thought to represent the deposits formed higher up in the river delta, nearer to the source of the sediment.

## **[References](#)**



(Figure 4.7) Millstone Grit successions of the north crop of the South Wales Coalfield. All after Jones (1974, fig. 24).