
Coed-y-Darren

Highlights

Coed-y-Darren is the best exposure of the junction between the Productive Coal and Pennant formations on the east crop, and provides important information on the geological evolution of this part of the South Wales Coalfield.

Introduction

A landslip scar on the side of Twmbarlwm, 2 km north of Risca, Gwent, Wales [ST 240 921] shows the junction between the Pennant and Productive Coal formations, as developed on the east crop of the coalfield. Descriptions of the outcrop are provided by Moore (1948), Squirrell and Downing (1964, 1969), George and Squirrell *in* Owen (1971d) and Squirrell (1971).

Description

Lithostratigraphy

The main part of the exposed sequence here is just under 30 m thick (Figure 4.29). The lower 15 m consists of a series of mudstones and sandstones of the Productive Coal Formation. Only one thin coal (0.15 m thick) is exposed, but there are also a number of seat earths, particularly in the lower part of this interval. Squirrell (1971) assigned the upper part of this predominantly argillaceous interval (i.e. between the Cambriense Marine Band and the base of the Rhondda Member) to the Pennant 'Measures', based on the pseudo-chronostratigraphical classification of Woodland *et al.* (1957). However, they are quite clearly of the same facies as the Productive Coal Formation.

The upper 15 m of the sequence belong to the Pennant Formation, which lies unconformably on the Productive Coal Formation. Immediately above the unconformity are 7.6 m of massive quartz-conglomerate (a brief petrological description is provided by Hawkes *in* Squirrell and Downing, 1969). This is in turn overlain by about the same thickness of massive sandstones, typical of the Rhondda Beds. These sandstones, which are often referred to as orthoquartzites (although Kelling, 1974 has queried the use of this term for these deposits), are quite different from the lithic arenites present in the central part of the coalfield, such as at Earlswood Road Cutting and Blaenrhondda (see earlier reports in this chapter). Kelling (1964, 1968) interpreted them as alluvial deposits derived from a nearby source to the east, probably the Usk Axis, but later (1974) modified this, and regarded them as probably littoral or lagoonal deposits, but it is difficult to reconcile this with the absence of any palaeontological evidence of marine conditions in the Pennant Formation.

Biostratigraphy

A thin mudstone 5.5 m above the base of the section has yielded trace fossils known as *Planolites ophthalmoides* Jessen. This is generally taken to represent the Cambriense Marine Band (e.g. George and Squirrell *in* Owen, 1971d; Squirrell and Downing, 1969).

About 4 m below this is a seat earth. Squirrell and Downing (1969) regard it as marking the position of the coal that underlies the Shafton Marine Band elsewhere in this part of the coalfield.

However, the marine band itself has not been This section demonstrates the significantly confound here. densed nature of the succession developed on the east crop of the coalfield. This is partly as a result of unconformity, with part of the Productive Coal Formation and probably the lower part of the Rhondda Beds having been removed by erosion. However, it is also probably a result of reduced rates of sedimentation. Assuming that the marine band correlations mentioned above are correct, the 4 m distance between the Shafton and Cambriense marine bands contrasts with about 45 m for a similar interval in the main part of the coalfield (e.g. Archer, 1968).

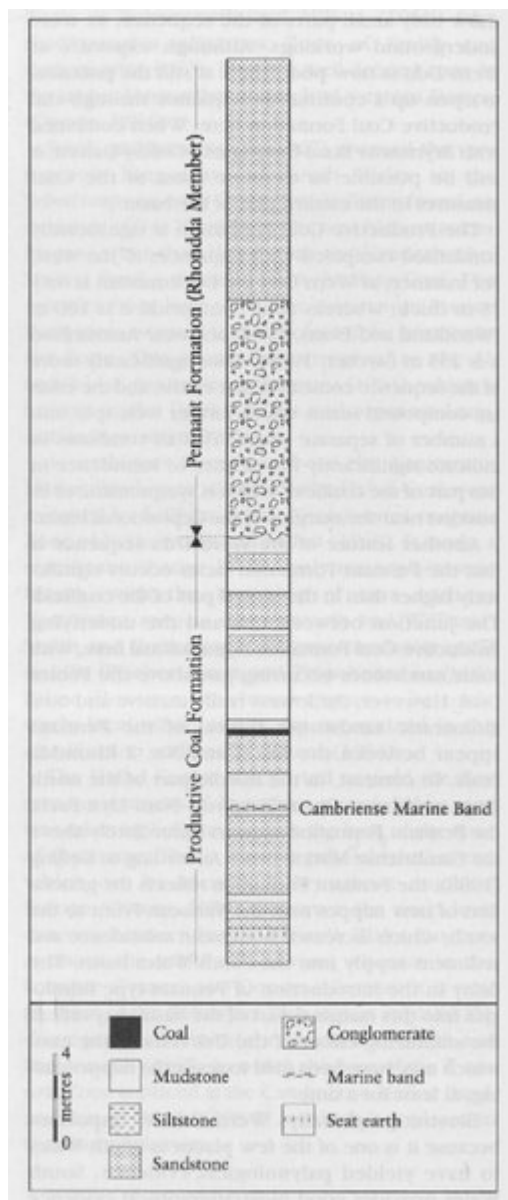
The lower part of the section here overlaps with that seen at Wern Ddu Claypit (see above). However, it shows higher strata than is present at the latter site, as well as demonstrating the unconformity below the Rhondda Member.

The site is also important for understanding the lithostratigraphy of the coalfield. Following the classification proposed by Woodland *et al.* (1957), all strata between the Cambriense Marine Band and the No. 2 Rhondda Seam should be assigned to the Llynfi 'Beds', the basal member of the Pennant Measures. While in the central part of the coalfield, this interval consists largely of Pennant-like strata, on the east crop (such as at Coed-y-Darren) they are clearly of the same facies as the Productive Coal Formation. It thus seems reasonable to assign these strata on the east crop to the Productive Coal Formation, and to place the base of the South Wales Pennant Formation at the unconformable base of the Rhondda Beds.

Conclusions

Coed-y-Darren is the best exposure of the junction between rocks known as the Productive Coal and South Wales Pennant formations on the east crop of the South Wales Coalfield. The junction marks a significant change in the environment in the coalfield, due to the development of major river systems flowing from the south. The information visible at this site has proved important for understanding the geological evolution of this part of the South Wales Coalfield at about 308 million years ago.

References



(Figure 4.29) Exposed sequence at Coed-y-Darren. Based on Squirrell (1971, pp. 51–2).