
Daw End Railway Cutting

[SK 036 003]

Introduction

Daw End Railway Cutting is located within the Silurian inlier of the Walsall district, which is surrounded by or faulted against Carboniferous strata. In this inlier, the Silurian rocks generally dip at about 10° or less into the north-west quadrant. Knowledge of the Wenlock rocks in the Daw End area has been gained through three main types of activity. A great number of quarries, pits and shafts were opened up to work the upper Wenlock Much Wenlock (Dudley) Limestone Formation, such operations probably dating even from Roman times, and mining of the Coal Measures also sometimes tapped into Silurian sediments (Cantrill, 1919). The construction in the mid-19th century of the nearby Rushall Canal made available at that time very fossiliferous sections through the Coalbrookdale Formation and the younger Much Wenlock Limestone Formation. Lastly, construction in 1877 of a branch of the Midland Railway exposed these two units in the Daw End cutting, the older formation to, probably, an unrivalled extent.

Murchison (1839) described the Walsall Silurian and referred to limestone workings at Daw End. Shortly afterwards Jukes (1853, 1859) described the Silurian geology of this district and a list of fossils was provided therein by Salter. Oliver (1877) was the first to describe the cutting itself, whilst Cantrill (1919) provided detailed data on the section and surrounding workings. The latter account, together with that of Butler (1939), are the best descriptions available of the exposure, though it is also discussed in Crossfield and Johnston (1914), Whitehead and Eastwood (1927), Hill *et al.* (1936) and Bassett (1974a). Most recently, Ratcliffe (1988) has investigated the sedimentology of the Much Wenlock Limestone Formation of the Walsall (and Dudley) area.

Description

The railway section is about 1 km long and approximately coincides with an ENE–WSW trending fault that downthrows to the north and has shifted the strata on the southern side of the cutting to the west (Cantrill, 1919). Butler (1939) provided the following description for the section on the north bank of the track, east of the Rushall aqueduct (Figure 4.3):

Lower Quarried Limestone, Much Wenlock Limestone Formation	4+ m. Dark grey, medium-grained limestone, weathering brown, beds 10–30 cm thick with thin grey shale partings. Few fossils.
Basement Beds, Much Wenlock Limestone Formation	3.2 m. Thin (2.5 cm) beds of mainly fine-grained blue-grey limestones separated by grey shale beds of similar thickness at the base, but thinner towards the top. Contains ballstones. Very fossiliferous.
Coalbrookdale Formation	63+ m. Grey fossiliferous mudstones with bands of calcareous nodules and occasional thin, laterally impersistent beds of fine-grained limestone.

The strata of the Coalbrookdale Formation, which are extensively exposed, represent the upper part of this unit in the area. A deep boring put down in Walsall town encountered, also, some 237 m of it (Butler, 1937; Bassett, 1974a). Within the formation, both the soft grey mudstones and the occasional, very thin, discontinuous limestone bands are very fossiliferous, the fossils often being washed out whole from the steep banks. Corals, cornulitids, brachiopods, gastropods and trilobites from this horizon of the cutting are noted in the faunal list of Cantrill (1919). This list as a whole needs revision, though many of the brachiopods, which in terms of specimens and species are the most abundant part of the macrofauna, have received modern treatment by Bassett (1970a, 1972, 1974b, 1977), who has recorded from the Coalbrookdale Formation of the cutting the following taxa, some examples of which he figured: *Skenidioides lewisii*, *Resserella canalis*, *Dicoelosia biloba*, *Dalejina hybrida*, *Eoplectodonta duvalii*, *Coolinia pecten*, *Pentlandia lewisii*, *Leptaena depressa*, *Leptaena depressa restricta*, *Brachyprion* sp., *Strophonella* (*Strophonella*) *euglypha*, *Leptostrophia*

(*Leptostrophia*) *filosa*, *Amphistrophia* (*Ampbistrophia*) *funiculata* and *Protochonetes minimus*. In addition, the present author has collected species of *Meristina*, *Gypidula*, *Cyrtia* and *Atrypa*, and Hill *et al.* (1936) recorded the bivalve *Ctenodonta* and the gastropod *Holopella*, together with the corals *Omphyma*, *Spongophylloides* and *Tryplasma*. Conodonts belonging to *Ozarkodina sagitta sagitta* and the earliest specimens of *Ozarkodina confluens* occur (Aldridge, 1975, 1985), as do well preserved acritarchs (K.J. Dorning, pers. comm.).

Just east of where the aqueduct of the Rushall Canal crosses the cutting, three bioherms ('ballstones' or 'crog-balls') interrupt the stratified, thinly bedded limestone and shale units of the Basement Beds. The westernmost of these is the largest, being about 14 m across and 5.5 m high; it extends upwards into the Lower Quarried Limestone and its base sags into the thinly bedded limestones beneath. The central bioherm measures about 4.5 m by 2.5 m, the most easterly one being smaller still. They are composed in large part of the colonial corals *Heliolites*, *Favosites* and *Halysites*, together with other reef-associated organisms such as bryozoans and calcareous algae.

The 4+ m of Lower Quarried Limestone recorded by Butler (1939) on the north side of the track above the bioherms is currently largely covered by vegetation, as are the reported outcrops of this unit elsewhere along the northern bank of the cutting, for example 70 m east of the Bosty Lane road bridge, (Cantrill, 1919; Whithead and Eastwood, 1927). The Lower Quarried Limestone was worked along its outcrop, or by shallow shafts and mined underground along dip to the north-west, or even by pits descending through the Coal Measures. The 19th century workings known as Linley Caverns (see Oliver, 1877; Cantrill, 1919), which are indicated on Ordnance Survey maps as an area of disturbed ground immediately north of the cutting and just north-east of Bosty Lane road bridge, and which are included within the boundary of the present site, were opened to mine the Lower Quarried Limestone. Cantrill (1919) recorded a total of 29 species from this unit, adjacent to the Rushall aqueduct, comprising corals, brachiopods, gastropods, bryozoa, trilobites and an orthoconic nautiloid. In modern terms Bassett (1972, 1977) has recorded *R. canalis* and *Scamnomena rugata*.

The Nodular Beds of the Much Wenlock Limestone Formation, which succeed the Lower Quarried Limestone in the area and which were also reported from the northern bank of the cutting, for example west of the Rushall aqueduct and again west of Bosty Lane road bridge, are also effectively unavailable. They were also exposed, originally at least, in the Linley workings by way of 'sinks' or 'crownings-in' — structures produced by collapse of the roof of the (mined) Lower Limestone. Cantrill (1919) records a fauna of corals and brachiopods from the Nodular Beds.

Outcrops of the succeeding Upper (thin) Quarried Limestone were formerly present in 19th century workings at, in particular, the Radleys just to the north of Daw End (Cantrill, 1919; Whitehead and Eastwood, 1927).

Since at least the early 19th century, the Walsall Silurian in general has provided a wealth of fossils. For instance, it provided many middle to upper Wenlock specimens used by Davidson (1847, 1866–1871, 1882–1883) in his classic brachiopod studies, including type and figured material, such as (Bassett, 1974b, 1977) the specimens of *Eoplectodonta duvalii* (Davidson, 1847) and *Megastrophia* (*Protomegastrophia*) *semiglobosa* (Davidson, 1871). As exemplified above, most of the exposures in the district that produced such material are now overgrown, filled with water, or built on. Daw End railway cutting is still a prolific source of fossils in its own right, but it might thus also act as a proxy in the area for type localities in the Wenlock from which it is now impossible to collect (e.g. that of *Hypanthocrinites granulatus* Lewis, 1847, from the Wenlock Shale' of the Rushall Canal cut), or which were imprecisely localized originally (e.g. Wenlock Shale' of Walsall).

Interpretation

Palaeogeographically, the Walsall area lies on the western margin of a presumed land area, the Midland Platform (Bassett, 1974a; Ratcliffe, 1988; Holland, 1992; Ratcliffe and Thomas, 1999). The muds of the Coalbrookdale Formation were deposited under low energy conditions in moderately deep water, with the Much Wenlock Limestone biohermal carbonates being an expression of the distinct, final shallowing phase to the Wenlock Epoch.

Other similar Silurian inliers within the South Staffordshire Coalfield to that of the Walsall district are those of Wren's Nest, Castle Hill and Hurst Hill, all in the Dudley area some 10 km to the south-west. The Daw End site forms part of a group of three sites of Wenlock age in this coalfield. Stratigraphically, it follows on from the nearby Hay Head site which

exposes the lower Wenlock Barr Limestone Member of the Coalbrookdale Formation; it precedes, with slight overlap, the Wren's Nest site where less than a metre of Coalbrookdale Formation is exposed together with the full sequence of the Much Wenlock (Dudley) Limestone Formation, the lithological members of which are the same there as in the Daw End–Walsall area.

Conclusions

This railway cutting displays the best exposure of Wenlock rocks in the Silurian inlier of the Walsall district. It provides a superb, 1 km long section through 63 m of the upper part of the Coalbrookdale Formation and the bottom 7 m of the Much Wenlock Limestone Formation. The extent here of the outcrop of the Coalbrookdale Formation is, arguably, unparalleled anywhere, even in the type Wenlock area. In the latter region the thick, facies-equivalent Apedale Member of this formation typically forms low, easily eroded ground with small, stream-course exposures, the Eaton Track site being the exception, though even this is not as extensive nor exposes such a thickness of strata. The Daw End Wenlock rocks are richly fossiliferous, with the Coalbrookdale Formation yielding especially well-preserved brachiopods that have been used in systematic studies since the mid-19th century.

References



(Figure 4.3) Daw End Railway Cutting, Walsall area, West Midlands. Section on north side of the track, immediately east of Rushall Canal bridge, showing three small bioherms (in the distance and the centre of the photo) in the Basement Beds of the Much Wenlock Limestone Formation, beneath which is the uppermost part of the Coalbrookdale Formation. (Photo: Derek J. Siveter.)