Maesbury Railway Cutting, Somerset

[ST 607 476]

Introduction

The Maesbury Railway Cutting GCR site is situated 5 km ESE of Wells in Somerset. This disused railway cutting [ST 607 476] offers an almost complete if partly overgrown Courceyan section that extends from the middle of the Lower Limestone Shale Group through to the lower part of the Black Rock Limestone Group —arguably the finest section of this interval in southern England. Early reference to the site was made by Sibly (1906) and Welch (1929), but the more significant accounts are those of Green and Welch (1965) who provided a list of the macrofauna, Butler (1972, 1973) who noted the distribution of conodonts and considered sedi-mentological aspects, and Higgs and Clayton (1984) who recorded the distribution of miospores.

Description

The section is located on the northern limb and at the western end of the Beacon Hill Anticline (Welch, 1929). The succession dips gently to the north and is best exposed on the west side of the cutting (Figure 9.41). Here, both Green and Welch (1965) and Butler (1972, 1973) identified three units in the middle and upper parts of the Lower Limestone Shale with a total thickness of approximately 85 m. The lowest of the exposed units (*c.* 20 m) comprises thick, fine-grained limestones with laminations of a possible microbial origin and lenses of coarser material interbedded with fissile siltstones and shales. Overlying this, the shale-dominated middle unit (*c.* 40 m) includes siltstones with thin stringers of bioclastic debris and a few limestones, some of which, near the base of the unit, contain phosphatic nodules. The upper unit (*c.* 25 m) comprises a sequence of irregularly shaped lenticular limestones interbedded with micaceous siltstones and shales. Butler (1972, 1973) and Matthews *et* al. (1973) recognized two types of limestone in this unit: limestones with a laminated top and an erosive channel base, and limestones with a mega-rippled top surface. Structures resembling hummocky cross-stratification and bioturbation features also occur in these beds. In the higher parts of the unit where the 'channeled limestones' are missing from the sequence, limestones with mega-ripples increase in abundance and eventually 'coalesce to produce the Black Rock Limestone' (Matthews *et al.,* 1973). Butler (1973) described this lower part of the Black Rock Limestone (*c.* 60 m) as being composed of lenticular and well-bedded packstones and grainstones with some mud flasers.

The fauna from the Lower Limestone Shale includes a variety of brachiopod taxa namely ?*Spinocarinifera* '*Avonia*' *bassa, Plicochonetes stoddarti, Macropotamorhynchus* '*Camarotoechia*' *mitcheldeanensis, Pugilis* '*Dictyoclostus*' *vaughani, Unispirifer tornacensis, Schellwienella* cf. *aspis* and *Rhipidomella michelini* (Green and Welch, 1965) and a rich conodont assemblage with *Pseudopolygnathodus dentilineatus, Polygnathus symmetricus, Patrognathus variabilis, Siphonodella isosticha* and *Polygnathus inornatus* (Butler, 1973). Miospores extracted from the Lower Limestone Shale and Black Rock Limestone at Maesbury include *Verrucosisporites nitidus, Krauselisporites hibernicus, K. mitratus, Spelaeotriletes balteatus, S. pretiosus, Hymenozonotriletes explanatus, Umbonatisporites distinctus, Rugospora polyptycha, Vallatisporites vallatus, Raistrickia clavata* and *R. condylosa* (Higgs and Clayton, 1984). Consideration of the time ranges given for these taxa (see Riley, 1993) indicates the presence of *Siphonodella* Zone conodont faunas, a VI–PC Zone miospore assemblage and a brachiopod fauna typical of the *Vaughanla vetus-Zaphrentites delanouei* assemblage biozones, thus confirming an early Courceyan age for most of the Maesbury section.

Interpretation

Although an early Carboniferous (K-Z) age (Sibly, 1906; Welch, 1929) for the Maesbury section is widely accepted, it was not until Butler (1972, 1973) completed his detailed biostratigraphical work on the distribution of conodonts in Tournaisian sections from the Bristol–Mendips area that a more complete picture of the stratigraphical significance of the site was established. In conjunction with other sites, Butler (1973) used the Maesbury section as a test-bed for the assertion that

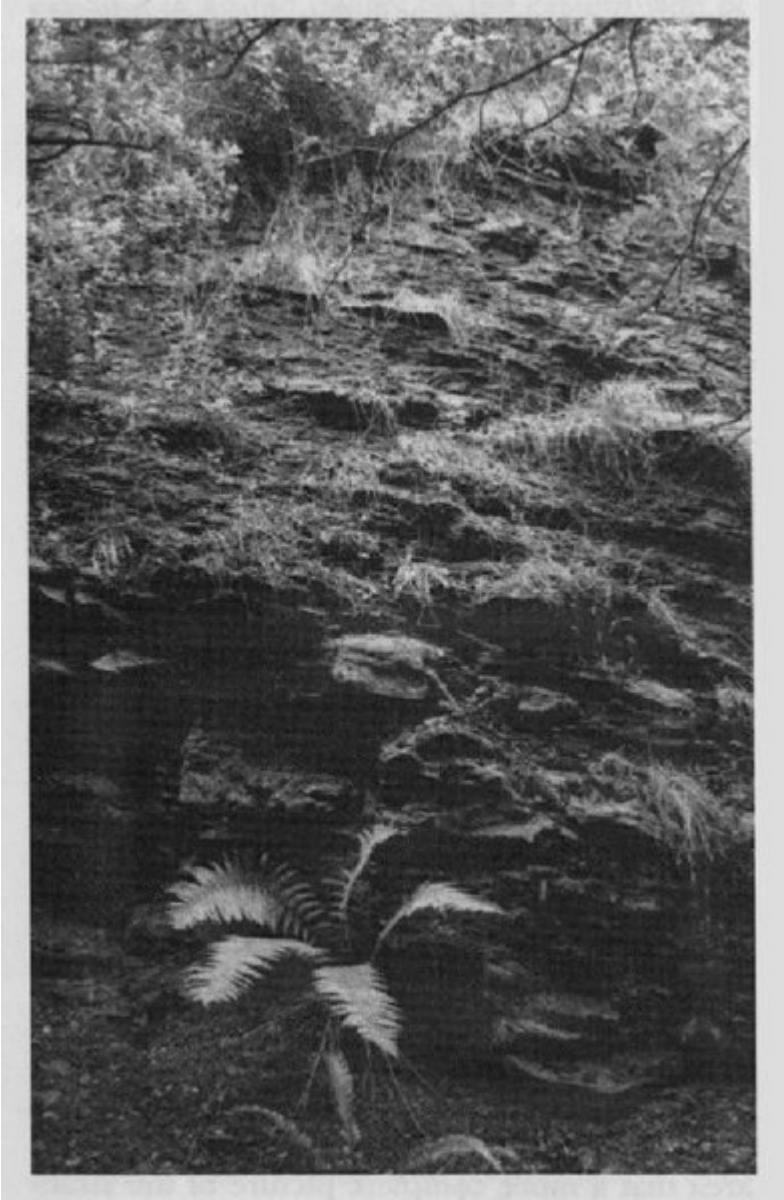
the Lower Carboniferous successions In the Mendips might be stratigraphically more complete than those of the Avon Gorge area (see GCR site report, this chapter) in which several non-sequences had been identified (Mitchell, 1972; Ramsbottom, 1973). While Butler (1973) recognized notable differences in the conodont assemblages obtained from the Maesbury and Avon sections (see Rhodes *et al.,* 1969), these differences were attributed to the existence of unexposed intervals in the Avon section and facies-controlled faunas. However, although unequivocal evidence of a major stratigraphical gap in the Lower Limestone Shale sequence at Bristol could not be demonstrated, Butler (1973) indicated that missing beds associated with a discontinuity at the level of the Palate Bed in the Avon Gorge might have some representation in the lower unit of the Lower Limestone Shale at Maesbury. His attempt to correlate the eastern Mendips succession with that of the Avon Gorge was reasonably successful, but efforts to correlate the former with equivalent sections in Europe and North America proved less conclusive.

Regional studies indicate that the Lower Limestone Shale sequence of southern Britain was deposited on a southward-dipping carbonate ramp (Wright, 1986a, 1987a; Leeder, 1992) in a variety of nearshore and offshore environments (Burchette, 1987; Burchette *et al.,* 1990). Its formation was a depositional response to the major and globally recognized sea-level rise that took place at the beginning of Carboniferous times. Whereas the existence of limestones of a possible microbial origin indicates that part of the Maesbury section may have been deposited in a nearshore setting, the general character of the remaining part of the succession, with its open marine faunas and its possible storm-generated limestone beds, suggests deposition in deeper water. The succession compares closely to a particular lithofacies (LAIII) of the Lower Limestone Shale that Burchette (1987) Interpreted as an offshore deposit formed in moderately deep water below fair-weather wave-base. An outer-ramp setting is therefore envisaged for most of the Maesbury section. This interpretation stands out in marked contrast to the interpretation of Lower Limestone Shale sequences at Tongwynlais Road Cutting (see GCR site report, this chapter) in South Wales and at Stenders Quarry (see GCR site report, this chapter) in the Forest of Dean, where a more marginal, peritidal and back-barrier–lagoonal facies is recognized (Burchette, 1977, 1981, 1987; Davies *et al.,* 1991). Although Burchette (1987) demonstrated the presence of a number of transgressive–regressive depositional cycles in the Lower Limestone Shale, their recognition in outer-ramp facies, as at Maesbury, may prove difficult (see Wright, 1986a). A broadly similar ramp setting is envisaged for the Black Rock Limestone at this site. Further sedimentological research on this important section is clearly warranted.

Conclusions

This locality affords the finest section of the middle and upper parts of the Lower Limestone Shale in the Mendips. The section extends upwards to include the lower part of the Black Rock Limestone. The sequence records the progressive sedimentary response to changes associated with the earliest phase in development of an extensive carbonate ramp (Ahr, 1973, 1985; Wright, 1987a) that stretched across the South Wales–Mendip Shelf during early Carboniferous (Courceyan) times. The site is an important reference section for regional and international stratigraphical correlations as well as a valuable resource for future sedimentological research.

References



(Figure 9.41) Outcrop of the Lower Limestone Shale Group at Maesbury Railway Cutting. (Photo: P.J. Cossey.)