Meadowtown Quarry

[SJ 3111 0116]

Introduction

This quarry is the type locality for the Meadowtown Formation, a varied succession of flags, mudstones and calcareous beds that equates with the Llandeilian Stage in the Shelve area. It was known to Murchison (1839), as 'Meadow Town' and is the type locality of his graptolite *Diplograptus foliaceus* (Murchison). The formational name was proposed by Lapworth and Watts (1910, p. 752) as the 'Meadowtown Calcareous Beds' or 'Stage', a restricted use of Lapworth's (1887, p. 662) term 'Meadowtown Series', which encompassed a much broader group of strata, ranging from the Weston Flags Formation up to and including the Rorrington Shale Formation of present usage.

Meadowtown Quarry is a well-known source of fossils and, together with localities along the road to Rorrington and in Lower Wood Brook, shows a discontinuous succession through much of the *teretiusculus* Zone as it is developed in the Shelve area. Trilobites were described by Whittard (1955–1967), brachiopods by Williams (1974), graptolites by Hughes (1989) and chitinozoans by Jenkins (1967).

Description

The old quarry in Meadowtown (Figure 10.6) shows the type development of the Mead-owtown Formation, exposing the lowest third out of a total thickness of about 400 m. Slightly older horizons exposed a short distance to the east, in Meadowtown (Whittard, 1979, locality 161), comprise 20 m of flaggy calcareous beds with bands of ashy material. In the quarry itself, Whittard (1952a, p. 160) logged 9.75 m of strata that dip at 45° to the WNW He recognized eight divisions (Whittard, 1979, p. 44), which he grouped into three units; from the base these are: (1) 3 m of flags, shales and limestones (beds 1–3); (2) 3 m mainly of limestone (beds 4–7); and (3) 3.7 m of shales (bed 8). The lowest unit has yielded an abundance of the trilobite *Ogyginus corndensis* (Murchison), with smaller numbers of *Flexicalymene cambrensis* (Salter) and rare *Basilicus tyrannus* (Murchison), *Metopolichas patriarchus* (Wyatt-Edgell) and *Marrolithus craticulatus* Whittard.

Bed 3 yielded the holotype of *Ogyginus corndensis novenarius* Whittard, and 'Meadowtown Quarry' is the type locality for *Whittardolithus superstes* (Whittard). Williams (1974, p. 110) reported the brachiopod *Tissintia immatura* (Williams) from 'bed B' here. At the west side of the quarry the highest beds exposed are probably the source of the holotype of *Diplograptus foliaceus* (Murchison) (see Whittard, 1952a, p. 150), although graptolites are uncommon there (Hughes, 1989, p. 51).

Correlative beds, currently well exposed in Quinton's Quarry, 200 m NNE of Meadowtown, are the source of the types of *Eumorphocystis coxi* Paul and Fone (in Paul, 1973–1997, p. 157).

Higher horizons in the Meadowtown Formation are exposed along the road to Rorrington, west of Meadowtown (Whittard, 1979, localities 164–166). The trilobite *Whittardolithus inopinatus* (*Whittard*) is reported 18 m west of the quarry [SJ 3109 0118], and 73 m west [SJ 311 013] is the type locality for the brachiopods *Lingulella displosa* Williams and *Schizotreta transversa* Williams; *Palaeoglossa attenuata* (Sowerby) and the trilobites *Lloydolithus lloydii* (Murchison) and *Ogygiocarella debuchii* (Brongniart) also occur here. Around 200 m west of Meadowtown Chapel [SJ 309 012], at Whittard's (1979) locality 164, the graptolite *Cryptograptus* ex gr. *tricornis* (Carruthers) and the brachiopods *Dalmanella salopiensis* Williams and *Palaeoglossa attenuata* have been found. Blue-black mudstones near the top of the Meadowtown Formation crop out in Lower Wood Brook north of the road crossing [SJ 3062 0107] and in the roadside just to the west [SJ 3065 0093], where they have yielded abundant trilobites (*Ogygiocarella debuchii* and *Lloydolithus lloydii*) , as well as graptolites, including *Dicranograptus irregularis* Hadding. Upstream from the road crossing, successively older horizons in the Meadowtown Formation are exposed, complementing the roadside exposures near Meadowtown. Shales 122 m southeast of the road [SJ 307 008] yielded the *Palaeoglossa attenuata* and *Lingulella displosa* (see Williams,

1974), and farther upstream [SJ 3082 0073], around Whittard's (1979) locality 504, horizons low in the Meadowtown Formation have afforded the trilobites *Whittardolithus intertextus* (Whittard), *Marrolithus inflatus* Williams and *Atractopyge williamsi* McGregor. According to Whittard (1979, fig. 28), the adjacent locality 505 falls within the underlying Betton Shale Formation, but Hughes (1989, text-fig. 13) noted *teretiusculus* Zone graptolites there, and the British Geological Survey (1991) 1:25 000 geological map places the formational boundary farther upstream.

Interpretation

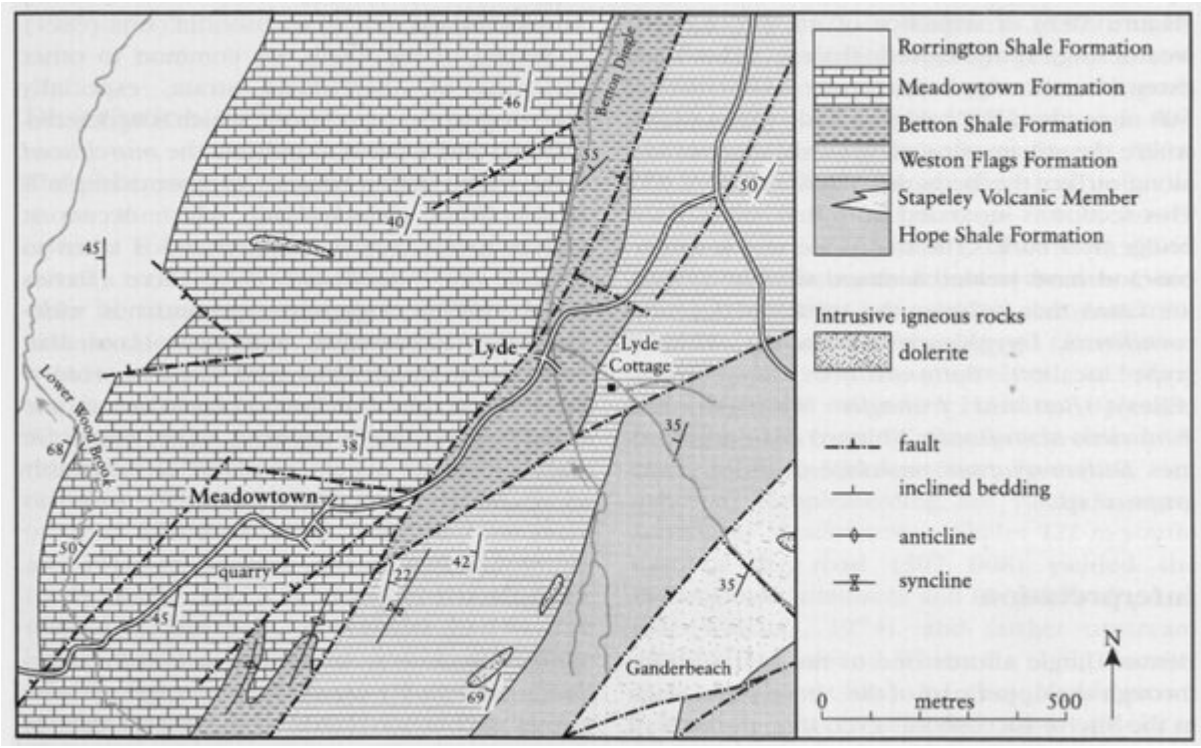
Meadowtown Quarry and nearby localities together provide a composite section through the Llandeilian Stage at Shelve and have yielded an abundant fauna dominated by trilobites, brachiopods and graptolites. From the point of view of correlation, all the graptolites are long-ranging taxa, except *Dicranograptus irregularis,* which ranges through most of the *teretiusculus* Zone and the basal part only of the *gracilis* Zone (Hughes, 1989). Of the trilobites, *Lloydolithus lloydii* and *Marrolithus inflatus* are restricted to the lower Llandeilo Flags at Llandeilo, whilst *Flexicalymene cambrensis* extends up to the basal upper Llandeilo Flags (see Wilcox and Lockley, 1981); R. Bettley (pers. comm., March 1998) has recorded *F. cambrensis* and *B. tyrannus* up to the equivalent of the top of the Llandeilo Flags in the Narberth Group around Llanmill. On balance, the Meadowtown Formation appears to equate to the lower half of the Llandeilo Flags sequence in South Wales, although facies control in the vertical distribution of these species cannot be ruled out.

Applying the Wilcox and Lockley (1981) bio- facies model to the Shelve succession gives a generally upwardly deepening sequence, from the more onshore, lower, beds in Meadowtown Quarry, with *Basilicus tyrannus* and *Flexicalymene cambrensis,* to distal, dysaerobic mudstones characterized by *Schizocrania transversa* and *Ogygiocarella debuchii* in higher beds exposed along the Rorrington road and near its crossing over Lower Wood Brook (see also Williams *et al.,* 1981).

Conclusions

The variety of facies present in the Meadowtown Formation leads to a diverse brachiopod–trilobite fauna that represents the Llandeilian Stage in the Shelve succession, and the presence of such species as the trilobite *Lloydolithus lloydii* enables correlation with the type succession near Llandeilo. The site is the type locality for several fossil species, including the venerable species *Diplograptus foliaceus.*

References



(Figure 10.6) Geological map of the area of Betton Dingle and Meadowtown, from the British Geological Survey (1991).