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# Mytton Dingle and Snailbeach

[SJ 365 005]–[SJ 374 006] and [SJ 378 023]–[SJ 380 024]

## Introduction

This site is important in having exposures of much of the Mytton Flags Formation, a predominantly shallow-water development that characterizes the Arenig Series in the Shelve area. It has also furnished the type specimens of several species of trilobites (particularly trinucleids), brachiopods, a bivalve, a rostroconch and a crinoid.

Mytton Dingle (also referred to as Mytton Batch and Myttonbeach) and nearby Crowsnest Dingle were mentioned briefly by Murchison (1839, p. 285), who noted the presence there of 'sandstones and schists'. Mytton Dingle is the type locality for the Mytton Flags Formation, a term proposed (as the 'Mytton Group') by Lapworth and Watts (1894, p. 316). Lapworth (1916) later subdivided the unit into four divisions, which from the base are: Lord's Hill Beds; Ladywell and Snailbeach Grits and Flags; Shelve Church Beds; and Tankerville Flags. These terms have subsequently fallen into disuse (Whittard, 1979, p. 16), but the lithologies distinctive of the two upper units crop out respectively at the Shelve Church and Bergam Quarry sites (see site reports).

Mytton Dingle is one of several striking steep-sided unwooded valleys, known locally as 'batches' or 'beaches' (Whittard, 1979, p. 17), that drain the west side of the Stiperstones ridge at the east side of the Shelve area (Figure 10.3) and (Figure 10.4). The sides of the valley and isolated outcrops around its head show much of the Mytton Flags Formation to advantage, and most of Whittard's fossil localities are hereabouts. The area around Snailbeach is more affected by faulting, but provides several important fossil localities, for which reason it is included within this site. The lack of continuous sections means that the stratigraphy of the Mytton Flags has to be assembled from such isolated exposures. The whole area contains many old mine workings, and the majority of the mineral veins (galena, blende, barytes) in the Shelve area occur in fault fissures within the Mytton Flags Formation (Whittard, 1931, p. 325; 1979, p. 17).

## Description

Mytton Dingle cuts an east–west cleft between Green Hill on the south and Oak Hill on the north (Figure 10.3). Its line is clearly fault-controlled (British Geological Survey, 1991), and there are old mine shafts and an adit at the head of the valley. The best exposures are on the north side and cover the greater part of the succession, although the lowest strata are largely obscured by talus and scree at the foot of the Stiperstones ridge. The beds dip steeply to the north-west, and Whittard (1952a, p. 158) gave a total thickness of about 3000 ft (900 m) for the formation, much in excess of Lapworth's (1916) estimate of 1600 ft (< 500 m). The exposures in the north side of Mytton Dingle are in massive, greyish-weathering, blue-hearted siltstones, flags and sandstones, with laterally impersistent coarse siltstones and sandstones; the more resistant beds, which form three distinct ridges, are presumably Lapworth's 'Ladywell and Snailbeach Grits and Flags'. They are bioturbated at many levels, but fossils are generally absent from this part of the succession.

Lower horizons are seen at isolated points at the head of the valley and on the ground to the north, around the head of Crowsnest Dingle (Figure 10.4) and near Blakemoorflat. However, the oldest fauna from the Mytton Flags Formation appears to be that from beside an old adit [SJ 3710 0018] at the head of Perkins Beach, immediately to the south (Whittard, 1979, p. 18: locality 805, fig. 7, p. 13). Five, silver-grey weathering, micaceous silty shales and flags yielded trilobites including *Myttonia confusa* Whittard, *Merlinia major* (Salter), *Neseuretus murchisoni* (Salter) and *N. brevisulcus* Whittard. These are from within 60 m of more shaly beds, which Whittard (1979) estimated to be about 180 m above the Stiperstones Quartzite; they probably correspond to Lapworth's (1916, p. 37) 'Lord's Hill Beds'. Similar beds are seen at the head of Mytton Dingle alongside the steep path to Blakemoorflat [SJ 3736 0059], where they have yielded a fauna like that at Perkins Beach, with the addition of the trilobites *Ampyx* cf. *reyesi* Benedetto and Malanca, *Neseuretus cornplanatus* Whittard (type locality) and the brachiopod *Monobolina plumbea* (Salter); the type locality for the crinoid *Aethocrinus murchisoni* Donovan is probably hereabouts. Yet another outcrop, at the head of Crowsnest Dingle [SJ 3719

0087], has a similar fauna, comprising the trilobites *Myttonia multiplex* Whittard and *Neseuretus parvifrons* (M'Coy) and the brachiopods *M. plumbea* and *Palaeoglossa myttonensis* Williams. The type locality for *Neseuretus brevisulcus* Whittard is nearby. From a slightly higher level, 305 m above the Stiperstones Quartzite, Whittard (1955–1967) reported *Cyclopyge grandis* (Salter) in yellowish siltstones 530 m NNE of Blakemoorflat [SJ 3769 0127].

Exposures to the NNE, around Lord's Hill, show further examples of the horizon seen at the head of Mytton Dingle, as, for instance, at the entrance to Yewtree Level [SJ 3800 0183], which is the type locality for the trilobite *Myttonia confusa*, here occurring with the brachiopod *Paralenorthis* cf. *proava* (Salter) and the bivalve *Pensarnia*. At Lord's Hill, or thereabouts, are the type localities for the trilobite *Neseuretus murchisoni* (Salter), the bivalve *Redonia anglica* Salter and the rostroconch *Riberia complanata* Salter. A short distance to the north-east, just west of Eastridge [SJ 3828 0226], is one of the few points at which beds transitional to the underlying Stiperstones Quartzite can be seen; flags with a preponderance of quartzitic rocks are exposed here (Whittard, 1979, locality 858). West of Lordshill Farm a small dry valley [SJ 3782 0210] (Whittard, 1979, locality 157) exposes resistant gritty flags belonging presumably to horizons seen along the steep northern side of Mytton Dingle. The resistant sandstone bodies present around Mytton and Crowsnest dingles do not appear to be developed around Snailbeach.

At Old Perkins level [SJ 380 023], above the reservoir in the valley east of Snailbeach, *Neseuretus* and *Monobolina plumbea* are reported from a horizon probably slightly younger than most of the fossiliferous horizons described above. However, a small quarry NNE of the reservoir [SJ 3790 0242] exposes blocky siltstones cut by a small dolerite intrusion immediately to the south. Whittard (1955–1967) estimated these siltstones to lie 610 m above the Stiperstone Quartzite, and they have afforded a diverse fauna of trinucleid trilobites; it is the type locality for Whittard's species *Anebolithus simplicior*, *Bergamia matura*, *B. inquilinum* and *Lordshillia confinalis*, as well as for the non-trinucleid trilobite *Thymurus incertus*. Other trilobites reported from this locality are *Merlinia major*, *Neseuretus murchisoni* and *Macrogrammus scylfensis* Whittard, and it is also the type locality for the brachiopod *Astraborthis uniplicata* Williams. An exposure near the top of the Mytton Flags in Snailbeach Coppice [SJ 375 026] (Whittard locality 894) does not resemble the 'Tankerville Flags' lithology seen at Bergam Quarry (see site report), indicating either that those flags are laterally impersistent or that they are not exposed at Snailbeach.

Lastly, a little beyond the northern extremity of the site, exposures in the old adit in Maddox's Coppice [SJ 3815 0300] is worthy of mention as the type locality for the trilobites *Myttonia multiplex* and *Macrogrammus scylfensis*, occurring here with *Merlinia major* and species of the brachiopods *Euorthisina*, *Orthis* and *Monobolina* (Williams, 1974). This fauna contains species common to the locality north-east of Snailbeach Reservoir and to lower horizons exposed between Perkins Beach and Lord's Hill and may therefore fall within the intervening stratigraphical interval.

## Interpretation

The bulk of the Mytton Flags Formation is assigned on faunal grounds to the Moridunian and Whitlandian stages of the Arenig. Most of the fauna is peculiar to the Mytton Flags, which makes correlation with other areas difficult, but *Neseuretus murchisoni* is common to parts of the Ogof Hên Formation in South Wales and *N. parvifrons* to the Henllan Ash in North Wales, both Moridunian, and *Cyclopyge grandis* is known from rocks of Whitlandian age in both North and South Wales. Because the succession can only be pieced together from isolated outcrops, the precise relationships of the succession here with the 'Tankerville Flags' (see site report for Bergam Quarry) and the 'Shelve Church Beds' (see site report) is uncertain, though their faunas show that those two divisions are Fennian and lie near the top of the succession.

Although detailed sedimentology and facies analysis remain to be done, it is likely that much of the Mytton succession was deposited in shallow subtidal conditions, similar to those of the higher part of the Habberley Formation beneath the Stiperstones Quartzite (see Granham's Moor site report, Chapter 7). In contrast to the Arenig of South Wales, the Mytton Flags show a persistence of the shallow-water *Neseuretus* biofacies throughout most of the succession. Slightly deeper-water conditions are likely for the 'Shelve Church Beds' and 'Tankerville Flags' facies at the top of the sequence, probably heralding the generally deep-water offshore regime of the succeeding Hope Shales Formation.

The trinucleid trilobites from the Mytton Flags are some of the oldest known from anywhere in the world, and specimens from this site (and several other localities in the Shelve area whose names have been bestowed on trinucleid genera), contribute significantly to our understanding of the early evolutionary history of the group (Hughes *et al.*, 1975). In *Lordshillia* they include probable ancestors to the genus *Trinucleus* itself.

## Conclusions

The present site is important regionally and nationally. Exposures of the Mytton Flags show the development of the Arenig at the edge of the Welsh Basin, where shelly faunas continued to develop in a shallower-water setting than obtained in South Wales. The trinucleid trilobites from the Mytton Flags Formation uniquely represent the early evolutionary radiation of this stratigraphically important group.

## References



(Figure 10.3) View eastwards along Mytton Dingle. The Mytton Flags Formation, cropping out on the north side of the valley, dips steeply towards the viewer and strikes obliquely south-west. The ridge on the left is Blakemoorflat; Green Hill, on the right, slopes down into Perkins Beach. (Photo: Cambridge University Collection of Air Photographs, BM 13: copyright reserved.)



*(Figure 10.4) Scarp of the Mytton Flags Formation on the east side of Hope Valley, looking north-east. The lower ground is occupied by the Hope Shale Formation, the road following the Mytton–Hope boundary quite closely. The white tip-heap is spoil from Snailbeach Mine. The next nearer cleft is Crowsnest Dingle. (Photo: Cambridge University Collection of Air Photographs, BM 8: copyright reserved.)*