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## Lower Wallop Quarry

[SJ 3150 0725]

### Introduction

The abandoned Lower Wallop Quarry is situated 3 km north of Brockton, and 18 km WSW of Shrewsbury in Shropshire (Figure 6.24) and forms part of a private property. The quarry exposes the best section of the Wallop Hall Member of the Causemountain Formation, Pridoli Series, in the Welsh Borderland. The section has previously been shown to extend down into rocks of the Ludfordian Upper Whitcliffe Formation, which in 1996 were not exposed. An abundant fauna of beyrichiacean and non-palaeocene ostracods, bivalves, lingulate brachiopods, and rarer fish and eurypterid remains, and a fossil micro- and macroflora is preserved. Although much of the section was obscured for some time, in Spring 1996 the main quarry face was cleared of vegetation and excess scree, by members of the Shropshire Geological Society. The strata exposed form part of the Long Mountain sequence (Das Gupta, 1932; Palmer, 1970, 1972).

Details of the stratigraphy and the stratigraphical occurrence of the flora and fauna may be found in a number of publications; the general stratigraphy, fauna and microflora (Das Gupta, 1932; Antia, 1981); ostracods (Shaw, 1969; Miller, 1995); the macroscopic flora (Bassett and Edwards, 1982; Edwards, 1990 and references therein), and the palynomorphs (Richardson and Rasul, 1990).

### Description

The main exposure (Figure 6.25) shows about 4 m of section, the base of which lies an estimated 2 m above a bone bed. This bone bed has been considered a possible correlative of the Ludlow Bone Bed (Richardson and Rasul, 1990) which crops out in the Wenlock Edge–Ludlow area some 30 km to the south-east; it is obscured by talus produced in clearing the main quarry face, and by removal of a dangerous overhang. A few metres east of the main face, the lower part of the section in which Palmer (1970, 1972; Miller, 1995; (Figure 6.26)) recorded the same bone bed, is normally obscured by vegetation. Another exposure of what is possibly the same bone bed about 100 m to the east (D. Palmer, pers. comm.) is not presently available for study. In the Welsh Borderland several bone beds occur at about the Ludlow–Pridoli stratigraphical boundary; because of the difficulty of biostratigraphical correlation in the increasingly terrestrial facies represented by the sequences it cannot be assumed which bone bed is the precise correlative of which at other localities (Miller, 1995, p. 341).

The main quarry section is in the Wallop Hall Member of the Causemountain Formation; it is composed of grey, medium-bedded micaceous blocky fine sandstones and siltstones that grade up into silty mudstones. About 4.75 m of the Wallop Hall Member were recorded by Miller (1995). A gradual transition from parallel-laminated siltstones (rich in articulate brachiopods) via the thin bone bed (Bed K of Miller, 1995) to very fine sandstones, characterized by gastropods, inarticulate brachiopods and plant fragments, can be seen.

Fossils are abundant and generally well preserved in the part of the main face now exposed; previous accounts indicate that they are less abundant closer to the bone bed. Antia (1981, p. 193) recorded *Lingula cornea* (sometimes in life position), the bivalve *Leodispis barrowsi*, the ostracods *Cytherellina siliqua*, *Hermannia marginata* and *Londinia kiesowi*, remains of eurypterids, and the fish *Gomphonchus murchisoni*. At this locality, Miller (1995; see (Figure 6.27)) recorded the ostracods *Frostiella groenvalliana*, *Lophoctenella* cf. *L. scanensis* and *Nodibeyrichia verrucosa* as occurring 0.6 m above the bone bed, *Calcaribeyrichia torosa* and *Hemsiella* cf. *H. maccoyiana* that occur below the bone bed but also in the beds just above, and *Londinia arisaigensis*, *L. fissurata* and non-palaeocopes that occur from just below the bone bed through the whole of the exposed section. The conodont *Coryssognathus dubius* has been recovered from the bone bed (Miller 1995, p. 364). In addition, Antia (1981) recorded *Loxonema* sp., *Londinia kiesowi*, *Modiolopsis complanata* and *Turbocyclus helicites* from the post-bone bed sequence at this locality. The flora consists of fragments of *Cooksonia pertoni* with fertile sporangia on Y-shaped axes, from which in-situ spores have been isolated (Rogerson *et al.*, 1993). An analysis of the palynofacies of the quarry sequence was given by Richardson and Rasul (1990, figs 6 and 7), who used

the relative occurrence of sporomorphs, polygonomorphs and sphaero- morphs to give a measure of 'inshore index'.

The occurrence of *Cooksonia pertoni* (see Rogerson *et al.*, 1993) and *Frostiella groenvalliana* (see Miller, 1995) in the exposed part of the quarry (above the bone bed) indicates the Pridoli age of this part of the sequence (see also Richardson and Lister, 1969).

## Interpretation

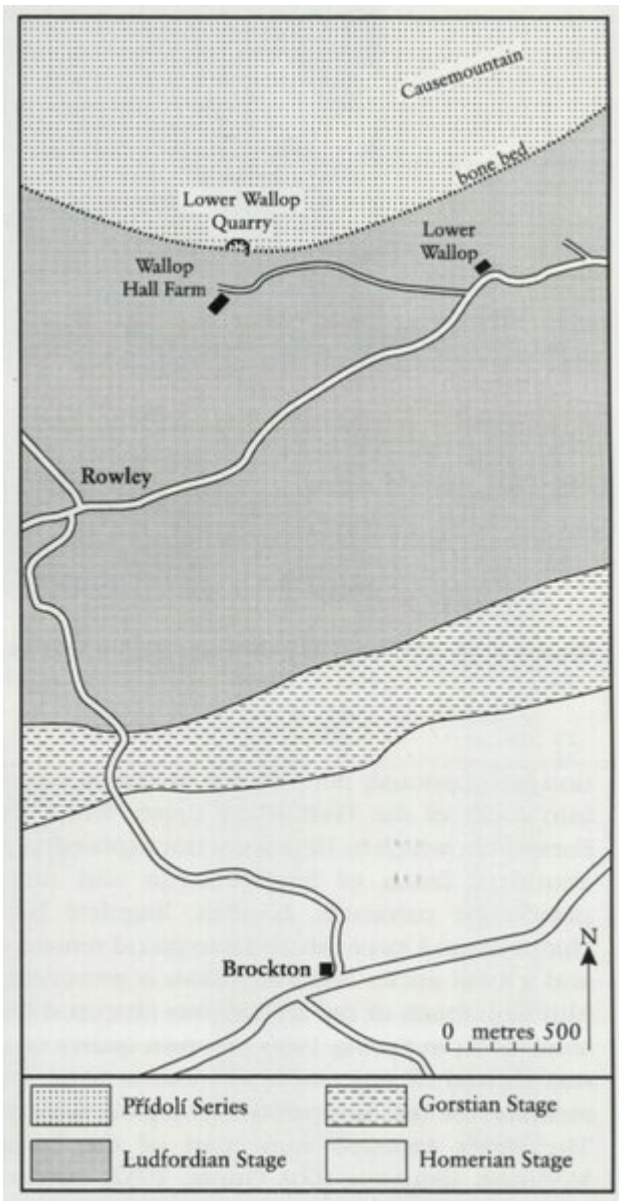
The rocks exposed at Lower Wallop Quarry represent the upper part of a fining-upwards sequence. It is stratigraphically and environmentally transitional between marine Ludlow and Old Red Sandstone facies. However, this site is that which on regional grounds is most distant from the fully oceanic conditions that it is proposed were situated to the south-east (Cope, *et al.*, 1992, p. 55, fig. S9). Although regarded as shallow marine in the Pridoli, the sequence exhibits synaeresis cracks that indicate intermittent emergence or possibly very shallow conditions, and the latter is further borne out by the lack of 'fully' marine groups such as articulate brachiopods, trilobites and corals above the bone bed. In-situ specimens of *Lingula* at some horizons additionally indicate possible shallow, even intertidal, conditions. Richardson and Rasul (1990, figs 6 and 7) considered that the Pridoli palynofacies as traced up sequence in this section indicated a generally increasingly inshore position, interrupted by a small 'offshore' event about 1.6 m above the bone bed.

The Lower Wallop Quarry site forms a GCR network particularly well with the Ludford Lane and Ludford Corner, and Brewin's Canal sites. Of these sites, being farthest west it is the most distant from the Rheic Ocean, which was developing to the south-east; the longer persistence of marine faunas at Little Wallop Quarry attests to the continuing marine conditions in the shrinking Welsh Basin well into Pridoli times.

## Conclusions

When fully cleared, Lower Wallop Quarry and adjacent exposures show a rock sequence, fauna and flora from Ludlow to Pridoli times. It is therefore stratigraphically and palaeoenvironmentally important, illustrating part of the generally shallowing sequence from late Ludlow to early Old Red Sandstone facies. A bone bed is present that probably approximates to the Ludlow Bone Bed exposed to the south-east at the Ludford Lane and Ludford Corner site. The site has yielded early land plants. It also holds a key palaeogeographical position being positioned in the late Silurian remnant of the Welsh marine basin; this remnant basin lies to the east of fully marine conditions as evidenced in boreholes (e.g. Little Missenden) in south-east England.

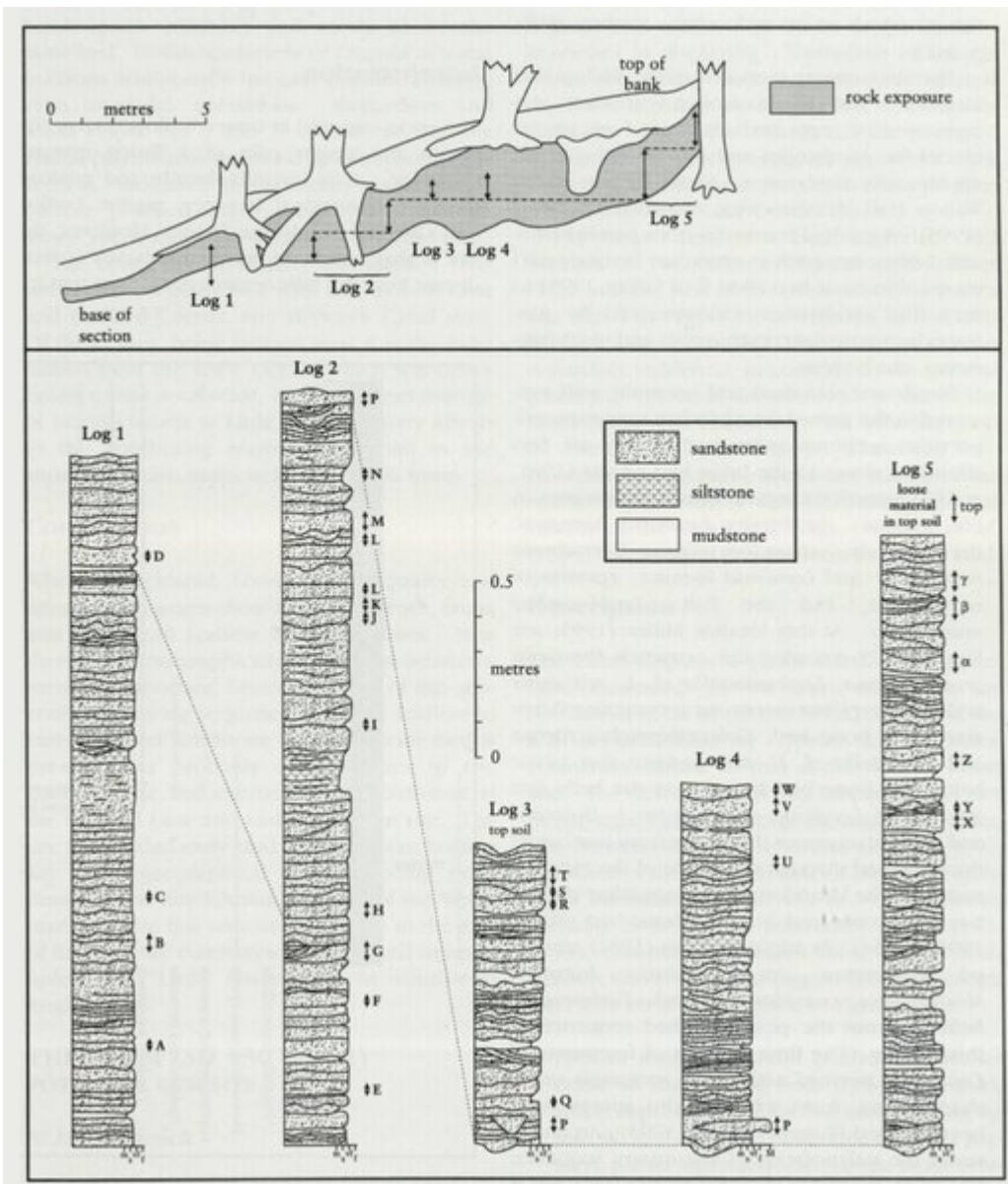
## [References](#)



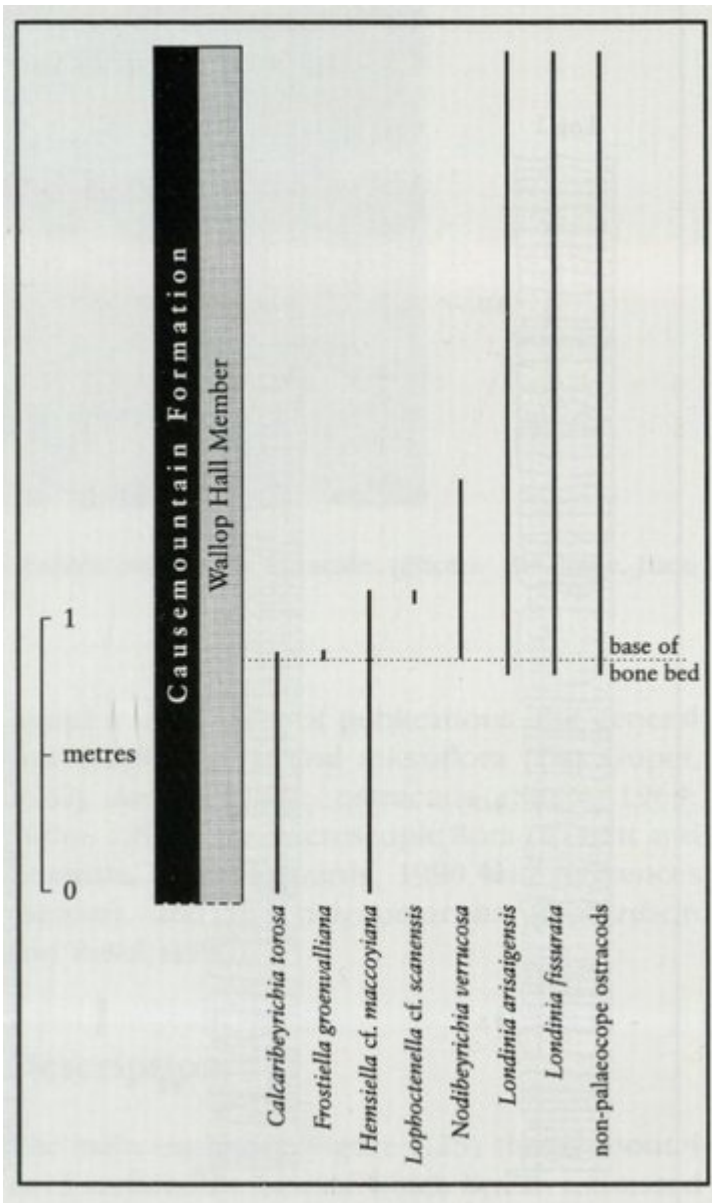
(Figure 6.24) Geological map of the area around Lower Wallop Quarry, Shropshire (modified from Das Gupta, 1932).



*(Figure 6.25) The main face of Lower Wallop Quarry, Shropshire; metre rule for scale. (Photo: P.D. Lane, June 1996.)*



(Figure 6.26) Log of previously exposed section in Lower Wallop Quarry, Shropshire, exposed a few metres to the east (right) of the main face shown in Figure 6.25 (modified from Miller, 1995, text-fig. 11).



(Figure 6.27) Stratigraphical range of ostracods in Lower Wallop Quarry, Shropshire (modified from Miller, 1995, text-fig. 12).