Gurney's Quarry

[SO 7170 3840]

Introduction

This large, abandoned quarry lies just west of the A449 road, about 1 km north-east of Ledbury, Herefordshire, in the central part of the Welsh Borderland. The locality is also known as County Quarry, Ledbury Quarry and Lower Hall Farm Quarry. It exposes a section across the Wenlock–Ludlow boundary (Figure 5.45).

This GCR site is part of the Silurian of the Malvern–Abberley–Ledbury Hills area. Originally studied by Murchison (1839) and Phillips (1848) and later by Groom (1899, 1900, 1910), the Silurian litho- and chronostratigraphy and structure of this ground was mapped in modern times by Phipps and Reeve (1967, 1969). The Silurian stratigraphy of the south Malverns–Ledbury district is also summarized in the British Geological Survey Memoir for the country around Tewkesbury (Worssam *et al.,* 1989). Cocks *et al.* (1971, 1992) showed correlation of the Silurian here with the type and other sequences of Shropshire.

Several of the local Silurian localities have appeared in two field guides to the area (Penn and French, 1971; Bullard, 1989), of which the former briefly mentions Gurney's Quarry. Phipps and Reeve (1967) recorded the local Silurian faunas. Fossils from the quarry that have featured in specialist studies include trilobites (Thomas, 1978), brachiopods (Bassett, 1970a) and the microflora (Dorning, 1981b).

In the Welsh Basin Gurney's Quarry shows one of the best outcrops of the Wenlock–Ludlow junction outside the Ludlow area. It was one of the sections selected by Corfield *et al.* (1992) in their carbon isotope studies of that boundary.

Description

The quarry occurs more or less along the axis of a minor, NE–SW trending anticline and about 0.5 km east of the north-south aligned Ledbury Fault (Phipps and Reeve, 1969). The long, mostly vertical exposure shows gently clipping Much Wenlock Limestone Formation (late Homerian, Wenlock Series) overlain conformably by the Lower Ludlow Formation (early Gorstian, Ludlow Series). These Lower Ludlow beds are equivalent to the lower part of the Lower Elton Formation of Shropshire.

The Much Wenlock Limestone Formation is a grey, bedded, nodular and bioclastic carbonate; argillaceous partings and interbeds are common. In the Malverns area this stratigraphical unit has a varied fauna of brachiopods, corals, bryozoans, algae, stromatoporoids, crinoids and trilobites; gastropods, cephalopods and bivalves are rarer (Phipps and Reeve, 1967). Bioherms are not recorded from the limestone at Gurney's Quarry but very rare examples are known locally (Penn, 1971). Lawson (1954) used the characteristics of the Much Wenlock Limestone at Gurney's Quarry in determining a late Wenlock age for the Gorsley Limestone of the Gorsley Inlier some 13 km to the south-east.

The Lower Ludlow Formation exposed consists predominantly of grey calcareous mudstones and siltstones. Locally this unit contains a varied, much comminuted shelly fauna dominated by small brachiopods; colonial organisms are virtually absent (Phipps and Reeve, 1967). Well-preserved microfloras, assignable to the *Leptobrachium longhopense* acritarch Biozone, have also been recovered from these elastic rocks (Dorning, 1981b, and unpublished data).

Interpretation

The late Wenlock to early Gorstian deposits represented at Gurney's Quarry accumulated on the outer shelf of the eastern, Midland Platform to the Welsh Basin (see Siveter *et al.,* 1989, figs 8–10; Bassett *et al.,* 1992, figs Sib, S4a; (Figure 5.47)). The lithological changes across the series boundary, from carbonates to fine elastics, possibly reflect a sea-level transgression (e.g. see Hurst, 1975b; Bassett, 1976; Dorning, 1981a; Siveter *et al.,* 1989; Johnson *et al.,* 1991).

Shifts in climatic and associated oceanic states provide another possible explanation for such lithofacies changes (Jeppson, 1990; Jeppson *et al.,* 1995).

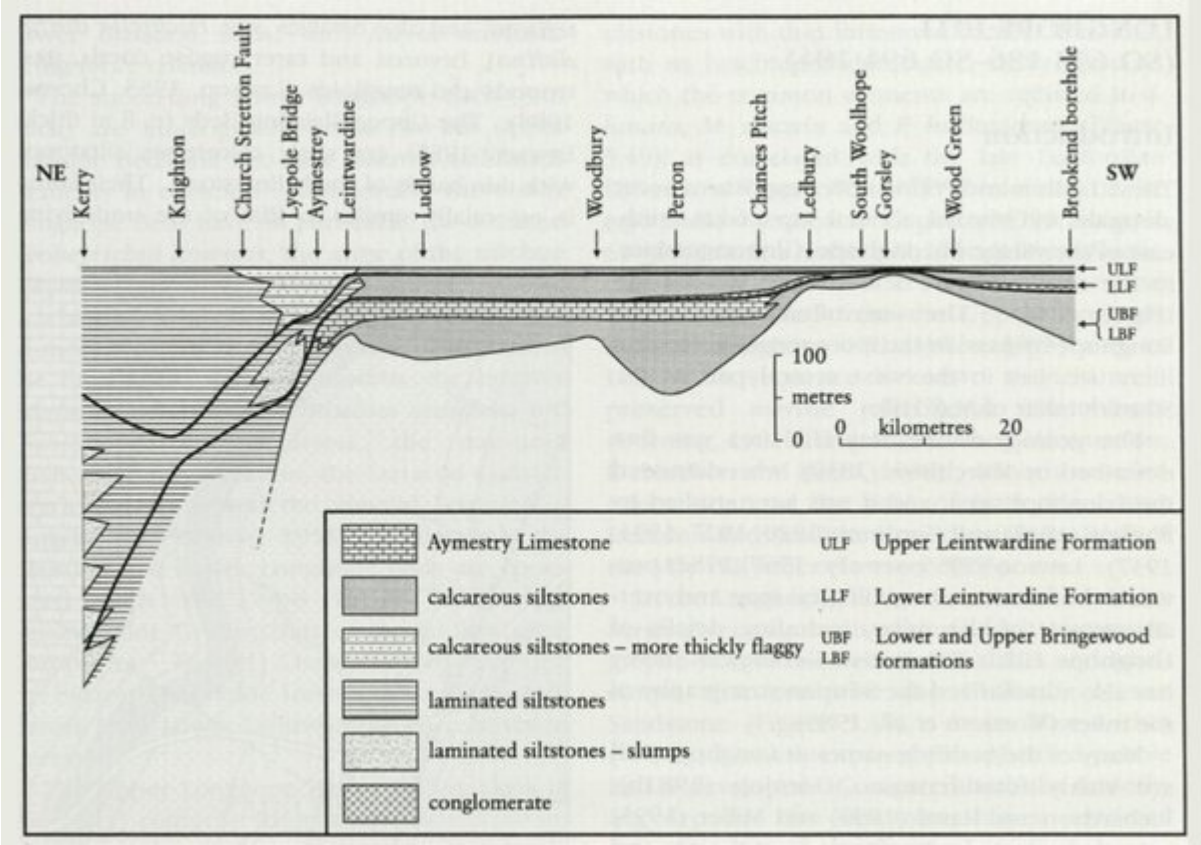
Gurney's Quarry and Woodbury Quarry, about 28 km to the north, are the only GCR sites that display Ludlow strata in the Malvern–Abberley–Ledbury Hills area. The only other GCR site in that area is Gullet Quarry (Llandovery Series), at the southern end of the Malvern Hills. Gurney's Quarry is one of several sites that show the Ludlow–Wenlock boundary in the Welsh Basin (see list under 'Pitch Coppice'). Like the sequence at Gurney's Quarry the boundary stratotype at Pitch Coppice in Shropshire reflects a shallow marine setting. Coeval localities representative of a range of depths in the Welsh Basin all show a marked carbon isotope depletion in the latest Wenlock, which in part is related to a decline in graptolite diversity (Corfield *et al.,* 1992).

Conclusions

This locality contains sediments indicative of a marine platform environment of the Welsh Basin. The site is readily accessible and is important because it displays a well-exposed Wenlock–Ludlow boundary sequence containing rich macro- and microfaunas and floras; moreover, it is the type locality for several species. The site is referred to in many research papers and should be conserved.

References

(Figure 5.45) Gurney's Quarry Ledbury, Herefordshire: Much Wenlock Limestone Formation and the calcareous mudstones and siltstones of the overlying Lower Ludlow Formation. (Photo: Derek J. Siveter.)



(Figure 5.47) The concept of the 'Gorsley topographical high' of the Welsh Basin, as illustrated in the facies and thickness variations of the Leintwardine Group (early Ludfordian Stage) in a general south-west to north-east transect from the region of the Brookend Borehole, Gloucestershire, to Kerry, Powys (after Cherns, 1988).