
Linton Quarry

[SO 6770 2570]

Introduction

This former working quarry lies 300 m south of the B4221 Newent to Ross-on-Wye road, in the village of Gorsley, Herefordshire (Figure 4.11). The Gorsley area contains the smallest of the Silurian inliers in the Welsh Borderland. Linton Quarry provides the most accessible and most complete local Silurian sequence, exposing Wenlock, Ludlow and Pridoli strata. The rocks of the latter two series are described here; the deposits of Wenlock age of the site are described separately in this volume.

The geology of the Gorsley area was first described in 1839 by Murchison. Phillips (1848), Symonds (1872) and Pocock (1950) have also discussed its stratigraphy. The most recent first-hand account of the rocks and fossils of Linton Quarry is by Lawson (1954; (Figure 4.11), (Figure 4.12), (Figure 5.46). The stratigraphy of the Gorsley Inlier, and in particular that of Linton Quarry, is also reviewed in correlation charts, field excursion guides and British Geological Survey memoirs (e.g. Holland *et al.*, 1963; Squirrell and Tucker, 1967, 1982; Cocks *et al.*, 1971, 1992; Worssam *et al.*, 1989).

The Wenlock or Ludlow age of the Gorsley Limestone, the lowest stratigraphical unit exposed in Linton Quarry, has attracted debate for more than 150 years (see discussion of Linton Quarry, a Wenlock site, this volume). In addition to Lawson's (1954) survey of the faunas of Linton Quarry, Richardson and Lister (1969) and Richardson and Rasul (1990) have documented its palynomorphs. The topographical, bathymetric and palaeogeographical implications of the condensed Ludlow sequence of Linton Quarry have been graphically represented in several papers (e.g., Holland and Lawson, 1963; Cherns, 1988; Siveter *et al.*, 1989; Bassett *et al.*, 1992; see (Figure 5.47)).

Description

The Ludlow Series (Lawson, 1954; see (Figure 4.12), (Figure 5.46) consists of approximately 3.5 m of strata lying above a hard, massive carbonate, the

Gorsley Limestone (c. 3.6 m seen). This limestone is generally thought to be a correlative of the Homeric Stage Much Wenlock Limestone Formation (Lawson, 1954; Bassett, 1974a; Cocks *et al.*, 1992; cf. Hurst *et al.*, 1978). Although no angular discordance is detectable in the section (all beds dip approximately 5° to the southwest), several unconformities are inferred.

The oldest rocks assigned to the Ludlow Series comprise 1.4 m of bluish-grey, shaly calcareous siltstones, the 'Lower Siltstones' of Lawson (1954). They yield a shelly fauna in which the brachiopods *Protochonetes ludloviensis*, *Isorthis orbicularis*, *Dayia navicula* and *Sphaerirhynchia wilsoni* are common. The bivalves *Fuchsella* and *Pteronitella* and the graptolite *Saetograptus leintwardinensis* also occur. The presumed early Ludfordian age of these siltstones implies that the entire Gorstian Stage is absent in the Gorsley Inlier.

The Lower Siltstones are separated from a 2.1 m sequence of siltstones above, in which current bedding is more prominently developed, by a 2–13 mm thick phosphatized pebble bed. These lightish coloured, shaly calcareous Upper Siltstones contain the brachiopods *Protochonetes ludloviensis* and *Microsphaeridiorhynchus nucula* and the bivalve *Pteronitella retroflexa* as common elements, together with *Orbiculoidea*, *Isorthis*, *Goniophora* and the tube-dwelling worm *Serpuloides longissimus*. *Isorthis orbicularis*, *Dayia navicula* and *Sphaerirhynchia wilsoni* are absent. Both the Lower and Upper Siltstones have well-preserved acritarchs, such as *Visbysphaera* and '*Dictytidium*' and spores (Richardson and Lister, 1969; Richardson and Rasul, 1990). The Upper Siltstones are correlated with the Upper Whiteliffe Formation of Shropshire, thus indicating a local unconformity that spans some of the lower and middle part of the Ludfordian Stage.

The Upper Siltstones are succeeded by a thin (2–7 mm), unfossiliferous Upper Phosphatised Pebble Bed, above which is the Clifford's Mesne Sandstone (at least 6 m). The latter stratigraphical unit here consists of a lower part of yellowish-brown, shaly siltstones (1.4 m) containing eurypterid and plant fragments and the brachiopod *Lingula minima*, and an upper part comprising a very pale orange, unfossiliferous sandstone (about 4.6 m). Lithological, palaeontological and general stratigraphical evidence suggest that the Upper Phosphatised Pebble Bed and the Clifford's Mesne Sandstone are the local correlatives of the Ludlow Bone Bed Member and Platyschisma Shale–Sandstone members respectively of the main outcrop of the Pridoli Series Downton Castle Sandstone Formation of Shropshire. Analysis of palynomorphs present across the Ludlow–Pridoli boundary of Linton Quarry in general shows a decrease in inner-shelf marine microflora and a corresponding marked increase in land-derived material (Richardson and Lister, 1969; Richardson and Rasul, 1990).

Interpretation

The very thin, incomplete and unconformable nature of the sequence of Ludlow rocks at Gorsley suggests that the area was probably the site of a syndepositional axis of uplift (Lawson, 1954; (Figure 5.47)). Isopachyte maps (Holland and Lawson, 1963) support the existence of this submarine topographical feature, the so-called 'Gorsley High', which was part of the Midland Platform shelf area in the south-eastern part of the Welsh Basin and proximal to the southern landmass of Pretannia (see Siveter *et al.*, 1989, fig. 10; Bassett *et al.*, 1992, figs S4b, S5a).

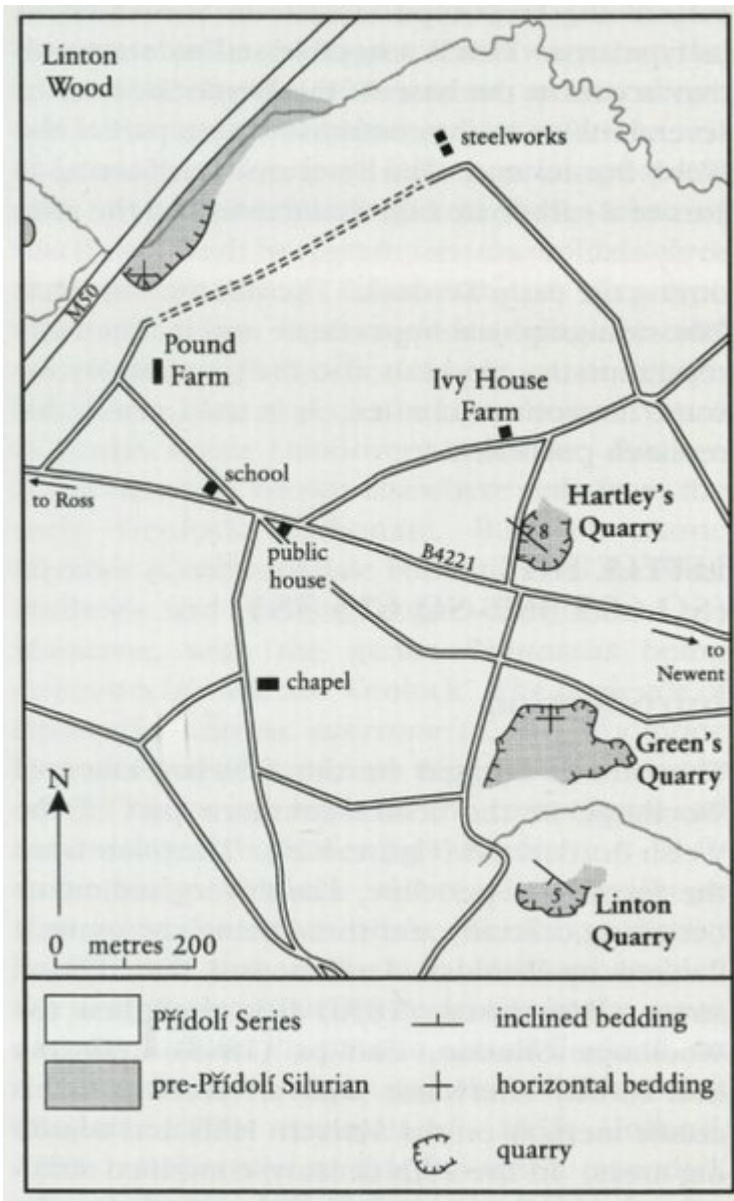
Palaeoenvironmentally, the sequence at Linton Quarry charts a transition from open marine shelf (Wenlock and Ludlow series) to marginal marine–coastal mudflat conditions (Pridoli Series; see Bassett *et al.*, 1982 and Allen, 1985). These changes herald the onset, across central Britain, of thorough-going continental conditions of Devonian times.

Linton Quarry (see also under Wenlock sites) is the only GCR site in the Gorsley Inlier, although several others occur in the nearby May Hill and Woolhope inliers. The Sawdde Gorge in South Wales is the only other GCR Ludlow site that has exposures of the three latest of the four Silurian series, but the sequence there is not condensed.

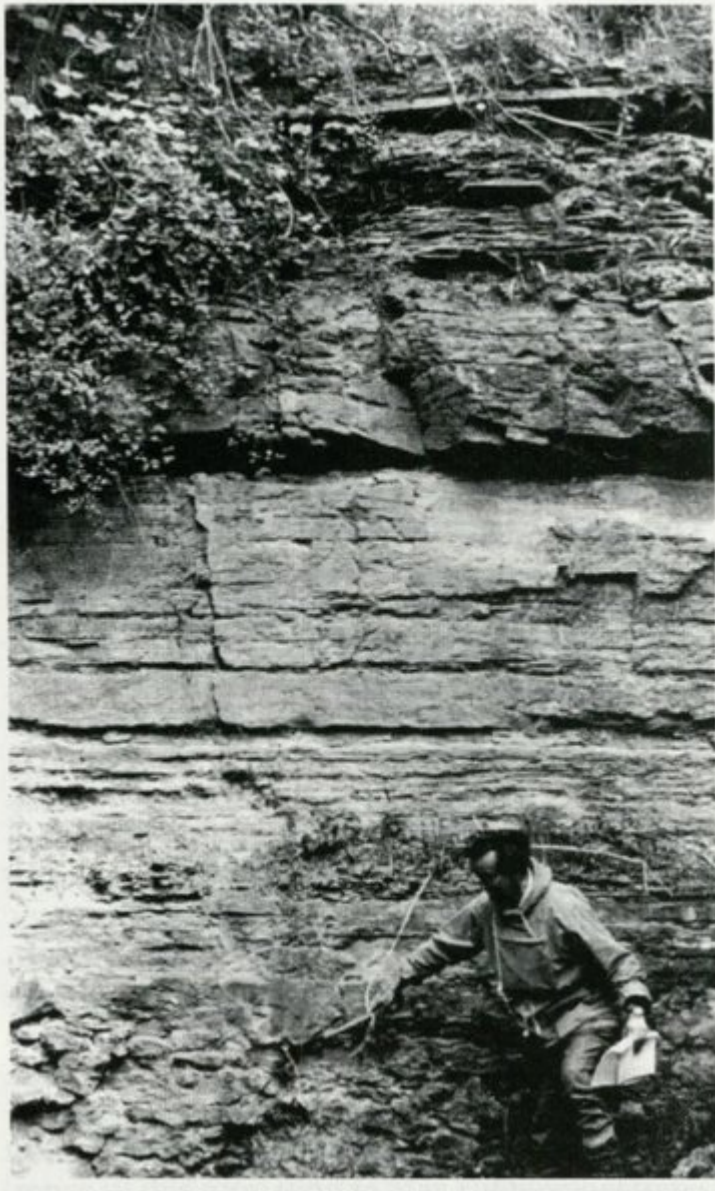
Conclusions

Linton Quarry is an important site for determining the geology of the region and should be conserved. It contains the most complete succession of Silurian rocks in the Gorsley Inlier. The locality and the inlier are unique within the Welsh Basin in having a very condensed Ludlow sequence, thus implying the existence of a local topographical high. The locality also contains the local Ludlow–Pridoli series boundary.

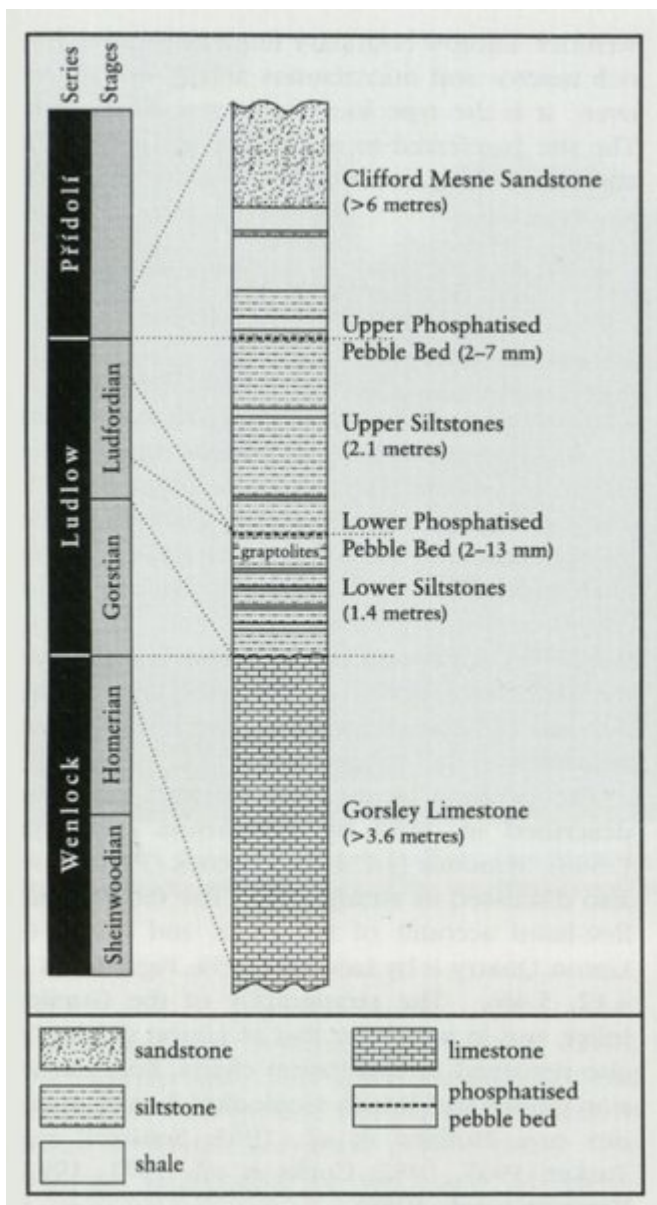
[References](#)



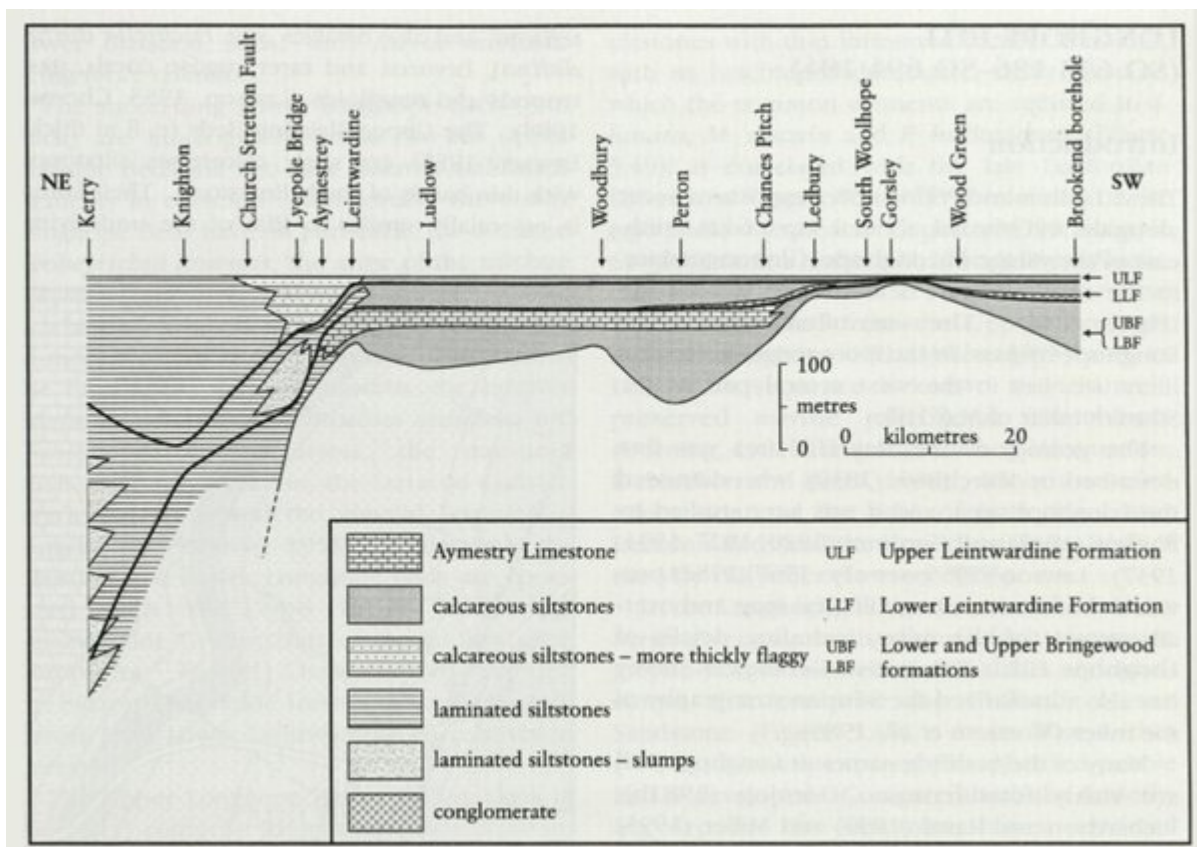
(Figure 4.11) Location of Linton Quarry and geology of the Gorsley area, southern Welsh Borderland (after Lawson, 1954).



(Figure 4.12) Linton Quarry, Gorsley area, southern Wales Borderland. Dr Jim Lawson indicating the Wenlock–Ludlow series boundary: the Gorsley Limestone of Wenlock age lies below the hammer head and the Lower Siltstones of Ludlow age above it. The middle part of the quarry face comprises a much condensed Ludlow sequence, with the Páidolí age Clifford Mesne Sandstone forming the top. (Photo: Derek J. Siveter.)



(Figure 5.46) Succession and correlation of the Silurian strata at Linton Quarry, Gorsley Inlier, Herefordshire (after Lawson, 1954; see also Cocks et al., 1971, 1992).



(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).