Buckover Road Cutting

[ST 667 908]

Introduction

This is the second site of Wenlock age from the Tortworth Inlier in this volume, the other being Brinkmarsh Quarry (Figure 3.14) and (Figure 4.15). Under the report on that quarry, a synthesis is given of the geology of the area together with references to the more important works concerning Silurian rocks and fossils in the inlier. The studies of Reed and Reynolds (1908b), Curtis (1972), and Cave (1977) are the most significant for the general geology of the Silurian hereabouts, and the last two of these plus Curtis and Cave (1964), for data on the present site in particular.

Unlike Brinkmarsh Quarry, which has figured in geological literature for over 170 years, Buckover Road Cutting has only been available since 1963. It exposes beds in the upper part of the Wenlock and amongst other things helps provide a fully representative sequence for this series in the Tortworth Inlier. Wenlock sediments are unconformably overlain in the cutting by the Devonian Upper Old Red Sandstone, and the Triassic is also represented.

Description

The road cutting is situated on the eastern limb of a southerly-plunging syncline that is composed of Silurian–Devonian rocks, the axis of the syncline running through Buckover and Milbury Heath. This fold is complementary to the southerly-plunging anticline that has its axis passing through Whitfield (very close to Brinkmarsh Quarry) and Horseshoe Farm (Figure 4.15).

There are some 244 m of strata in the Wenlock of the Tortworth Inlier, all belonging to the Brinkmarsh Formation, with three laterally discontinuous bands of bioclastic limestone occurring at the base, near the middle, and towards the top of the succession. The upper 55 m (22%) of these strata are dissected by the cutting, which trends NE–SW (Figure 4.16) and (Figure 4.17). The dip of the rocks here is to the west and steepest (37°) in the north-east part of the section, where the oldest strata occur. Towards the south-west, approaching the synclinal axis, dips gradually decrease so that the highest Wenlock beds are at an angle of about 34° and the basal and highest units of the Upper Old Red Sandstone are at about 33° and 20°, respectively. There is no clear angular discordance between the Wenlock and Old Red Sandstone strata, both of which occur either side of the cutting. The bottom bed of the 'Old Red', a sandstone, has in places small (< 1 cm) pebbles at its base. The Trias is confined to a very small patch on the north-west side of the section at its south-western end.

Minor faults are present which trend between west and north-west. The two largest both have a generally southerly downthrow; one involves only the Old Red Sandstone and displaces strata by a minimum of 9–12 m, the other has a throw of about 5 m and affects both Wenlock and Old Red Sandstone rocks at the unconformity. In the north-east of the section, several other smaller faults displace Wenlock strata by a metre or so.

The Wenlock sediments in the section are mainly mudstones and siltstones, with some fine sandstones occurring in its upper part. A full log (Curtis and Cave, 1964) is shown in (Table 4.1), bed 6 being the upper limestone referred to above.

(Table 4.1) Lithological log of the Brinkmarsh Formation at Buckover Road Cutting, Tortworth Inlier (after Curtis and Cave, 1964).

Bed no.	Lithology	Thickness (m)

(18)	Hard yellow current-bedded, fine-grained calcareous sandstone, weathering to a brown laminated rottenstone; contains abundant crinoid ossicles.	0.4 5
(17)	Silty mudstone with some silty sandstone bands; mainly green below and red and green above.	1.21
(16)	Purplish-red shaley mudstone, with occasional bands of hard, green, fine-grained sandstone and a thin layer of green clay at the base.	1.87
(15)	Banded green and purplish-red silty mudstone, with some hard sandy siltstone bands.	2.59
(14)	Banded green and purplish-red silty mudstone, with occasional bands of hard, fine-grained sandstone, and a few pale green clay partings.	1.67
(13)	Green siltstone, with some sandier bands showing fine current bedding and containing rounded masses with curved bedding.	1.21
(12)	Brown sandy siltstone with some curved bedding; abundant fossils.	0.91
(11)	Banded green and purplish-brown silty mudstone.	0.60
(10)	Yellowish-green siltstone, with bands of harder siltstone. Bands of yellowish■ brown, fine-grained calcareous siltstone up to 30 cm thick, sometimes highly fossiliferous, most abundant in middle and upper part. Some reddish-brown and purplish streaks towards base and top.	5.48
(9)	Purplish-red mudstone and silty mudstone, with layers of slightly harder siltstone and two 10 cm bands of fine-grained sandstone.	3.04
(8)	Banded purplish-red and drab green mudstone and sandy mudstone with a band of green argillaceous sandstone, 17 cm thick at base.	1.37
([7])	Purplish-red mudstone, with green streaks, and occasional bands of green mudstone and sandy mudstone up to 30 cm thick. Abundant fossils in bed of purple mudstone apparently about 1.8 m above base.	10.05

(6)	Hard, purple and purplish-grey argillaceous and silty limestone, occurring in lumpy, irregular beds with clay partings. The highest 60 cm is most massive and regularly bedded. Drusy cavities, up to 5 cm across, contain small crystals of white and pink celestine. About 60 cm above base is band of purplish-blue clayey mudstone 23 cm thick.	3.66
(5)	Purple and purplish-red mudstone with occasional calcareous nodules; in the lower part a few seams of nodular, lumpy limestone up to 23 cm thick.	2.74
(4)	Purplish-red mudstone, slightly calcareous towards the base, with green limestone and mudstone band, 7 cm thick, at base.	3.95
(3)	Purplish-red mudstone with occasional thin green and purplish-blue bands. Nodular lumps of purple limestone, up to about 10 cm thick, in lower part.	2.42
(2)	Purplish-red mudstone with an occasional calcareous nodule in upper part, and with occasional thin green and purplish-blue bands and streaks.	7.91
(1)	Soft purplish-red mudstone with occasional very thin green partings.	4.50

Fossils (see Curtis and Cave, 1964; Curtis, 1972) are lacking in the lower part of the section, that is the part of the succession that regionally lies between the middle and upper limestones, but the lower mudstones of bed 7 immediately overlying the latter have yielded a rich fauna, including: *Favosites gothlandicus forbesi, Meristina obtusa, Trigonirhynchia stricklandi, Amphistrophia funiculata, Leptaena depressa* and *Cordatomyonia edgelliana.* The siltstones and sandstones of beds 10–18, which form the upper 16 m of the Wenlock here, especially bed 10, have produced a large fauna that includes *Craniops implicatus, Salopina conservatrix, A. funiculata, Coolinia pecten, Coolinia applanata, Protochonetes* cf. *ceratoides, Howellella* cf. *angustiplicata, M. obtusa, Actinopteria* cf. *pleuroptera, Cornellites* sp., *Acaste downingiae, Dalmanites caudatus,* and *Trimerus* sp..

Interpretation

Prior to the studies of Curtis and Cave (1964) and Curtis (1972), there had been much uncertainty as to whether the highest Silurian beds in the inlier, previously exposed near the Buckover Road Cutting in the lane by Horseshoe Farm, were Wenlock or Ludlow in age. Murchison (1839) and Phillips (1848), for instance, considered these beds to be Ludlow, whereas Reed and Reynolds (1908a, 1908b) thought on balance a Wenlock assignment better. The brachiopods from the cutting from beds that are at the same horizon as the beds in the lane (above the upper limestone) confirm a Wenlock age. Specifically, they indicate correlation with the upper part of the Coalbrookdale Formation or possibly with the Much Wenlock Limestone Formation (Curtis, 1972; Bassett, 1974a; Cocks *et al.,* 1992).

The presence of sandstones in the upper part of the Buckover section, some with ripple marks and current bedding, has been taken to indicate a nearshore situation. Also there is a relative abundance of bivalves — generally shallow water indicators — above the upper limestone. Thus in palaeogeographical reconstructions of the Anglo-Welsh area for late Wenlock times, the Tortworth region is positioned just north of the Pretannia landmass, close to the boundary between

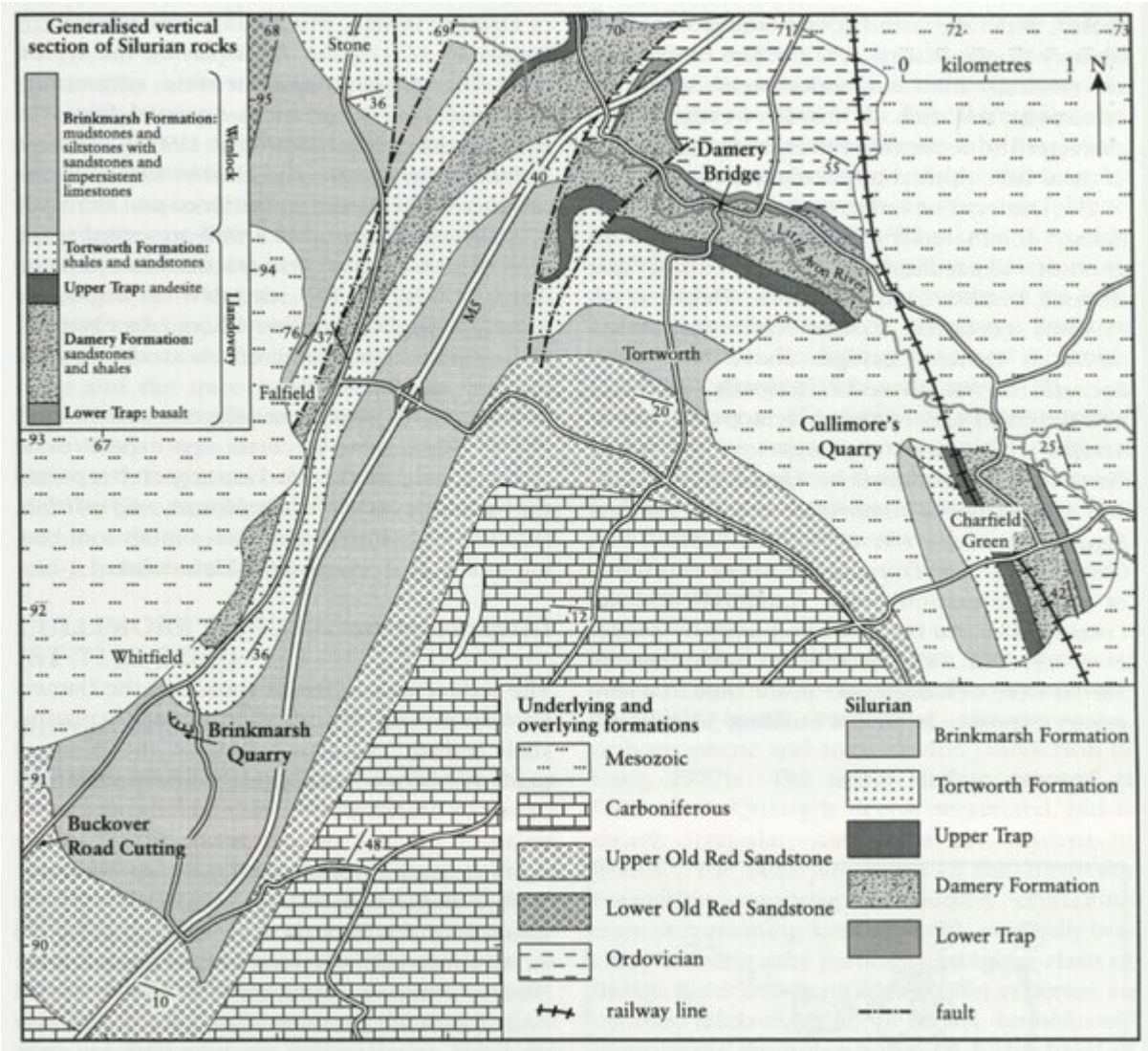
elastic and carbonate belts (Bassett, 1974a; Hurst *et al.,* 1978; Holland, 1992).

Strata exposed in the Buckover Road Cutting link stratigraphically with those in the Brinkmarsh Quarry site nearby, where the lowest beds of the Brinkmarsh Formation of earliest Wenlock age crop out, including the lower limestone. The Rhymney Grit of the Rumney Quarry site in the Cardiff Inlier is broadly coeval with the Buckover section and it, too, suggests the proximity of a landmass to the south, but this grit is considered subtidal, which implies an even more proximal position. Other sites in this volume from the main Tortworth Inlier are those of Damery Bridge and Cullimore's Quarry, both of Llandovery age. Also, on the Severn estuary to the north of the main outcrop is that of Tites Point, a Ludlow Series GCR site.

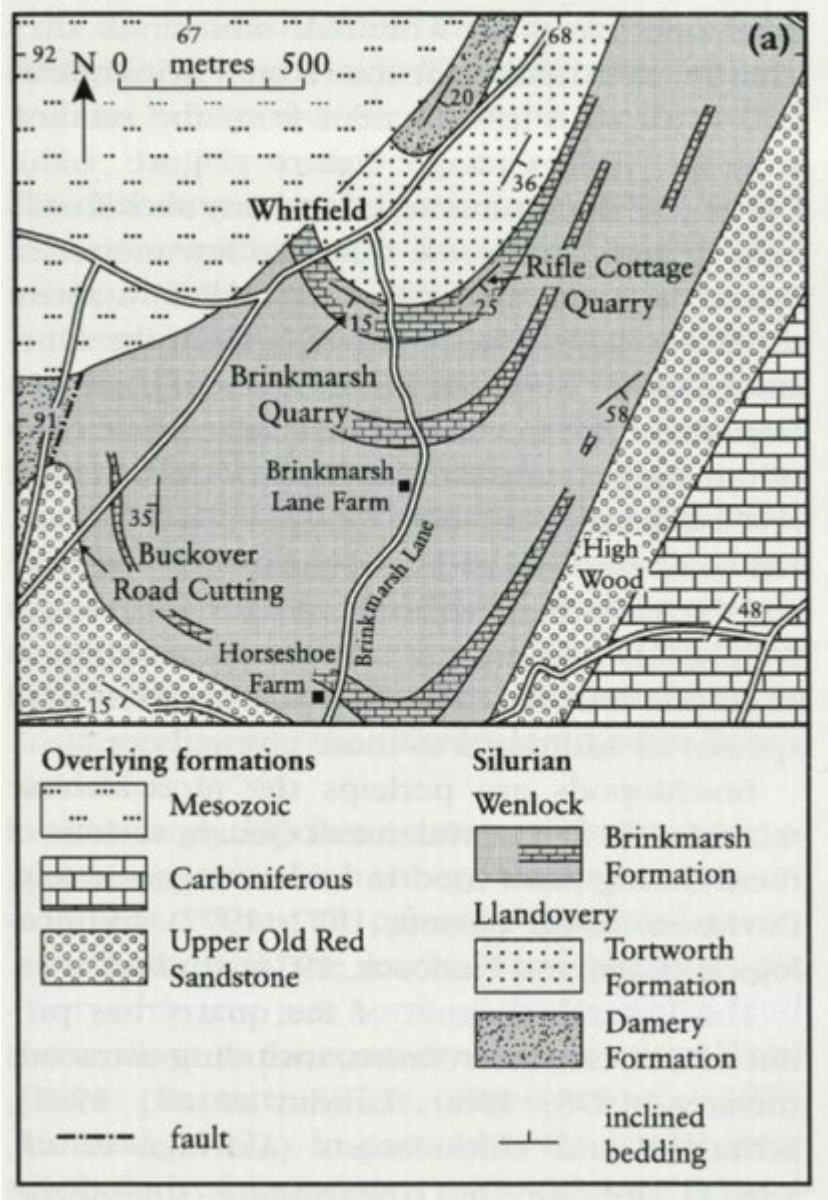
Conclusions

Fossils from this cutting enable a late Wenlock age to be assigned to the upper part of the Silurian succession of the main Tortworth Inlier, there having been longstanding debate as to whether these strata were Wenlock or Ludlow in age. The upper Wenlock strata and fossils of the cutting combine with the lower Wenlock rocks of the Brinkmarsh Quarry site to provide coverage of all the main facies and faunas of Wenlock age in the inlier. Interpretation of the facies and faunas from the cutting enables the Tortworth area to be positioned close to the southern margin of the Welsh Basin in late Wenlock times. The usefulness of this road section is reinforced by the unavailability now of other localities of the same age in the inlier.

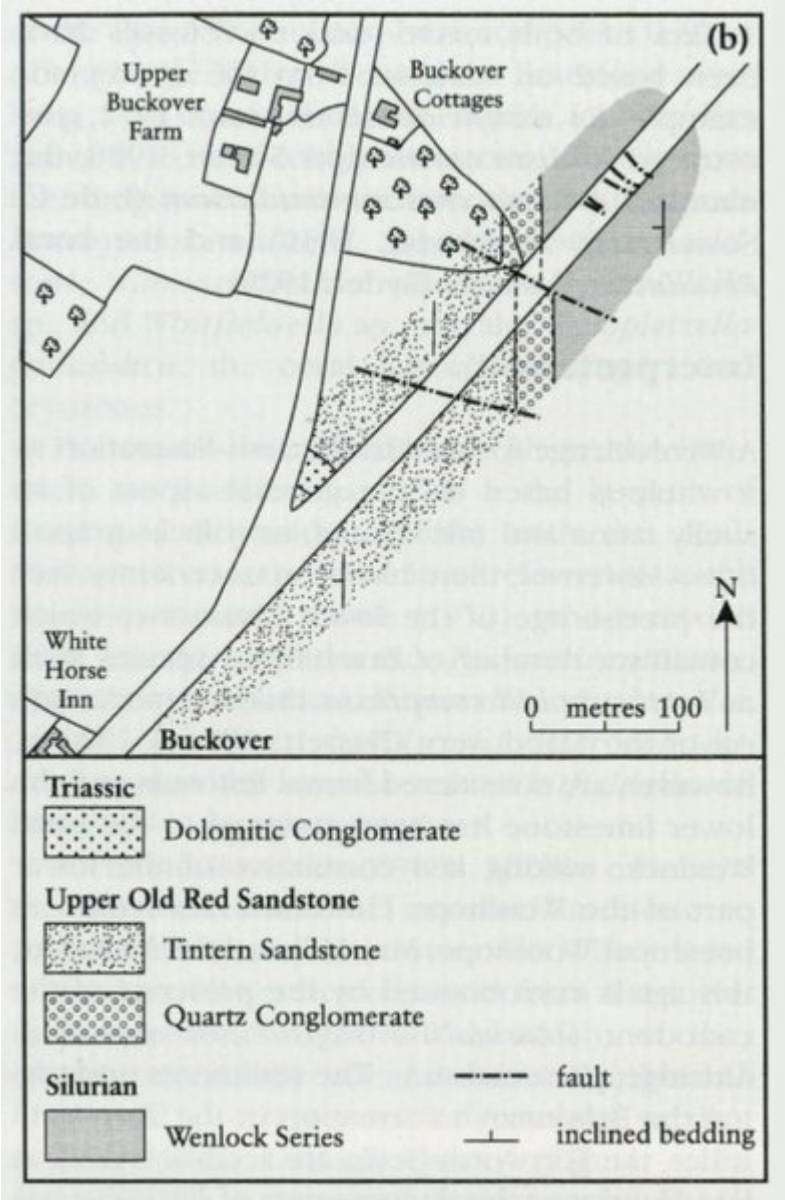
References



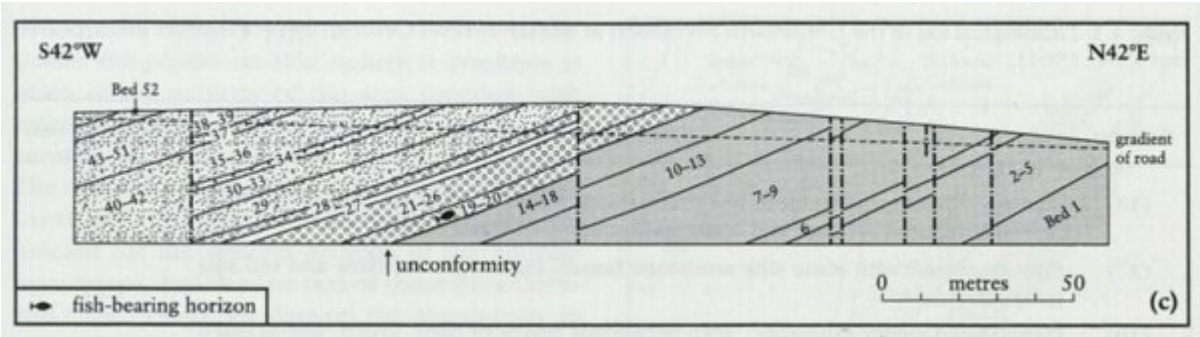
(Figure 3.14) Geological map of the Tortworth Inlier (after Curtis, 1972).



(Figure 4.15) Location of Brinkmarsh Quarry and Buckover Road Cutting, and geology of this southern part of the Tortworth Inlier (after Curtis, 1972).



(Figure 4.16) Buckover Road Cutting, Tortworth Inlier. General geology (after Curtis and Cave, 1964).



(Figure 4.17) Buckover Road Cutting, Tortworth Inlier. Geological section. Beds 1–18 belong to the Brinkmarsh Formation, Wenlock Series; beds 19–52, above the unconformity, belong to the Upper Old Red Sandstone (Devonian). (After Curtis and Cave, 1964.)

Bed no.	Lithology	Thickness (m)
(18)	Hard yellow current-bedded, fine-grained calcareous sandstone, weathering to a brown laminated rottenstone; contains abundant crinoid ossicles.	0.45
(17)	Silty mudstone with some silty sandstone bands; mainly green below and red and green above.	1.21
(16)	Purplish-red shaley mudstone, with occasional bands of hard, green, fine-grained sandstone and a thin layer of green clay at the base.	1.87
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(9)	Purplish-red mudstone and silty mudstone, with layers of slightly harder siltstone and two 10 cm bands of fine-grained sandstone.	3.04
(8)	Banded purplish-red and drab green mudstone and sandy mudstone with a band of green argillaceous sandstone, 17 cm thick at base.	1.37
(7)	Purplish-red mudstone, with green streaks, and occasional bands of green mudstone and sandy mudstone up to 30 cm thick. Abundant fossils in bed of purple mudstone apparently about 1.8 m above base.	10.05
(6)	Hard, purple and purplish-grey argillaceous and silty limestone, occurring in lumpy, irregular beds with clay partings. The highest 60 cm is most massive and regularly bedded. Drusy cavities, up to 5 cm across, contain small crystals of white and pink celestine. About 60 cm above base is band of purplish-blue clayey mudstone 23 cm thick.	3.66
(5)	Purple and purplish-red mudstone with occasional calcareous nodules; in the lower part a few seams of nodular, lumpy limestone up to 23 cm thick.	2.74
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