
Bradnor Hill, Herefordshire

[SO 291 577]

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Introduction

Bradnor Hill is situated about 0.75 km north of Kington, Herefordshire. This area lies on the main strike of Silurian rocks as they trend southwest from the Ludlow Anticline in the central part of the Welsh Borderland towards the Builth and Llandoverly districts in central Wales.

The Silurian geology of the country around Kington was originally mapped on the 1:63 000 scale by the Geological Survey (Ramsey *et al.*, 1850). Subsequently this general area was included in the stratigraphical and facies reviews of upper Silurian strata of Stamp (1923), King (1934), Kirk (1951), Holland and Lawson (1963), and Bassett *et al.* (1982). Upper Silurian rocks from ground topographically and stratigraphically immediately below the Bradnor Hill site were described and logged in detail by Holland and Williams (1985). Most recently, the British Geological Survey compiled a new map of the area on the 1:50 000 scale, incorporating new data based on aerial photograph interpretation, limited field reconnaissance, and published papers (Wilby, 2004). There is no Geological Survey memoir of the area.

This site is of considerable significance for the present arthropod volume because it yielded in the mid-19th century a rich eurypterid fauna of late Silurian, early Pridoli Series age, the study of which involved some of the leading geological figures of the day. Salter (1856, 1859a,b) was pre-eminent in researching this material. R.W. Banks (1856), who lived locally and was a banker by profession but who enthusiastically embraced the fledgling science of geology, was involved in bringing the eurypterid discoveries at Bradnor Hill to light and in studying them. Huxley, also, interpreted some of the specimens, and material from Kington featured in one of Woodward's (1872b) monographs of British 'Crustacea'. Further indication of the importance of the Bradnor Hill finds was the involvement of Murchison. He briefly referred to the geology of the area in his benchmark 1839 work, was in discussion with Banks in considering the nature of the Silurian strata and the eurypterid and other fossils of the Kington area (see Banks, 1893 and, for example, Murchison, 1872), and in 1855 he communicated the contents of Banks' 1856 paper to the Geological Society of London.

In the last century Størmer (1934, 1973) commented on Kington eurypterid species; Kjellesvig-Waering (1950, 1958, 1961, 1986) discussed members of the group from here as part of his wide-ranging studies of eurypterids and fossil scorpionids; one of the species received brief mention by Waterston (1964); and all species from the locality were referred to by Plotnick (1999). Very recently, two species from here have received modern systematic interpretation by Tettie (2006a).

The agnathan and gnathostome fish from Bradnor Hill have merited inclusion of the site in the GCR for its fossil fishes (Dineley and Metcalf, 1999).

Description

The Bradnor Hill site, comprising the old quarry at Bradnor Green, is now on the edge of a golf course. The hill is underlain by Ludlow Series rocks and is capped by Old Red Sandstone type sediments of Pridoli age, some 417 million years old.

In the lane leading from Newton to Bradnor Hill, Banks (1856) described a fossiliferous upper Ludlow horizon, 5–7.5 cm thick, which contained a variety of invertebrates and fish remains and which he regarded as the equivalent of the Ludlow Bone Bed. Above this he recorded layers with the bivalves '*Orthonota amygdalina*' and '*Trochus helicites*', these being succeeded by thin tilestone beds containing a small *Lingula* species and traces of *Pterygotus*. This sequence occurs in the lower part of Newton Lane, one of the sections investigated by Holland and Williams (1985), who recognized it in

modern stratigraphical terms as straddling the Ludlow–Pridoli series boundary. They described from there about 0.35 m of Upper Whitcliffe Formation (Ludlow Series) and 0.6 m of Downton Castle Sandstone Formation (Pridoli Series) strata. In the nearby section on the Kington bypass, they recorded some 0.8 m of Upper Whitcliffe Formation, overlain by 2.22 m of Downton Castle Sandstone Formation, the latter comprising, in ascending order, the Ludlow Bone Bed, the *Platyschisma* Shale and the Sandstone members. Eurypterid fragments were registered by them occurring near the base and the top of the *Platyschisma* Shale Member, this unit also yielding *Turbocheilus helicites*.

There are no descriptions in modern lithostratigraphical terms of the full succession in the old quarry complex on Bradnor Hill, though it must comprise strata of Pridoli age that belong wholly to the Downton Castle Sandstone Formation. A summary of Banks' (1856) description of the section in the quarry is as follows:

A few tilestones below soil level.

Three beds of hard, unfossiliferous, bluish-white stone, in total about 2.75 m thick.

A grey to blackish-grey layer, 7–15 cm thick, with small iron-stained nodules. On the western side of the quarry contains *Pterygotus*, fish and 'vegetable' remains.

A yellowish-white, close-grained sandstone, 1–1.25 m thick. Contains *Pterygotus*, fish and *ikochus* material. Passes on the eastern side of the quarry into a blue and even harder stone with *Lingula cornea* and *Pterygotus* remains. Probably represents the equivalent of the Downton Sandstone (of the Ludlow area).

A grey layer with *Pterygotus* and fish remains, and 'vegetable' matter.

A yellow sandstone, about 1.25 m thick. Represents the main bed at the base of the quarry, and in its lower portion comprising flagstones. Contains *Pterygotus* and fish remains down to its base, where there are also horizons with *Trochus helicites* and *Lingula*.

Ludlow rock. A hard, unmanageable, 'greenstone'.

In the mid-1990s the exposure at Bradnor Hill Quarry was recorded as comprising 1.5 m of flaggy sandstones overlying 5 m of cross-bedded yellow sandstone (Dineley, 1999b), though correlation of these beds with those described by Banks (1856) was considered uncertain. The beds low in the original quarry section that produced the eurypterids are now, according to the most recent report, covered by metres of scree (Tetlie, 2006a).

In addition to the main quarry at Bradnor Hill, Banks (1856) also mentioned other quarries in the Bradnor Hill/Kington area that produced eurypterids. These were those near the iron foundry, reportedly lower down Bradnor Hill (see Dineley, 1999b); at Lodge farm in the adjoining parish of Huntington; at New Barn Farm on the southern side of the River Arrow, Kington; and high on the Radnor Forest, approached by the road from New Radnor to Harley. Most, if not all of these additional exposures are no longer effectively available (see, also, Dineley 1999b).

Kjellesvig-Waering (1961) recorded the following species from 'Bradnor Hill' and 'Kington' (Figure 2.51) (Figure 2.52) and (Figure 2.53): *Erettopterus gigas* Salter, 1859; *Erettopterus spatulatus* Kjellesvig-Waering, 1961; *Eurypterus cephalaspis* Salter, 1855; *Hughmilleria banksii* (Salter, 1856); *Nanahughmilleria pygmaea* (Salter, 1859); *Parahughmilleria salteri* Kjellesvig-Waering, 1961; *Pterygotus ludensis* Salter, 1859; *Salteropterus abbreviatus* (Salter, 1859); and *Slimonia? stylops* (Salter, 1859). Tetlie (2006a) revised *Hughmilleria banksii* and *S. abbreviatus* from here; in the process he referred the former to its own monotypic genus, *Herefordopterus*, which was inferred to lie between the *Hughmilleria* and *Slimonia/Salteropterus* clades, and he regarded the latter as a possible senior synonym of *S.? stylops*, another Kington-based species. In total, Bradnor Hill/Kington represents the type locality for about half of the above species. The fish fauna from Bradnor Hill, which includes heterostracans, thelodonts, osteostracans and acanthodians, has been described by Banks (1856) Huxley and Salter (1856), Symonds (1859), Denison (1964) and Turner (1973).

Interpretation

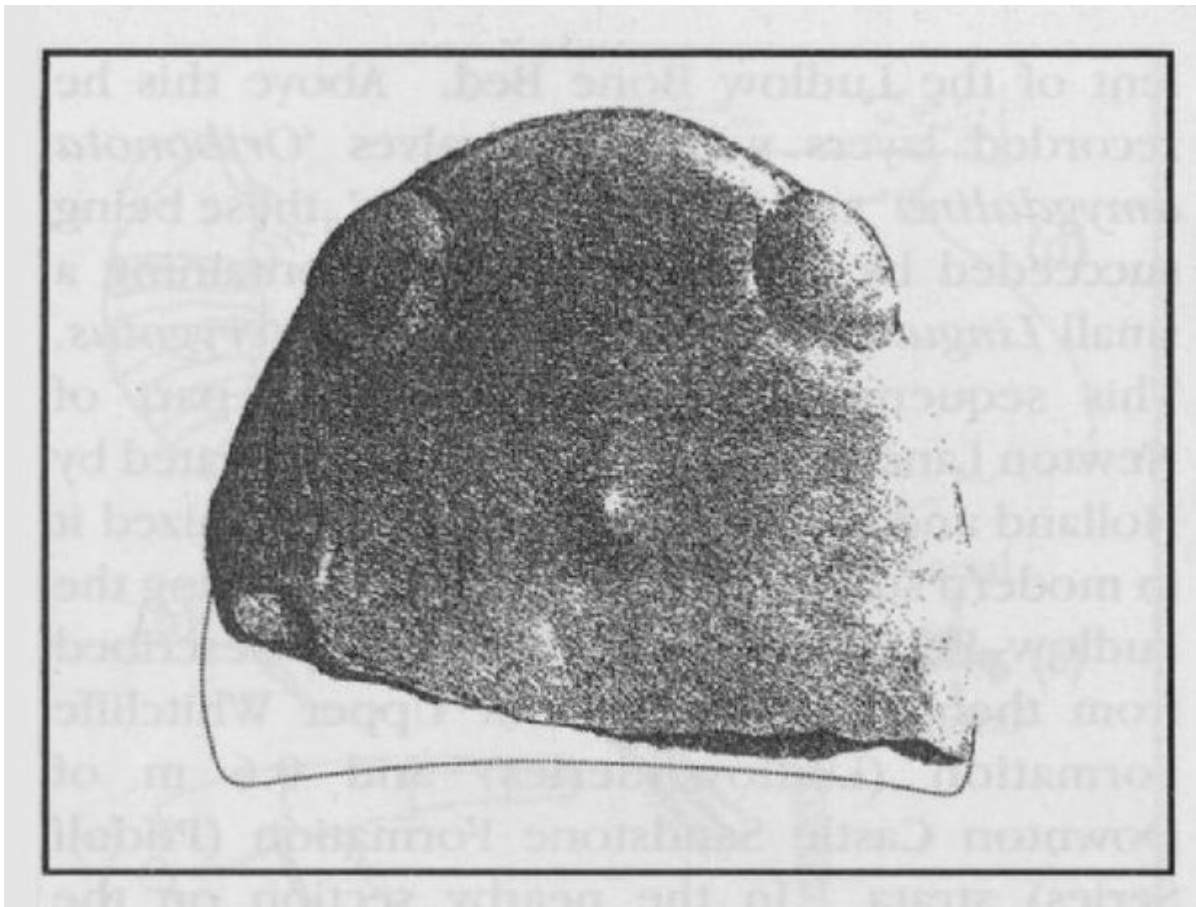
The eurypterid fauna of Bradnor Hill inhabited what by late Silurian times was a largely infilled Anglo-Welsh Basin. This fauna has similarity with those from Ludford Corner and Ludford Lane in the Ludlow Anticline, Tin Mill Race in the Downton Syncline, and Perton Lane in the Woolhope Inlier. All these sites are Pridoli in age and they share several species in common. Bradnor Hill also links with the eurypterid localities of Church Hill in the Leintwardine area and the Whitcliffe site at Ludlow. However the latter two are Ludlow Series sites and in terms of their eurypterid faunas both are

distinct from that of Bradnor Hill and all the other Welsh Borderland sites, and also from each other. The lack of stylonuroid eurypterids immediately distinguishes Bradnor Hill from the Scottish Siluro-Devonian eurypterid sites of Gutterford Burn, Dunside, Slot Burn and Turin Hill.

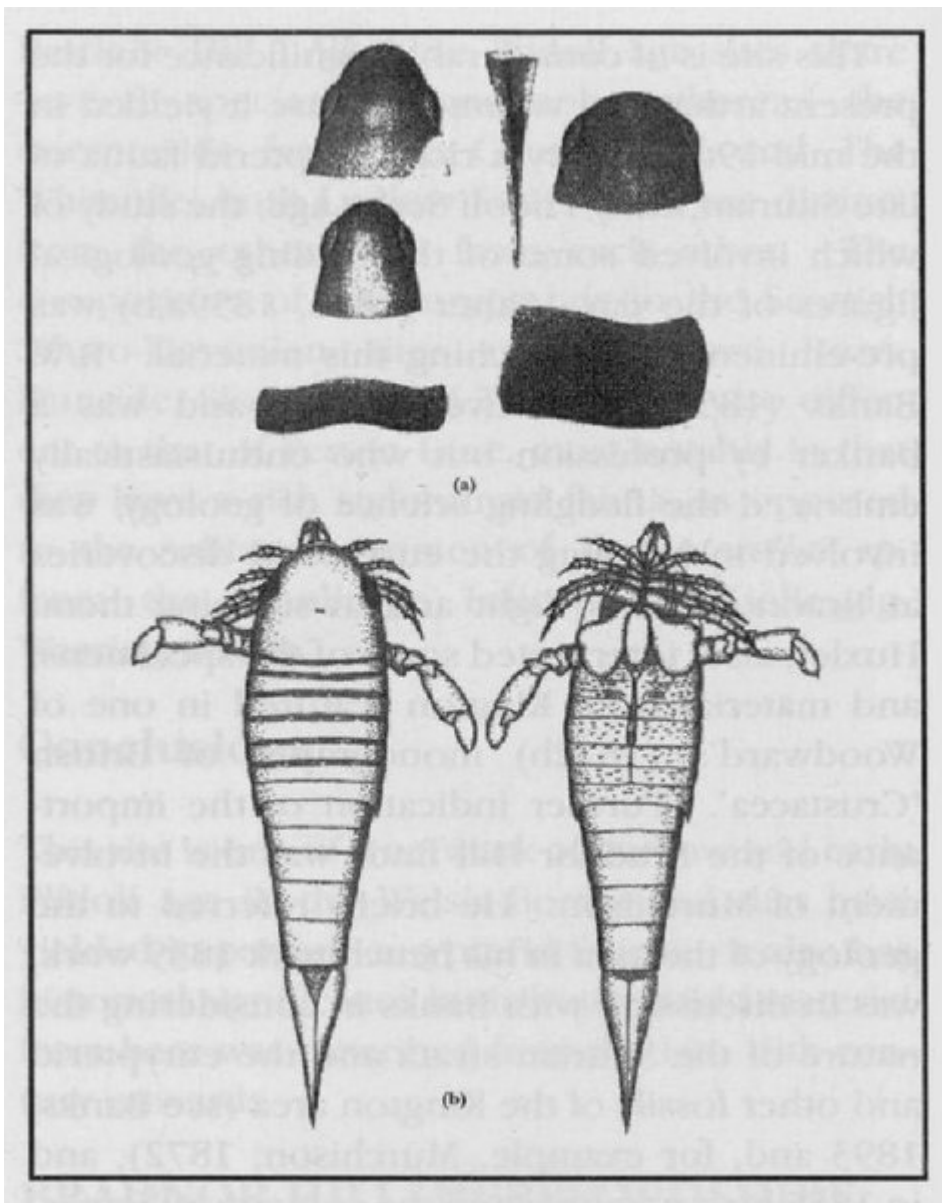
Conclusion

Bradnor Hill forms one of a group of upper Silurian, Ludlow and Hildale series, Welsh Borderland sites that are important for their eurypterid faunas. It stands as the type locality for many of the eurypterid species that occur there. It is also of historical importance as it represents one of the most significant Anglo-Welsh localities in mid- to late 19th century studies of this arthropod group, and attracted the attention of leading palaeontological/geological commentators of the day.

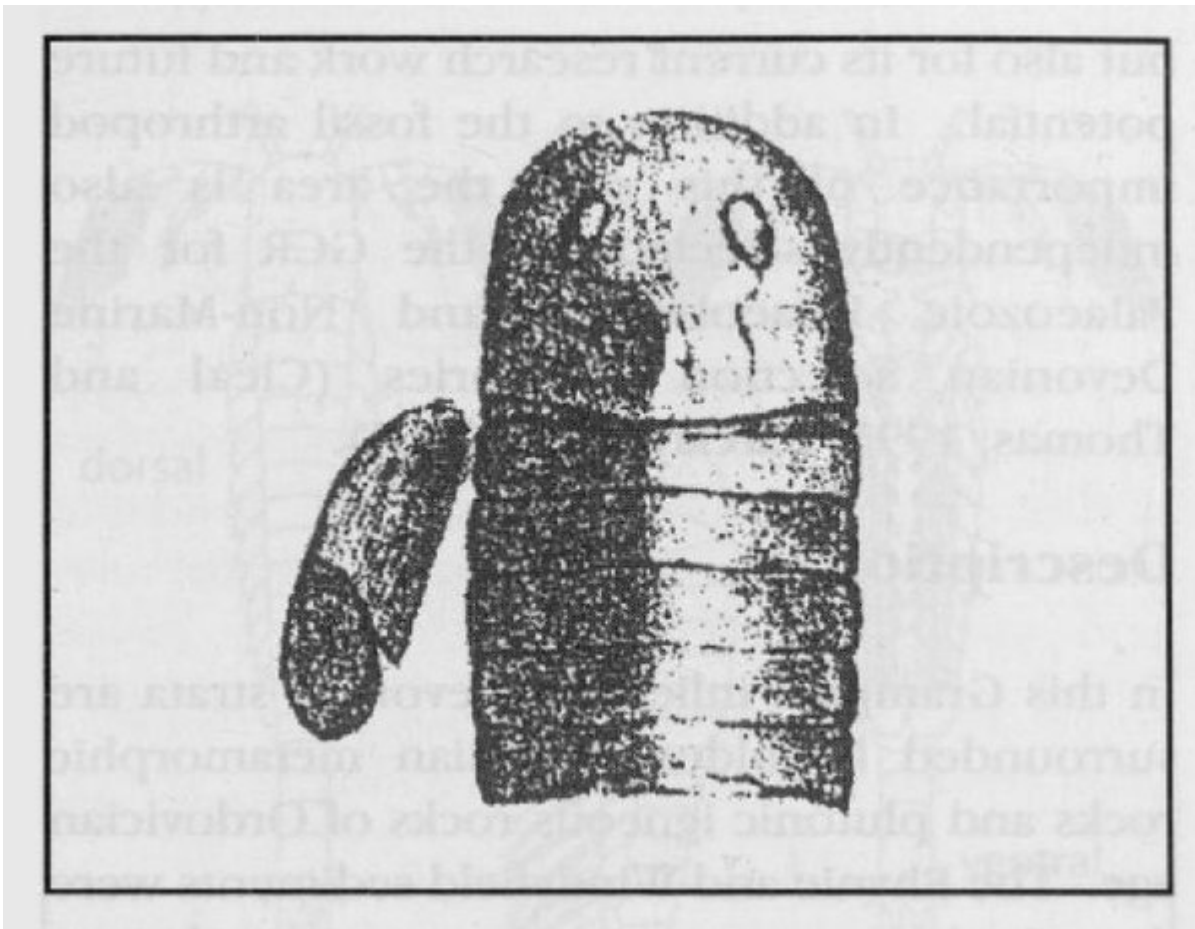
[References](#)



(Figure 2.51) *Erettopterus gigas* Salter, 1859; lectotype, carapace, collection of Richard Banks; Downton Sandstone Formation, Piddoli Series, Kington, Herefordshire. (From Salter (1859a, plate 8, fig. 1.)



(Figure 2.52) *Herefordopterus banksii* (Salter, 1856); Downton Sandstone Formation, Piddol Series, Kington, Herefordshire. (a) Carapace, body segments and telson, collection of Richard Banks, from Banks (1856, plate 2, figs 5 and 6). (b) Idealized reconstructions, dorsal (left) and ventral views, from Tetlie (2006a, fig. 7).



(Figure 2.53) *Nanahughmilleria pygmaea* (Salter, 1859); lectotype, British Geological Survey, GSM89483, carapace, partial body and left swimming leg, collection of Richard Banks; Downton Sandstone Formation, Piddoli Series, Kington, Herefordshire. (From Salter, 1859b, plate 10, fig. 4.)