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# Tin Mill Race, Shropshire

[SO 460 754]

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## Introduction

Tin Mill Race is situated on the River Teme some 5.5 km west of Ludlow, and 10 km ENE of Leintwardine in the central Welsh Borderland. The locality lies within the Downton Syncline, just 0.5 km to the NNE of the synclinal axis, and thus comprises some of the youngest Silurian strata in the Ludlow–Leintwardine area, which are about 417 million years old.

The general geology of this area has been described in many publications from the time of Murchison (1839), most recently those of Bassett *et al.* (1982) and White and Lawson (1989), both of which covered the stratigraphy, facies and fauna of the Pridoli Series of the region. Historically, rocks of this age in the Anglo-Welsh area were referred to the Downton Series, the name being derived from the Downton area of the River Teme, of which the Tin Mill Race site forms a part. An early reference to the beds exposed at this site is that of Lightbody (1873). Elles and Slater (1906) included the locality and several others nearby in their account of the highest Silurian rocks of the Ludlow district, and they gave a detailed log of the section at Tin Mill race which has provided the basis for subsequent studies. Whitaker (1962), for example, commented on fossils from Tin Mill Race in his record of the geology of the Leintwardine area. The most detailed and recent geological map to include the locality is the Institute of Geological Sciences (1973) Special Sheet for the Leintwardine–Ludlow area which was also, in part, based on the work of Whitaker.

The arthropods recorded from Tin Mill Race comprise entirely eurypterids. They were referred to first in the 19th century publication of Marston (1870). Subsequently they were listed by Elles and Slater (1906); included in the study of Welsh Borderland and other eurypterids by Kjellesvig-Waering (1958, 1961); referred to by Manning (1993) in his palaeoecological study; and mentioned by Tetlie (2006a) in his revision of certain species. The locality forms part of a tightly knit group of upper Silurian eurypterid-bearing sites in the borderland region.

The Tin Mill Race site has also been independently selected for the GCR for its fossil fishes (Dineley and Metcalf, 1999). In addition to the fossil arthropod importance of this site, the area is also independently selected for the GCR for the Silurian–Devonian Chordata and Ludlow selection categories.

## Description

The sediments exposed at Tin Mill Race belong to the Temeside Shales Formation of the Pridoli Series, the type section for which is on the Teme at Ludlow, though an additional reference section is that at the old quarry in Tin Mill Wood near Tin Mill Race (White and Lawson, 1989). The strata at the mill race site were originally named the 'Tin Mill Shales' by Lightbody (1863). Elles and Slater (1906) later referred to these beds as the 'Temeside Shales' or 'Eurypterus Shales', and in current usage they are the Temeside Shales Formation.

For the most part the mill race section (Figure 2.46) comprises some 8.5 m of shales and marls, intercalated with a few sandy/gritty horizons. In the lower half of the section the shales are rubbly, and a local bone bed occurs some 1.5 m above a thin red shale horizon. In their upper part the shales are olive coloured, and here the Temeside Bone Bed occurs, this purportedly being a correlative of the one of the same name at Ludlow. The olive shales are capped by a grey micaceous grit — the so-called 'Fragment Bed' — which is crowded with carbonaceous remains and forms the top of the Temeside Shales Formation. Above the Fragment Bed there are about two metres of massive purple-red sandstones that form the lowest part of the Ledbury Formation (Pridoli Series).

Eurypterids were recorded from the Temeside Bone Bed of Tin Mill Race by Marston (1870), and from the same horizon and from throughout the upper part of olive shales at the site by Elles and Slater (1906). Kjellesvig-Waering (1961)

recorded the following species from here: *Eurypterus cephalaspis* Salter, 1855; *Erettopterus gigas* (Salter, 1859); *Erettopterus spatulatus* Kjellesvig-Waering, 1961 (Figure 2.47); *Hughmilleria banksii* (Salter, 1856) and *Parahughmilleria salteri* Kjellesvig-Waering, 1961. Many of Kjellesvig-Waering's records were based on specimens collected in the late 1950s by Robert H. Denison, whose material was deposited in the Chicago Natural History Museum. Also, the species Kjellesvig-Waering referred to as *Hughmilleria banksii* has subsequently been placed in *Herefordopterus*, following the revision of Tetlie (2006a).

## Interpretation

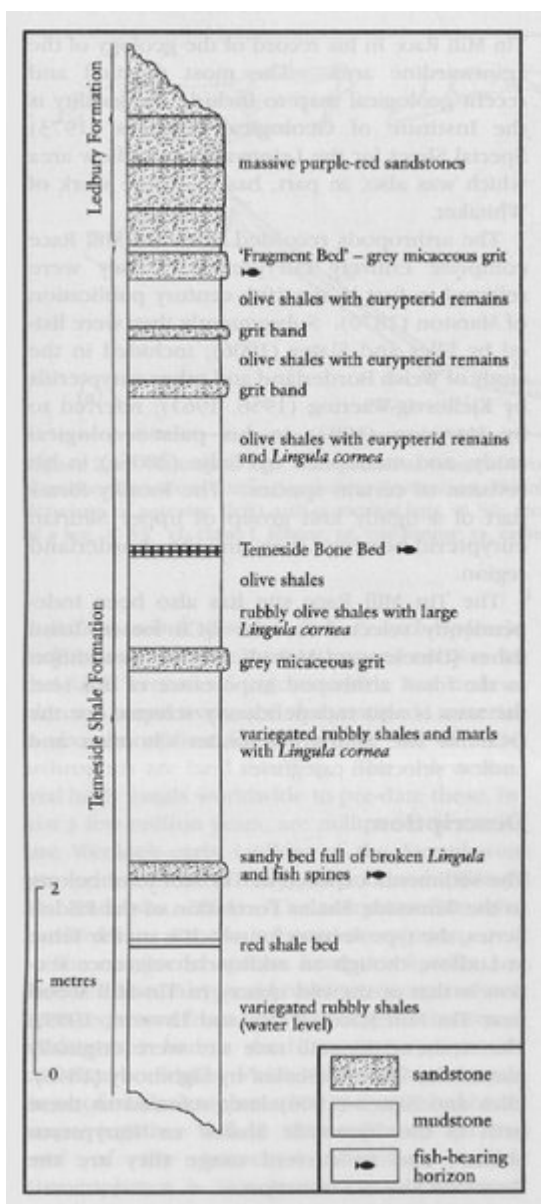
By Pridoli times the Anglo-Welsh Basin, which had existed as a marine basin since Cambrian times, had essentially filled up, and quasi-marine environments prevailed. The sediments of the Temeside Shales Formation are considered to have accumulated largely in intertidal mud flats subject to prolonged exposure, and with sand shoals marginal to large rivers (Allen and Tarlo, 1963; Allen, 1974, 1985; Antia, 1981, 1983; Bassett *et al.*, 1982; White and Lawson, 1989).

The eurypterid fauna from Tin Mill Race is most closely associated with those from the Ludford Lane and Ludford Corner site in the Ludlow Anticline, Bradnor Hill some 30 km to the south-west near Kington in the south central Welsh Borderland, and Perton Lane in the Woolhope Inlier. All these Pridoli age sites have yielded several species in common. Tin Mill Race is also closely linked to the nearby arthropod sites of Church Hill in the Leintwardine area, and the Whitcliffe site in Ludlow. Eurypterids also occur in these other two sites, but the species composition in all three sites is mutually exclusive and, unlike at Tin Mill Race, other arthropods are also known from them. All of the Scottish Siluro-Devonian sites in this volume that include eurypterid faunas, namely Gutterford Burn, Dunside, Slot Burn and Turin Hill, differ immediately from Tin Mill Race in having yielded stylonuroid species. The stylonuroid *Marsupipterus sculpturatus* Caster and Kjellesvig-Waering, 1955 is, however, known from the Pridoli (Downton Castle Sandstone) of nearby Forge Bridge, Downton (Kjellesvig-Waering, 1961).

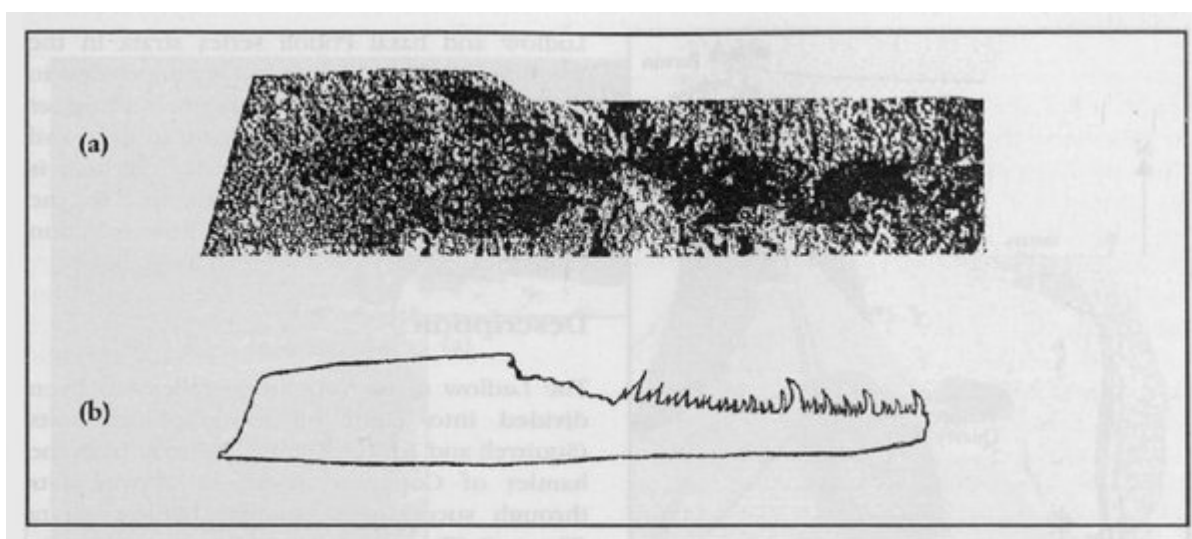
## Conclusion

Tin Mill Race, a locality of Pridoli age, forms part of a network of Welsh Borderland upper Silurian arthropod sites that have produced significant eurypterid faunas. Many of the specimens from this site were collected in the 1950s, that is, relatively recently by comparison with the recovery of material from other, classic 19th century Welsh Borderland eurypterid sites.

## [References](#)



(Figure 2.46) The section at Tin Mill Race, Downton area, Shropshire, comprising the Temeside Shales Formation and the Ledbury Formation, Downton Group, P<sup>h</sup>idol<sup>i</sup> Series. (After Dineley, 1999b and Elles and Slater, 1906.)



(Figure 2.47) *Erettopterus spatulatus* Kjellesvig-Waering, 1961; Chicago Natural History Museum, PE 1524, fixed ramus of chela, collected by Robert H. Denison, 1950s; Temeside Shales Formation, Downton Group, P<sup>h</sup>idol<sup>i</sup> Series, Tin Mill Race, Downton area, Shropshire. (a) Photograph, x 3. (b) Interpretive drawing. (From Kjellesvig-Waering, 1961, plate 94, fig. 7 and text-fig. 3.34.)