
Wear River Bank

Highlights

Wear River Bank is one of the most important Upper Carboniferous palaeontological sites in Northern England, yielding insects, non-marine bivalves, xiphosurids, ostracods, fish and plants.

Introduction

This section on the north bank of the River Wear [NZ 362 579], 3 km west of Sunderland, Tyne and Wear, which is sometimes known alternatively as Claxheugh, is one of the very few exposures of upper Westphalian strata in the Northumberland and Durham Coalfield. The most recent description of the geology of the site is by Trechmann and Woolacott (1919). In addition, aspects of the palaeontology of the site have been covered by Kirkby (1864, 1867), Stobbs (1905b), Woodward (1918), Bolton (1921–1922) and Armstrong and Price (1954).

Description

Lithostratigraphy

The main part of this exposure shows 5.2 m of Carboniferous strata. Most of the section consists of shaley sandstone, light yellow-brown in the lower part, more grey towards the top. About 2 m above the base, however, is about 1 m of shales and siltstones with ironstone nodules, which is the fossiliferous band.

To the west, this main part of the section is limited by two faults, on the downthrow side of which are about 9 m of shaley sandstone. These are thought to be the same as the upper sandstone in the main part of the face. About 20 m further west again, another fault has brought down yellow sandstone, thought to be Permian.

Biostratigraphy

Non-marine bivalves

Stobbs (1905b) and Trechmann and Woolacott (1919) record abundant shells of *Anthraconauta phillipsi* (Williamson). However, Calver in Armstrong and Price (1954) argued that these shells were only homeomorphs of *A. phillipsi*, and in fact belong to *Naiadites* (this view was supported by Trueman and Weir, 1960). Associated with them were *Naiadites* aff. *daviesi* Dix and Trueman and *N. aff. elongata* Hind non Dawson (syn. *N. hindi* Trueman and Weir). Such an assemblage is typical of the upper part of the 'Upper similis–pulchra' Zone, indicating the lower Bolsovian.

Estheriids

Kirkby (1864) established the species, *Ancyclus vinti*, based on some small shells from here. He was unable to establish their affinities, but Hind (1899) regarded them as non-marine bivalves, and transferred them to *Carbonicola vinti* (Kirkby) Hind. Bolton (1915) subsequently argued that they were the young fry of *Anthraconauta phillipsi*, a view supported by Trechmann and Woolacott (1919). Most recently, however, Calver in Armstrong and Price (1954) has interpreted them as estheriid shells of the genus *Euestheria*.

Insects

Insect wings were first recorded from here by Kirkby (1867). The best preserved specimen was identified by Trechmann and Woolacott (1919) as *Eoblattina mantidioides* Goldenberg (they attribute this identification to Kirkby, although he does not use that name in his 1867 paper). Bolton (1922) re-described the fossil and showed that Kirkby's illustration was inaccurate. Nevertheless, he confirmed the identification, although he transferred the species to the blattoid genus

Phylomyiacris.

A second specimen was identified by Trechmann and Woolacott (1919) as *Lithomyiacris kirkbyi* Woodward. Bolton (1921) lists this specimen in the introduction of his monograph, but does not describe it in the systematic section.

Plant macrofossils

Kidston *in* Trechmann and Woolacott (1919) listed the following species from here. *Paripteris gigantea* (Sternberg) Gothan (in fact, probably *P. pseudogigantea* (Potonié) Gothan), *Calamites suckowii* Brongniart, *Lepidodendron simile* Kidston, *Lepidophyllum triangulare* Kidston and *Sigillaria discophora* (König) Kidston. The assemblage is not biostratigraphically diagnostic.

Other groups

Fish fragments are abundant in the ironstones. Calver *in* Armstrong and Price (1954) list a *Diplodus* tooth, together with several types of scale (*Elonichthys*, *Rhabdoderma*, *Rhadinichthys*, *Rhizodopsis*, indet. palaeoniscid).

Woodward (1918) described a well-preserved limulid from here as *Belinurus trechmanni*. Other arthropods include ostracods (*Geisina*).

Interpretation

This is one of the classic palaeontological sites in the Upper Carboniferous of Northern England. Its full potential has still to be developed, but already a wide variety of animal and plant fossils have been found here. Of particular interest is the presence of insect fossils, which are generally very rare, particularly in surface exposures. Durden (1984) referred the assemblage to his Portbarnettian 'Provincial Insect Age'. The best known assemblages of this 'age' are from the Dunkard Basin of west Pennsylvania, USA (Handlirsch, 1906), while there are also well documented examples from France and Germany (Pruvost, 1919; Guthorl, 1934). In Britain, the only other localities mentioned by Durden as yielding insects of this 'age' are the roof-shales of the Swansea Two Feet and Graigola coals of South Wales, which in fact are stratigraphically much higher than this Durham site (upper Westphalian D — Cleal, 1978).

Also significant is Calver's work (*in* Armstrong and Price, 1954) on the bivalves from here. *Anthraconauta phillipsi* is one of the key species for recognizing the upper Bolsovian in northern Europe, and he demonstrated that certain naiaditids in the lower Bolsovian could develop homeomorphs of this species.

Conclusions

Wear River Bank is one of the most important sites in Britain for fossils of Late Carboniferous age (these are just about 311 million years old). So far, there have been found here the remains of insects, non-marine bivalves, xiphosurids, ostracods, fish and plants.

[References](#)