

A WESTPHALIAN EURYPTERID FROM SOUTH WALES

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ABSTRACT. The first known eurypterid from the Coal Measures of Wales is a well-preserved prosoma described here as *Adelophthalmus* cf. *moyseyi* (Woodward, 1907). It is of upper Westphalian A or lower Westphalian B age, and is compared with other approximately contemporaneous species.

EURYPTERIDS are rare in the Coal Measures (late Carboniferous) of Britain, with only some twenty undoubted specimens known, reported in the literature from the Somerset, Derbyshire–Nottinghamshire, and Lanarkshire coalfields, and all are of Westphalian age. (Three specimens (BM 16539–16541) from the Old Hards Coal (Westphalian A) of Hartley Bank Colliery, Horbury, Yorkshire, first mentioned by Stainier (1915, p. 614) and then by Kjellesvig-Waering (1948, p. 9) were subsequently re-examined by Dr. Kjellesvig-Waering in 1949, and his notes which now accompany the specimens identify them not as eurypterids but as the centipede-like arthropod *Arthropleura*.)

A number of specific names have been proposed for these British eurypterids. In a comprehensive review Kjellesvig-Waering (1948) recognized three English species, which he described as *Lepidoderma wilsoni* (Woodward, 1888), *L. moyseyi* (Woodward, 1907) (with *Eurypteris derbiensis* Woodward, 1907 as a junior synonym), and *L. kidstoni* (Peach, 1888), while Waterston (1957) later redescribed the single Scottish specimen as *Eurypterus minutisculptus* (Peach, 1905). Earlier reviews of some of the material were published by Stainier (1915), Moore (1936), and Van Oyen (1956), and in 1958 Kjellesvig-Waering emended the nomenclature to include all the English species in the genus *Adelophthalmus* Jordan and von Meyer, 1854 and the Scottish specimen questionably in *Campylocephalus* d'Eichwald, 1860. Waterston (1968) subsequently erected *Vernonopterus* to accommodate the latter.

The first eurypterid from the Coal Measures of Wales, a well-preserved though slightly crushed prosoma, was presented to the National Museum of Wales in July 1974 by Mr. David Old of Ynysawdre Comprehensive School, near Bridgend in Mid Glamorgan; it was found by his father in loose material at the head of Garw Colliery, Blaengarw. The horizon from which the specimen came is not known with certainty, but there is no doubt that it was from the colliery itself. The sequence in the colliery includes Lower and Middle Coal Measures, with workable coals ranging from the Gellideg Seam upward through the Amman Marine Band to the Two-Foot Nine Seam. Over the last few years or so work has concentrated on the Gellideg and Upper Nine-Foot seams, but there have also been workings on intervening coals. The horizon of the specimen can therefore be tied down only within these limits, indicating an upper Westphalian A or lower Westphalian B age, within the uppermost

communis, *modiolaris* or lower *similis-pulchra* non-marine bivalve zones (see Woodland and Evans (1964) and Thomas (1974) for summaries of stratigraphy).

Because of its rarity and good preservation the specimen is described here, and its relationship to other species is discussed. Other comparative British material is figured on Plate 29.

Family HUGHMILLERIIDAE Kjellesvig-Waering, 1951
Genus ADELOPHTHALMUS Jordan and von Meyer, 1854

Type species. *Adelophthalmus granosus* Jordan and von Meyer, 1854.

Remarks. Three generic names have been used in the past for a group of similar late Carboniferous eurypterids—*Adelophthalmus*, *Lepidoderma* Reuss, 1855, and *Anthraconectes* Meek and Worthen, 1868 and their possible synonymy has been discussed by a number of authors (e.g. see Wills 1964, pp. 474–475, Størmer 1973, p. 148 for summaries).

There is general agreement among most authors that *Lepidoderma* is a junior synonym of *Adelophthalmus*, and Kjellesvig-Waering (1958, pp. 1140–1143) and Størmer also included *Anthraconectes* in probably synonymy. However, Wills (1964, pp. 474–475) preferred to retain *Adelophthalmus* and *Anthraconectes* as separate genera until more became known of the ventral organs of the former. Here we agree with Kjellesvig-Waering and Størmer, and believe that the senior name *Adelophthalmus* should be used until such time as the ventral organs can be shown to differ from those in *Anthraconectes*.

Adelophthalmus cf. *moyseyi* (Woodward, 1907)

Plate 29, fig. 1

Material. One prosoma, NMW 74.20G.1, from Coal Measures, Westphalian A or B, loose material beside stop-lock at head of railway, Cwm Nant-hir, 180 m ENE. of Garw (Ocean) Colliery, Blaengarw, Mid Glamorgan (SS 9317 9073).

EXPLANATION OF PLATE 29

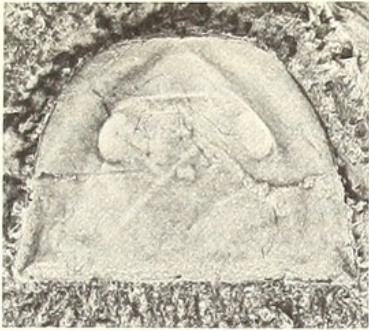
Fig. 1. *Adelophthalmus* cf. *moyseyi* (Woodward, 1907). Prosoma, NMW 74.20G.1, Coal Measures, Westphalian A or B, stop-lock at head of railway 180 m ENE. of Garw (Ocean) Colliery, Blaengarw, Mid Glamorgan (SS 9317 9073), $\times 2$.

Figs. 2, 5. *Adelophthalmus wilsoni* (Woodward, 1888). 2, mesosomal and metasomal segments, CMB Ca7193, Coal Measures, Westphalian D, Camerton Colliery, near Radstock, Avon (orig. Moore 1936, p. 354, fig. 58), $\times 1$. 5, holotype mesosoma, BM Il463, Coal Measures, Westphalian D, Ludlow's Colliery, Radstock, Avon (orig. Woodward 1888, p. 420, text-fig.), $\times 1$.

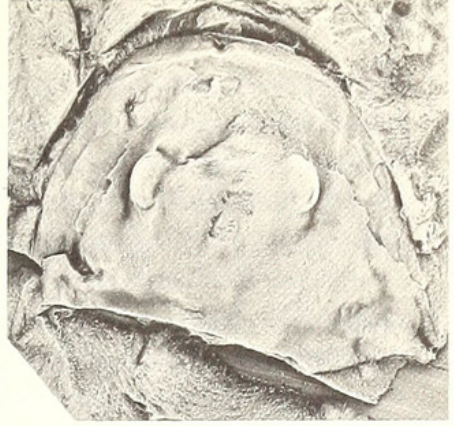
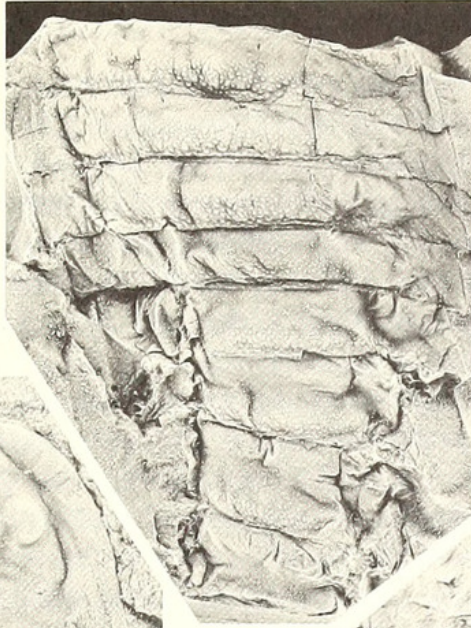
Fig. 3. *Adelophthalmus kidstoni* (Peach, 1888). Holotype prosoma, GSM 49452, Coal Measures, Westphalian D, Radstock, Avon (orig. Peach 1888, pl. 20, fig. 1), $\times 2$.

Fig. 6. *Adelophthalmus* cf. *wilsoni* (Woodward, 1888). Almost complete dorsal surface, BM In35610, Coal Measures, Westphalian C, Bromley Colliery, near Pensford, Avon (orig. Moore 1936, p. 357, fig. 59), $\times 1.25$.

Figs. 4, 7. *Adelophthalmus moyseyi* (Woodward, 1907). 4, latex cast of dorsal surface of prosoma, mesosoma, and part of metasoma, GSM 30250, Coal Measures, Westphalian B, Shipley Clay Pit, near Ilkeston, Derbyshire (orig. Moore 1936, p. 367, fig. 63), $\times 1.5$. 7, latex cast of incomplete dorsal surface of small specimen, GSM 30197, horizon and locality as fig. 4 (holotype of *Eurypterus derbiensis* Woodward, 1907, pl. 13, fig. 3), $\times 2$.



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Description. Prosoma of low relief, roughly trapezoidal, about three-quarters as long as wide. Anterior margin more or less transverse, gently curved forwards, anterolateral margins strongly but smoothly curved. Lateral margins weakly curved outwards to within about 5 mm of the genal angle, thereafter nearly straight. Posterior border straight, genal angles acutely rounded, about 80° , not produced as spines.

Along the anterior margin is a narrow, weakly concave flange, about 0.4 mm wide sagittally, narrowing to zero in front of lateral eyes. Sagittally, a small triangular notch just indents posterior margin of flange.

A pair of median ocelli, apparently almost conjoined, is situated centrally on the prosoma, slightly closer to posterior than to anterior margin. Lateral compound eyes reniform, about one-fifth the length of prosoma, with posterior ends at about the mid-length and anterior ends nearly equidistant from anterior and lateral margins.

A depressed zone runs from the middle of the anterior margin backwards and outwards outside the eyes to the genal angles, being widest just behind the eyes and narrowing almost to a point at either end. This zone defines a triangular elevated area between the genal angles, eyes, and the centre of the anterior margin. The anterolateral areas of the prosoma are also slightly elevated.

Prosoma apparently smooth, with the exception of a zone about 1 mm wide along the posterior margin, which has a scaly sculpture, with the convex edges of the scales directed backwards.

Dimensions. Sagittal length, 13.5 mm. Width across posterior margin, 18.5 mm.

Comparison. Of British species, our prosoma compares closely with both *Adelophthalmus kidstoni* and *A. moyseyi*. *A. wilsoni* is known only from mesosomal and metasomal segments, but occurs at about the same horizon as *A. kidstoni* in the Somerset coalfield. Moore (1936, p. 355) provisionally referred the holotype of *A. kidstoni* to *A. wilsoni*, and (ibid., p. 356) described a fairly complete specimen from a somewhat lower horizon in the same area as *Eurypterus* (= *Adelophthalmus*) cf. *wilsoni*. The prosomal differences between *A. kidstoni* and Moore's *A. cf. wilsoni* are small, although the anterior ends of the lateral eyes are somewhat further from the anterior than the lateral margin in the former, while they are equidistant in the latter. Kjellesvig-Waering (1958, p. 1143) placed *A. cf. wilsoni* in *A. wilsoni*. *A. moyseyi* is known only from partially complete material. The prosoma is similar to those of both *A. kidstoni* and *A. cf. wilsoni*, the eye position being closer to that of the latter. Most of the prosoma of the latter two is covered with a sculpture of small scales. The sculpture is similar in *A. moyseyi*, but is more localized, being best developed close to the posterior margin and on the posterior half of the prosoma. A further prosoma, from the Namurian Limestone Coal Group of Scotland, was described by Waterston (1968, p. 2, pl. 3, figs. 4, 5) as *A. cf. wilsoni*, and is the oldest British representative of the genus.

Eurypterids from Westphalian A and B of Limburg, southern Netherlands, have been figured as *A. imhofi* (Reuss, 1855) by Van Oyen (1956) who placed many different upper Carboniferous forms in synonymy with this species. This assignment was challenged by Kjellesvig-Waering (1963, pp. 98–100), who considered the Dutch material to belong to *A. cambieri* (Pruvost, 1930). *A. cambieri* itself, from the Westphalian B of Belgium (Pruvost 1930, pl. 13, fig. 1, 1a, text-fig. 7) is based on a poorly

preserved specimen in which details of the prosomal sculpture are not known, but the Dutch material assigned by Kjellesvig-Waering (1963) to this species has scales covering most of the prosoma; the lateral eyes are similar in position to those of *A. moyseyi*, but are proportionately smaller. We have examined collections in the Sedgwick Museum and British Museum (Natural History) from the Limburg coal-field which confirm these relationships between *moyseyi* and *cambieri*.

Of North American species, *A. mazonensis* (Meek and Worthen, 1868) is similar to all the above, and the lateral eyes are similar in size and position to those of *A. moyseyi*. As in *moyseyi* the surface sculpture of the prosoma is rather localized, occurring at the posterior end and in the central region between the eyes. There is also general resemblance to *A. kidstoni* and Kjellesvig-Waering (1948, p. 29) noted that *wilsoni* (*sensu* Moore, 1936 = *kidstoni* herein) and *mazonensis* might be sub-species.

Our specimen compares with *A. moyseyi*, *A. cf. wilsoni* (of Moore), *A. cambieri* (*sensu* Kjellesvig-Waering 1963), and *A. mazonensis* in eye position, and with all except *A. cambieri* in eye size. It is particularly distinctive in its very restricted surface sculpture; this seems primary rather than preservational, as the specimen shows no sign of having been worn or weathered. None of the species mentioned above has similarly restricted sculpture, although it is more restricted in *A. moyseyi* and *A. mazonensis* than in the others. As there are so few British specimens known, there is no information on variation within species, or whether such features as surface sculpture vary much between individuals, or from population to population. Van Oyen (1956) illustrated a large number of specimens of *A. 'imhofi'* from the Netherlands, and examination of his plates suggests that the amount of prosomal sculpture remains fairly constant. Should this apply to other taxa, then it is likely that our specimen belongs to a new species, but as yet there is insufficient material to describe it as such. At present, we consider that it most closely resembles *A. moyseyi* in its prosomal outline and general morphology. It is from a similar horizon to the type material of *A. moyseyi*.

Acknowledgements. We thank Mr. David Old for presenting the specimen on which this paper is based, and Mr. F. L. Evans (Ynysawdre Comprehensive School) and Mr. A. J. Thomas (National Museum of Wales) for first bringing it to our attention. Dr. W. G. Thomas (National Museum of Wales) kindly gave us information on seams mined in Garw Colliery, and Dr. M. L. K. Curtis (City Museum, Bristol—CMB), Dr. R. A. Fortey (British Museum (Natural History)—BM), Mr. M. Mitchell (Institute of Geological Sciences, Leeds—GSM), and Dr. R. B. Rickards (Sedgwick Museum, Cambridge University) allowed us to borrow specimens in their charge for comparative purposes. Dr. R. A. Fortey supplied the photograph for Plate 29, fig. 6.

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Typescript received 21 May 1975

Revised typescript received 23 June 1975



Owens, Robert M and Bassett, Michael G. 1976. "A Westphalian eurypterid from South Wales." *Palaeontology* 19, 185–190.

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