SCORPIONIDÆ.

Eoscorpium Sparthensis, Baldwin & Sutcliffe, Quart. Journ. Geol. Soc., 1904, vol. lx, pp. 394–399, figs. 2 and 3 in text.

The type of this species was found by Messrs. Baldwin and Sutcliffe at Sparth Bottoms, Rochdale, at 135 feet above the Royley or Arley mine of the Middle Coal-measures. (It is now in the Rochdale Museum.)

MYRIOPODA.

Euphoberia Browni, H. Woodward,¹ GEOL. MAG., 1871, Vol. VIII, pp. 102–104, Pl. III, Fig. 6.

Found in shale in which the fossil tree trunks occur at Dixon Fold on the Lancashire and Yorkshire Railway. The horizon is, I believe, that of the shales lying over the Doe mine in the Middle Coal-measures.

Euphoberia ferox, Salter,² sp., 1863.

Remains of this species were found in association with *Arthropleura mammata* at the pit top of Pendleton colliery, the horizon being the 'ferny metal' under the 'Big Coal' or Rams mine of the Middle Coal-measures. It has also been found by Messrs. Sutcliffe and Baldwin at Sparth Bottoms, 45 yards above the Royley mine.

Xylobius sigillariæ, J. W. Dawson,³ 1860, Quart. Journ. Geol. Soc., vol. xvi, pp. 268–277.

A specimen (species undeterminable) is in the Manchester Museum, having been obtained from the waste-heaps of the Ashton Moss colliery by Mr. Robert Cairns.

Insecta are represented by an imperfect specimen of a Neuropterous insect from 47 yards above the Royley or Arley mine at Sparth Bottoms, Rochdale, and a doubtful larval form of *Etolblattina* from about 60 yards over the Royley or Arley mine at the same place. Both specimens were found by Messrs. Baldwin and Sutcliffe.

II.—NOTES ON SOME CRUSTACEANS AND TWO MYRIOPODS FROM THE LOWER COAL-MEASURES NEAR COLNE, LANCASHIRE.

By HENRY WOODWARD, LL.D., F.R.S., F.G.S.

BY the courtesy of my friend Mr. Herbert Bolton, the Curator and Secretary of the Bristol Museum, several specimens have been placed in my hands for examination. They were collected by Mr. Peter Whalley from the 'Soapstone bed,' a little distance above

¹ The type-specimen was obtained by the late Mr. Thomas Brown, of Glasgow, in a clay-ironstone nodule from the Coal-measures of Kilmaurs.

² Described as a *Eurypterus* by Salter, Quart. Journ. Geol. Soc., 1863, vol. xix, p. 86, really a spined Myriopod; see H. Woodward, "Myriopods of the Coal Period," GEOL. MAG., 1887, pp. 1–10 and 116–117 (figs. in text).

³ A Chilognathous Myriopod from the hollow trunk of an erect *Sigillaria* in the South Joggins Coalfield, Nova Scotia. This genus was first found in Scotland by Mr. Thomas Brown in the Coal-measures of Kilmaurs, and described by Dr. H. Woodward in Trans. Geol. Soc. Glasgow, 1866, vol. ii, p. 234, pl. iii, fig. 11. A second specimen from the clay-ironstone band, Cooper's Bridge, was obtained by Mr. Joseph Tindall, of Huddersfield, and figured on the same plate (op. cit.), figs. 13 and 13a. Noticed by Mr. Edward Binney, F.R.S., Trans. Lit. and Phil. Soc. Manchester, Jan. 8th, 1867; see GEOL. MAG., 1867, Vol. IV, p. 132.

the 'Bullion Mine' (or 'Mountain Four Feet'), on the hill near Colne, Lancashire, and he permits me to figure and describe them.

All the specimens are enclosed in small, elliptical nodules of clay-ironstone, evidently formed around the organisms by a process of concretionary action at the time of their embedment in the sediment forming the layer in which the nodules occur, the fossils being, as usual in such cases, exposed by splitting the concretions open along their periphery.

CRUSTACEA.

DECAPODA—MACROURA.

1. *ANTHRAPALÆMON SERRATUS*, H. Woodw., sp. nov. (Text-fig. 1.)

This specimen is represented by only a portion of one side of a nodule; the remainder and counterpart are alike wanting.

The Crustacean is disposed longitudinally on the split surface of the matrix, and is 90 millimetres in length, of which the cephalothorax measures 50 mm. long, and the five abdominal segments 40 mm.; the rostrum, which is smooth, sharply pointed, ridged, and slightly curved downwards in front, is 20 mm. in length, the anterior border on the left side is 11 mm. broad; the antennules and antennæ are only imperfectly preserved; the outer antenna was furnished with a broad, recurved spatulate scale 14 mm. in length. The outer latero-anterior margin bears four short serrations, but the rostrum appears to have been quite smooth. Only four of the five pairs of ambulatory legs are imperfectly preserved, but the presumably larger anterior chelate pair, if present, are not visible in the fossil.

The latero-posterior border of the carapace is slightly rounded off, and the margins raised and thickened. The median line of the five abdominal segments is slightly raised, and the lateral margins truncated. If epimeral pieces existed to these segments they are hidden in matrix or are not now preserved. The caudal segment and appendages are wanting. The surface of the body-segments is finely punctate; the surface of the cephalothoracic shield has doubtless adhered to the other, lost side of the split nodule. A very small maxilliped with a three-jointed palpus attached appears lying on the surface of the cephalothorax where the carapace has been removed (unfortunately this is not shown in Fig. 1).

This specimen approaches most nearly to Dr. B. N. Peach's *Anthropalæmon Etheridgei*¹ from the Carboniferous rocks of Eskdale, but in the latter the rostrum bears a row of four or five well-marked small spines, and the extremity is also serrated on each side, the antennal scales are more oval in form, not so obliquely curved and spatulate as in our specimen, nor is the border of the cephalothorax serrated along the latero-anterior margin as in this example from Colne. I am therefore inclined to separate this form specifically, giving it the trivial name of *serratus*.

¹ Trans. R. S. Edinb., 1880, vol. xxx, pp. 76-78, pl. viii, figs. 3a-g.

Locality and formation: 'Soapstone bed,' a little distance above the Bullion Mine, Colne Hill, Lancashire. Lower Coal-measures. Collection of Mr. Peter Whalley.

2. *ANTHRAPALEMON WOODWARDI*, R. Etheridge, jun., 1879.
(Text-fig. 2.)

Quart. Journ. Geol. Soc., 1879, vol. xxxv, p. 468, pl. xxiii, figs. 4-9.

Among a number of Lower Carboniferous Crustaceans from the cement-stone of the Calciferous Series near New Castleton, Roxburghshire, Mr. Robert Etheridge figured and described, in 1879, several

FIG. 1.—*Anthrapalæmon serratus*, H. Woodw., sp. nov. Enlarged $1\frac{1}{2}$ nat. size. Soapstone bed, Lower Coal-measures: Carre Heys, Colne, Lancashire.

FIG. 2.—*Anthrapalæmon woodwardi*, R. Etheridge, jun., 1879. Formation and loc. same as Fig. 1. *a'*, antennule; *a''*, antenna; *o*, stalked eye; *cf*, cervical furrow; *c*, cephalothorax; *ab*, abdomen; *t*, telson or caudal segment.

examples which he referred to this species (originally figured from a less perfect example, Quart. Journ. Geol. Soc., 1877, vol. xxxiii, p. 872, pl. xxvii).

The following is Mr. Etheridge's description:—

"Sp. char. Carapace oblong, narrowing towards the anterior part, and divided into two unequal portions by the cervical groove, the posterior being the largest; relative convexity unknown. Anterior lateral margins¹ not spinous and without serrations; posterior lateral angles rounded; posterior margin concave. Cervical groove strongly marked and widely V-shaped. Middle line of the carapace

¹ Produced at antero-lateral angles into a spine (see Fig. 2 above).

occupied by a strong ridge continuous with the rostrum and extending to the posterior margin, and flanked on each side by a straight or slightly curved lateral ridge extending from the frontal border to the posterior margin. Like the central one, these ridges are minutely crenulated. That portion of the carapace anterior to the cervical groove is crushed, and cannot satisfactorily be made out." [Mr. Etheridge thought this form probably possessed a prominent rostrum, but the figures given on his pl. xxiii, op. cit., do not represent anything more than a very slight double spine.¹]

"Flagella of the antennæ bent obtusely outwards, composed of numerous minute subdivisions. Antennæ having a peduncle or protopodite of four segments, and terminating in two slender filamentous whips. First pair of chelate appendages probably present, small, elongate. Eyes large and reticulated. Abdominal segments six in number, with pointed pleuræ² and a well-marked central line extending throughout their whole length, and corresponding with the central ridge of the carapace; articular area small, but distinctly visible, defined by a small transverse ridge on each segment. Telson primarily consisting of a central hastiform plate, flanked on each side by two lateral caudal swimming-lobes, which arise from and are articulated to the sixth segment of the abdomen."

I do not think I need add a further description to that by Mr. Etheridge. The impressions left by the rather large eyes, the basal joints of the antennules, and the outer antennæ, with portions of their flagellæ, can be made out. The small limbs are not preserved in this specimen, nor the chelate anterior pair.

Length of Mr. Whalley's specimen 65 mm., length of cephalothorax 33 mm., breadth 22 mm., length of five abdominal somites 20 mm., length of second abdominal segment 7 mm., length of caudal plates 10 mm. (probably longer).

Locality and horizon: Colne Hill, Soapstone bed, Lower Coal-measures. Original specimen in Mr. Peter Whalley's collection.

3. ANTHRAPALEMON TRAQUAIRII (?), Peach.

Trans. Roy. Soc. Edinburgh, 1880, vol. xxx, pt. 1, p. 80, pl. x, figs. 5a-f.

In Mr. Whalley's collection is a rather large Arthropod, probably referable to Dr. Peach's species *A. Traquairii*, from the Lower Carboniferous rocks of Eskdale. The specimen is very obscure, and I have therefore not figured it; but a brief note may serve to record it, and to stimulate further research, which it may be hoped will result in the obtaining of more perfect material for study.

The whole animal measures $8\frac{1}{2}$ cm. in length, by 2 cm. in breadth. The carapace is $3\frac{1}{2}$ cm. long, and appears to have slipped forward in the matrix (when soft) exposing 2 cm. length of the uncovered thoracic region with the imperfectly preserved thoracic limbs; behind these, again, are the traces of the five abdominal somites; the nodule

¹ The presence of a rostrum is not confirmed by Mr. Whalley's specimen, and I am doubtful whether this species had a prominent rostrum.

² The pleuræ cannot be seen in Mr. Whalley's specimen.

has been truncated just where the caudal appendages would join the abdominal segments. The carapace is rounded posteriorly, and the cervical furrow is well-marked. There is also a median dorsal furrow down the centre of the carapace. The limbs are very imperfect. Two obscurely defined scale-like bodies are present in front of the head.

We can only hope for better material from the Soapstone nodules, to enable one to determine this interesting fossil.

Locality and formation, the same as the preceding specimens.

TRACHEATA (Air-breathers of the Coal Period).

ARCHIPOLYPODA, Scudder.

Fam. 2.—EUPHOBERIDÆ, Scudder.

Genus EUPHOBERIA, Meek & Worthen.

Paleontology of Illinois, 1868, p. 556.

1. EUPHOBERIA BROWNII, H. Woodw., 1871.

GEOL. MAG., Vol. VIII, Pl. III, Figs. 6a-c (in clay-ironstone, Coal-measures, Kilmaurs, near Glasgow).

The specimen from Mr. Peter Whalley's collection of which a figure is given here (Fig. 3) is identical with *Euphoberia Brownii*, from Kilmaurs, figured and described by me in 1871.

FIG. 3.—*Euphoberia Brownii*, H. Woodw., 1871. Enlarged twice natural size. From Soapstone bed, Coal-measures: Carre Heys, Colne, Lancashire. *ds*, dorsal surface; *ls*, bases of spines; *p*, walking-feet.

Both sides of the nodule from Colne Hill are preserved and expose a coiled up Myriopod, having indications of a head and about 30 equal-sized segments, each composed of a saddle-shaped plate rounded at its lower edge, covering the dorsal region and having a raised rounded border before and behind; the interlocking posterior smooth border is of equal breadth behind the

saddle, the smooth margin of which passes under the succeeding segment; at the lower lateral rounded border of each saddle-shaped plate the base of a round spine (?) is seen broken off; occasionally the base is double. Some of the saddle-plates have a third additional ridge upon them. Below each saddle-shaped dorsal plate are two smaller ventral plates,¹ also ridged, to each of which a pair of slender, six- or seven-jointed walking-limbs is articulated. The saddle-plates of the segments nearest the head have a delicate crenulation along their raised margins. The head has two rounded lobes, which are probably the eyes, although the facets are not very distinct. The last segment (telson?) is smaller than the rest and appears to be somewhat semicircular in form; quite 15 to 20 pairs of jointed ambulatory appendages can be made out, two pairs being attached to each double segment.

Measured around the curve of the coiled-up specimen the body is 8 centimetres in length; the segments 10 mm. deep and about 8 mm. long; the walking-legs are about 10 mm. in length. There is a second specimen in Mr. Whalley's collection, with counterpart (broken off at each end), which measures 3 cm. in length.

Euphoberia Brownii is closely related to *E. armigera*, described by Messrs. Meek & Worthen in their great work on "The Geology and Palæontology of Illinois, U.S.," 1868, vol. iii, p. 556, figs. a-d, from the clay-ironstone nodules of the Coal-measures, Grundy County, Illinois, reproduced in our Pl. III, GEOL. MAG., 1871, p. 104.

Locality and formation: from the Soapstone bed, Colne Hill. Lower Coal-measures. In the collection of Mr. Peter Whalley.

2. XYLOBIUS MONILIFORMIS, H. Woodw., sp. nov. (Text-fig. 4.)

The earliest recorded examples of Chilognathous Myriopods met with in a fossil state were discovered by Sir William Dawson in the hollow trunk of a still erect *Sigillaria*, in a bed of coal on the South Joggins Coalfield, Nova Scotia, and described by him in the Quarterly Journal of the Geological Society of London in 1853, vol. ix, p. 58. A fuller description by the same author followed December 15th, 1859 (op. cit., vol. xvi, p. 268). These terrestrial Myriopods have also been found in the Coal-measures of Illinois by Messrs. Meek & Worthen, and in the Coal-measures of Kilmaurs, near Glasgow, by Mr. Thomas Brown. Some of these forms were described and figured by me in the Trans. Glasgow Geol. Soc., 1866, vol. ii, p. 235, pl. iii, figs. 11-13.

In 1867 Mr. Binney exhibited fossils collected by Mr. Joseph Tindall, of Huddersfield, from the Lower Coal-measures near that town. One of these was a remarkably good example of *Xylobius* in a nodule of clay-ironstone, having about 46 well-preserved articulations to its body. This specimen showed the segments to have been ornamented with transverse, finely undulating lines, as

¹ Not clearly shown in the figure.

noticed in the original examples from Nova Scotia, and I referred it in my description to Dr. Dawson's species *Xylobius sigillaria*.¹

The specimen here figured (Fig. 4) from near Colne, Lancashire, shows only a part of the body of a Myriopod, consisting of about 25 rounded segments, truncated at the larger anterior end by the loss probably of the half of the nodule in which the animal is imbedded, the part preserved being the posterior or caudal moiety with its counterpart. Each somite or segment has a raised ring or ridge passing around near the anterior border, having (so far as exposed upon the matrix) a single row of upwards of 10 minute oblong bead-like ornaments on it, with a plain, slightly raised moiety forming the posterior articular boundary of each segment. Beyond the first 13 or more anterior segments, counting from the truncated end, the body-rings gradually diminish in size towards the posterior extremity, which is slightly curled round like the tail of the letter J. Length of the entire body about 6 cm. Length of six segments 20 mm.,

FIG. 4. — *Xylobius moniliformis*, H. Woodw., sp. nov. Soapstone bed, Lower Coal-measures : Carre Heys, Colne, Lancashire. Enlarged twice natural size. *d*, dorsal aspect of specimen; *p*, walking-feet.

width of anterior segment 8 mm. Minute walking-legs, about 5 mm. long, are to be seen for almost the entire length of the body; there are two pairs (where preserved) to each segment.

The interest attaching to this specimen of *Xylobius* consists in the preservation of the extremely beautiful ornamentation on the body-segments, reminding one of the jointed columns of some Silurian Crinoid such as *Gissocrinus* or *Gothocrinus*. It is to be regretted that the remainder of the nodule has not been preserved, as we might then have been able to describe the head, and have ascertained the entire length of the body.

Locality and formation : Soapstone bed, Lower Coal-measures, Colne Hill, Lancashire. In the collection of Mr. Peter Whalley.

Amongst the nodules sent up by Mr. Whalley there is in one the remains of a fish, *Acanthodes Wardii*; another contains two very small Gasteropods which have not been identified.

Mr. G. C. Crick, F.G.S., has kindly examined two other nodules for me, and writes as follows :—

¹ See Trans. Lit. and Phil. Soc. Manchester, January 8th, 1867; GEOL. MAG., 1867, Vol. IV, p. 132; and Trans. Glasgow Geol. Soc., 1866, vol. ii, p. 236, pl. iii, figs. 13 and 13a.

DIMORPHOCERAS DISCREPANS (T. Brown¹).

In one nodule is exhibited about one-half of the lateral area and a portion of the periphery of the septate part of a *Goniatite*, 3 mm. in diameter, that seems to be referable to this species. The test is not preserved, but the septa are well shown.

ORTHOCERAS, sp. 1.

In the same nodule as the example of *Dimorphoceras discrepans* there is a fragment of a slender, slowly-tapering *Orthoceras*, 8 mm. long and about 2 mm. in diameter. Rather more than the uppermost 2 mm. form part of the body-chamber; the rest is entirely septate and exhibits fifteen chambers, so that these may be described as very shallow, about five occupying the space of 2 mm. The septa are slightly oblique; the cross-section is elliptical; the siphuncle appears to be nearly marginal and situated at the extremity of the long axis. The test is thin and polished. *Orthoceras asciculare*, T. Brown,² is described as having the siphuncle near the side, but, judging from the figure, that species has deeper chambers than the present specimen.

ORTHOCERAS, sp. 2.

Another nodule contains a fragment of a slender *Orthoceras*, about 6 mm. long. The specimen is only partially exposed, the greatest width being only 1.5 mm., but it seems to belong to a more rapidly tapering shell than sp. 1. Although nearly covered with the test, it appears to be entirely septate, the chambers being a little deeper than in sp. 1, eight chambers occupying about 5 mm. The test is thin, polished, and has very feeble annulations, which apparently correspond to the septa, whilst the surface between the annulations is covered with exceedingly fine transverse lines.

III.—SEDGWICK MUSEUM NOTES.

NEW FOSSILS FROM THE HAVERFORDWEST DISTRICT. IV.

By F. R. COWPER REED, M.A., F.G.S.

(PLATE XXIII.)

THE following species of Brachiopoda were recorded by Messrs. Marr & Roberts³ from the Ordovician beds of the Haverfordwest district:—

LLANDEILO LIMESTONE.

Leptana [*Plectambonites*] *sericea*, Sow.
Orthis striatula, CONR.

DICRANOGRAPTUS SHALES.

Orthis argentea, His.
Siphonotreta micula, McCoy.
and “other horny brachiopods.”

¹ T. Brown, *Fossil Conchology*, 1849, p. 28, pl. xxi, figs. 8, 8a, and 15 (*Goniatites discrepans*). See also Foord & Crick, *Cat. Foss. Ceph. British Museum*, pt. 3, 1897, p. 222 (*Dimorphoceras discrepans*).

² T. Brown, *Trans. Manchester Geol. Soc.*, vol. i, 1841, p. 220, pl. vii, fig. 39;
and T. Brown, *Foss. Conch.*, 1849, p. 249, pl. xxix*, fig. 29.

³ Marr & Roberts: *Q.J.G.S.*, vol. xli (1885), pp. 476–491.