

II.—A NEW CARBONIFEROUS ARACHNID.

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Introductory Remarks.

LAST April Dr. Anton Frič, of Prague, applied to the Natural History Museum for the loan of a fossil Arachnid which he had seen during a short visit to London in the Summer of 1902, and wished to include in a descriptive monograph of Carboniferous Arachnida which he has now in preparation. Since the specimen is unique, it was unfortunately impossible to accede to the request. Dr. Smith Woodward, however, kindly suggested that I should examine the specimen and, if necessary, describe and figure it, so that perchance an account of it might yet be in time to find a place in the monograph above referred to. The specimen, imbedded in the two pieces of a split nodule of clay-ironstone from the Carboniferous measures at Coseley, near Dudley, belonged formerly to the collection of Mr. Henry Johnson. It bears the register number 1551, and is ticketed by Dr. H. Woodward "*Eophrynus*, sp. nov." The dorsal surface is exposed, part of it adhering to one face of the matrix, part to the other.

1.—*Description of the Specimen ; its generic and specific features.*

The *carapace* unfortunately is crushed, and nothing positive can be affirmed as to its structure save that it appears to have been slightly wider than long, with a shallow, postero-lateral constriction and a straight, transverse, posterior border. In the middle line behind, however, there is an acutely angular impression, obviously representing the median impression occupying the same position and presenting much the same form in *Eophrynus prestvicii*, H. Woodw.¹ The crushed condition of the carapace suggests that its median area was axially elevated as in the last-mentioned species and in *Kreischeria wiedei*.² Had it been flat or but slightly convex as in *Anthracomartus*, the details of its structure would have been preserved, if we may judge from the state of preservation of the relatively depressed abdominal area. It is justifiable, therefore, to conclude that the carapace was constructed essentially as in *Eophrynus* and *Kreischeria*, approaching in particular that of the former in the smallness of the posterior flattened area and the shortness of the median muscular impression. It was, however, less expanded at its postero-lateral angles, and occupied in this respect a stage of development midway between that presented by the carapaces of these two genera.

The *appendages* show no new morphological features. None of them are complete. Of the first and second pairs nothing is left but undecipherable fragments. On the right side three of the legs, which, from their position, I judge to be the first, second, and fourth, are fairly well preserved. The basal segments (coxa and trochanter) are

¹ See H. Woodward, GEOL. MAG., 1871, pp. 386–388, Pl. XI, and R. I. Pocock, GEOL. MAG., 1902, p. 490, Fig. 1, A.

² See Haase: Zeitschr. deutsch. geol. Ges., xlii (1890), pl. xxx, fig. 6.

very vaguely defined, but the femur, patella, tibia, and protarsus of the first and second pairs can be easily made out. They resemble those of *Eophrynus prestvicii* in being grooved, but are hardly noticeably pitted. In the fourth leg the femur, patella, and most of

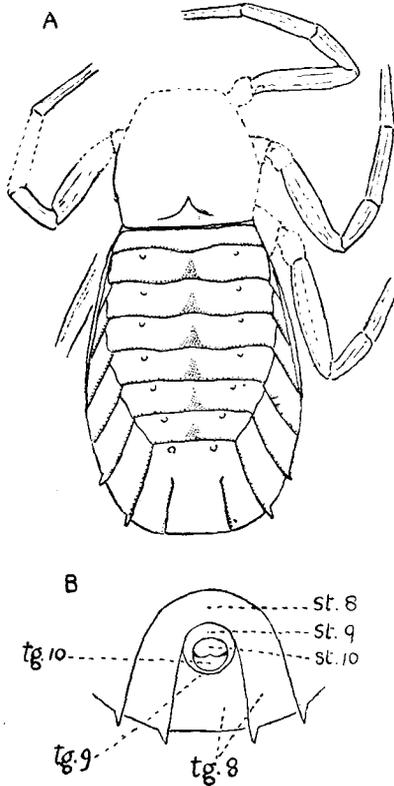


FIG. A.—*Anthracosiro woodwardi*, gen. et sp. nov. \times about $2\frac{3}{4}$. The lateral laminae on the second, third, and fourth abdominal segments are relatively larger than seen in the specimen, and the angular projection of the tergal plates abutting against the antecedent laminae a little too far back.

FIG. B.—Emended figure of the posterior extremity of the ventral area of *Eophrynus prestvicii*, showing the division of the anal tubercle into a tergal (*tg.* 10) and sternal (*st.* 10) element; *tg.* 9 and *st.* 9, tergal and sternal area of annuliform preanal somite; *st.* 8, sternal area of eighth somite; *tg.* 8, median and lateral lamina of the dorsal area of the same.

the tibia are shown.¹ On the left side part of the femur of the fourth projects from beneath the abdomen, and half the femur, the patella, and the greater part of the protarsus of the second are likewise visible.

From the width of the carapace and the extent to which the basal segments of the appendages are left uncovered by its lateral borders,

¹ This appendage lies in a more vertical plane than the others, being thrust back partly over the abdomen. In the annexed figure what is to be seen of it has been drawn in a horizontal plane so that the structure of the abdomen is not concealed.

it may be inferred that the sternal area of the cephalothorax (prosoma) was wide, as in *Eophrynus*.

The *opisthosoma* (abdomen) shows very distinctly eight, and only eight, plates on its upper side. It thus resembles this region in *Kreischeria wiedeii*, and differs from that of *Eophrynus prestwicii*, where nine plates are exposed, the first and second being short and apparently representing conjointly the first that is retained in *Kreischeria wiedeii* and in the species now under notice. In the latter the first is the shortest of the series, the second the longest. The posterior border of the first is slightly convex in the middle; that of the others is fairly straight from side to side, although on account of a distinct and gradual elevation of the median area of the second, third, and fourth, this border appears from a superficial examination to be slightly concave in the middle. In the comparative straightness of the hinder border of the posterior terga, this species differs strikingly not only from *Eophrynus* and *Kreischeria*, but also from *Brachypyge* and *Anthracomartus*, in all of which the terga become progressively more and more recurved towards the posterior extremity of the abdomen. In the middle of the terga there is a distinct triangular granular area, wider behind than in front; there is also a series of fine granules defining the divisional lines between the terga and their laminæ; but the tubercles, which form so conspicuous a feature on the terga and lateral laminæ both of *Eophrynus* and *Kreischeria*, are here represented by a single pair of small tubercles upon the terga, and these are scarcely discernible on the anterior segments. The lateral borders of the third, fourth, fifth, and sixth terga are slightly produced anteriorly, and come into contact with the proximal extremity of the posterior side of the lamina of the antecedent segments. The lateral laminæ, too, are very different from those of the genera of *Anthracomarti* hitherto described. None are visible upon the first; on the second they appear as slender sclerites lying obliquely backwards; on the third and fourth they are of the same form, but larger, and project back in the same way, and their external margins are bordered by a strip of chitinous integument belonging to the lateral or ventral area of the body. It is not until the fifth segment is reached that the laminæ are at all comparable in development to those of other genera. From the fifth backwards they are large but fairly normal in size and form, their outer edges forming an evenly continuous curve. The posterior angles of the laminæ of the sixth and seventh segments, not of the seventh and eighth as in *Eophrynus* and *Kreischeria*, seem to be furnished with a spiniform process; but upon this point it would be rash to make a positive statement. The eighth segment is large, and furnished with the normal median and the two lateral laminæ separated by a deep groove; the lateral laminæ, however, are not marked off from the median area of the tergum, as is the case in most other *Anthracomarti* known. Owing to the small size of the anterior laminæ and the large size and obliquely backward direction of those at the posterior end of the abdomen, this region of the body is much longer in proportion to its width than in most *Anthracomarti*. The impression of the circular anal plate, omitted

from the drawing, is plainly visible through the eighth segment, near its anterior border.

The principal measurements in millimetres of the type-specimen are as follows:—Total length 21, length of carapace 6, width 7 (approx.); length of abdomen 15; greatest width 10; width in front 6·5.

The characters enumerated above, though proving incontestably the right of the species to a place amongst the *Anthracomarti* near *Eophrynus* and *Kreischeria*, show no less clearly the impossibility of associating it with either of these genera. And since it is not intermediate between these or any two genera known, but differs strikingly from all in certain well-marked features, it becomes necessary to erect a new genus for its reception. This I propose to name and diagnose as follows:—

Gen. ANTHRACOSIRO, nov.

Carapace and appendages of *prosoma* constructed apparently as in *Eophrynus*, having the posterior horizontal area and the median impression short. *Opisthosoma* consisting of eight tergal plates on its upper surface, as in *Kreischeria*, but the anterior and posterior border of all the plates transverse and subparallel, and not becoming progressively more and more recurved towards the hinder end of the body, as in *Eophrynus*, *Kreischeria*, etc. All the lateral laminae directed obliquely outwards and backwards: those of the anterior segments in the form of narrow sclerites, overlapped externally by the chitinised subjacent integument; those of the posterior segments large. In *Kreischeria* and *Eophrynus* all the laminae are large and subsimilar in size and shape.

The generic name for this Arachnid is suggested by the geological formation in which the fossil was found, and by its affinity, remote though it be, to the existing Opilionid genus *Siro*.

The typical and only known species of this genus I propose to name *Anthracosiro woodwardi*, sp.n., dedicating it to Dr. Henry Woodward, F.R.S., as a slight tribute to his valuable contributions to our knowledge of fossil Arthropoda. The specific characters of this species are enumerated with sufficient detail in the description of the specimen already given.

2. *Further remarks upon the morphology of the Anthracomarti.*

While working out this new Arachnid, I examined a cast of *Eophrynus prestvicii*, which I did not see previous to the publication of the description of this fossil in the GEOLOGICAL MAGAZINE for October and November of last year. In this cast I notice one little structural point, of some morphological importance, which was not sufficiently defined in the others to allow me to speak with assurance about it. With reference to the anal plate, I said (p. 447): "This plate has the form of a transversely oval tubercle, and in one of the casts is marked by an incomplete transverse groove which suggests the possibility of its consisting of distinct sternal and tergal elements. If this be the case, the anal somite will resemble that of the Amblypygous Pedipalpi [Phrynidæ], rather than that of the Cyphophthalmous Opiliones." This groove is so strongly defined in the new

cast that I see no escape from the conclusion that it represents the anal orifice. Hence the anal somite is complete with respect to its tergal and sternal elements. In *Eophrynus*, therefore, eleven terga and ten sterna can be made out in the opisthosoma. The first tergal plate, which has no sternal representative, I homologised with the tergum of the pregenital somite, and the second, with the corresponding first sternal plate, with the tergum and sternum of the genital somite in *Phrynus* or the Pseudoscorpiones. A subsequent study of the Opiliones, however, has suggested an alternative interpretation of these plates which divorces *Eophrynus* from the Pedipalpi and brings it more into touch with the members of the former order, with which the structure of the appendages of the prosoma and of the segments of the opisthosoma forcibly suggests the Anthracomarti to be nearly related. In *Kreischeria*, *Brachypyge*, and *Anthracomartus*, for instance, only ten terga and nine sterna seem to be distinguishable in the opisthosoma, the difference in the number of segments in this region between these genera and *Eophrynus* being attributable to the disappearance, either by fusion or excalation, of the first tergal and the last sternal plates that are traceable in the latter genus. And when it is remembered that ten terga and nine sterna are also found in the opisthosoma in the Cyphophthalmous Opiliones, that the tergum of the eighth forms the posterior extremity of the dorsal surface, and overlaps that of the ninth, which, with its corresponding sternum, is reduced to an annuliform preanal sclerite, and that the tenth or last tergal plate has no sternal equivalent, but closes like a valve over the anus and is encircled in the way just described, exactly as occurs apparently in *Anthracomartus* and *Brachypyge*, it is difficult to doubt that the segments of the opisthosoma correspond each to each in the Cyphophthalmi and the genera of Anthracomarti just mentioned. If this be so, the first tergum and the first sternum in *Anthracomartus*, *Kreischeria*, and *Brachypyge* will correspond to the tergum and sternum of the first post-genital somite in *Phrynus*. In that case the genital aperture in the Anthracomarti must have opened in front of the first sternum, as it does in the Opiliones, and not behind it as I assumed in my former paper. *Eophrynus* is peculiarly interesting in this connection because it appears to be the only known genus of Anthracomarti that has retained an unmistakable trace of the genital somite, unless the suggestion that I made with regard to the first tergal plate in *Anthracomartus völkelianus* and *Kreischeria wiedeii* be correct.

In view of this new reading of the facts, the explanation of Fig. 1, A, p. 490, of my previous paper may be emended as follows:—The plate marked *pregen. tg.* will be the tergum of the genital somite, and the plate marked *1 tg. (gen.)* that of the first post-genital somite.

This view of the matter was briefly alluded to in my paper upon the classification of the Opiliones,¹ and coincides with the explanation of the morphology of *Leptopsalis*, one of the genera of Cyphophthalmi, put forward by Börner six months earlier.²

¹ Ann. Mag. Nat. Hist. (7), x, pp. 504-515, December, 1902.

² Zool. Anz., June, 1902.