

ART. XIX.—Description of a New Genus of the Order *Eurypterida* from the Utica Slate; by C. D. WALCOTT.

IN the February number of this Journal,* notice was given of the discovery of the fragmentary remains of a large Pœciliopod in the Utica slate and its identification with the *Eurypterida*, a provisional reference being made to the genus *Eurypterus*. A review of this and the genera of its order shows that none of them present the characters seen in the remarkable cephalic appendage from which the genus now proposed derives its name.

Echinognathus, n. g.

Endognathary limbs (one or more pairs) formed of eight or nine joints, six of which carry long, backward curving spines articulated to their posterior side. Terminal joint slender, elongate, acuminate. Surface of the body and larger joints of the cephalic appendage ornamented with scale-like markings, as in the genus *Pterygotus*. Type, *E. Clevelandi*.

Echinognathus Clevelandi.

Syn. *Eurypterus?* *Clevelandi* Walcott. This Journal, vol. xxiii, p. 151, 1882.

The only portion of the body discovered is illustrated by fig. 1. It appears to be the left side or half of the ventral surface of the anterior thoracic segment. The reference to the ventral surface is from the presence of a thin membranous

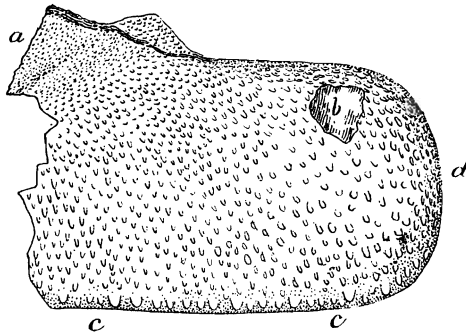


Fig. 1.—Reduced to 7-10ths the natural size.

extension of the anterior margin, a feature observed on the anterior segment of *Dolichopterus macrocheirus* Hall.† The test appears to have been thin and firm, and the margins are clearly outlined on the dark, smooth slate, while the surface is ornamented with fine scale-like markings on the anterior portion that increase in size toward the posterior margin (*cc*).

* Vol. xxiii, p. 151, 1882.

† Pal. New York, iii, p. 414*.

Figure 2, is a sketch, 7-10ths of the natural size, of the cephalic appendage as it appears on the surface of the slate and in the matrix. The entire length of the appendage from the point *a a* to the end of the terminal joint 7, as restored from its natural position, would be 12.5^{cm}, exclusive of the basal joint at *a a*. The long spines of the joints 3 and 4 are 5^{cm} in length.

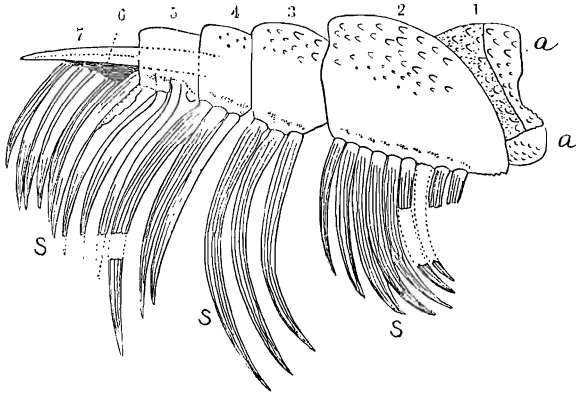


Fig. 2.—Reduced to 7-10ths the natural size. The joint (1) overlaps (2) and is broken away on its posterior margin. The line crossing it should be a slight ridge.

The joint marked (1) is broad and short with a rounded depression at the center of its inner margin. There is no evidence of the attachment of the long spines that are articulated to the posterior side of the succeeding joints. From the form of the joint and the presence of broken fragments of the test in the matrix at *a a* it is probable that it is the second joint of the appendage and that the first or basal joint is broken up. The joint (2) is large, elongate, rudely subtriangular, the long anterior margin curving around to meet the nearly straight posterior margin at its inner end. The latter margin has nine long curved spines articulated to it while the three following joints (3, 4) and (5) have but three each on their posterior margins. These joints (3, 4, 5), are more or less quadrangular in outline, (3) and (4) being transverse and (5) a little elongate. The spines of (3) and (4) are the longest of any attached to the appendage. Beyond (5) traces of another joint are shown (6), and another is indicated by the position of the three curved spines beyond those of (6). These two latter joints were crushed by the forcing back of the long terminal joint (7), the inner end of which is seen beneath the center of the joint (4). This joint or terminal spine is slender, slightly curved backward, and marked by a slight median ridge and longitudinal striæ. The surface of the

joint (1) and the anterior portions of (2) and (3) show the scale-like markings observed on the fragment of the thoracic segment. If there were but one joint beyond the transverse joint (1), i. e. the basal, the entire appendage would have had nine joints, if our interpretation of the crushed joints is correct.

The long curved spines (*s, s, s*), are a very curious feature of the appendage and the most marked character of the genus and species. They are articulated to the posterior margin of the joints, as the latter rest flattened out in the slate or shale, and there is no evidence but that they formed a single series, as shown in the specimen and in the drawing, fig. 2. Each spine is constricted a little near its base, forming a rounded end or point of articulation; from this well out toward their pointed termination they retain an average width curving gently backward and inward. They appear to have been flattened when in a natural condition, and formed of a thin test which is rather strongly striated.

It is difficult to understand the purpose these spines served unless they are considered as having some relation to the branchial system of the animal. That they were used in securing food or carrying it to the mouth is not apparent, and no other use than the above is suggested from a study of the specimens we now have.

In the specimen of *Dolichopterus macrocheirus*, previously referred to, a few short, small spines are seen projecting from the posterior margins of the third, fourth and fifth joints of the third endognath. That they may represent in a greatly modified degree the spines shown in fig. 2 is not improbable. *Eurypterus punctatus* (Salter) Woodward, as restored in Woodward's Monograph of the Fossil Merostomata, p. 157, has a pair of long curved spines on four of the joints of the endognathary palpus, but they are represented as projecting forward, which does not appear to have been the case in the Utica slate species.

The character of the endognathary palpus of *E. Clevelandi* may indicate the approach to an earlier type of the Eurypterida, but from the characters shown by these remains and the fact that its size, estimating from the fragment of the thorax, was not less than 45 or 50^{cm} in length, and the approximate width 15^{cm} or more, it is evident that we must search deep in the strata of the Trenton group, or even lower, for the first members of the order.

As far as known to us the Eurypterida has not been represented hitherto on the American continent below the Medina sandstone of New York, and no described species is known below this horizon elsewhere. M. Barrande mentions the discovery of a fragment of the test of a Pterygotus in his étage D, 5.

at the close of the second fauna,* which would place it a little below that of the Medina sandstone.

The specific name of the species under consideration was given in honor of Rev. Wm. N. Cleveland, who obtained the specimens described in the Utica slate formation north of the village of Holland Patent, Oneida County, N. Y. On the same pieces of slate with them occur two characteristic fossils of the formation, *Leptobolus insignis* and *Triarthrus Becki*, and I have also obtained from the same locality and stratum of slate, *Dendrograptus tenuiramosus*, *Chimacograptus bicornis*, *Schizocrania filosa*, *Endoceras proteiforme*, etc.

Several collectors have been and are now working in the Utica slate both in New York State and Canada, and a number of undescribed and interesting species are in their hands, as also several described from the Trenton limestone but unknown from the slate before. It is largely due to the persistent efforts of Mr. Chas. H. Haskell that the many localities in Oneida County, N. Y., have been discovered, and their rich fauna made known from the slate, from one of which localities the form we have described was obtained.