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ORIGINAL ARTICLES.

I.—WOODWARDIAN MUSEUM NOTES: SALTER'S UNDESCRIBED SPECIES. VII.¹

By F. R. COWPER REED, M.A., F.G.S.
(PLATE VII.)

CEPHALOPODA.

TROCHOCERAS SPURIUM, Salter, 1873. (Pl. VII, Fig. 1.)

1873. *Trochoceras spurium*, Salter, n.sp.: Cat. Camb. Sil. Foss. Woodw. Mus., p. 160 (a 466).
1882. *Trochoceras striatum*, Blake: Brit. Foss. Ceph., p. 222, pl. xxix, fig. 5; pl. xxx, figs. 3, 4, 4a, 4b.
1891. *Trochoceras striatum*, Foord: Cat. Foss. Ceph. Brit. Mus., p. 32.
1891. *Trochoceras spurium*, Woods: Cat. Type Foss. Woodw. Mus., p. 131.

Salter's original specimen comes from the Wenlock Shale, Builth Bridge, and was described (Salter, loc. cit.) as having "much narrower whorls than *Phr. nautilium*." The specimen consists only of the greater portion of the outer whorl, including the body-chamber, and it shows the aperture and ornamentation very well preserved. It agrees with Blake's species *Tr. striatum* in shape, rate of increase, characters of body-chamber and aperture, degree of obliquity of the transverse ribs, their absence on the body-chamber, the fine lines parallel to them on the rest of the whorl, the epidermids, and the shape, position, and distance apart of the septa. The stratigraphical horizon on which it is found is also the same, and there can be no doubt that the species are identical, as they agree in all the essential characters and even in every minute detail.

ORTHOCERAS FLUCTUATUM, Salter. (Pl. VII, Fig. 2.)

1873. *Orthoceras fluctuatum*, Salter, n.sp.: Cat. Camb. Sil. Foss. Woodw. Mus., p. 37 (a 611).
1882. *Orthoceras fluctuatum*, Blake: Brit. Foss. Ceph., p. 122 (cf. *O. recticinctum*, Blake).
1891. *Orthoceras fluctuatum*, Woods: Cat. Type Foss. Woodw. Mus., p. 129.

Salter describes this species as possessing "coarser striæ than *O. subundulatum*, Portl., and apparently more bent still than in that species." The single specimen (a 611) named by Salter comes from the Lower Bala (Llandeilo) of Wellfield, Builth, and consists of an imperfect external hollow cast of a portion of the shell, showing

¹ For previous articles see GEOL. MAG., 1901, pp. 5, 106, 246, 355, and 576; 1902, p. 122.

a series of undulating, equidistant, regular, transverse, coarse striae, six in a space of 4 mm. These striae on the cast would be represented on the surface of the shell by raised thread-like lines. But this material is absolutely insufficient for the creation of a new species, and Blake (loc. cit.) hesitates in identifying it with *O. recticinctum*, partly on the ground of its imperfect preservation and partly because it comes from a different geological horizon. It seems advisable, therefore, to let the name drop, as the original specimen does not admit of a sound species being established.

LAMELLIBRANCHIATA.

PTERINEA EXASPERATA, Salter. (Pl. VII, Figs. 3-5.)

1873. *Pterinea exasperata*, Salter: Cat. Camb. Sil. Foss. Woodw. Mus., p. 150 (a 813, a 814, a 815, a 816).

1891. *Pterinea exasperata*, Woods: Cat. Type Foss. Woodw. Mus., p. 89.

The specimens labelled *Pterinea exasperata* by Salter are eleven in number. All are from the Wenlock Limestone of Dudley and belong to the Fletcher Collection. One has both valves preserved, though the right one is somewhat imperfect. The others are all left valves, and one (a 815) shows the inner side of this valve. Five more specimens of this species have been acquired since 1873. Salter (loc. cit.) described it as "a reticulate species, long known but not yet described."

DIAGNOSIS.—Body of shell obliquely ovate, elongate, unequally biconvex; long straight hinge-line; left valve slightly more convex than the right; furnished with small rounded, triangular anterior ear and large flattened posterior wing.

Left valve with obliquely elongate convex body; beak gibbous, prominent; anterior ear not sharply marked off from body; posterior wing large, pointed, more than two-thirds the length of posterior slope, depressed, flattened, more or less distinctly marked off from body, posterior margin concave. Hinge-line long, straight, making angle of about 30°-40° with body behind umbo.

Surface of body marked by strong, straight, radiating, narrow, equidistant ribs, 25 to 35 in number, very feebly developed or absent on anterior and posterior ears. Half-way between each pair of these main ribs is a finer, thread-like rib which begins at some distance from the beak, and increases in strength towards the margin so as ultimately to be equal in size to the main ribs. Ribs crossed by regular, equidistant, concentric, scale-like lamellæ, arched backwards towards the umbo between each pair of main ribs, and between every pair of ribs near the ventral margin. The lamellæ are continued on to the ears, where they are more closely packed together and crenulated, and on the posterior ear are parallel to the concave posterior margin. Right valve rather less convex than left valve, but in other respects apparently similar.

MEASUREMENTS.

| | I. | II. | III. |
|-----------------------------------|-----|-----|------|
| | mm. | mm. | mm. |
| Length along oblique axis of body | 30 | 30 | 43 |
| Length at posterior end | 21 | 23 | 31 |
| Width along hinge-line | 24 | 22 | 28 |

REMARKS.—A species which appears to be closely allied to this form is *Pt. fimbriata*¹ (McCoy), from the Silurian (Wenlock?) of Dingle, co. Kerry. This Irish species differs, however, in being less elongated, in possessing a shorter posterior wing and a more acute umbo, but the ornamentation of the surface closely agrees. McCoy figures only a right valve. From *Pt. subfalcata* (Conr.) our species differs in the regularity and strength of its concentric lamellation, in its larger posterior ear, and the different shape of its anterior ear.

PTERINEA CONDOR, Salter. (Pl. VII, Figs. 6 and 7.)

1873. *Pterinea condor*, Salter, n.sp.: Cat. Camb. Sil. Foss. Woodw. Mus., p. 169 (a 809, a 810).

1891. *Pterinea condor*, Woods: Cat. Type Foss. Woodw. Mus., p. 89.

There are three specimens labelled *Pterinea condor* by Salter, but one of these (a 810) is probably due to a mistake, as it obviously belongs to an entirely different species. The specimens all come from the Lower Ludlow beds of Dudley and belong to the Fletcher Collection. Salter describes it as having "very wide hinge line, three inches broad."

DIAGNOSIS.—Shell transversely oblong, very inequivalve, flattened. Hinge-line long, straight. Left valve weakly convex, flattened posteriorly into large posterior wing, which is bluntly pointed behind, slightly excavated along posterior margin, and extended along upper margin beyond body of shell. Hinge-line longer than shell. Anterior ear very small, depressed below body of valve. Umbo small, prominent, rising above hinge-line. Distinct band along hinge-line marked off from posterior wing, representing ligamental facet. Surface of valve marked by faint concentric striae parallel to margins.

Right valve (? of same species), Fig. 7, subquadrate, flattened. Upper and anterior margins straight, meeting at angle of 120°, each furnished with longitudinally striated, band-like area, of which the upper is marked with five longitudinal shallow grooves, interrupted along part of their length near anterior end. Posterior margin broadly rounded, weakly emarginate at inferior angle. Inferior margin rounded, meeting anterior margin at nearly a right angle. General surface of valve feebly convex, especially in central part of hinge-line. Oval muscular impression in anterior angle between upper and anterior margins.

MEASUREMENTS.

| <i>Left valve.</i> | | | | | | mm. |
|--------------------------|-----|-----|-----|-----|-----|-----|
| Width (along hinge-line) | ... | ... | ... | ... | ... | 74 |
| Length | ... | ... | ... | ... | ... | 40 |
| <i>Right valve.</i> | | | | | | |
| Width (along hinge-line) | ... | ... | ... | ... | ... | 31 |
| Length | ... | ... | ... | ... | ... | 32 |

REMARKS.—This form most resembles *Pterinea retroflexa*, var. *naviformis* (Conr.), but differs in its more extended hinge-line and more pointed posterior wing, as far as the left valve is concerned.

¹ McCoy: Silur. Foss. Irel., 1846, p. 21, pl. ii, fig. 7; Brit. Pal. Foss., 1851, p. 263, pl. ii, figs. 3, 3a.

The great inequality and difference of shape of the opposite valves ascribed to the same species are also characteristic and peculiar features.

EXPLANATION OF PLATE VII.

- FIG. 1.—*Trochoceras spurium*, Salter (a 466). Wenlock Shale: Bulth Bridge. Drawn nat. size.
 FIG. 2.—*Orthoceras fluctuatum*, Salter (a 611). Lower Bala (Llandeilo): Wellfield, Bulth. \times twice nat. size.
 FIG. 3.—*Pterinea exasperata*, Salter (a 816). Wenlock Limestone: Dudley. $\times 1\frac{1}{2}$ nat. size.
 FIG. 4.—Ditto (a 813).
 FIG. 5.—Ditto (a 816), 4 ribs enlarged 4 times nat. size, to show ornamentation.
 FIG. 6.—*Pterinea condor*, Salter (a 809). Lower Ludlow Beds: Dudley. Left valve. Nat. size.
 FIG. 7.—Ditto, right valve (a 810), nat. size.

II.—ON *CAMPYLOPRION*, A NEW FORM OF *EDESTUS*-LIKE DENTITION.

By Dr. C. R. EASTMAN, of Cambridge, Mass., U.S.A.

(PLATE VIII.)

IN the January number of the GEOLOGICAL MAGAZINE for 1886, an elaborate description is given by Dr. Henry Woodward of a peculiar ichthyic structure from the Carboniferous of Western Australia, which is referred by him provisionally to *Edestus*, under the specific title of *E. davisii*. Interesting comparisons are drawn between this and other known species of *Edestus*, and the hypothesis advanced that it is a pectoral fin-spine, resembling in its segmented character the Cretaceous *Pelecopterus*. This segmentation, which is so conspicuous a feature of *Edestus*, is attributed by Dr. Bashford Dean in his book on "Fishes, Living and Fossil," to a metameral origin, and he follows Leidy, Owen, Cope, Newberry, and others in interpreting all this class of remains as dorsal fin-spines.

As early as 1855 Louis Agassiz¹ compared the type-specimen of *Edestus minor*, Newberry, with the rostral prolongation of *Pristis*, and pronounced it a dermal defence, pertaining probably to the snout region of a shark or skate. Quite recently this hypothesis has been revived by Dr. A. Karpinsky, Director of the Russian Geological Survey, in his superb memoir on *Helicoprion*,² a spirally coiled form whose segments resemble those of *Edestus*, and is regarded by the author as a powerful weapon placed above the snout in the median line. To this Permo-Carboniferous genus, *Helicoprion*, the Russian Director also refers the Australian form described by Dr. Henry Woodward as *Edestus davisii*, which differs principally in the lesser extent of its spiral. In an appreciative review of his monograph, Dr. Arthur Smith Woodward³ questions the probability of Karpinsky's conjecture, and cites a recent discovery made by Dr. Traquair in the Lower Devonian of Forfarshire, which "proves

¹ Proc. Amer. Assoc. Adv. Sci., 1855 (1856), p. 229.

² Verh. k. russ. min. Ges. St. Petersburg, 1899, ser. II, vol. xxxvi, No. 2.

³ GEOL. MAG., 1900, Dec. IV, Vol. VII, p. 33.