ARTICLE VI.

DESCRIPTIONS OF THE REMAINS OF FISHES FROM THE CARBONIFEROUS LIMESTONE OF ILLINOIS AND MISSOURI.

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The present communication consists of short descriptions of remains of Cestraciont fishes, principally discovered by Dr. Benjamin Shumard of St. Louis, in the Carboniferous Limestone of Illinois.

From the variety in form of the teeth in different positions of the jaws of *Cestracion Phillippii*, the only surviving member of its family, we may infer that in the determination of extinct species from isolated teeth, which form the usual condition of the remains of Cestraciontes, we may consider as characteristic of several genera and species what may really belong to a single species. Under the circumstances the error is perhaps unavoidable; and it must be left to subsequent discovery, in which entire series of teeth in their original relationship may be found, to correct the error.

COCHLIODUS AG.

1. COCHLIODUS NITIDUS, Leidy.

This species is proposed on the specimen of a tooth, apparently from the left side of the lower jaw. The tooth is trilateral in outline, with the inner border convex, the anterior thick and straight, and that postero-externally straight and oblique in its direction. The triturating surface is transversely convex, with an anterior narrower and a posterior broad groove dividing three ridges crossing the tooth obliquely. Structure finely porous. Length from the posterior to the anterior angle seven lines; breadth of anterior border four and a half lines; breadth of inner border six lines.

Locality.—Carboniferous limestone of Chester, Illinois. Plate V., Fig. 2. Tooth of *Cochliodus nitidus.*

2. COCHLIODUS OCCIDENTALIS, Leidy.

This species is proposed on eight more or less imperfect specimens of teeth. In their perfect condition, the teeth have a trilateral outline; are strongly curved transversely; and have the outer extremity narrow, the inner border convex, the anterior part recurved, and the posterior border thick and slightly concave. The posterior two-thirds of the triturating surface are prominently convex and smooth, or wrinkled transversely or longitudinally. Structure coarsely porous. Antero-posterior diameter from eight lines to nearly an inch; transverse diameter from eight lines to one and a quarter inches.

Locality.—Carboniferous limestone of Warsaw, Illinois. Besides the preceding specimens there were discovered in the same locality fragments of six larger teeth, which are too imperfect to judge of their form. Possessing the same structure as those just described, they may probably be the middle teeth of the series in the jaws. The largest of the specimens is three lines thick, and all appear as if they might be the greater portion of trilateral plates. Their triturating surface is moderately convex and smooth, or slightly wrinkled. At one broken border it appears as if it were recurved, and at the opposite border it turns downwards at right angles, and what is probably the inner border is thick and convex.

Plate V., Figs. 3—10. Teeth of *Cochliodus occidentalis.* Figs. 11—16. Six fragments of teeth last referred to in the above description, and probably belonging to *C. occidentalis.*

3. COCHLIODUS LATUS, Leidy.

This species is proposed on a fragment of a large tooth, apparently a second of the series in the jaw. In its perfect condition the tooth has been over two inches in length, and more than one and a half in breadth. The triturating surface presents two oblique convexities separated by a shallow depression, and there may have been a third ridge at the anterior border. The postero-internal angle of the specimen is abruptly bevelled off, apparently as the result of wearing. The structure is coarsely porous.

Locality.—With the preceding species.

Plate V., Fig. 17. Tooth of *Cochliodus latus;* the margins of the specimen being broken.

HELODUS AG.

4. HELODUS GIBBUS, Leidy.

This species is proposed on a single and imperfect specimen of a tooth, which in the fragment exhibits a prominent gibbosity obscurely divided into two. Surface coarsely porous. Height of crown three lines; probable length when perfect one and a quarter inches; probable breadth in the same condition seven and a half lines.

Locality.—The Carboniferous limestone of Warsaw, Illinois. Plate V., Fig. 18.

CHOMATODUS, AG.

5. CHOMATODUS VENUSTUS, Leidy.

This species is founded on the specimen of a tooth, the crown of which forms a narrow, oblong, quadrilateral plate elevated on the outer side, into an obtuse ridge. The latter rises towards its middle into a mammillary eminence with a truncated apex, centrally impressed and punctured at the margin. Along the summit of the ridge, to one side of the principal eminence, there are five other similar but comparatively minute ones, and on the opposite side there are several others nearly obsolete. The internal side of the crown is depressed, and is bordered by four or five delicate folds of ganoine, which are likewise in a much enfeebled condition, extended on the outer side of the crown. The root of the tooth is a narrow, thin, flat plate extending in the direction of the crown. Length of the specimen seven lines; breadth at middle two lines; depth at middle one and a half lines.

Locality.—From the Carboniferous limestone of Warsaw, Illinois. Plate V. Fig. 19. Triturating surface of the tooth of *Chomatodus venustus*, magnified three diameters. Fig. 20. Profile section of the same tooth at the middle; three diameters. Fig. 21. Profile section at one side.

6. CHOMATODUS OBSCURUS, Leidy.

This species is proposed on a fragment of a tooth, the crown of which in its perfect condition appears to have been an oblique, oblong, quadrilateral plate, with an obtuse, compressed hemi-elliptical ridge extending along the outer part of the triturating surface. The latter is bordered by a basal ridge apparently worn smooth in the specimen, except in one position, where it exhibits five folds of ganoine. The root is hemi-elliptical, extended in the length of the crown, and is twice the depth externally that it is internally. Height of the specimen four and a quarter lines; antero-posterior diameter of the crown, when perfect, about four and a quarter lines; probable transverse diameter twice its present extent, which is seven lines; depth of root internally two lines, externally four lines.

Locality.—The Carboniferous limestone of Warsaw, Illinois. Plate V. Fig. 22. Triturating surface of the tooth of *Chomatodus obscurus*. Fig. 23. Profile section of the tooth.

PALAEOBATIS, Leidy.

7. PALAEOBATIS INSIGNIS, Leidy.

This species is proposed on a fragment of a remarkable tooth, recalling to mind one of the dental plates of *Myliobates*, of which plates the specimen apparently corresponds to the half of one. The upper surface of the crown is a linear plane, and its posterior side presents a single row of deep pits, of which about four may be counted in each line of extent; and below the row of pits a band-like basal ridge without folds, separates the crown,

from the root of the tooth. The anterior side of the crown has developed from it a scroll-like ridge, the edge of which is nearly on a level with the triturating surface, and includes between it and the latter a wide sulcus. The root posteriorly forms a nearly vertical plane, but anteriorly is subdivided into a series of demi-cylindrical fangs, confluent at their back part. The bottoms of these fangs exhibit the orifices of coarse nutritive canals; and the crown of the tooth is a very little more dense in structure than the root. The transverse diameter of the specimen in its present condition is eight lines, but in its perfect condition has probably been twice this extent. The antero-posterior breadth of the crown is one and a quarter lines, and the height one and three quarter lines.

Locality.—The Carboniferous limestone of Warsaw, Illinois.

The specimen upon which this species is founded appears to resemble the figure 9, of table 12, in volume iii., of Agassiz' Poissons Fossiles, representing the tooth of *Chomatodus linearis*, but the figure is so obscure that I can make nothing of its details.

Plate V. Fig. 24. Posterior view of the tooth of *Palaeobatis insignis;* magnified two diameters. Fig. 25. Anterior view of the same tooth; magnified to the same extent. Fig. 26. Profile section of the same tooth; magnified four diameters.

CTENOPTYCHIUS, AG.

8. CTENOPTYCHIUS DIGITATUS, Leidy.

The species is proposed on a fine specimen of a remarkable-looking tooth discovered by Mr. Koch, the celebrated explorer of extinct animal remains, and presented by him to Dr. Shumard of St. Louis.

The crown is palmate in form, with the sides vertical, excepting that the outer one slopes inferiorly to the basal ridge. The summit is divided into four unequal, thick, obtuse, digitate processes, of which the median pair are confluent. The basal ridge descends much lower externally than internally, and in the former position is acute, in the latter thick, and presenting only the faintest trace of folding. The root slopes inwardly from the basal ridge on the outer side, and its inner side presents an extensive shallow excavation. Length of the specimen nine lines; breadth nine lines; length of the crown externally six lines; internally three and a half lines; depth of the root externally three and a half lines; internally five lines.

Locality.—Carboniferous limestone, near St. Louis, Missouri. Plate V. Fig. 27. Internal view of the tooth. Fig. 28. External view. Fig. 29. Profile section.