

spect. It, however, further differs in the relatively more compressed or oval centrum, and much greater size. From *H. minor* the present reptile differs in the opisthocoelian vertebræ, the known caudals of the former having plane articular surfaces, and in the much larger size. It is not possible to compare similar parts of this species and the *Ornithotarsus immanis*, Cope, but the larger size and much lower stratigraphic horizon of the latter renders their identity very doubtful.

Should the genus *Thespesius* of Leidy turn out to be well established, the present species will enter it. I am not, however, entirely satisfied that the difference in the form of the articular faces of the caudal vertebræ is such as indicates generic difference. It was on this ground that I referred this form to *Hadrosaurus* (in Synopsis Extinct Batr. Rept. N. Amer., p. 98), and not from misapprehension of Leidy's definition of it, as the latter supposes (Proceed. Aca. Nat. Sci., 1870, p. 67).

The rather slight material above described is fortunately so characteristic as to enable us to establish satisfactorily the existence of another monster of the remarkable group of the Dinosauria; beings, whose appearance and structure have rivalled the strangest creations of the imagination, and shown again what every other page of the book of nature teaches, that reality is stranger than fiction.

On Two extinct forms of Physostomi of the Neotropical Region.

By E. D. COPE, A. M.

(Read before the American Philosophical Society, March 3, 1871.)

Fam. ELOPIDÆ.

PRYMNETES, Cope.

Dorsal fin above the anal with short basis and very elongate rays; the posterior ray free and longer than the others. Ventrals posterior. Vertebræ with deep lateral grooves, disproportionally numerous in the abdominal region, viz.: Abd. 49, caudal 18. Tail deeply bifurcated, its exterior or supporting rays, like those of the dorsal, ventral and pectoral, very stout and obliquely segmented. Head short, mouth (in the specimen) inferior; teeth simple, small. Scales with many concentric grooves and a few radii on the proximal portion. No lateral line discoverable.

The pertinence of this genus to the Elopidae is indicated in various ways. The general form is that of *Elops* and *Megalops*, and the normal and supernumerary ribs are quite as in the former. The interneural spines extending from the head to the dorsal fin, are quite like those of the same genus. It differs from both in the posterior position of dorsal fin, and relatively numerous abdominal vertebræ. From *Elops* it differs especially in the long posterior lash-like ray of the dorsal, and the deeply grooved vertebræ.

PRYMNETES LONGIVENTER, Cope, sp. nov.

Established on a very fine and nearly perfect specimen, preserved on a

block of lime slate from Chiapas, Mexico. The body is seen in profile, but the head has been pressed from above, and the view is therefore oblique.

The general form is elongate. The pectoral fins are inserted at the pectoral plane, and are of moderate length. The ventrals are short and small. It is uncertain whether they reach the anal, as the anterior part of that fin is destroyed. From the small number of interhæmal spines, the anal has probably had a short basis. Caudal lobes narrow. A strong horizontal interneural spine. The anterior interneurals are like those of *Megalops*, slender, gently curved rods, apparently, but not really continuous with the neural spines in some places. The dorsal fin laid backwards extends to the emargination of the caudal. The vertebræ near the head are not altered. There appears to have been a laminiform crest on the head, but the bones thus described may be those of the opposite side of the cranium. The muzzle appears to be contracted and projecting beyond the mouth. Three narrow obtuse teeth appear on the edge of the premaxillary bone. Dentary bone, stout. Orbit, round, large; entering 4.66 times the head to the posterior margin of the operculum, and 1.33 times the length of the muzzle. Operculum rounded.

Radii; D. 2. 13. 1, C. ? ? 6, 6, A. ? V. ? I. 7. P., apparently not numerous, but very numerous divided. There are about twenty-five longitudinal series of scales at a point a short distance anterior to the ventral fins.

| | M. |
|---------------------------------|--------|
| Total length..... | 0.530 |
| Length to orbit..... | .024 |
| Vertical diameter of orbit..... | : .018 |
| “ dentary bone..... | .016 |
| Length to opercular border..... | .086 |
| “ ventral fins..... | .310 |
| “ dorsal “..... | .363 |
| “ basis caudal..... | .380 |
| Depth at pectoral fins..... | .085 |
| “ ventral “..... | .074 |
| “ posterior margin dorsal..... | .04 |
| “ basis caudal..... | .02 |

This species was found near Tuxtla Chiapas, Mexico, by Dr. J. Berendt, and by him sent to the Smithsonian Institution. Mus. No. 9819-20.

Fam. (?) CHARACINIDÆ.

ANÆDOPOGON, Cope.

Mouth opening almost vertically upwards. Dentition weak, consisting of lancet shaped teeth on the dentary and premaxillary bones; maxillary without or with minute teeth. Post-temporal bone large. Scales with few radii, no concentric grooves or cells.

The pertinence of this genus to the *Characinidae* cannot be considered as entirely established, as the specimen described does not display any of the fins. The appearance is not unlike that of *Osteoglossum*, but the structure of the scales distinguishes it. The great development of the *sub- and postorbital bones*, and small size of the preorbital, distinguish it as allied to the Characins. Its dentition and general form approach the genus *Anacyrtus* Müll. but it is at the same time distinguished by the lack of maxillary teeth. In addition, it appears to lack the anterior inter-neural spines found in so many Characin and Clupeoid genera, and in families allied to them. They are at least not apparent on the faces of two fractures across the vertebral column. Three *vertebrae* are exposed throughout their length. They are longer than deep, and exhibit the two lateral grooves common to so many Teleosts. The only *scales* preserved are those above the pectoral fins, with but few above the vertebral column. None of these present traces of the lateral line. The *clavicle* makes a right angle with its inferior limb, and with the coracoid, and is produced backwards at the base of the pectoral fin. The *epiclavicle* and *post-temporal* are wide bones. The *operculum* is developed upwards to the epiotic, and the interoperculum is present. A fragment represents the *suboperculum*, which was probaly a narrow bone. The *coracoid* was a broad vertical lamina, extending horizontally forwards to below the preoperculum.

ANÆDOPOGON TENUIDENS, Cope.

Orbit round, its diameter entering the length of the head five times, and a little exceeding that of the muzzle and closed under jaw. The profile is gently descending and perhaps slightly concave; the symphysis mandibuli is very stout and presents an angle outwards; the inferior margin of the dentary is slightly convex. The maxillary bone is slender. The suborbital bones together form a shield deeper than wide; with the postorbitals they reach the preoperculum. The head increases rapidly in depth. The scales are large, and extended below the operculum on the sides of the coracoid region. They have smooth margins, and are everywhere quite thin. The surface is glistening, and in some scales exhibits under the microscope delicate parallel lines which separate short concave lines. The middle of the scale is marked with obtuse tubercular radii, or small or minute tubercles.

| <i>Measurements.</i> | <i>M.</i> |
|-------------------------|-----------|
| Length of head..... | 0.14 |
| “ of mouth..... | .061 |
| “ of coracoid bone..... | .091 |
| Depth head at eye..... | .093 |
| “ “ vertex..... | .126 |
| “ suborbital bone..... | .044 |

Six series of scales between basis of pectoral fin and vertebral column. A mandibular tooth is lancet shaped, and with minutely striate enamel. A premaxillary is more conic; both are rather small.

This species may have more affinities with *Amia* than with the *Characinae*. A single specimen was obtained in a clay nodule by the naturalists of the U. S. Paraguay Expedition under Capt. Page, from the neighborhood of Para. It was accompanied by several specimens of a fish from other nodules, which closely resembles an *Aspidorhynchus*. Museum of the Smithsonian Institution.

On the occurrence of fossil Cobitidæ in Idaho.

BY E. D. COPE.

(Read before the American Philosophical Society, March 3, 1871.)

Of the five genera of extinct Cyprinidæ and allied forms discovered by Capt. Clarence King* in the fresh water deposit of Catharine's Creek, etc., Idaho, the writer has been able to indicate the affinities of three. Thus *Semotilus*, *Anchybopsis* and *Mylocyprinus*, were regarded as representations of existing types of both carnivorous and herbivorous habits. *Oligobelus* and *Diastichus* were not assigned to any definite position in relation to known types of the same great group, and I am still compelled to leave the former in the same uncertain position. *Diastichus* I find, on the other hand, presents the peculiar direction of the pharyngeal teeth which is characteristic of the *Cobitidæ*, and I suspect that it represents a form of that family. I am entirely confirmed in this conclusion by the discovery, among the specimens submitted to me by the Smithsonian Institution, of the inferior element of the three modified anterior vertebræ, which are so characteristic of certain families of the *Physostomous* fishes. This portion, moreover, is that which occupies this position among the *Cobitidæ* only among them. It consists of a longitudinal plate terminating posteriorly in a bladder-like chamber on each side, each of which is closed below by a transverse process of the inferior plate: an angular fissure extends round the ends of these, and at the angle sends a short continuation upwards. This is quite similar to what is observed in *Cobitis*. The specimen described is apparently adult, and indicates a considerably smaller species than either the *Diastichus macrodon* or *D. parvidens*.

The occurrence of Cobitidæ is perhaps the most interesting fact brought to light by the examination of these extinct fishes. All of the numerous existing species are found in the Eastern Hemisphere, and the great majority in tropical Asia, a few only occurring in Europe and South Africa. Extinct species are found in the Miocene of Oeningen. We have, then, in the genus *Diastichus* another example of the occurrence of Asiatic types in North America prior to the glacial epoch, and as in a freshwater fish, strongly suggestive of continuity of territory of the two continents.

* See Proceed. Amer. Philos. Soc., 1870, 539.



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