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by O.C. Marsh.**

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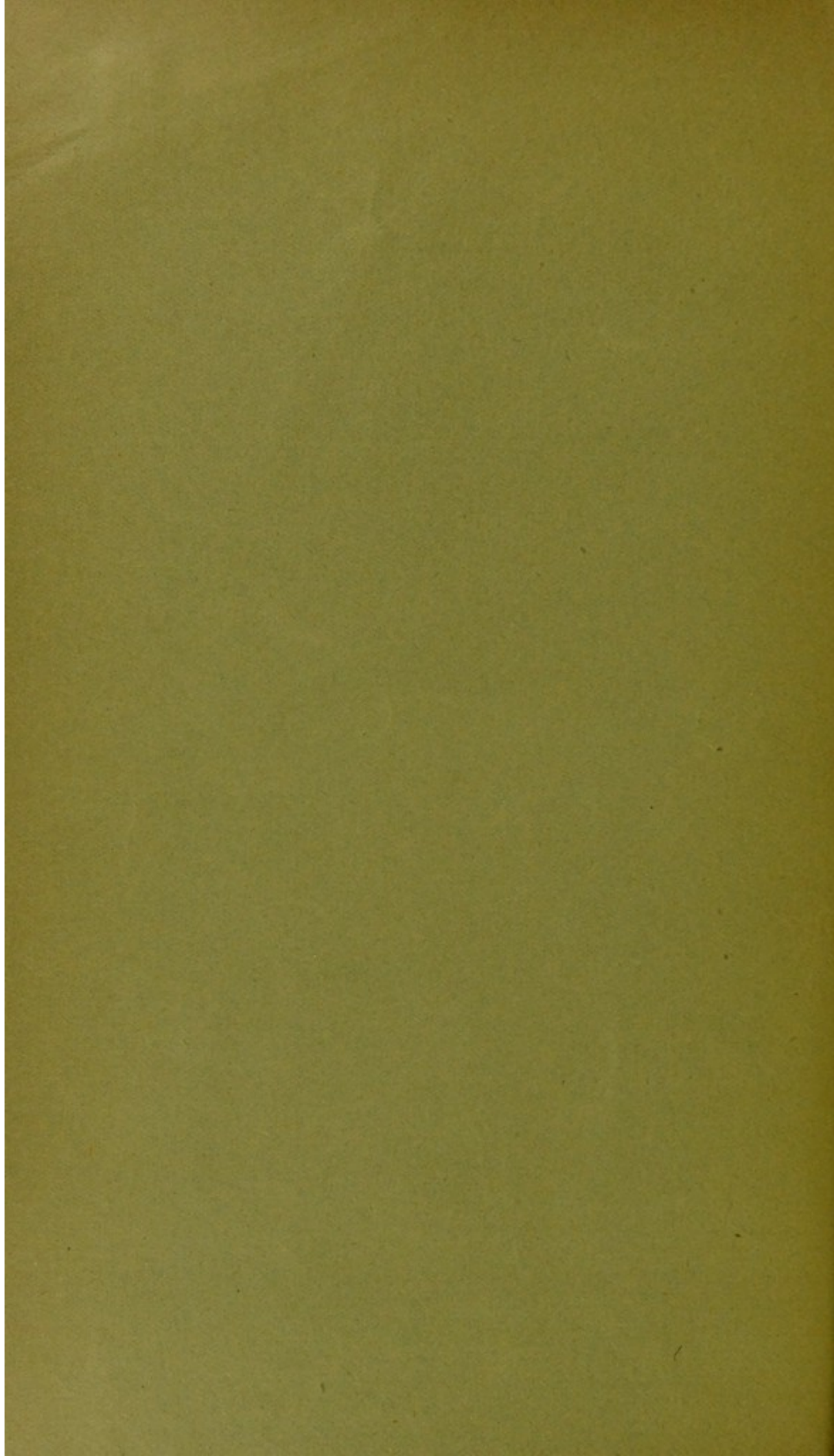


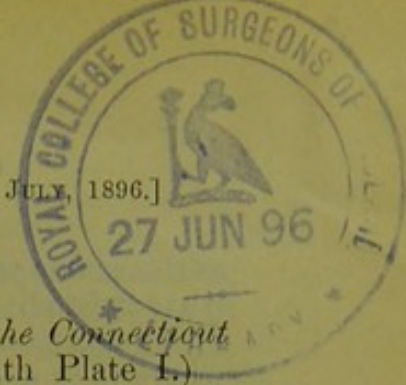
[FROM THE AMERICAN JOURNAL OF SCIENCE, VOL. II, JULY, 1896.]

A NEW BELODONT REPTILE (*Stegomus*) FROM
THE CONNECTICUT RIVER SANDSTONE.

By O. C. MARSH.

WITH ONE PLATE.





A New Belodont Reptile (STEGOMUS) from the Connecticut River Sandstone; by O. C. MARSH. (With Plate I.)

THE red sandstone of the Connecticut valley has long been famous for its footprints, especially the so-called "bird tracks," which are now very generally believed to have been made by Dinosaurian reptiles. These strata, however, like most deposits of similar physical character in other parts of the world, contain few osseous remains, and those discovered here, almost without exception, belong to carnivorous Dinosaurs of Triassic types, as the writer has shown elsewhere.

The *Belodontia*, one of the most characteristic groups of Triassic reptiles, are almost unknown in the Connecticut river sandstone, a single specimen only having been discovered, and recently named by the writer *Belodon validus*.* No footprints that can be referred to this order of reptiles have yet been found among the thousands brought to light in this region, although a careful search for such impressions has long been maintained, especially in the horizons where they were most likely to be preserved.

During the past year, a noteworthy discovery has been made in the Connecticut sandstone, within the city limits of New Haven, and it is the main object of the present paper to place this discovery on record, both on account of its local interest and its scientific importance. The specimen found is represented in the accompanying plate, one-third natural size. The fossil shows the impression of the dermal armor of a large reptile, which apparently represents a new genus of the *Belodontia*. The dermal covering thus preserved is mainly from the dorsal region, although the anterior part protected the back of the neck. No other portions of the dermal armor nor any of the skeleton were found, although a careful search was made at the time of the discovery and subsequently, both at the locality itself and in the vicinity. It is therefore probable that the dermal covering here described was torn from the animal after death and before entombment in the coarse sand and gravel then deposited by a strong current, as indicated by the present structure of the sandstone.

In the fossil represented in the accompanying plate, the dorsal region of the reptile is shown, with the anterior portion to the left. The median dorsal line is indicated by the narrow longitudinal ridge, placed nearly horizontal in the figure. In the cervical region, this nearly straight line is broken,

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as the armor was here turned slightly to the right and somewhat twisted. This median ridge was formed by the matrix filling the narrow space between the ends of the dorsal plates, where they met in pairs on the median line. The transverse ridges are likewise due to the filling in of the matrix between the adjoining plates, which evidently were somewhat separated by connecting tissue admitting of more or less motion, but which held the whole dorsal armor together as a carapace.

The large median plates indicated in this fossil are twenty in number in each of the two rows meeting on the middle line. These plates are elongated transversely, strongly convex, and their form is accurately shown in the figure. Their inner extremities are nearly at right angles to the sides, but the outer ends are oblique where they join the plates of the lateral series, or second row. These lateral plates were quite short, and their form and position are clearly preserved in the specimen figured. All the dermal armor indicated resembles, in its general features, the corresponding portions in the genus *Aëtosaurus*, Fraas, from the upper Trias of Germany. In the latter, however, the plates are imbricate.

The above description is based upon the impressions left by the inferior side of the plates upon the plastic matrix in which they were imbedded. The plates themselves have since disappeared, having been dissolved by infiltrating waters. The cast of the superior surface of the plates was of somewhat softer material than the matrix below, and most of it was lost in removing the specimen. The portions recovered show that the upper surface of the plates was rugose, but not deeply sculptured, being less marked in this respect than in the other known species of *Belodonts*. The rough surface preserved shows no regular pattern of ornamentation, and there are no indications of a crest on the plates. The form and position of the plates are characteristic features, and as both the genus and species appear to be distinct, the reptile may be known as *Stegomus arcuatus*. The animal when alive was of moderate size, probably eight or ten feet long. This would be about two-thirds the size of *Belodon validus*, the scapula of which is eight and one-half inches in length. The fossil here described indicates an animal with a body capable of some lateral flexure and considerable vertical movement. The type specimen was found by F. P. Clark, and presented by D. A. Van Hise to the Yale University museum.

Outside the Connecticut valley, remains of *Belodontia* have been found at several points in this country. Some of the best known were discovered by Prof. Emmons in the Triassic of North Carolina, most of the specimens having been obtained in the Deep river coal mines. One of these fossils is the skull figured by him under the name *Rutiodon Carolinensis*.*

* Manual of Geology, p. 179, 1860.

The genus is a distinct one, the characters now known separating it widely from *Belodon* of von Meyer, from the Keuper of Württemberg. This is indicated in figures 2 and 3, below.

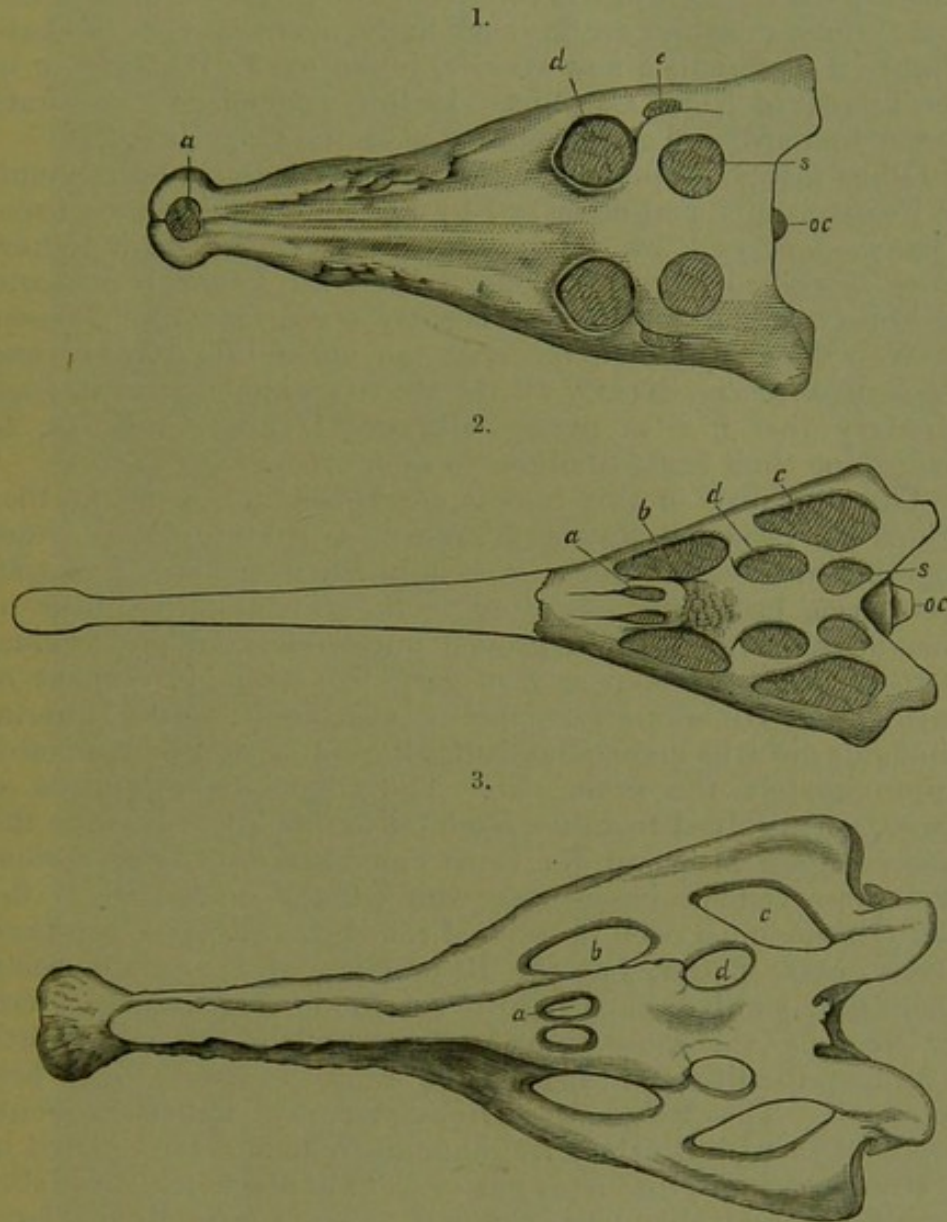


FIGURE 1.—Diagram of skull of *Diplosaurus felix*, Marsh.

FIGURE 2.—Diagram of skull of *Rhytidodon rostratus*, Marsh.

FIGURE 3.—Diagram of skull of *Belodon Kapffi*, von Meyer.

a, nasal aperture; *b*, antorbital opening; *c*, infratemporal fossa; *d*, orbit; *oc*, occipital condyle; *s*, supratemporal fossa.

Figure 1 is one-fourth, and figures 2 and 3 are one-eighth natural size.

The diagram of the skull of *Belodon* shows that the supratemporal openings, characteristic of the true crocodilians, are wanting, while in the genus *Rhytidodon* (*Rutiodon*), they are present, and in their usual position. The fluted teeth of

the latter genus are different from those of *Belodon*. Figure 1 shows the skull of *Diplosaurus*, a crocodilian from the Jurassic of Colorado. The superior nasal aperture (*a*) is in front, as in existing crocodiles, while in the Belodonts, as shown in figures 2 and 3, these openings are far back in the upper part of the skull. Figure 2 represents a new species, found by J. B. Hatcher in the Triassic of North Carolina. In this specimen, the quadrate slopes forward, and not backward as in the *Crocodylia*.

Other fossils of apparently the same group have been found in Pennsylvania, and described by Lea under the generic name *Centmodon*, and by Leidy, as *Omosaurus*. Still others were described later by Cope, from both Pennsylvania and North Carolina, and more recently some from the Triassic of New Mexico, which received the names *Typothorax* and *Episcoposaurus*. Nearly all the above specimens are so fragmentary that it is at present difficult, if not impossible, to determine their exact relations to each other.

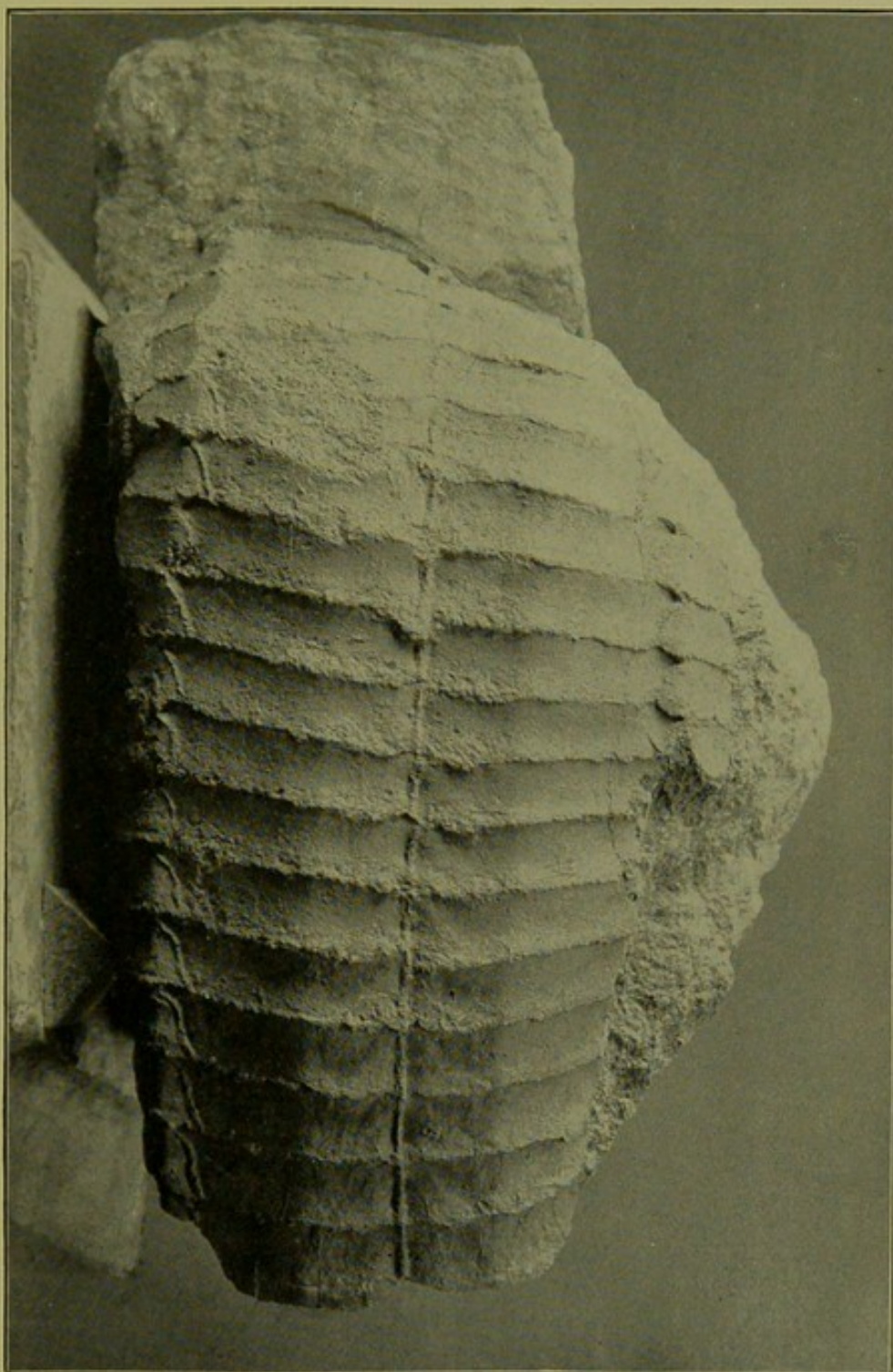
The difficulty in this case is practically the same as that which has occurred time and again in separating fossils found together at other localities, especially where genera of reptiles have been based upon isolated teeth, which, unlike those of mammals, have so often proved unreliable. In the original locality of *Belodon*, near Stuttgart, in Germany, remains of carnivorous Dinosaurs (*Zanclodon*) also occur, while Labyrinthodonts are still more abundant, all represented by species of approximately the same size. The fragmentary remains of these, when mixed together, have led to much confusion, as the many names proposed for them demonstrate. After various well-preserved specimens were studied, the separation of the Labyrinthodonts, even in isolated remains, became a comparatively easy matter, but the Belodonts and Dinosaurs, being more nearly allied, have hardly yet found their proper places.

Precisely the same thing occurred when the rich North Carolina localities of nearly the same horizon were first explored. The Belodonts, Dinosaurs, and Labyrinthodonts were all there, with their fragmentary remains commingled in a still more indiscriminate manner. This was in part true, also, of the Pennsylvania localities, and those in New Mexico have likewise contributed their share to the general confusion. The discovery of more perfect specimens will doubtless gradually remove the obscurity now existing as to the strange vertebrate fauna of this extensive horizon.

Yale University, New Haven, Conn., June 5, 1896.

EXPLANATION OF PLATE I.

Impression of dermal armor of *Stegomus arcuatus*, Marsh. One-third natural size. From the Triassic sandstone, New Haven, Conn.



STEGODUS ARCUATUS, Marsh. One third natural size.

