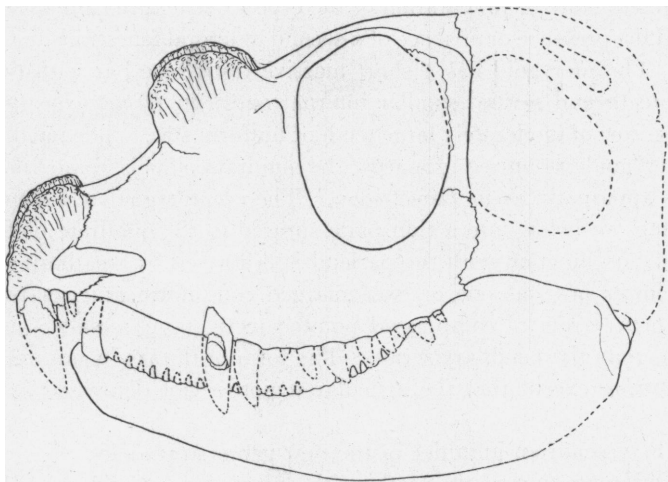


**Article XI.—A FOUR-HORNED PELYCOSAURIAN FROM THE
PERMIAN OF TEXAS.**

BY W. D. MATTHEW.

***Tetraceratops insignis* gen. et sp. nov.**

The collections of Permian vertebrata brought together by the late Professor Cope are now being catalogued, arranged and prepared for exhibition and study at the American Museum under direction of Prof. Henry F. Osborn. While engaged upon this work the writer came across a skull which appears to represent a new and remarkable genus of Pelycosauria. The specimen, No. 4526 Am. Mus., Cope Coll., was collected by Mr.



Tetraceratops insignis, natural size.

Charles H. Sternberg in 1897 in the Permian beds of Baylor County, Texas. It consists of a fairly complete skull about ten centimeters long with one ramus of the lower jaw complete. The temporal arches of the right side are gone and the whole specimen is somewhat crushed laterally and partly buried in a hard matrix.

The most noticeable feature is the presence of two pairs of prominent bony bosses or "horns," one rising from the premaxillaries, the other from the prefrontals. These bosses project upwards from the skull, are laterally

compressed, longer than high, rugose toward the tips and were probably crowned with a horny cap.

The premaxillaries bear a pair of large caniniform tusks set near together and projecting downwards, followed by two or three small teeth. Behind them is a diastema of 17 mm. to the enlarged maxillary canine. Behind the canine is a row of 9 or 10 smaller teeth, the last three laterally compressed, and rapidly decreasing in size. The dentition appears to be much as in *Dimetrodon* except that the caniniform teeth are more differentiated in the new genus and the curvature of the tooth line much less, especially at the diastema.

The orbit is remarkably large and much further forward than in *Dimetrodon* and the borders are not so prominent; its vertical diameter is nearly one half greater than the horizontal. The face is high and compressed, the top of the skull very narrow. The temporal and occipital region is comparatively massive, with certainly one large postorbital fenestra, but in the present state of preparation of the type its structure cannot be clearly seen, and the presence or absence of a second temporal fenestra is not demonstrable. The pterygoid has a short massive transverse bar with two large external teeth and several smaller internal ones; in *Dimetrodon* there is a transverse row of moderately large teeth of uniform size. The palatal plates of the pterygoid are buried in matrix, the quadrate plate is broad and flat, its relations apparently as in *Dimetrodon*. The epipterygoid is a slender rod broadening out below into a thin plate sutured to the quadrate plate of the pterygoid; its junction with the parietal is destroyed by weathering.

The lower jaw has one or two enlarged caniniform anterior teeth and behind them a row of compressed pointed teeth, much smaller and more numerous than the maxillary series. The form of the jaw is not unlike that of *Dimetrodon* except that the articular region is not depressed as in that genus.

The Pelycosaurian affinities of the new genus appear in:

1. Differentiation of the teeth, with enlarged premaxillary and maxillary tusks separated by a diastema for the mandibular tusk, remaining teeth simple, pointed, laterally compressed, the mandibular series smaller.

2. High narrow skull, rimmed orbit.

3. Heavy transverse bar on pterygoid, with comparatively large teeth set along it.

The above specializations differentiate the typical Pelycosauria from the primitive Diapsidan or two arched type represented by the Protorosauria. They are further distinguished by the great elongation of the neural spines of the vertebræ, but these are unknown in the new genus. In *Dimetrodon* the articular region of the jaw is much depressed and the adjoining parts of

the skull much extended downwards; the curvature of the tooth row is much greater and the orbit much farther forward. In these respects the new genus is far more primitive. On the other hand, the relative enlargement and specialization of the caniniform teeth on premaxillary, maxillary, dentary and pterygoid is further advanced in *Tetraceratops*. The peculiar "horns" are not indicated in *Dimetrodon* or *Clepsydropus*, nor in any of the more primitive genera which Case has included under the order Pelycosauria. Among reptiles the nearest approach to them is seen in the carnivorous Dinosaurs *Ceratosaurus* and *Allosaurus*. In both genera the prefrontals have bony horns similar to those of *Tetraceratops* but more rudimentary. In *Ceratosaurus* a median nasal horn is also present between the premaxillaries. As the carnivorous Dinosaurs have a very considerable adaptive resemblance in the skull to the Pelycosauria, combined with a more remote genetic relationship, the parallelism is not surprising. The skull has a considerable superficial resemblance to that of the Oligocene artiodactyl *Protoceras*.

From the relationship to *Clepsydropus* and *Dimetrodon* it may be inferred that the vertebral spines of *Tetraceratops* were probably elongated into a high dorsal fin. I have not seen in the collections any vertebræ of this type which appeared small enough to be of appropriate size. As the genus is evidently a highly specialized predaceous adaptation, the skull would probably be of relatively large size to the skeleton, and should be correlated with long-spined vertebræ of smaller size than those with the less specialized and somewhat larger skull of *Clepsydropus natalis*. But the skeletal association must remain conjectural for the present.

