

**Article XIX.—REPTILIAN AND STEGOCEPHALIAN REMAINS
FROM THE TRIASSIC OF PENNSYLVANIA IN THE
COPE COLLECTION**

BY F. VON HUENE, Tübingen

The whole Triassic Cope Collection has been sent over to me for reëxamination from The American Museum of Natural History in New York City. Therefore my hearty thanks are due to Professor H. F. Osborn and Dr. W. D. Matthew. The collection consists of New Mexican and Pennsylvanian fossils. In a previous paper¹ I gave some observations on the New Mexican part of that collection and now the Pennsylvanian fossils are to be briefly treated.

The most important part of the Pennsylvanian Triassic collection consists of nicely preserved teeth which have been described and named, but not all of them have been figured, and some have been figured in rather rare papers. Therefore some doubts have existed about what these teeth are like and as to their classification. It is necessary to have good figures of these types, although no interesting conclusions are to be made from them. Only after this has been done can they be identified with skulls and skeletons more completely preserved. Most of them belong with the Parasuchia, and since the paper of McGregor (1906) have been considered as synonymous with *Rutiodon carolinensis*. In addition to these teeth the collection contains the bones of "*Belodon*" *lepturus*, also considered as synonymous with *Rutiodon carolinensis* by McGregor. With the parasuchian remains there are a few saurischian teeth, also some stegocephalian and possibly pterosaurian bones.

I. **PARASUCHIA**

***Palæoctonus appalachianus* Cope**

Figures 1 and 2

The teeth indicate an enormous parasuchian skull, possibly something like *Machæroprosopus validus* Mehl.² There are posterior and anterior teeth. Cope has figured one of each kind. The posterior tooth is compressed and relatively short and broad, with sharp and finely serrated longitudinal edges. The medial side of the tooth is nearly flat, the lateral side more rounded. The anterior edge is nearly straight, the posterior more curved, so that the top of the tooth points a little

¹1915, Bull. Amer. Mus. Nat. Hist., XXXV, pp. 485-507.

²1916, Quart. Bull. Univ. Oklahoma, N. S. 103, March, p. 6.

more to the anterior direction. The whole tooth is very slightly curved in transverse direction (little convex laterally and little concave medially). As all illustrations of the teeth are given in natural size or $\times 2$, I do not think it necessary to give measurements.

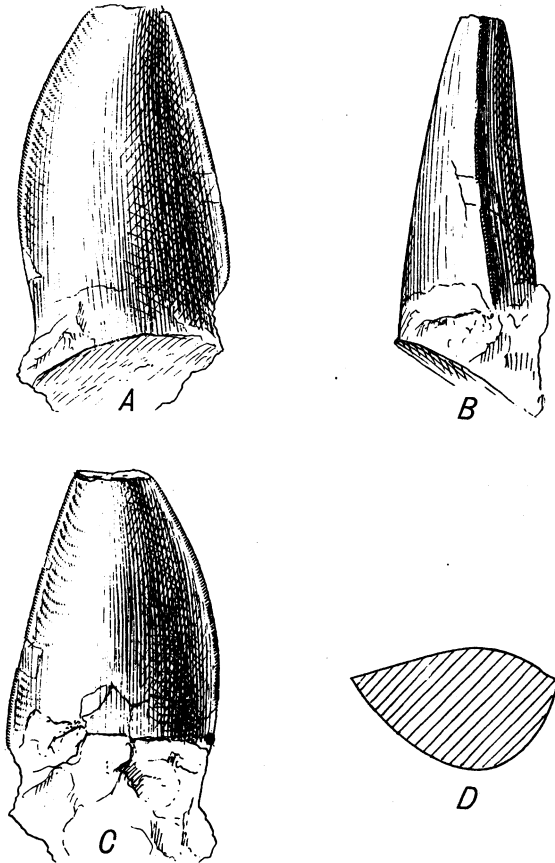


Fig. 1. *Palaeodonus appalachianus* Cope (No. 2320). Natural size. Posterior tooth. Three aspects: lateral (A); anterior (B); medial (C); with section (D).

The anterior tooth (Fig. 2) is very much higher and less compressed; viewed from outside it looks nearly round, only the medial side is nearly flat. The latter is bordered by two longitudinal edges with the same serration as in the posterior tooth, only the edges are not so sharp as in the posterior tooth. The top of this tooth is very acutely pointed; this

is also true in another specimen. The transverse curvature is rather more than in the posterior tooth, but is only very slight in the second specimen.

The teeth figured by Cope have the number 2320, and the other two 2329.

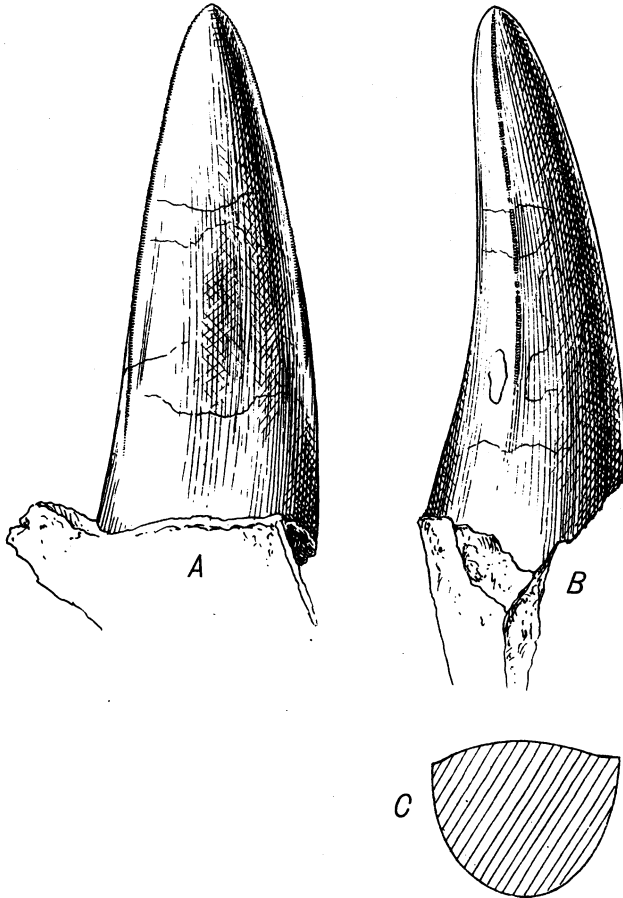


Fig. 2. *Palæoctonus appalachianus* Cope (No. 2337). Natural size. Anterior tooth. Anterior (B) and lateral (A) aspects, with section (C).

***Palæoctonus aulacodus* Cope**

Figures 3 and 4

These teeth have also been described as *Suchoprion aulacodus* by Cope. They are smaller than *P. appalachianus* and relatively thicker, but are also somewhat compressed. The difference between the flat

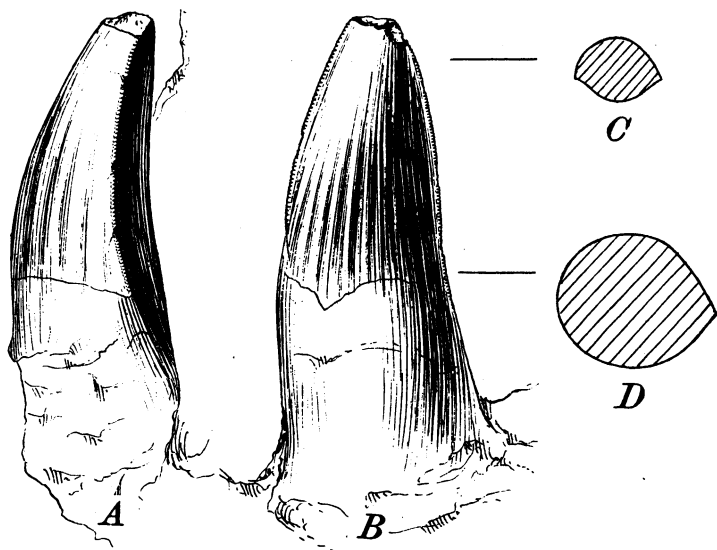


Fig 3. *Palæortonus aulacodus* Cope (No. 2335). $\times 2$. Anterior (A) and lateral (B) aspects, with sections (C, D).

medial and the much rounded lateral side is great. Both longitudinal edges are finely serrated. The posterior edge is shorter than the anterior, especially in the smaller of the two teeth; the anterior edge runs the full length of the crown. The smaller of these teeth shows very slight indications of longitudinal ridges in the lower part of the lateral face. In the figure they are perhaps a little too strong. The transverse curvature is rather well shown in both teeth.

***Suchoprion sulcidens* Cope**

Figure 5

There is only a single tooth mentioned by Cope with this name, but never described or figured. This tooth is nearly round in horizontal section. It is especially characterized by the longitudinal ridges in the middle and lower part. In the upper half are two slight longitudinal edges, one of them with very minute serration, the other without serration, but the top of the tooth is broken and might have been serrated in the uppermost part. The tooth possesses a well-marked transverse curvature and resembles the teeth of *Mystriosuchus planirostris* of Württemberg.

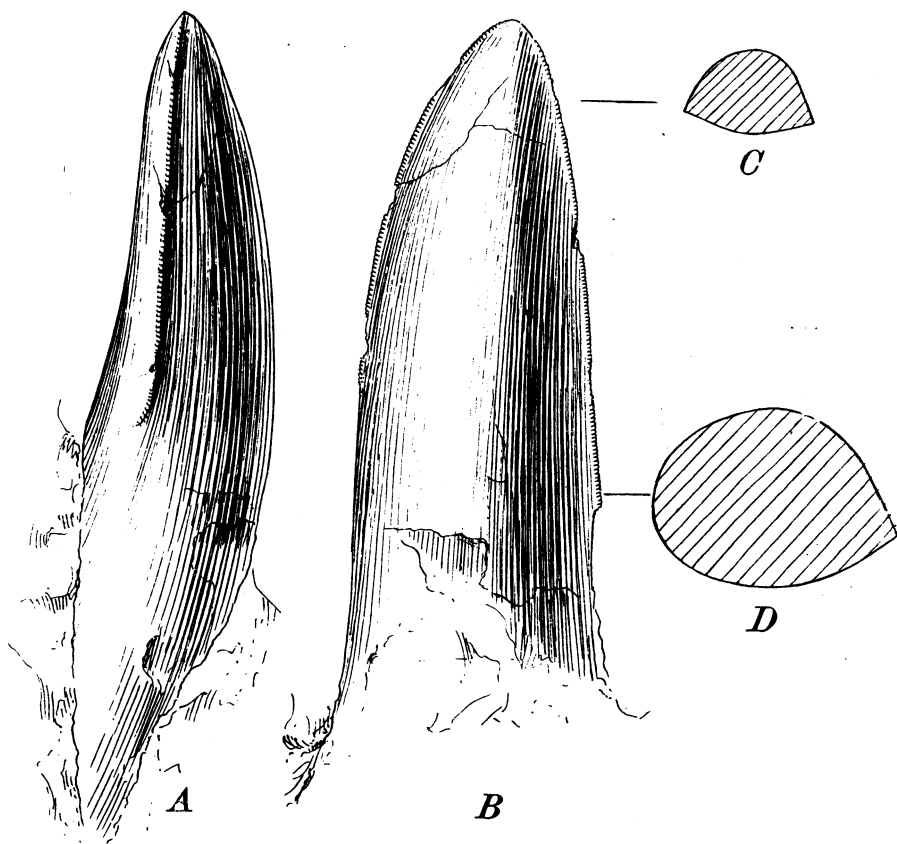


Fig. 4. *Palæoctonus aulacodus* Cope (No. 2335). $\times 2$. Anterior (A) and lateral (B) aspects, with sections (C, D).

Suchopriion cyphodon Cope

Figure 6

There are a few teeth of this type. They are round in horizontal section and are nicely curved in transverse direction. Two longitudinal edges border the narrower medial side. These edges consist of extremely minute and short serrations.

Clepsysaurus pennsylvanicus Cope

Figure 7

Of *Clepsysaurus pennsylvanicus* there is the type specimen of Cope and Dana, marked with number 2337. It is an acute, slender tooth, round in section, but rather thicker than broad. It has a very slight

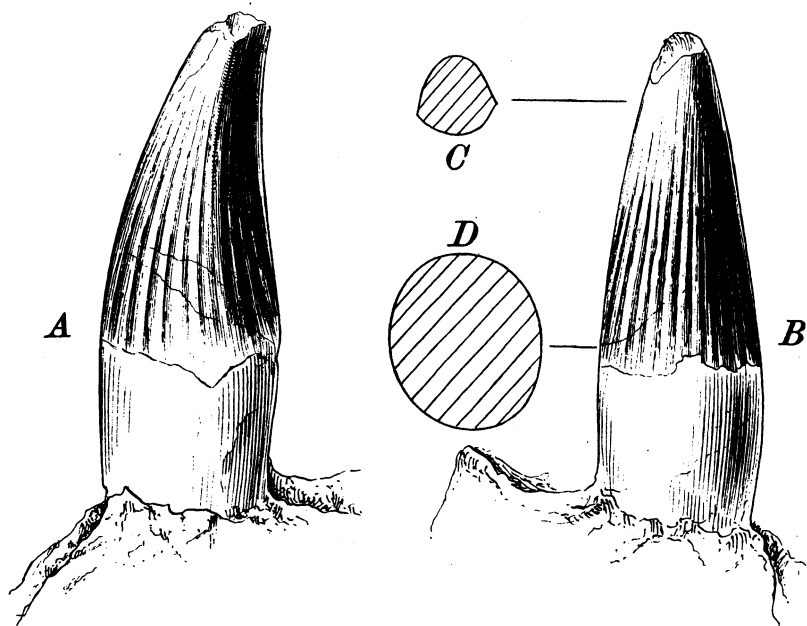


Fig. 5. *Suchoprion sulcidens* Cope. $\times 2$. Anterior (A) and lateral (B) aspects, with sections (C, D).

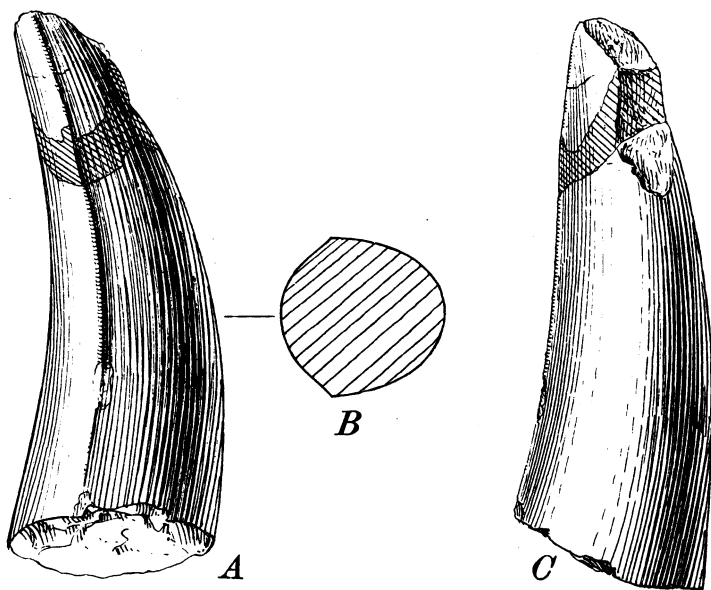


Fig. 6. *Suchoprion cyphodon* Cope (No. 2331). $\times 2$. Posterior (A) and lateral (C) aspects, with section (B).

double curvature in transverse direction and possesses two longitudinal edges without any serration, just cutting. They are both as long as the preserved part of the tooth, which is practically the complete crown.

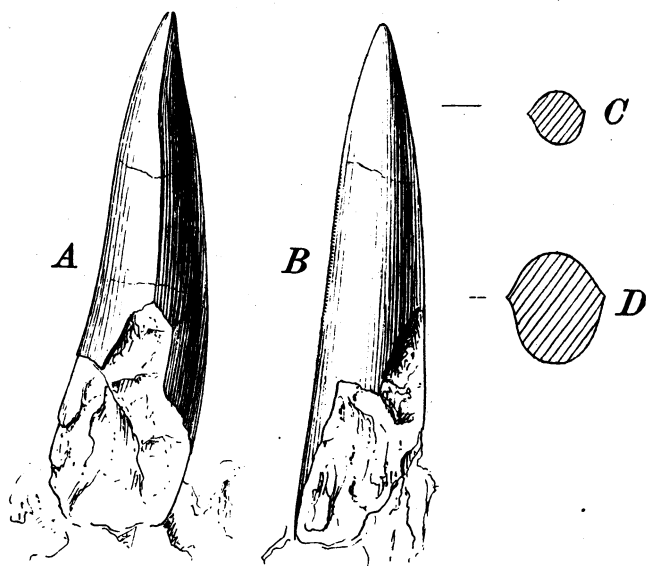


Fig 7. *Clepsysaurus pennsylvanicus* Cope (No. 2337). $\times 2$. Two aspects (A, B), with sections (C, D).

***Clepsysaurus veatleianus* Cope**

Figures 8 and 9

The tooth representing this species has not previously been figured. It is nearly straight, slightly compressed and has only one sharp longitudinal edge with well-marked but minute serrations.

It is probable that another tooth (Fig. 9) associated in the collection with *Suchoprion cyphodon* belongs to *Clepsysaurus veatleianus*. It is larger than the type specimen. The upper half of it is broken off. This tooth is also slightly compressed, has one cutting serrated edge; the opposite side is rounded. The tooth is curved not in transverse but in sagittal direction.

"*Palæosaurus*" *fraserianus* Cope

Figure 10

The tooth to which Cope gave this name resembles very much the former species, but it is a good deal smaller. It has only one cutting edge with minute serration, and the opposite side rounded and rather

thick. It is curved in sagittal direction as in the former species. I suppose that the teeth of *Clepsysaurus vealleianus* and *Palæosaurus fraserianus* represent the same species, and as the former name was given a year earlier the second should disappear, if this conclusion be true.

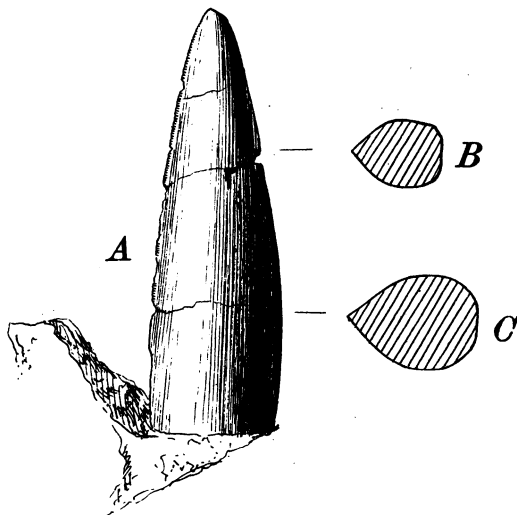


Fig. 8. *Clepsysaurus vealleianus* Cope (No. 2330). Natural size. Lateral aspect (A), with sections (B, C).

"Belodon" priscus Cope

Figure 11

This tooth is scarcely distinct from the preceding one, except that it is much less curved and the fine serration at the cutting posterior edge is restricted to the upper half; it probably belongs, however, to the same species.

REMARKS ON THE DIFFERENT SPECIES OF THE ABOVE-MENTIONED PARASUCHIAN TEETH

Possibly to a single or more probably to two species of long and low-snouted parasuchians belong Cope's following types of teeth:

Perhaps not belonging with following teeth	{ <i>Suchoprion cyphodon</i> <i>Clepsysaurus pennsylvanicus</i> " <i>vealleianus</i> " <i>Palæosaurus" fraserianus</i> " <i>Belodon" priscus</i>

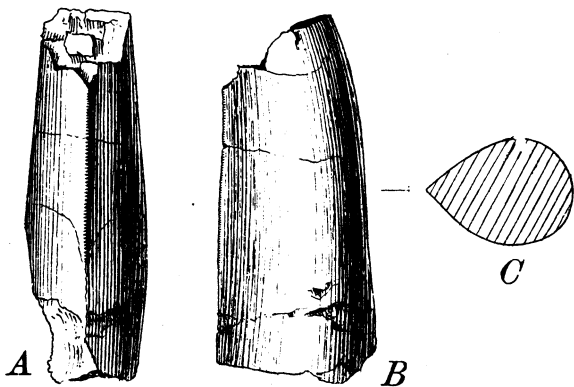


Fig. 9. *Clepsysaurus vealleianus* Cope (No. 2331). X 2. Posterior (A) and lateral (B) aspects, with section (C).

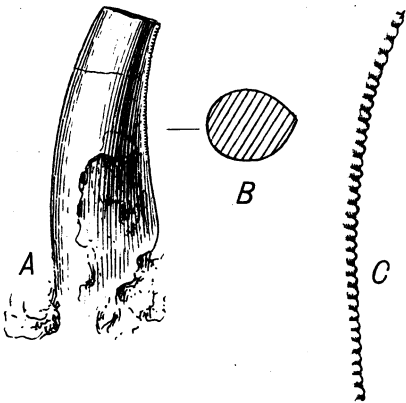


Fig. 10. "*Palaeosaurus*" *fraserianus* Cope. Lateral aspect (A), with section (B). X 2. C, serration. X 6.

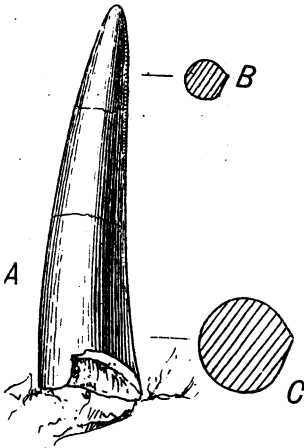


Fig. 11. "*Belodon*" *priscus* Cope. X 2. Lateral aspect (A), with sections (B, C).

The teeth named *Palæoctonus appalachianus* and *P. aulacodus* may belong with a single or with two different species; it is impossible to say. But it is nearly certain that they do not belong with the foregoing named teeth, surely not with the last two. Only American investigators will now be able to decide which of those teeth belong with the recently described genera *Machæroprosopus*, *Angistorhinus*, and *Palæorhinus*, or with *Rutiodon*.

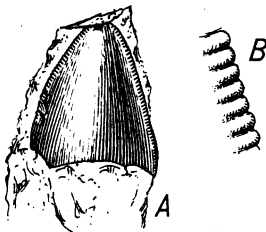


Fig. 12. *Rutiodon carolinensis* Cope (No. 2338). Posterior tooth. A, lateral aspect. $\times 2$. B, serration. $\times 6$.

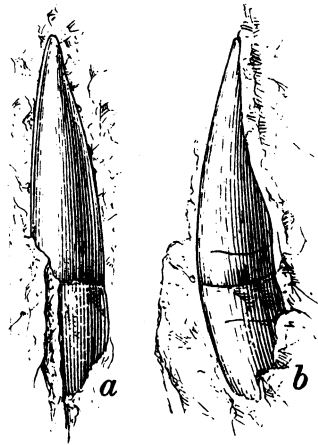


Fig. 13. *Rutiodon carolinensis* Cope (No. 2338). Middle tooth. $\times 2$. A, lateral, B, anterior aspect.

In the same collection there are also four teeth of "*Palæosaurus*" *carolinensis* Cope (No. 2338) with the remark on the label "common" (Figs. 12, 13). They are lying in black bituminous shales of the Deep River coalfield in North Carolina, the same shales as in the Phoenixville tunnel, Pa., which yielded *Rutiodon carolinensis* and "*Belodon*" *lepturus*. Most probably these teeth are those of *Rutiodon carolinensis* and to this probably also belong "*Palæosaurus*" *fraserianus* and "*Belodon*" *priscus*.

Two of these teeth of "*Palæosaurus*" *carolinensis* are of the slender type, one of them has a cutting edge, and two of them are short, broad, flattened and with two cutting edges. That means that the last ones are from the posterior part of the jaws and the first ones from the middle or anterior part.

All of these teeth described under eight names possibly belong with only three or four species:

- I. *Palæoctonus appalachianus* Cope 1877
" *aulacodus*
- II. *Clepsysaurus pennsylvanicus* Lea 1852
" *vealleianus*
Suchoprion cyphodon
- III. "*Palæosaurus*" = *Rutiodon carolinensis* Emmons 1856
" *fraserianus*
" *Belodon*" *priscus*

It is not quite impossible that the teeth under II might belong with *Rutiodon manhattanensis* Huene, and with the fragmentary scapula from Connecticut called by Marsh "*Belodon*" *validus*.

Note on "*Belodon*" *lepturus* Cope.

The type material of "*Belodon*" *lepturus* in black bituminous shales from the Phoenixville tunnel, Pa., forms part of the Cope collection (No. 3879). Cope has given very good figures of these specimens. There are a number of vertebræ, ribs, one femur, a fibula and dermal plates. I do not find any difference from *Rutiodon carolinensis*.

II. SAURISCHIA

Thecodontosaurus gibbidens Cope

Figures 14 and 15

There are two small teeth of the same type as those of *Thecodontosaurus antiquus* Morris, *T. elizæ* Sauvage, "*Plateosaurus*" *ornatus* Huene, and "*Plateosaurus* sp." from Friedrichstrasse near Hechingen (1915, N. Jahrb. f. Min., etc., I, p. 13). They belong

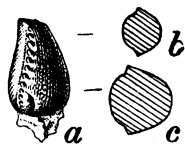


Fig. 14. *Thecodontosaurus gibbidens* Cope (No. 2339). $\times 2$. Anterior aspect (A), with sections (B, C).



Fig. 15. *Thecodontosaurus gibbidens* Cope. Lateral aspect. $\times 1$.

to the allophagous division of the Pachypodosauria (Huene, 1914, Centralbl. f. Min., etc., pp. 154–158). These teeth are short and very thick, with a characteristic kind of cutting edges ("Spitzkerbung," as called by the author). The axis of these teeth is slightly curved to the inside, but not at all backwards. There is also a slight resemblance of these teeth to those of *Scelidosaurus*.

III. STEGOCEPHALIA

?*Eupelor durus* Cope

Figures 16 to 18

There is one tooth, fragments of sculptured parts of the skull roof, a good lateral dermal plate, and part of an interclavicular plate of a big labyrinthodont-like *Mastodonsaurus* from the Triassic of Pennsylvania. The tooth (Fig. 16) is straight and conical; its lower part has longitudinal ridges. The parts of sculptured skull bones do not show any suture. All of these fragments are small. The lateral or clavicular plate (Fig. 18) is nearly complete, only the narrow process below the sculptured part of it is fragmentary. The sculpture of these bones is much like that of *Mastodonsaurus*. The aspect of the interclavicular plate (Fig. 17) seems a little different from the sculpture of the clavicular plate; therefore it is not certain they belong to the same species.

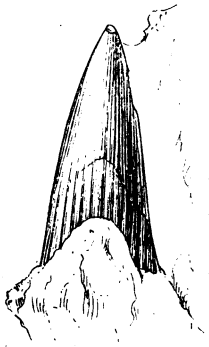


Fig. 16. Labyrinthodont tooth (? *Eupelor durus* Cope) (No. 2333).
× 2.

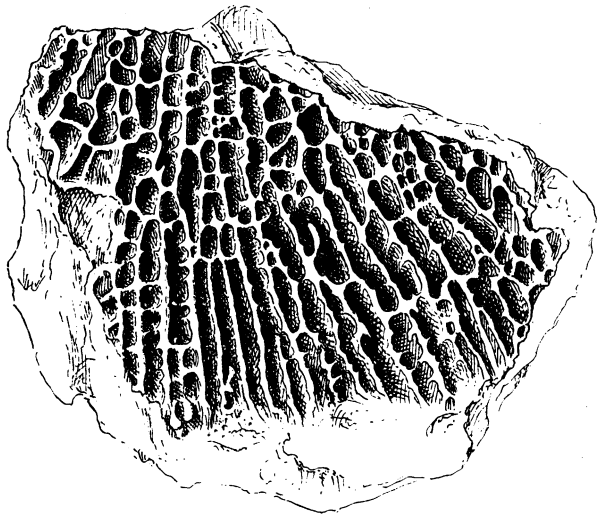


Fig. 17. Part of labyrinthodont inter-clavicular plate (No. 2338).
× 1/2.

IV. PTEROSAURIA?

Figures 19 and 20

The probable pterosaurian remains described by Cope as *Rabdopelix longispinis* from the Triassic of Gwynned, Montgomery Co., Pa., have not been found in the Cope collection, but there are two tiny bones in black bituminous shales from the Phoenixville tunnel, Pa. They are in the same black shales which have yielded "*Belodon*" *lepturus* Cope.

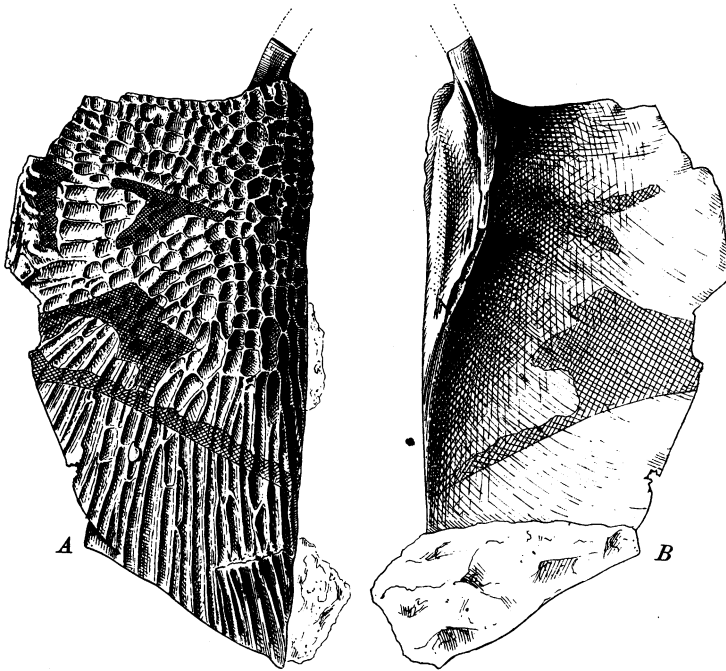
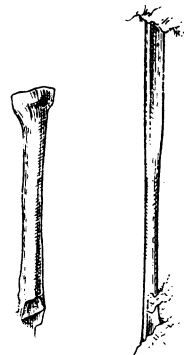


Fig. 18. Left labyrinthodont clavicular plate (?*Eupelor durus* Cope) (No. 2324). $\times \frac{1}{2}$. A, outer, B, inner aspect.

One of these bones (Fig. 19) shows one natural extremity with a diameter of 2.5 mm., but the straight tiny bone has only a diameter of 1 mm. The other end is broken off. The preserved length of the bone is 17 mm. (with a short bit of impression). The broken end shows the bone to be hollow, with very thin walls.

The second bone (Fig. 20) is quite straight, also with a diameter of 1 mm. Both extremities are hidden in the rock. Its visible length is 21.5 mm.

Although it is impossible to determine such fragmentary bones, they are of some interest because of the possibility of belonging to pterosaurs. H. v. Meyer had described similar bones from the uppermost Triassic of Württemberg as probably belonging to pterosaurs.



Figs. 19 and 20. Two possibly pterosaurian bones (No. 2338). $\times 2$.

NOTE.—All of these teeth, etc., are found in black limestone and marl of Triassic age in the Phoenixville tunnel, York Co., Pa.

All references to the literature will easily be found in the 'Bibliography and Catalogue of the Fossil Vertebrata of North America, by O. P. Hay, Washington, 1902.

