

ART. XL.—*Notice of some New Reptilian Remains from the Cretaceous of Brazil*; by Prof. O. C. MARSH, of Yale College.

THE only account of vertebrate fossils from the fresh-water cretaceous deposit near Bahia, Brazil, which appears to have been published hitherto, is a short notice in a paper by Mr. S. Allport, in the *Journal of the Geological Society of London* for 1860. In this article the author gives a description of the locality, and figures several specimens of reptilian and fish remains, but with no explanation of them except a reference to the opinions of Prof. Owen, and Sir Philip Egerton, as to their general affinities.

While engaged in a geological exploration of the coast of Brazil, in 1867, Prof. C. F. Hartt, of Cornell University, visited the same locality, and among the fossils obtained was a small collection of vertebrate remains, supposed to be mainly reptilian, which he has recently submitted to the writer for examination and description. Most of the specimens are too imperfect to admit of accurate determination, but some, however, are sufficiently well preserved to show clearly their main characters, and a number of them prove to be identical with those obtained by Mr. Allport. Several of the specimens were found on examination to be portions of large fishes, in part referable to the genus *Lepidotus*, and some of them indicating apparently a new type. These will be described, with other fossils from Brazil, in a work on the geology of that region, soon to be published by Prof. Hartt.

The most interesting of the reptilian remains collected by Prof. Hartt in the Bahia deposit is the tooth of a large Crocodylian, from the arenaceous shale near Plantaforma station, on the Bahia railroad. This specimen is in an excellent state of preservation, and indicates a species new to science. It is larger, more slender, and more pointed, than the teeth of existing crocodiles, resembling most nearly those of some extinct American species. It is conical in form, round at the base, and slightly compressed at the apex. The crown is two inches and

three lines in length, along the outer side, and ten lines in diameter at the base. One edge is somewhat more convex than the other, and this is also true of one of the sides, and hence the tooth appears slightly curved in two directions. On either edge of the crown there is a sharp ridge, most prominent near the apex, over which it passes, but gradually disappearing before reaching the base, resembling in this respect the teeth of *Thoracosaurus*, from which, however, this specimen differs in being longer, and less curved than the teeth of that genus usually are. The sides of the crown are covered with fine, interrupted, undulating striæ, which appear to be different from the dental sculpture of the *Crocodylia* hitherto described. These striæ are most distinct near the middle of the tooth, becoming much more delicate at the base, and nearly obliterated at the apex.

In size and general appearance, this specimen resembles somewhat the teeth of *Crocodylus antiquus* Leidy, from the Miocene of Virginia, but differs from that species in being less tapering, and in having the ridge on the edges extend farther downward. It resembles still more closely the teeth of a new species of *Crocodylus* discovered by the writer at Squankum, N. J., in the tertiary green-sand, which will soon be more fully described under the name *Thecampsia Squankensis* Marsh. Both species have essentially the same proportions, and similar dental striæ, but the cutting ridge of the New Jersey specimens is more prominent, and extends nearly or quite to the base of the crown. The two species were apparently about the same size, both being considerably larger than existing *Crocodylians*.

Other parts of the skeleton of the Brazilian species would perhaps show generic characters to distinguish it from the modern procœlian *Crocodyles*, but in the absence of these, it may for the present be placed in the same genus. Its form, cutting edges, and especially its peculiar striæ, readily distinguish it from any species with which it is liable to be confounded, and it may appropriately be named *Crocodylus Hartti*, in honor of its discoverer, whose recent researches have thrown so much light on the geology of Brazil.

Several specimens of reptilian teeth collected by Mr. Allport at Montserrate, a locality in the same deposit about two miles southwest of Plantaforma station, evidently belong to this species, as the illustrations accompanying his paper (Plate xvi, figures 1, 2, 3, and 5) clearly indicate. The explanation of the plate refers to the specimens as, "Teeth of *Crocodylus* with delicately wrinkled surface," but no further description is given.

In the same paper Mr. Allport has given figures of several

Crocodylian teeth from the localities at Plantaforma and Montserrat, which are quite different from those above described. These are represented in Plate xv, figure 5, and Plate xvi, figures 4, 6, 7, and 8, and are referred to on page 268 as, "Teeth of Crocodile with strong continuous striæ, and coarse riblets." These specimens, taken in connection with some imperfect remains in the collection made by Prof. Hartt, indicate the existence in this deposit of a second, and smaller species of Crocodile, probably allied to the modern gavials. The teeth are not so large as those of *Crocodylus Hartti*, and are more tapering, and more curved. They also differ widely in the striæ and lateral folds. These specimens may provisionally be referred to the genus *Thoracosaurus*, and, as the species is evidently new, it may be called *T. Bahiensis*.

An interesting fossil, found by Prof. Hartt at Plantaforma station, is a fragment of a bone, evidently reptilian, but the exact affinities of which it is difficult to determine from this specimen alone. It resembles in some respects the extremity of an ulna, but after a careful comparison the writer is inclined to consider it the proximal end of a rib. It is much flattened at the articular extremity, and tapers gradually to the broken end, which is somewhat triangular in outline. Its length is about four inches, the transverse diameter of the perfect end two and a half inches, and of the other, one and a quarter inches. The larger extremity is divided into two articular facets lying oblique to each other, the smaller one being elevated about half an inch above the other, and covering rather more than a third of the entire terminal surface. In form and general proportions this specimen is not unlike the upper end of a right dorsal rib of some of the amphicelion Crocodiles, especially a rib in which the head and tubercle have so closely approached each other that their articular surfaces are nearly confluent. The size and other characters of the specimen, however, seem to exclude it from that order, and it probably belonged to a Dinosaurian reptile, possibly the same as a large vertebra from Montserrat, which Mr. Allport figured in his paper in Plate xvii, and which Prof. Owen suggested might prove to be allied to *Megalosaurus*.

The only other specimen in this collection that need be particularly mentioned here is a small flat bone, about two inches in length, with one articular extremity partially preserved. This appears to resemble most nearly the fibula of a Tortoise, and probably should be referred to that group of reptiles. The other vertebrate remains from Brazil obtained by Prof. Hartt are, in general, of less interest, but will be fully described in his forthcoming work.

Yale College, April 5th, 1869.