

PALEONTOLOGY. — *On the existence of sauropod and theropod dinosaurs in the Upper Cretaceous of Madagascar*. Note by Mr. **CHARLES DEPÉRET**, presented by Mr. Milne-Edwards.*

“I received, via medical officer Mr. Salêtes as intermediary, a good series of Cretaceous fossils from the environs of Mevarana, a locality situated on the right bank of the eastern arm of the Betsiboka, 46 km south of Majunga (western coast of Madagascar).

These fossils were collected with a zeal worthy of praise, by Mr. Landillon, adjutant of the marines, who also sent to me precious information on these localities and the geology of this region.

The region is constituted by a regular plateau in horizontal beds, around 120 m in altitude. The upper entablature is formed by a limestone base, a dozen meters thick, cut out into cornices by erosion. Numerous marine fossils such as oysters are recovered in these limestones, including smooth ones from the *O. vesicularis* group, and other folded forms (*Alectryonia* aff. *larya* or *ungulata*); there are also echinoids and molds of *Natica*, *Turritella*, *Venus*, etc. This base belongs to the Upper Cretaceous, probably the Senonian.

The cutting of the Betsiboka valley deeply notched the Cretaceous plateau and updated the lower bases that constitute the principal slopes of the plateau in the form of clays, sandy clays, and sandstone, as well as many buttes which form the low hills around Mevarana up to near the edge of the river. In several places spread apart from one another on the denuded and sterile surface of these clayey-sandy mounds, vertebrate bones are recovered, which must be very abundant in the beds, judging by the number of fragments spread out on the surface. Moreover, this clayey-sandy formation with reptile bones seems to be clearly tied to the marine Upper Cretaceous of the plateau, because bivalve and gastropod molds analogous to those of the upper table were recovered in the hills of the plain, not far from the bone remains.

* Original citation: Depéret, C. 1896. Sur l'existence de Dinosauriens, Sauropodes et Théropodes, dans le Crétacé supérieur de Madagascar. *Comptes Rendus de l'Académie des Sciences, Paris* 122:483-485. Translated by Matthew Carrano, Department of Anatomical Sciences, Stony Brook University, July 2002.

The study of these bones has permitted me to recognize the presence of two very distinct types of dinosaurs:

1st The first, of large size, belongs to the *sauropod* group. It is represented by a large, anteroposteriorly compressed humerus fragment without a medullary cavity, which must correspond to a bone 0.90 m long. I refer to it two vertebrae from the anterior caudal region, one larger than the other but more shortened; the dorsoventral diameter of the centrum is 0.14 m for the first, 0.045 m for the second. Both are well characterized as caudal vertebrae by the presence of articular facets for the chevron anteriorly and posteriorly on the ventral surface. They are *deeply procoelous*, an important character that is found to an equal degree only in the genus *Titanosaurus* Lyd. from the middle Cretaceous of India and the Wealden of England. The other details of these vertebrae, such as the very advanced position of the neural arch on the centrum, and the presence of a median longitudinal furrow on the ventral face bordered by two anteriorly and posteriorly diverging lateral crests, confirm this generic connection. However, the species from Madagascar is different from *Titanosaurus indicus* Lyd., whose caudal vertebrae are strongly compressed transversely, and it more closely approaches *T. blanfordi* Lyd. from the same Indian beds, in which the caudal centra have a more regularly circular cross-section without the lateral depression that is shown in the type from Madagascar (*T. madagascariensis* n. sp.).

I attribute to this same type, but without absolute certainty, a large dermal ossification, generally oval in shape and with an external surface ornamented by radiating rugosities, whose position on the animal is difficult to specify for the moment.

2nd A second type, from the predatory *theropod* order, is indicated by two small, laterally compressed teeth, presenting the recurved saber-blade shape and fine denticles on the trenchant edges characteristic of the genus *Megalosaurus*. I also attribute to it a recurved, claw-shaped ungual phalanx and an elongate, amphicoelous caudal vertebra of the ordinary *Megalosaurus* type.

It is interesting to note that Mr. Lydekker (*Palaeontologica Indica*, ser. IV, col. I) described from the *Lameta horizon* in India, attributed to the middle Cretaceous, some dinosaur remains from the two genera *Titanosaurus* and *Megalosaurus*, whose presence I have noted in the Upper Cretaceous beds of Madagascar. Moreover, this community of

association of the dinosaur genera is an argument to add to those which have already been invoked in favor of a junction between the great island of Madagascar and the Indian continent during the Mesozoic Era.