

## X. A NEW SPECIES OF APATOSAURUS.

BY W. J. HOLLAND.

In the Carnegie Quarry, near Jensen, Utah, the Carnegie Museum among other specimens has recovered a remarkably perfect skeleton, which is provisionally referred to the genus *Apatosaurus*.

The specimen consists of a series of vertebræ, complete from the atlas to nearly the end of the tail. From the anterior dorsals to the posterior caudal vertebræ the bones were found lying *in situ*, but slightly dislocated. Possibly eight or ten posterior caudals are missing. The tail is very long and contains at least seventy-three vertebræ, of which sixty-four were recovered. The cervical vertebræ had been separated from the dorsals and shifted, but the entire series was found articulated in regular order. The limb bones were found approximately in place, one of the femora being articulated in the acetabulum. The entire left fore limb was found with the bones articulated. The femur, tibia, and fibula of the right hind limb the left femur and the left hind foot were also found. The foot was articulated. The ribs were approximately in position. The whole specimen has been mounted, save that the skull has not as yet been supplied. A skull, which, judging from its location, belongs to the specimen, was found within eleven feet of the atlas. It does not differ greatly in form from the skull which belongs to *Diplodocus*, but is much larger than any skull of the latter genus known to the writer. I have already in a previous article (ANNALS CARNEGIE MUSEUM, Vol. IX, p. 273) called attention to the uncertainty which exists as to the skull of *Apatosaurus*, and will not renew the discussion in this paper, believing it more prudent to await the result of excavations which are now being carried on, and which promise perhaps to yield positive information as to this matter. Mr. Douglass is at present taking up the remains of another specimen, somewhat smaller than the one which has been mounted in the Carnegie Museum, and which seems to be lying *in situ*. He has not yet reached the region of the cervicals, but is not without hope that the head of this specimen may be found attached to the vertebræ. It seems prudent therefore

to refrain from further remarks as to the nature of the skull of *Apatosaurus*, in the hope that more light may be soon thrown upon the subject.

It should be stated that the writer has in preparation a large monographic paper relating to the genus, based in part upon the specimen specifically described in this paper, the publication of which has been held back, partly in order that the plates and illustrations which are to accompany it may be prepared.

*Apatosaurus louisæ*, sp. nov.

**Type:** No. 3018, Carnegie Museum Catalog of Fossil Vertebrates.

**Locality:** Carnegie Quarry, near Jensen, Uinta County, Utah.

**Horizon:** Upper Jurassic (Morrison Beds).

The differences between the present species and *Apatosaurus* (*Brontosaurus*) *excelsus*, which reveal themselves in many of the minor details of structure, such as the position and form of the laminae supporting the transverse processes of the dorsal vertebræ, are multitudinous, but may perhaps in part be attributed to individual variation. Of these differences I shall not speak in the present paper. A few of the specific characters which will facilitate the recognition of the species are the following:

1. The lateral cavities in the centra of the dorsals do not have their openings situated at the middle of the centrum, as in *A. excelsus*, but they are located higher up, at the base of the pedicle of the neural arch, and open inwardly and downward, forming deep pocket-like cavities.

2. The round hemispherical articulating surface of the anterior ends of the centra, which are well-developed in the first five dorsal vertebræ of *A. excelsus*, appear only in the first two dorsals of *A. louisæ*, being feebly indicated in dorsal No. 3, after which all the centra in *A. louisæ* have their anterior articulating surfaces platyan.

3. Whereas in *A. excelsus* Marsh, and in another specimen belonging to the Carnegie Museum, referred to *excelsus* by Hatcher, and coming from the same horizon in Wyoming from which Professor Marsh obtained the type, there is a large foramen piercing the lateral transverse laminae on either side of the anterior three caudals above the level of the neural canal, such openings do not occur in the type specimen of *A. louisæ*. This causes the bones to present a very different appearance from those of the type of *A. excelsus* when viewed either from before or behind.

4. The facets for the attachment of the capitulum of the ribs in the dorsals are much lower down in *A. excelsus* than in *A. louisæ*. This fact also imparts to the vertebræ when compared with each other a very different appearance.

5. The neural spines of the caudals at the middle of the tail in *A. louisæ* are more erect, more nearly approaching the perpendicular, than in *A. excelsus*, as represented in the specimen in the Carnegie Museum, as well as in the type preserved in the Peabody Museum, so far as the material there represented permits comparison.

There are numerous diagnostic characters which the writer does not take up in the present paper, but which he hopes to be able shortly to present in the larger publication already referred to.

The type is fully adult, as is shown not only by its great size, but by the complete coössification of the pubic and ischial bones where they unite in forming the acetabulum, and also by the coössification of the pubic and ischial bones at their distal extremities.

The species is named in honor of Mrs. Andrew Carnegie.