

articulated, well preserved with remarkably little distortion, in a soft clayey sandstone easily removed and leaving the surface of the bones clean. This particular state of preservation provided an opportunity for study and description seldom accorded. A preservation of this nature was especially welcome in the skull as in the generality of cases the elements of the skull in dinosaurs are found in place and are not easily freed from each other. Any particular bone is largely hidden by the surrounding ones, and it is a matter of difficulty, often of impossibility, to remove it in order to see it in all its aspects. Also, when a skull is preserved with the elements in place any distortion that may have occurred is likely to affect all of the elements to a greater or less extent. In a naturally disarticulated skull, distortion when present in any particular bone is confined to the limits of that bone. With few exceptions all the drawings reproduced in this memoir in illustration of the text were made by Mr. Arthur Miles under the supervision of the writer.

MATERIAL ON WHICH EDMONTOSAURUS IS BASED.

Edmontosaurus is represented in the collections of the Geological Survey by remains, including the skull, of at least two individuals, as follows:

Collection of 1912, Edmonton formation, Red Deer river, Alberta, field No. 27, Cat. No. 2288, genotype, from opposite the mouth of Three Hills creek, at 200 feet above the level of the river: the skull figured and described in this paper, with most of the vertebræ in place back to the sixth caudal, one hind limb lacking a few phalanges, one humerus, both pubic bones together, one ischium, the greater part of the right ilium, and some ribs. Estimated length of individual considerably over 30 feet. From field measurements the length of the following bones are: femur 47 inches, humerus 27 inches, ischium 54 inches. The discovery of this specimen was made by L. Sternberg, assistant on the Geological Survey party of 1912.

Collection of 1916, Edmonton formation, Red Deer river, field No. 6, Cat. No. 2289, paratype, found by G. F. Sternberg 7 miles west and north of Morrin, in sec. 16, tp. 31, range 21, on the west side of the river, 90 feet above water level: a skeleton lacking some of the bones of the feet, the tail vertebræ behind the fifth caudal, the premaxillaries and the prementary. There is a possibility of the right ilium not being present. The bones of this individual are splendidly preserved and lay closely scattered within a grey, clayey sandstone which is easily removed leaving the surfaces in good condition. The elements composing the top of the skull are preserved together. The remaining bones of the head, including the mandibles, were found disarticulated. Femur 49 inches long, humerus 27½ inches, left ulna 30 inches, left radius 26 inches, largest right rib 50 inches along the curve, dentary 30 inches, depth of dentary in advance of base of coronoid process, from the lower surface to external alveolar border 6½ inches.

Of the type skeleton the skull only (Figures 3 and 4) has as yet been prepared. This work was skilfully performed by L. and C. M. Sternberg.