

## THE SMALLEST KNOWN HORNED DINOSAUR, BRACHYCERATOPS.

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The mounted skeleton of *Brachyceratops montanensis* recently placed on exhibition (pls. 1 and 2) in the United States National Museum is the smallest horned dinosaur that has yet been discovered. It was found by the writer during the summer of 1913 in the Two Medicine formation of the Upper Cretaceous, while working under the auspices of the United States Geological Survey on the Blackfeet Indian Reservation, in northwestern Montana.

Since the osteological details<sup>1</sup> of the skeletal structure have been fully described, it is proposed here to give only a brief account of the specimen as it is now prepared for exhibition.

The mounted skeleton is 1625 mm. (5 feet, four inches) long from the end of the beak to the tip of the tail, and stands about 762 mm. (30 inches) high at the hips, with a skull that measures 558 mm. (22 inches) in length. The skeleton is mounted standing on a base of artificial matrix calculated to represent the color and texture of the layer in which the bones were originally found. The animal is posed in a quadrupedal walking position, the forelimbs strongly flexed at the elbow, as indicated by the strong olecranon process of the ulna. The tail drops rapidly from the sacrum and its distal portion drags upon the ground. The scapula has been given a horizontal position well down on the sides of the ribs, in accordance with the evidence of the position of this bone in an articulated skeleton of *Monoclonius* in the American Museum of Natural History, New York City.

The painstaking care entailed in cleaning the bones of this skeleton from the adhering matrix, fitting together of the broken pieces, the restoring of the missing parts, and the articulation and mounting of the specimen can be more fully appreciated when it is explained

<sup>1</sup> Gilmore, Charles W., *Smiths. Miscell. Coll.*, vol. 63, No. 3, 1914, pp. 1-10; *Prof. Paper* 103, U. S. Geol. Survey, 1917, pp. 1-38, pls. 1-4, 47 text figures.

that Mr. Norman Boss, who has so skillfully done all of this work, spent 345 working days, or over a year, in its preparation.

It is a composite skeleton, that is, made up of the bones of more than one individual, but all from the same deposit, a small rectangular area of about 6 by 7 feet (1828 to 2133 mm.) in extent. In this small space were found the bones of at least five individuals, all pertaining to this one species and all practically the same size. With the exception of two articulated hind feet and three series of caudal vertebrae, one of which, Cat. No. 7953, U. S. N. M., was entire and articulated with the sacrum, and it in turn closely associated with the complete pelvis and femora, all of the other skeletal parts were disassociated, and it was quite impossible to determine the precise individual to which they belonged. Specimen No. 7953, U. S. N. M., was used as the basis for the present mount. The ribs and presacral vertebrae have been tentatively associated with this rear portion, though it is quite probable that the association in some instances may be in error.

The skull was found disarticulated, but the sutures interlocked so perfectly as to leave no doubt that the assembled elements belonged to the same cranium. The juvenile character of this particular animal is indicated by the open sutures of the skull, vertebrae, and sacrum. When fully grown it was doubtless a relatively small species.

The presacral vertebral series is represented by parts of some 13 vertebrae, none of which were found in sequence, nor were any of the neural processes attached to their respective centra. These have been arbitrarily associated, and the position in the column was determined as carefully as possible by comparison with the articulated skeleton of *Monoclonius* mentioned above. The vertebral column has been given the same number as found in the *Monoclonius* skeleton, which consists of 14 dorsals and 8 cervicals, or 22 in all, as in *Triceratops*. Parts of 23 ribs, several of which are complete, have been inserted in the restoration, but, as with the vertebrae, the same doubt exists as to their all belonging with specimen No. 7953.

The structure of the forefoot is perhaps somewhat conjectural, although as restored it is based on a complete articulated forefoot of *Monoclonius*, kindly loaned by the authorities of the American Museum of Natural History, New York. The few foot bones found have been inserted in accordance with the evidence of the borrowed foot.

The greatest difficulty encountered in mounting this specimen was in articulating the bones of the pelvic arch. It was found to be impossible to do this properly owing to distortion by crushing of the

individual parts. However, this is hardly noticeable except as one makes a critical examination of this portion of the skeleton.

The missing bones have been restored largely, as in the case of the humeri both of which were gone, from the homologous bones of *Monoclonius*. The restored portions have been given a distinctive color which at once distinguishes them from the original parts, as is well shown in the illustrations in plates 1 and 2.

The bones used in this composite mount are catalogued as follows:

Skull and lower jaw.....	No. 7951
Vertebral centra and processes.....	No. 7953?
Sacrum and complete caudal series.....	No. 7953
Complete pelvis.....	No. 7953
Femora.....	No. 7953
Ribs.....	No. 7953?
Scapula, left.....	No. 7958
Ulna, left.....	No. 8076
Radius.....	Nos. 8077, 8078
Bones of left forefoot.....	No. 8079
Fibula, tibia, and left hind foot.....	No. 7957

The small size of *Brachyceratops* is strikingly brought out by comparison with the *Triceratops*, as shown in plate 3, where, as may be seen, the length of the entire skeleton is less than that of the skull of the larger animal, but the proportions of the two are remarkably similar. In each the skull is about one-third the length of the entire animal; in the extreme shortness of the body, the deep thoracic cavity, and in other peculiarities they are essentially similar, though representing the two extremes of their race.

A life restoration of *Brachyceratops*, modeled one-sixth natural size and based on the materials forming the composite specimen, is shown in plate 4. The pose is very similar to that adopted for the skeleton. While it will probably be found to be incorrect in some respects, it at least gives some idea of the life appearance of the animal. The attempt is here made for the first time to depict the character of the scaled skin. That the horned dinosaurs had a scaled integumentary covering is now well known from several specimens discovered in the Belly River formation, Upper Cretaceous of western Canada. Some of these specimens had considerable areas of skin impression preserved and though the patterns differ in the several species, those adopted for *Brachyceratops* may be considered tentative until the discovery of actual impressions shall disclose their true nature.

#### EXPLANATION OF PLATES.

##### PLATE 1.

Lateral view of the mounted skeleton of *Brachyceratops montanensis* Gilmore in the U. S. National Museum. Viewed from the left side. About  $\frac{1}{6}$  natural size. Restored portions indicated by the light-colored areas.

## PLATE 2.

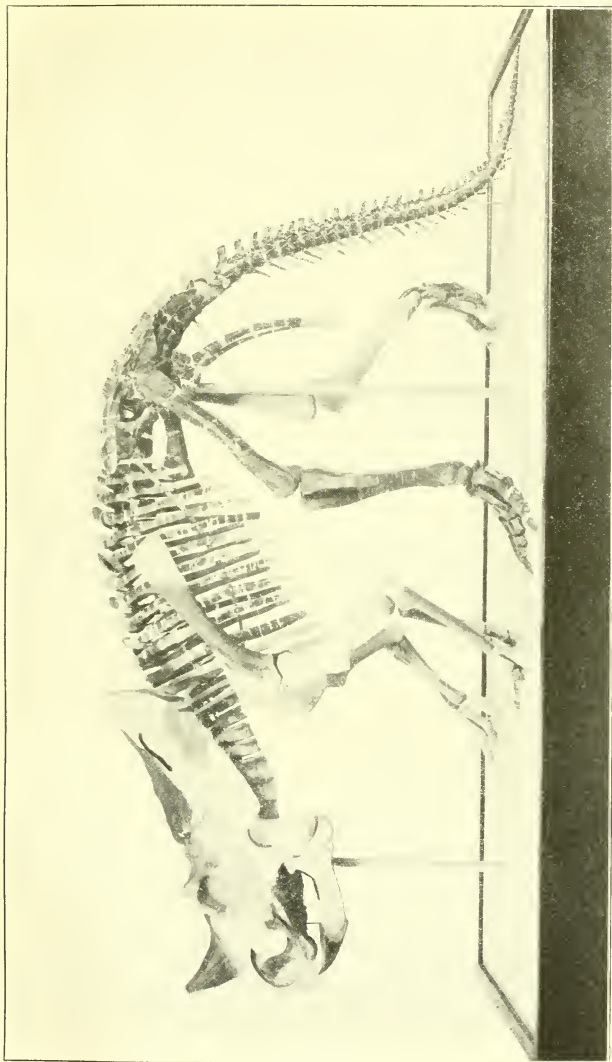
Same skeleton viewed from the right side.

## PLATE 3.

Comparative view of the mounted skeletons of *Brachyceratops* and *Tricceratops*, both in the United States National Museum.

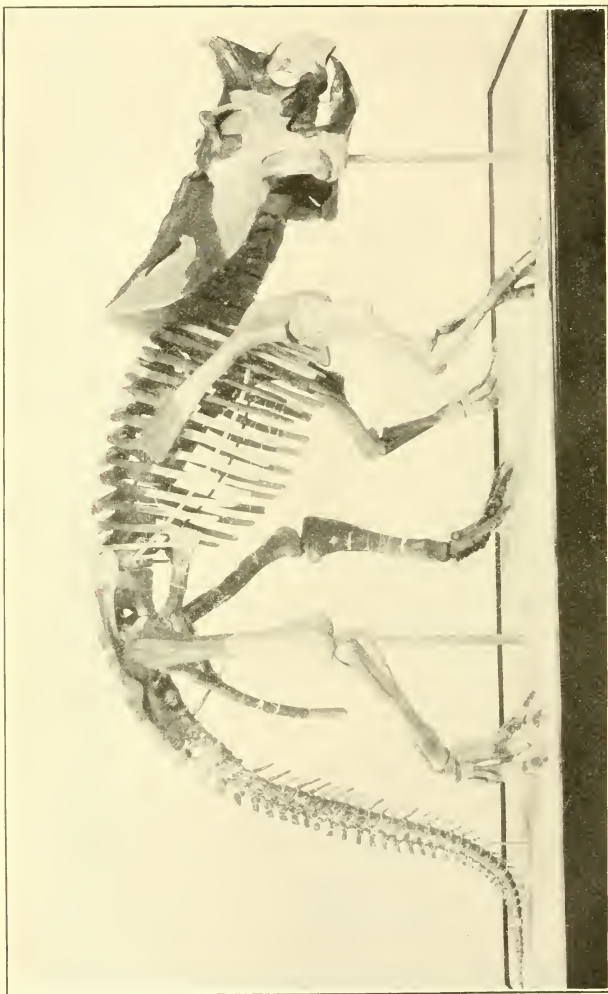
## PLATE 4.

Restoration of *Brachyceratops montanensis* Gilmore. Based on the mounted skeleton about natural size. Modeled by Charles W. Gilmore. 1915.



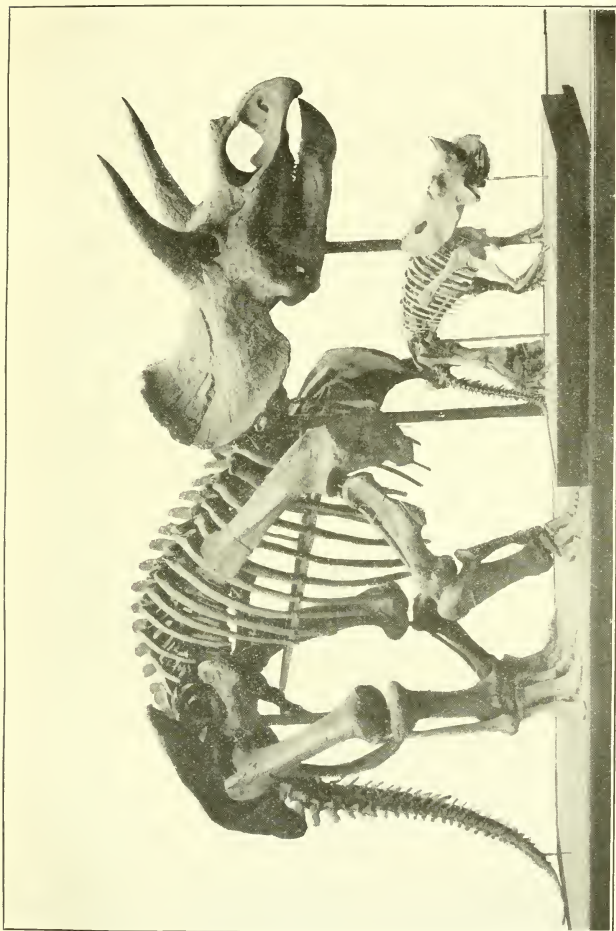
MOUNTED SKELETON OF BRACHYCERATOPS MONTANENSIS, VIEWED FROM THE LEFT SIDE.

FOR EXPLANATION OF PLATE SEE PAGE 3



MOUNTED SKELETON OF BRACHYCRATOPS MONTANENSIS, VIEWED FROM THE RIGHT SIDE.

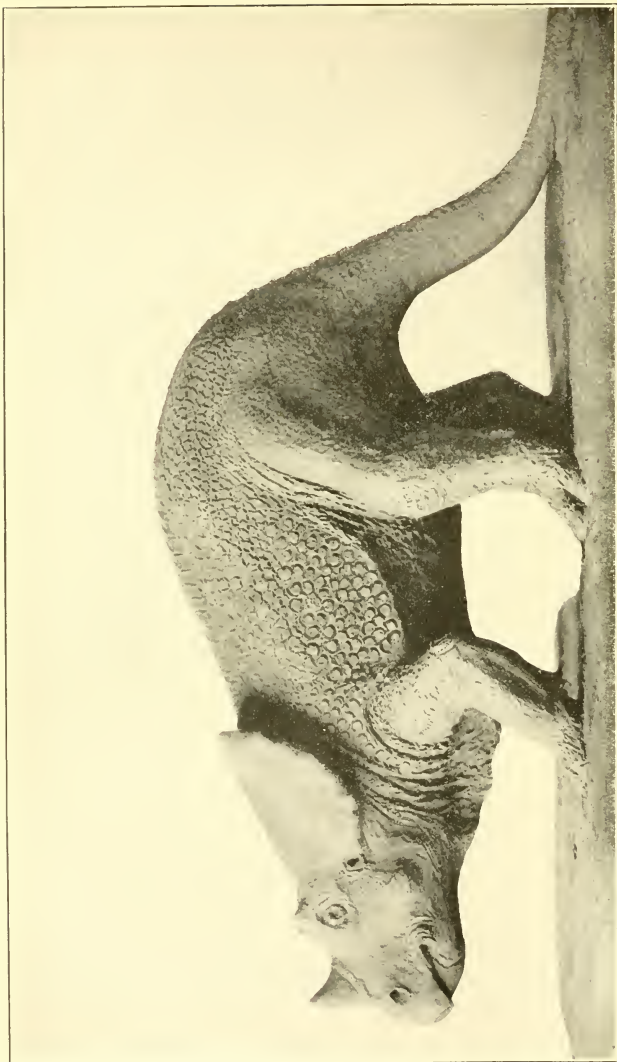
FOR EXPLANATION OF PLATE SEE PAGE 4.



MOUNTED SKELETONS OF BRACHYCRATOPS AND TRICERATOPS.

FOR EXPLANATION OF PLATE SEE PAGE 4.





RESTORATION OF BRACHYCERATOPS MONTANENSIS.

FOR EXPLANATION OF PLATE SEE PAGE 4.