

## THE MOUNTED SKELETON OF TRICERATOPS PRORSUS.

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Among the vertebrate fossils included in that part of the Marsh collection, now preserved in the United States National Museum, are the remains of several individuals pertaining to the large Cretaceous dinosaur, *Triceratops*. All of this material, which comes from the Laramie division of the Cretaceous, was collected by or under the supervision of the late Mr. J. B. Hatcher in the northeastern part of Converse County, Wyoming, a locality made historic by the researches of this enthusiastic student. From this one region he collected the remains of more than forty individuals of the *Ceratopsia*, a record that has never been equaled.

The skeleton of *Triceratops prorsus* recently placed on exhibition in the court devoted to vertebrate paleontology is the first one of this extinct genus to be mounted. As all of the specimens referred to above were more or less fragmentary, the most complete one (No. 4842<sup>a</sup>) [Sk. C, 2082 and 2084]<sup>b</sup> was used as a basis for the present restoration. The missing parts were substituted from other individuals of about the same size and belonging to the same species. When suitable bones were not available, as was the case in a few instances, these parts were restored in plaster colored to somewhat resemble the bones, but having the shade differ sufficiently to be easily recognized. Thus we have been able to present a fairly accurate representation of the skeletal structure of this peculiar reptile. Every bone used in the skeleton bears its catalogue number, and all plaster bones are marked with a red +. There is thus preserved a definite record of all the associated material comprising the composite skeleton.

In 1901, under the direction of Mr. F. A. Lucas, the skeleton of this animal was reproduced in papier-maché, and was included in the

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<sup>a</sup>Catalogue number of the U. S. National Museum.

<sup>b</sup>Marsh's numbers.



National Museum exhibit at the Pan-American Exposition<sup>a</sup> in Buffalo. Because of the general interest aroused by this reproduction, Dr. George P. Merrill, head curator of geology of the National Museum, conceived the idea that the original specimen would be not only an attractive but an instructive addition to the paleontological division of the Museum, and it has been largely through his enthusiasm and encouragement that the specimen was at last ready for exhibition.

The skeleton as mounted is standing on a base of artificial matrix, calculated to represent the color and texture of the Laramie sandstone in which the remains of these animals are found.

From the tip of the beak to the end of the tail the skeleton as restored is 19 feet 8 inches in length. The skull, which is 6 feet long, equals nearly one-third of this length. At the highest point (the top of the sacrum) it is 8 feet 2 inches above the base. The mounted skeleton presents several features which would otherwise be lost to the observer if seen in the disarticulated condition. The short body cavity, the deep thorax, the massive limbs, and the turtle-like flexure of the anterior extremities are characters only appreciated in the mounted skeleton. The position of the fore limbs in the present mount appears rather remarkable for an animal of such robust proportions, but a study of the articulating surfaces of the several parts precludes an upright mammalian type of limb, as was represented by Marsh in the original restoration. Moreover, a straightened form of leg would so elevate the anterior portion of the body as to have made it a physical impossibility for the animal to reach the ground with its head.

The fore feet are perhaps the most conjectural part of the whole restoration. Mr. Hatcher, after a careful study of all of the fore-foot material known, was unable to arrive at a satisfactory conclusion as to the arrangement of the bones or the number of digits comprising the manus. In constructing these parts we have followed Marsh's drawing, assisted somewhat by fore-foot material kindly loaned by Dr. H. F. Osborn, of the American Museum of Natural History, New York City.

The nasal horn of the skull used in the present skeleton appears to be missing, and on account of the unsatisfactory evidence as to whether the horn is wholly or only partly gone, it was decided not to attempt a restoration at this time. This will account for the absence of one of the important features upon which the name of the animal is based, *Triceratops* meaning three-horn face, in allusion to the presence of the two large horns above the eyes and the third smaller horn on the nose.

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<sup>a</sup> This papier restoration has since been exhibited at the expositions in Charleston, South Carolina, and St. Louis, Missouri, and is now in the Portland Exposition in Oregon.



It may be of interest to mention here that Prof. O. C. Marsh used this skeleton (No. 4842), supplemented by other remains now preserved in the collections of the Yale Museum, for the basis of his restoration of *Triceratops prorsus*, published as Plate LXXI in the *Dinosaurs of North America*.<sup>a</sup> Plates LXIV–LXVIII in the same work were also largely reproductions of parts of this same individual.

A comparison of the above restoration by Marsh with the mounted skeleton (see Plates I and II) shows several differences in points of structure, due chiefly to the better understanding of these extinct forms. The most striking dissimilarity is in the shortening of the trunk by a reduction of the number of presacral vertebræ. Marsh's error was due to an overestimate of the length of this region, a mistake also made in his restoration of *Brontosaurus* (*Apatasaurus*), as has been shown by Riggs.<sup>b</sup> Mr. Hatcher determined, from a well-preserved vertebral column in the Yale Museum, the number of presacrals as twenty-one, this being six less than ascribed to the animal by Marsh.

At the time of his death Mr. Hatcher had about completed a monograph on the *Ceratopsia* for the United States Geological Survey. This report was begun some years before by the late Professor Marsh, but after his untimely demise it fell to the lot of the collector of this material to finish it.<sup>c</sup> In studying all of the specimens preserved in the museums of this country, Hatcher was able to make several corrections in the structure of this animal, as originally figured by Marsh. These discoveries, as far as known, have been embodied in the present mount, though it must be understood there are many points in the structure yet to be determined.

The skeleton was mounted by the present writer, being very ably assisted by Mr. Norman Boss, but the author alone must be held responsible for whatever anatomical inaccuracies may be detected in the reconstruction.

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<sup>a</sup> Included in the Sixteenth Annual Report of the U. S. Geological Survey.

<sup>b</sup> *Science*, n. s., XVII, March 6, 1903.

<sup>c</sup> Mr. Hatcher's manuscript has recently been placed in the hands of Dr. R. S. Lull, of Amherst College, who will attend to its final preparation for publication.



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