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THE ALLOSAUROUS GROUP. DINOSAUR HALL (NO. 407, FOURTH FLOOR).

An Allosaurus, a great Carnivorous Dinosaur, is feasting upon the carcass of a Brontosaurus, an immense Herbivorous Dinosaur

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## ALLOSAURUS, A CARNIVOROUS DINOSAUR, AND ITS PREY.

ONE of the latest additions to the Collection of Fossil Vertebrates is the mounted skeleton of Allosaurus, the great Carnivorous Dinosaur of the Jurassic Period, now on exhibition in the Dinosaur Hall. Although smaller than its huge contemporary Brontosaurus, this animal is of gigantic proportions, being 34 feet 2 inches in length, and 8 feet 3 inches high. The group forms one of the most remarkable and attractive features of the hall.

This rare and finely preserved skeleton was collected by Mr. F. F. Hubbell in October, 1879, in the Como Bluffs near Medicine Bow, Wyoming, the richest locality in America for dinosaur skeletons, and is a part of the great collection of fossil reptiles, amphibians and fishes gathered together by the late Professor E. D. Cope, and presented to the American Museum in 1899 by President Jesup.

Shortly after the Centennial Exposition, it had been planned that Professor Cope's collection of fossils should form part of a great public museum in Fairmount Park, Philadelphia, the city undertaking the cost of preparing and exhibiting the specimens, an arrangement similar to that existing between the American Museum and the City of New York. The plan however fell through, and the greater part of this magnificent collection remained in storage in the basement of Memorial Hall in Fairmount Park, for the next twenty years. From time to time Professor Cope removed parts of the collection to his private museum in Pine Street, for purposes of study and scientific description. He seems, however, to have had no idea of the perfection and value of this specimen. In 1899, when the collection was purchased from his executors by Mr. Jesup, the writer went to Philadelphia, under the instructions of Professor Osborn, Curator of Fossil Vertebrates, to superintend the packing and removal to the American Museum. At that time the collection made by Hubbell in 1879 was still in Memorial Hall, and the boxes were



piled up just as they came in from the West, never having been unpacked. Professor Cope's assistant, Mr. Geismar, informed the writer that Hubbell's collection was mostly fragmentary and not of any great value. Mr. Hubbell's letters from the field unfortunately were not preserved, but it is likely that they did not make clear what a splendid find he had made, and as some of his earlier collections had been fragmentary and of no great interest, the rest were supposed to be of the same kind.

When the Cope Collection was unpacked at the American Museum, this lot of boxes, not thought likely to be of much interest, was left until the last, and not taken in hand until 1902 or 1903. But when this specimen was laid out, it appeared that a treasure had come to light. Although collected by the crude methods of early days, it consisted of the greater part of the skeleton of a single individual, with the bones in wonderfully fine preservation, considering that they had been buried for say eight million years. They were dense black, hard and uncrushed, even better preserved and somewhat more complete than the two fine skeletons of *Allosaurus* from Bone-Cabin Quarry, the greatest treasures that this famous quarry had supplied. The great carnivorous dinosaurs are much rarer than the herbivorous kinds, and these three skeletons are the most complete that have ever been found. In all the years of energetic exploration that the late Professor Marsh devoted to searching for dinosaurs in the Jurassic and Cretaceous formations of the West he did not obtain any skeletons of carnivorous kinds anywhere near as complete as these, and their anatomy was in many respects unknown or conjectural. By comparison of the three *Allosaurus* skeletons with one another and with other specimens of carnivorous dinosaurs of smaller size in this and other museums, particularly in the National Museum and the Kansas University Museum, we have been enabled to reconstruct the missing parts of the Cope specimen with very little possibility of serious error.

An incomplete skeleton of *Brontosaurus*, found by Dr. Wortman and Professor Knight of the American Museum Expedition of 1897, had furnished interesting data as to the food and habits of *Allosaurus*, which were confirmed by several other fragmentary specimens obtained later in the Bone-Cabin Quarry. In this *Brontosaurus* skeleton several of the bones, especially the spines of the tail vertebrae, when found in this rock, looked as if they had been scored and bitten off, as though by some carnivorous animal which had either attacked the *Brontosaurus*

when alive, or had feasted upon the carcass. When the Allosaurus jaw was compared with these score marks it was found to fit them exactly, the spacing of the scratches being the same as the spacing of the teeth. Moreover, on taking out the Brontosaurus vertebrae from the quarry a number of broken-off teeth of Allosaurus were found lying beside them. As no other remains of Allosaurus or any other animal were intermingled with the Brontosaurus skeleton, the most obvious explanation was that these teeth were broken off by an Allosaurus while devouring the Brontosaurus carcass. Many of the bones of other herbivorous dinosaurs found in the Bone-Cabin Quarry were similarly scored and bitten off, and the teeth of Allosaurus were also found close to them.

With these data at hand the original idea was conceived of combining these two skeletons, both from the same formation and found within a few miles of each other, to represent what must have actually happened to them in the remote Jurassic period, and mount the Allosaurus skeleton standing over the remains of a Brontosaurus in the attitude of feeding upon its carcass. Some modifications were made in the position to suit the exigencies of an open mount, and to accommodate the pose to the particular action; the head of the animal was lifted a little, one hind foot planted upon the carcass, while the other, resting upon the ground, bears most of the weight. The fore-feet, used in these animals only for fighting or for tearing their prey, not for support, are given characteristic attitudes, and the whole pose represents the Allosaurus devouring the carcass and raising head and fore-foot in a threatening manner as though to drive away intruders. The balance of the various parts was carefully studied and adjusted under direction of the curator. The preparation and mounting of the specimen were done by Mr. Adam Hermann, head preparator, and his assistants, especially Messrs. Falkenback and Lang.

As now exhibited in the Dinosaur Hall, this group gives to the imaginative observer a most vivid picture of a characteristic scene of that bygone age, millions of years ago, when reptiles were the lords of creation, when "Nature, red in tooth and claw" had lost none of her primitive savagery, and the era of brute force and ferocity showed little sign of the gradual amelioration, which was to come to pass in future ages through the predominance of superior intelligence.

W. D. MATTHEW.