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THE NEBRASKA STATE MUSEUM

ERWIN H. BARBOUR, *Director*

THE ARTICULATED SKELETON OF A TITANOTHERIUM

BY ERWIN HINCKLEY BARBOUR

The skeleton of a titanotherium, stored since 1894, was installed in the west corridor of Morrill Hall, April 28, 1931. In the meantime the specimen has been visited by many citizens, women's clubs, and especially by delegations of school children, boy scouts, and like organizations, from various parts of the State and elsewhere. Repeated requests for a popular report on this particular specimen actuates the writing of this leaflet.

Titanotheres were by far the largest creatures of Oligocene time in Nebraska. In point of size they are called gigantic, elephantine, and titanic. The titans of Greek mythology were giants, and therium means beast, so Titanotherium seems a fitting appellation for these huge and impressive creatures. The skeleton under discussion measures eleven to twelve feet in length, and it stands seven and a quarter feet at the shoulders. In the flesh it must have been about eight feet at the withers. It was a titanothere of medium rather than large size, otherwise it could not have been installed in the case shown in the figure.

During that remote time when the strata now exposed in our Bad Lands were being laid down as muds, titanotheres were very abundant. The territory embraced by Nebraska, South Dakota, and Wyoming, is counted the cradle of this strange and comparatively short-lived race. This region was their home, and the part they played in the drama of animal life was enacted here. They have been counted local, but may have been more cosmopolitan than is generally allowed. A few, at least, found their way across the land bridge into the eastern hemisphere, and some even reached Europe. Their gait was slow and heavy like the elephants, but those possessed of longer and less ponderous limbs were capable of corresponding activity and speed.

Their position in the animal kingdom is most easily expressed by saying that the odd-toed, hoofed mammals are the horses, titanotheres, tapirs, and rhinoceroses. It may be expressed somewhat more technically as follows:

Order PERISSODACTYLA. Odd-toed ungulates.

1. Superfamily. HIPPOIDEA. Palaeotheres and horses.
2. Superfamily. TITANOTHEROIDEA. Titanotheres.
3. Superfamily. TAPIROIDEA. Tapirs and lophiodonts.
4. Superfamily. RHINOCERATOIDEA. Rhinoceroses.

They roved our plains as the dictators of Oligocene mammals, and, being such huge beasts, they enjoyed a certain immunity from attack. They followed the general law that animals surrounded by ample food and not too harassed by foes tend to grow large. They flourished, increased in size, and became more specialized as time passed. All of these changes took place while about 200 vertical feet of titanotherium beds were being deposited. These beds yield numerous mammalian fossils of many other orders, and are amongst the most famous of fossiliferous horizons.

Titanotheres are strictly American forms. Starting in the Eocene these erratic ungulates experienced great expansion in the upper Eocene and lower Oligocene, passed their zenith and suddenly became extinct in the topmost titanotherium beds, about Mid-Oligocene. Some were relatively fleet, while others were sluggish and slow. All were vegetarians, those having short-crowned teeth were browsers, while others with longer crowns were grazers. Dr. Henry Fairfield Osborn in his great monograph entitled "The Titanotheres of Ancient Wyoming, Dakota, and Nebraska," describes an incredibly long list of Titanotheres even after eliminating many described species. The largest titanotheres reached a reported length of 14 feet and a height of 10 feet and, though ponderous and powerful, they necessarily yielded to accidents, disease, and old age like commonplace living creatures. Such of their carcasses as fell in the open, were utterly destroyed. The gases escaped into the air, and the ash mingled with the ground. Therefore the decay was complete. On the other hand, some carcasses were buried in mud and sand, so their bones were perfectly preserved. All bones that are quickly and deeply entombed in muds are likely to endure indefinitely. Later these muds became rock, which yields up bones when heavily washed by rains, or when attacked with pick and shovel, or by hammer and chisel.

The earliest titanotheres were small and hornless, but later they became larger and their skulls bore two small horns near the eyes. Still later they made further progress and bore two horns far forward on the nose. Finally they

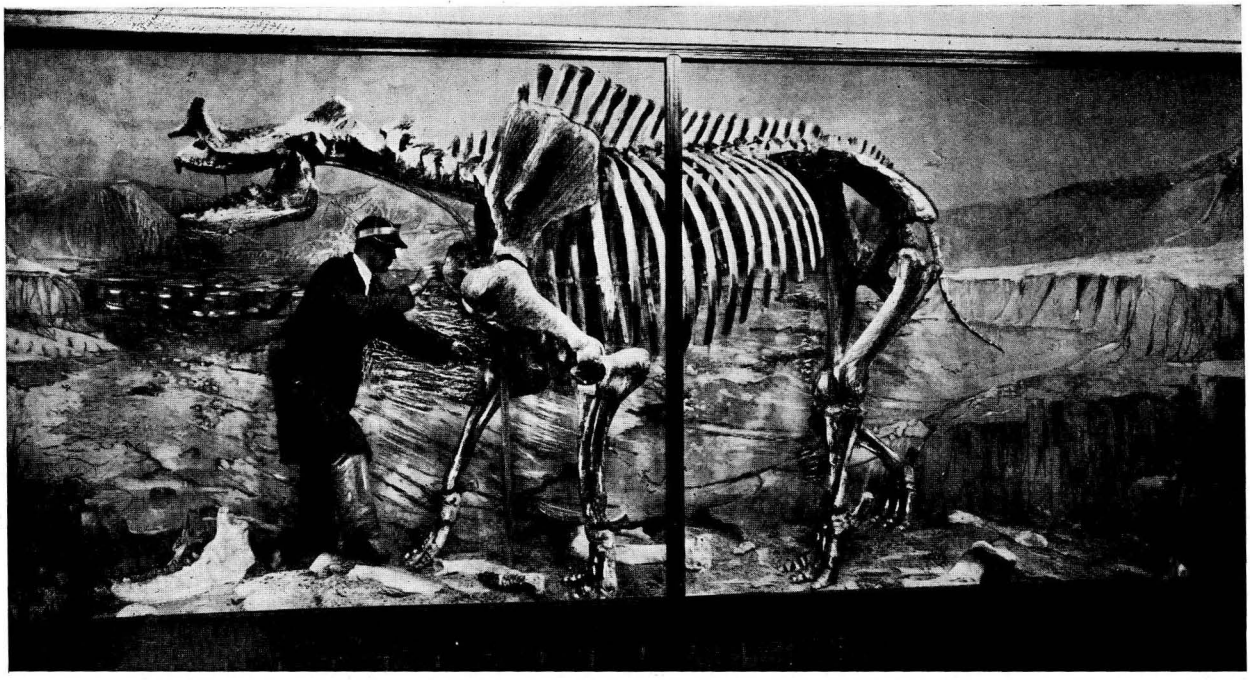

Fig. 150.—A titanotherium skeleton, Brontops dispar. The Morrill Palaeontological collections, the Nebraska State Museum, The University of Nebraska.

can be worked out with the humble shovel as truly as the prostrate oak, buried in the alluvium of a valley, can be dug out from root to stump, trunk, branch, and twig.

The following brief report deals with a well authenticated association of an arrow point with the bones of Bison occidentalis in Central Nebraska.

Some six or eight years ago, the Platte River swung to the right and began to cut its south bank heavily. In a short time a bed of the bones of Bison occidentalis was exposed four or five feet below the surface. The spot was visited May 4, 1923 by Earl Foster and Charles Foster, students in the Grand Island High School. The following week these two students re-visited the spot and returned with a portion of a skull, an atlas, and skeletal parts. The junior writer, Professor Meserve of Grand Island College, went immediately to the bison quarry, and, after extensive digging, secured another skull along with many parts of two skeletons. The bank containing these bones rises vertically, some 12 feet above the level of the river. The formation is thought to be Peorian, resting on Kansan gravels. Its location is about six miles south of Grand Island, Hall County, Nebraska.

While excavating these bones, an arrow point of gray flint was found under the left scapula of bison No. 1, two inches back of the glenoid cavity. This is numbered 10-12-31. This seems to be a genuine association of man with a fossil mammal, Bison occidentalis.

Even though these bison are close relatives, rather than remote ancestors of the living bison, they are, nevertheless, extinct, and their relics evidence a certain antiquity, which heightens interest in the artifact. All of the Meserve Bison bones were procured from Grand Island College for the Nebraska State Museum, November 19, 1931. The associated arrow head was donated by Professor Meserve.

The Meserve bison bones are being carefully cleaned, hardened, and articulated. The progress already made shows that two skulls and two skeletons, one esentially complete, are at hand. One or both of these will be prepared with care, and will be mounted along with other fossil bison in proximity to the case where the modern bison are to be installed. Plans have been carefully laid for an extensive and rather

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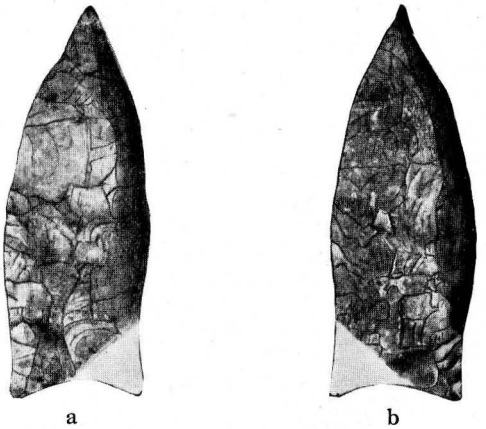
Editorial Note. Professor Meserve, now assistant professor of Zoology in Northwestern University, was then professor of Biology in Grand Island College, Grand Island, Nebraska. Being well trained, he was considered a close and reliable observer.

elaborate display of native bison in the Nebraska State Museum. No other creature in the faunal list of the State was so far famed, and qualified for this recognition. Nebraska was the center of the great bison population, and no other state is entitled to a more pretentious display of these animals.

In workmanship this arrow point shows average skill. It is of gray flint about 19 mm. wide, 53 mm. long, and 5 mm. thick, and is without notches for hafting.



a b

Fig. 151.—The Meserve artifact, found under the scapula of a fossil bison, Bison occidentalis, near Grand Island, Hall County, Nebraska. Specimen 10-21-31. The Nebraska State Museum.
a. Observe, natural size.
b. Reverse.

It should be noted here that in the field season of 1931, collecting parties, consisting of C. Bertrand Schultz, and assistant Frank Crabill, with Emery L. Blue, and Eugene Vanderpool were sent by the University to re-open the Meserve quarry. While digging out additional bison material, they came upon another arrow point, identical with the Meserve artifact in color, material, workmanship, and size. This arrow point, No. 1-25-7-31, was found amongst a bunch of ribs. It was photographed in place, and a block containing the mold of the arrow point was cut out and brought in. Both artifacts will be exhibited along side of the bones with which they were found.

Mr. Schultz, a graduate student in the University of Nebraska, has had a number of years of experience in anthropological work, as well as palaeontological field work, and made critical observations. A bulletin by him concerning this occurrence is in the hands of the printer.

BIBLIOGRAPHY

The limitations of this bulletin are such that a bibliography is inadmissible. Citizens of the State, students, amateurs, and collectors interested in anthropological research will find a full bibliography in a succeeding bulletin entitled "Association of Arrow Heads and Extinct Mammals in Nebraska," by C. Bertrand Schultz.

The University of Nebraska,
Lincoln, Nebraska, February, 1932