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ERWIN HINCKLEY BARBOUR, STATE GEOLOGIST

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NOTICE OF A NEW FOSSIL MAMMAL FROM SIOUX COUNTY NEBRASKA

BY
ERWIN HINCKLEY BARBOUR



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NOTICE OF A NEW FOSSIL MAMMAL FROM SIOUX COUNTY, NEBRASKA.

BY ERWIN HINCKLEY BARBOUR.

During the summer of 1905 the geological expeditions of the Hon. Charles H. Morrill of Lincoln were again resumed after a lapse of six or eight years. Owing to the over-crowded condition of the State Museum, coupled with unusual fire risks, Mr. Morrill withdrew his patronage, which had been so liberal since 1891.

Early in 1905 the State Legislature, pursuant to recommendations by Chancellor Andrews and the Board of Regents, voted the sum of fifty thousand dollars for the erection of a portion of the first wing of a new fireproof museum. Thereupon Mr. Morrill again offered substantial support to the amount of one thousand dollars annually for geological work. A party of students was organized and sent at once into the field to collect vertebrate fossils in the Daimonelix beds (Loup Fork) of Sioux county, at Agate, Nebraska, on the ranch of Mr. James Cook, which is an extensive one including some twelve miles along the Niobrara river.

As early as 1875 the bone beds of this region were recognized by Mr. James Cook. In 1892 they were visited by the writer, and collections were made by the Morrill geological expedition of that year. In the meantime every exposure of these beds throughout the entire region has been explored from year to year by Mr. Harold Cook. By him the specimen herein described was discovered, and for him it is named. Several discoveries were made during the season, but this one seems to outrank the others.

At first the skull and mandible were thought to constitute the known remains of this remarkable new fossil, but since this paper was begun it transpires that large blocks of material which had been taken out in connection with the skull, are literally packed with bones belonging to it. Though these bones are not sufficiently freed from the matrix to admit of description, yet it is now pos-

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sible to state that there is enough of the skeleton in evidence to make a restoration of the animal possible. Awaiting the preparation of the various skeletal parts it seems to be in order to offer a brief description of the skull and mandible, accompanied by a half tone reproduction.

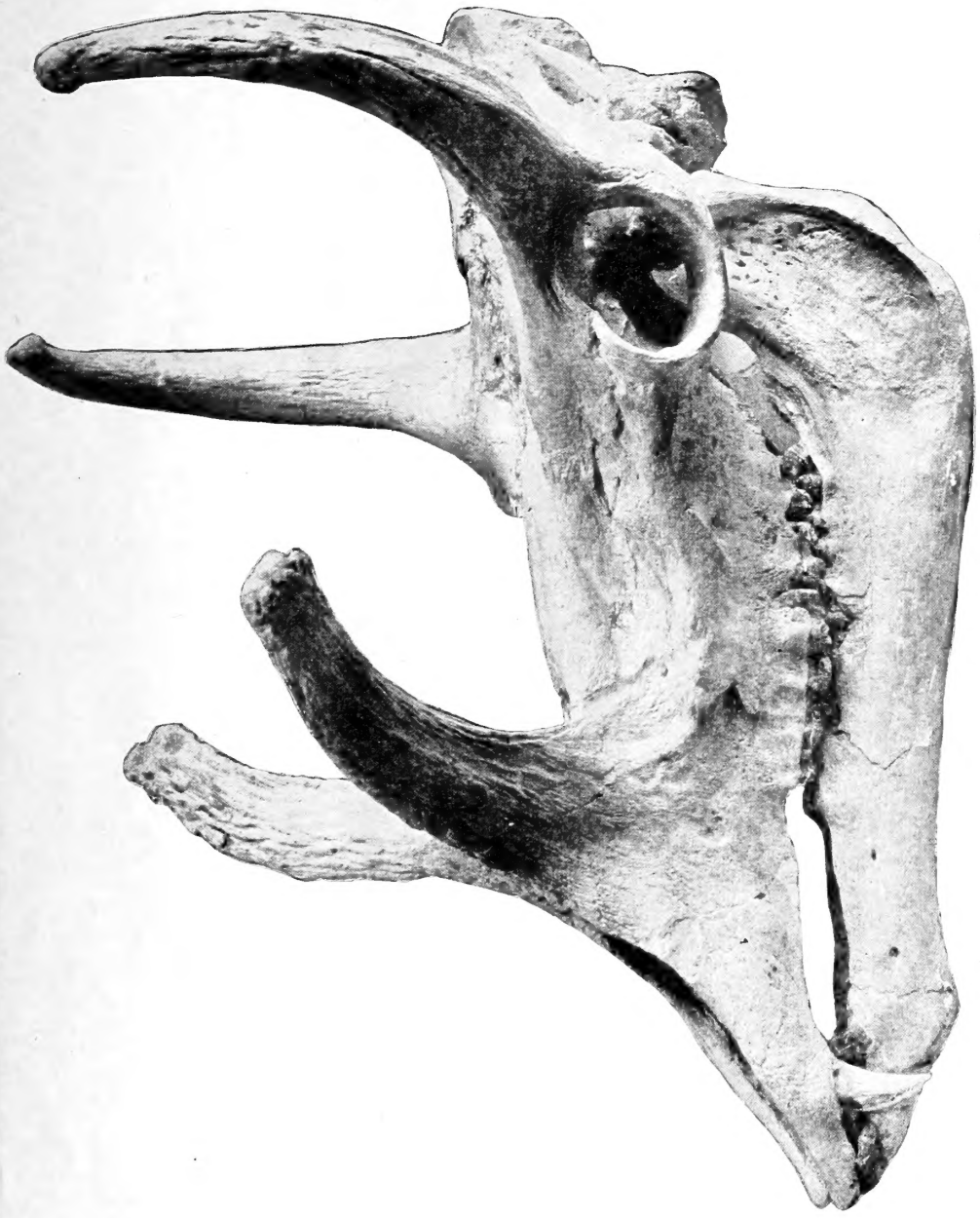
In general it may be stated that the skull, which is almost without break or blemish of any kind, is that of a primitive, "four-horned antelope" with wide orbits, tapering snout, and a well proportioned outline presaging a beast of grace and beauty equal to that of any living or extinct species.

The skull, which is that of an old animal, with sutures obliterated and teeth ground down, is decorated with four conspicuous horn cores, which in each case are grooved like those of the Bovidae. These horns constitute the first and most striking characteristic of the genus. The posterior or frontal pair curves upward and inward, while the anterior or maxillary pair curves upward and outward.

The writer would propose the name *Syndyoceras* for this genus, in allusion to the two pairs of horns. In addition to meaning two pairs *sunduo* in Greek has as a primary meaning two together, which is quite descriptive of the front horns, for they have fused and stand on a common trunk.

Next to the horn cores the most striking feature seems to be a nasal opening, of circular outline, just back of the anterior horns. The margins are roughened as though for ligamentous attachment, which suggests the possibility that it was functional. A parallel may be drawn here with *Protoceras*, in which, if the anterior horns or protuberances were enlarged, the nasal opening could easily be divided into two parts.

Another anatomical feature, interesting, though not unique, is found in the canine and first premolar on each side. The canine has migrated forward and has become incisiform functionally, while the first premolar has taken its place and has become caniniform in function.



SYNDYOCERAS COOKI, GEN. ET SP. NOV. $x\frac{1}{2}$.
Specimen No. 4-7-05 Geological Collections of Hon. Charles H. Morrill.



A NEW FOSSIL MAMMAL

Dental formula: I. $\frac{3}{3}$, C. $\frac{1}{1}$, P. $\frac{3}{3}$, M. $\frac{3}{3}$.

Measurements of the skull: Length of skull $12\frac{3}{4}$ inches (325 mm).

Distance between the orbits across the frontals, 5 inches (128 mm).

Elevation of the anterior horn cores above plane of molars, $6\frac{1}{2}$ inches (166 mm).

Spread of same at the summit, $8\frac{1}{2}$ inches (216 mm).

Height of posterior horn cores above plane of molars, $7\frac{3}{4}$ inches (197 mm).

Spread of same at widest point, 10 inches (254 mm).

Width of palate between molars, $1\frac{1}{4}$ inches (32 mm).

The known skeletal parts of *Syndyoceras* are the following: Skull and mandible complete: vertebral series complete, as far as exposed, and articulated: pelvis and sacrum and both hind limbs complete and likewise articulated: several ribs, attached to their respective vertebrae above and to the sternum below, are in view; and a portion of one scapula. The fore limbs are apparently missing but will doubtless be found either in the material collected or else in the quarry. Each hind foot has two toes, and it now remains to find the fore foot to settle doubts as to whether it also had two toes, or two with a rudimentary pair of toes, or four functional toes, after the manner of the ancestral antelopes.

The cervical vertebrae are noticeably large and broad, but short. The horn cores are roughened and grooved as in the Bovidae, but the horns were no doubt very like those of our common prong-horn antelope, and were probably shed annually.

In size it was about intermediate between a common sheep and the antelope.

Approximate measurements of hind limb:

Length of femur, $8\frac{3}{4}$ inches (222 mm).

Diameter of shaft, $\frac{7}{8}$ inch (24 mm).

Length of tibia, $9\frac{1}{2}$ inches (242 mm).

Length of tarsus, about 2 inches (51 mm).

Length of metatarsus, 5 inches (128 mm).

Length of first phalanx, $1\frac{3}{4}$ inches (45 mm).

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Length of second phalanx, $\frac{3}{4}$ inch (20 mm).

Length of ungual phalanx, $1\frac{1}{8}$ inches (30 mm).

Height of sacral spines, above the acetabulum, about $4\frac{1}{2}$ inches (115 mm).

According to these measurements, which are sufficiently exact for the present purpose, the hind quarters of the creature were between thirty and thirty-four inches in height.

The genus cannot be fully defined until more material and data are available. As to the affinities of *Syndyoceras* it seems to resemble *Protoceras* of the Oligocene more closely than any other known form, but the relationship seems remote. The antelope seems to be a related ally. For lack of full information it will be placed in the *Protoceratidae*, but further study will doubtless warrant assigning it to an entirely new family.

This adds another to the long list of fossils for which Nebraska has become famous in every center of learning, and now that the Morrill geological expeditions are again operative it is believed that many of these fine specimens which hitherto have been going to the eastern colleges and to European museums will begin to find a place in the museum of the state where they by right belong.

Before another year has passed a portion of the first wing of a new fireproof museum will be in readiness to receive and properly display all such specimens in the state collections.

The University of Nebraska, Sept. 1, 1905.



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