DESCRIPTIONS OF TWO NEW SPECIES OF PLEISTOCENE RUMINANTS OF THE GENERA OVIBOS AND BOÖTHERIUM, WITH NOTES ON THE LATTER GENUS.

By James Williams Gidley,
Of the United States National Museum.

Two interesting specimens, each representing an apparently undescribed species of the Bovidæ, have recently been placed in my hands for determination. They are from widely different localities, but since they are from practically equivalent horizons and the genera to which they are referable have been closely associated by former writers, they may be conveniently described together. The first to be considered is a nearly complete skull of *Ovibos*, closely related apparently to the living species, *O. moschatus*. It was discovered by Mr. C. W. Gilmore, of the U. S. National Museum, in the Pleistocene silts along the Palisades of the Yukon, Alaska, while exploring that region for fossils during the summer of 1907.

The second specimen, which I provisionally refer to the genus *Boötherium* Leidy, is from a post-glacial swamp deposit near Grand Rapids, Michigan. Unfortunately it consists of only the upper portion of the cranium, with complete horn-cores attached, but this fragment seems sufficiently characteristic to warrant description. The specimen is the property of the Kent Scientific Museum of Grand Rapids, Michigan, and was discovered by Mr. E. R. Callenbeck in association with the bones of a Mastodon which were being exhumed by a Kent Museum field party, under the supervision of Mr. Herbert E. Sargent, director of that institution.

The descriptions follow in the order in which the specimens are mentioned above.

OVIBOS YUKONENSIS, new species.

Plates LVII–LVIII.

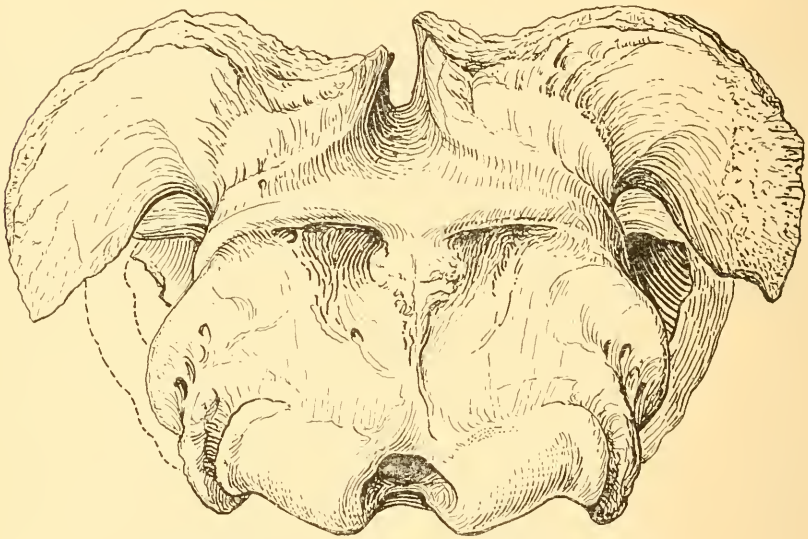
Type.—The greater portion of a skull, but lacking the nasals, the premaxillaries and most of the teeth. (Cat. No. 5728, U.S.N.M.) The skull is that of an old male with m^2 and m^3, the only teeth preserved, well worn.

Type-locality.—The Palisades, Yukon River, about 35 miles below Tanana, Alaska.

Horizon.—Pleistocene.

Species characters.—Size of teeth somewhat larger, with the internal median valley in the upper molars less infolded at base than in the living species *O. moschatus;* skull somewhat larger throughout; ascending process of the premaxillaries nearly or quite reaching the nasals; basisphenoid slightly overlapped by the vomer; otic bulla greatly reduced, being intermediate in size between that of *O. moschatus* and *Symbos tyrrelli* (Osgood) Osgood. The horn-cores droop in about the same degree as in the living species. (See fig. below.)

The species further differs from *O. moschatus* as follows: (1) Posterior narial opening much larger; (2) spheno-palatine foramen



POSTERIOR VIEW OF CRANIUM OF OVIBOS YUKONENSIS.

about one-third greater in diameter; (3) basioccipital proportionally wider, with a decidedly deeper and broader median fossa; (4) horn-cores more depressed at base; (5) frontals more arched in the median line, owing to their greater depression on either side above the orbits; (6) the much greater anteroposterior width of the horn-cores; and (7) the presence of a regularly striated rugosity on the frontals, fringing the anterior borders of the horn-core bases. This last character may be an age condition only, but it indicates a forward expansion of the horn-covering and suggests a tendency to extend the horn-core base forward, as in *Symbos.*

While there is no doubt regarding the generic reference of this species, in certain characters in which it differs from *O. moschatus* it appears to approach *Symbos tyrrelli.* These deviations are most

marked in the following characters: The modifications at the base of the horn-cores, the small size of the otic bulla, the enlargement of the posterior narial opening and the spheno-palatine foramen, and the broad proportions of the basioccipital.

Table of Measurements.

	O. yukonensis.	*O. moschatus.*	*S. tyrrelli.*
	mm.	*mm.*[a]	*mm.*[a]
Length of molar-premolar series	145	135	168
Anteroposterior diameter of m^2	30	31.5	35
Anteroposterior diameter of m^3	36	33	49
Transverse diameter of m^2	23	19	32
Transverse diameter of m^3	22	18	33
Anteroposterior diameter of horn-core at base	198	138	95
Vertical diameter of horn-core at base	60	68	72
Length of horn-core, outside (approximated)	230		
Anteroposterior diameter of orbit	68	63	73
Width of face across orbits	250	232	191
Width of skull across mastoids	190	180	197
Depth of occiput	119	123	117
Greatest width of basioccipital	70	64	72
Inferior lip of foramen magnum to anterior border of palatine notch	194	177	184
Inferior lip of foramen magnum to alveolus of m^3	244	217	218
Width of palate at m^2	80	79	84

[a] These measurements are taken from a table published by Osgood. Smithsonian Miscell. Coll., XLVIII, Pt. 2, July 1, 1905, p. 184.

BOÖTHERIUM SARGENTI, new species.

Plate LIX.

Type.—The upper portion of a skull, supporting the complete horn-cores, now deposited in the Kent Scientific Museum of Grand Rapids, Michigan.

Type-locality.—Moorland Swamp, on the Charles McKay farm, near Grand Rapids, Michigan.

Horizon.—Pleistocene, post-glacial.

Species-characters.—Size about two-thirds that of *Ovibos moschatus*, somewhat larger than *B. bombifrons;* horn-cores comparatively large, well rounded, long and slender; horn-cores at base horizontally directed at right angles to the skull as in Plate LIX, fig. *a*, but curving downward and forward in graceful semi-spirals, ending in slender anteriorly directed tips (see Plate LIX, fig. *b*); orbits comparatively large, depressed below the arching frontals, with thin gently shelving borders, not tubular as in *Ovibos.* In the general form and contour of the skull and horn-cores this species, together with *B. bombifrons*, is strikingly different from other known species of the Ovibovenæ.

The type of *B. sargenti*, compared with that of *B. bombifrons*, shows the following resemblances: (1) The fragment preserved indicates a skull but little larger in size and of the same general proportions; (2) the position, form, and contour of the orbits as well as (3) the general appearance of the facial and posterior portions of the cranium (see Plate LIX, fig. *c*) are essentially alike. The horn-cores are also similarly placed, but the differences in their relative size, form and proportions are very marked. In *B. sargenti* the base of the

horn-core is relatively heavier, is angular in front, and its superior border approaches much nearer the median frontal suture than in *B. bombifrons*. In addition, characteristic rugosites and markings on the frontals indicate that the horn-covering extended much beyond the horn-core base, nearly or quite meeting the one from the opposite side in the median line. In *B. bombifrons* the inter-horn space was apparently covered by a wide skin-band as in *Bos*. The horn characters seem sufficiently different to separate these species generically, but the other cranial characters denote generic relationship. Moreover it is possible that the extreme difference in type of horn-core may be due in part at least to difference in sex.

NOTES ON THE RELATIONSHIPS OF THE GENUS BOÖTHERIUM LEIDY.

The genus *Boötherium* has for some time been considered as closely allied to *Ovibos*, and by some authorities as synonymous with that genus. But in 1905 Mr. W. H. Osgood[a] re-defined *Boötherium*, selecting *B. bombifrons* as the type, and transferred the remaining species, *B. cavifrons*, to a new genus, *Scaphoceros*,[b] of which *S. tyrrelli* is the type. In the publication first cited Mr. Osgood has shown with good reason the untenability of the opinion held by Rütimeyer and others regarding the types of *B. bombifrons* and *Ovibos* [*Symbos*] *cavifrons*, which they considered the female and male, respectively, of the same, or closely related, species. He has also pointed out that the type of *B. bombifrons* does not represent an immature male, but a fully adult individual. By an analogy similar to that employed by Osgood it is equally clear that the type of *B. sargenti* can not be referred on these grounds to any species of *Ovibos* or *Symbos*. The validity of the genus *Boötherium* therefore seems to be well established.

The separation of the two species originally referred to this genus permits the study of its relationships in a new light. As now known the genus presents quite as many bovine as ovibovine characters, and if referable to the Ovibovinæ it is far removed from the other known genera of the group. From present evidence it seems probable that the finding of more complete material will show that, whether generically distinct from each other or not, the species *B. bombifrons* and *B. sargenti* represent a distinct group, or subfamily, of the Bovidæ. To this group may belong also the genus *Lissops* Gidley.[c] Since, however, so little is known of the species of the group as a whole, owing to the lack of good material, it would be unwarrantable to separate them at present from the Ovibovinæ.

[a] Smithsonian Miscell. Coll., (Quart.) XLVIII, Pt. 2, July, 1905, pp. 181–182.

[b] Mr. Osgood later substituted the name *Symbos* to replace *Scaphoceros*, preoccupied. Proc. Biol. Soc., Washington, XVIII, 1905, p. 226.

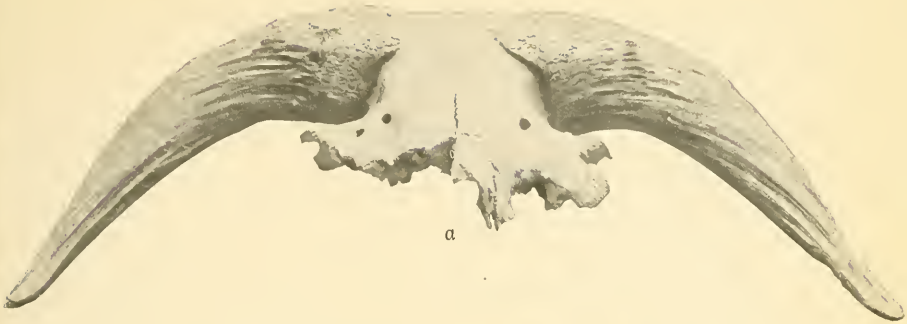
[c] This genus at present is represented by only the type-species which was founded on the posterior portion of a skull.

SUPERIOR VIEW OF THE CRANIUM OF OVIBOS YUKONENSIS.

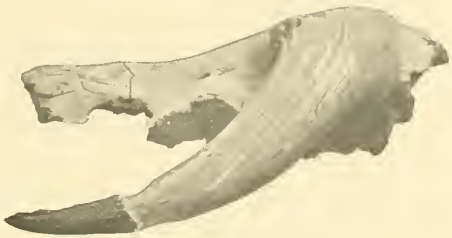
FOR EXPLANATION OF PLATE SEE PAGE 681.

PALATAL VIEW OF THE CRANIUM OF OVIBOS YUKONENSIS.

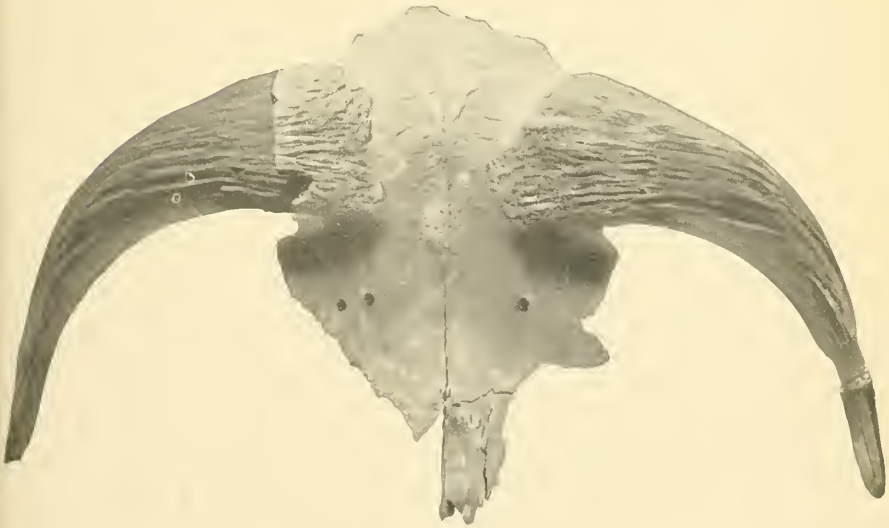
FOR EXPLANATION OF PLATE SEE PAGE 681.



a



b



c

HORN CORES OF BOÖTHERIUM SARGENTI.

FOR EXPLANATION OF PLATE SEE PAGE 683.