ON A TOOTH OF OVIBOS, FROM PLEISTOCENE GRAVELS NEAR MIDWAY, B.C.*

By LAWRENCE M. LAMBE, F.G.S., F.R.S.C., of the Geological Survey of Canada. *(With plate).*

An upper molar tooth of a ruminant has lately been presented to the Geological Survey by Mr. C. B. Bash, of Greenwood, British Columbia, who states in a letter accompanying the specimen that it is from Rock Creek about eight miles above its entry into Kettle River, and about four miles north of the International Boundary. Rock Creek joins Kettle River from the west about thirteen miles west of Midway. The tooth was found on a rock surface beneath a deposit of unconsolidated gravel, about two hundred feet in thickness, in a tunnel run into a hill in connection with placer mining.

The tooth received from Mr. Bash is the posterior true molar from the right side, and is referred provisionally to the genus Ovibos. In comparison with the corresponding tooth of an adult male musk-ox (*O. moschatus*, Zimm.) from Fort Rae, Great Slave Lake, in the Museum of the Geological Survey, it is seen to be slightly smaller and less robust but otherwise remarkably similar.

Remains, principally the hinder portion of skulls with horn-cores attached, from the Pleistocene of the United States, have been assigned to the genus Ovibos or related genera under a number of specific names, some of which are apparently synonyms. *Ovibos bombifrons* (Harlan) is from the Pleistocene of Kentucky; *O. cavifrons* (Leidy) is recorded from deposits of the same age in Indian Territory, Missouri, Kentucky, Ohio, Iowa, and Alaska, and both were included by Leidy in his genus Boötherium. A third species is *O. appalachicolus* (Rhoads), from the Pleistocene of Pennsylvania.

There are few records of the finding of the remains of Ovibos in Pleistocene deposits in Canada. Dr. George M. Dawson, in his Summary Report for 1898, p. 19 A, mentions the finding of portions of a skull of a musk-ox in old gravel deposits (Pleistocene) near Edmonton, Alberta. In his Report on the Klondike Gold Fields, 1905, p. 29B, Mr. R. G. McConnell refers to musk-ox, mammoth, buffalo, bear and mountain sheep and goat remains in the "low level creek gravels" of the Klondike district which are most probably of Pleistocene age, judging from the occurrence of mammoth bones in them. Lydekker in his Catalogue of Fossil Mammalia in the British Museum, pt. II, 1885, p. 39, refers, under the heading *Ovibos moschatus*, to a specimen

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consisting of the "hinder portion of the cranium of a small individual with part of the horn-cores," from the Pleistocene of the Upper Porcupine River, Yukon.

In the "Smithsonian Miscellaneous Collections," Vol. III, pt. 2, 1905, is a paper on "Scaphoceros* tyrrelli, an extinct ruminant from the Klondike gravels," by Wilfred H. Osgood. This paper is descriptive of the skull of an animal considered by Mr. Osgood to be "evidently related to the existing genus Ovibos, but sufficiently different to rank as a separate genus." The type skull is from Bonanza Creek. The remains of musk-oxen in the Yukon mentioned by Mr. McConnell in his report are the specimens on which this new genus has been established. Mr. Osgood in his important and interesting paper also reviews the literature of Pleistocene species of Ovibos. He assigns *O. cavifrons* (Leidy) to Scaphoceros, and retains the genus Boötherium with *bombifrons* as the type. In the skull of *Scaphoceros tyrrelli* from Bonanza Creek the teeth are preserved, an important feature, as no teeth have been found with the Pleistocene remains generally hitherto referred to the genus Ovibos under different specific names in Canada and the United States.

The tooth from Rock Creek, B.C., is in diameter about three-fifths the size of the last upper molar of *S. tyrrelli*, and its proportions are quite different. As already mentioned, it is nearly but not quite the size of the posterior molar of an adult male of *Ovibos moschatus* in the Museum of the Geological Survey, and in most particulars agrees very closely with it. As the styles or costæ are more slender, is is for the present only provisionally referred to the living form. In comparison with the corresponding tooth of an adult specimen of *Ovis montana* Cuv., the Mountain sheep or Big-horn, there are general resemblances. It is in size between the tooth of the mountain sheep and the musk-ox, but more nearly approaches the latter.

Figures in the accompanying plate are given of the tooth from Rock Creek. In comparing it with the corresponding tooth of the adult male musk-ox from Fort Rae, the three costæ or styles of its outer surface are seen to be more slender, but the proportionate development of the intermediate costæ or longitudinal ribs is about the same, and the tooth pattern is almost identical. The Rock Creek specimen is moderately worn and the posterior cement lake (valley) in the grinding surface connects at its anterior end with the longitudinal depression between the lobes on the inner side of the tooth. The complete enclosure of

*The generic term Symbos has since been substituted by Mr. Osgood for Scaphoceros (preoccupied). Vide, Proceedings Biological Society of Washington, Vol XVIII, p. 223, Oct. 17, 1905.

this lake would have taken place when the tooth had been worn down about 12 mm. more. The transverse section (Fig. 1 *c*) a little below the mid-height of the tooth (at *d*, Fig. 1) shows the posterior lake isolated with the addition near the inner division point of the lobes of the "small accessory valley (*e*, Fig. 1 *c*), to which attention is called by Dr. E. Lönnberg in his paper 'On the Structure and Anatomy of the Musk-ox.'"*

In the Fort Rae musk-ox the first and second upper true molars show this accessory valley well developed, and the third molar, which is not so much worn as the other two teeth, shows it in process of formation, but still attached to and continuous with the anterior cement lake. In this specimen only the small portion of the teeth above the alveolar border is available for examination.

In the specimen of *Ovis montana* neither of the cement lakes in the grinding surface of the last upper molar (very little worn) are completely enclosed; the anterior one communicates with the inner longitudinal furrow and also by a narrow surface with the posterior lake. With further wear (Fig. 2, section at mid-height of tooth) the two lakes become enclosed and distinct, but without the formation of the "small accessory valley." A second section nearer the base of the tooth reveals this small valley well formed. The first upper true molars in the same skull show this valley very plainly in the grinding surface, and it appears in a section at mid-height in the second molar. The "small accessory valley" is thus seen to be developed in both the musk-ox and the mountain sheep in the true molars. The styles of the Rock Creek tooth have about the same prominence and thickness as those of the sheep.

The Rock Creek tooth is without the "accessory column" that is stated to arise in Ovibos* at the base of the inner surface of the molars between the two lobes. This column is, however, apparently absent in the third upper molar‡ of Ovibos. In the second and third upper molars of the mountain sheep examined there is no trace of this column.

Measurements of the Rock Creek tooth (moderately worn), and those of the corresponding tooth in *Ovibos moschatus*

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*Proceedings of the Zoological Society of London for the year 1900, p. 712.

*Lönnberg, op. cit., p. 712.

†Osgood, op. cit., p. 177.

(much worn), and *Ovis montana* (slightly worn) are here given:

	Rock Creek tooth.	Ovibos moschatus.	Ovis montana.
Height or length of tooth.....	54 mm.	Ap. 40 mm.	55 mm.
Maximum anteroposterior diameter at grinding surface.....	25 mm.	31 mm.	18 mm.
Same at mid-height.....	29 mm.		25 mm.
Transverse diameter (width) of posterior lobe at grinding surface.....	10 mm.	12 mm.	6 mm.
Same at mid-height.....	13.5 mm.		11 mm.
Transverse diameter (width) of anterior lobe at grinding surface.....	12 mm.	13 mm.	9 mm.
Same at mid-height.....	15.5 mm.		12.5 mm.

In attempting, therefore, to determine whether the Rock Creek tooth is properly referable to the musk-ox or to the mountain sheep, the absence of the "accessory column" in the specimen does not afford any help in this particular case, and the presence of the "small accessory valley" is a character belonging to both animals. According to Dr. Lönnberg, "in sheep and goats this 'accessory valley' seems to be less constantly developed" (op. cit., p. 712), than in many members of the Bovidæ. Depending principally on its size and general robustness the Rock Creek tooth is provisionally referred to the musk-ox (*Ovibos moschatus*, Zimm.),in the belief that it may have belonged to a rather small individual.

The unconsolidated gravel under which the tooth was found is evidently of Pleistocene age. The enamel of the specimen varies in places from deep to light bluish-grey in colour, with a few irregular patches that are almost white. The dentine is of a very dark brown or almost black colour, with the cement a shade lighter. Dr. Reginald Daly, geologist for Canada to the International Boundary Commission, who is familiar with the geology of the Rock Creek district, says that the only unconsolidated gravels occurring there are, in his judgment, of glacial origin and of Pleistocene age.

EXPLANATION OF PLATE.

FIGURE 1—Right posterior upper true molar of ruminant (Ovibos) from Rock Creek, B.C.; exterior aspect.

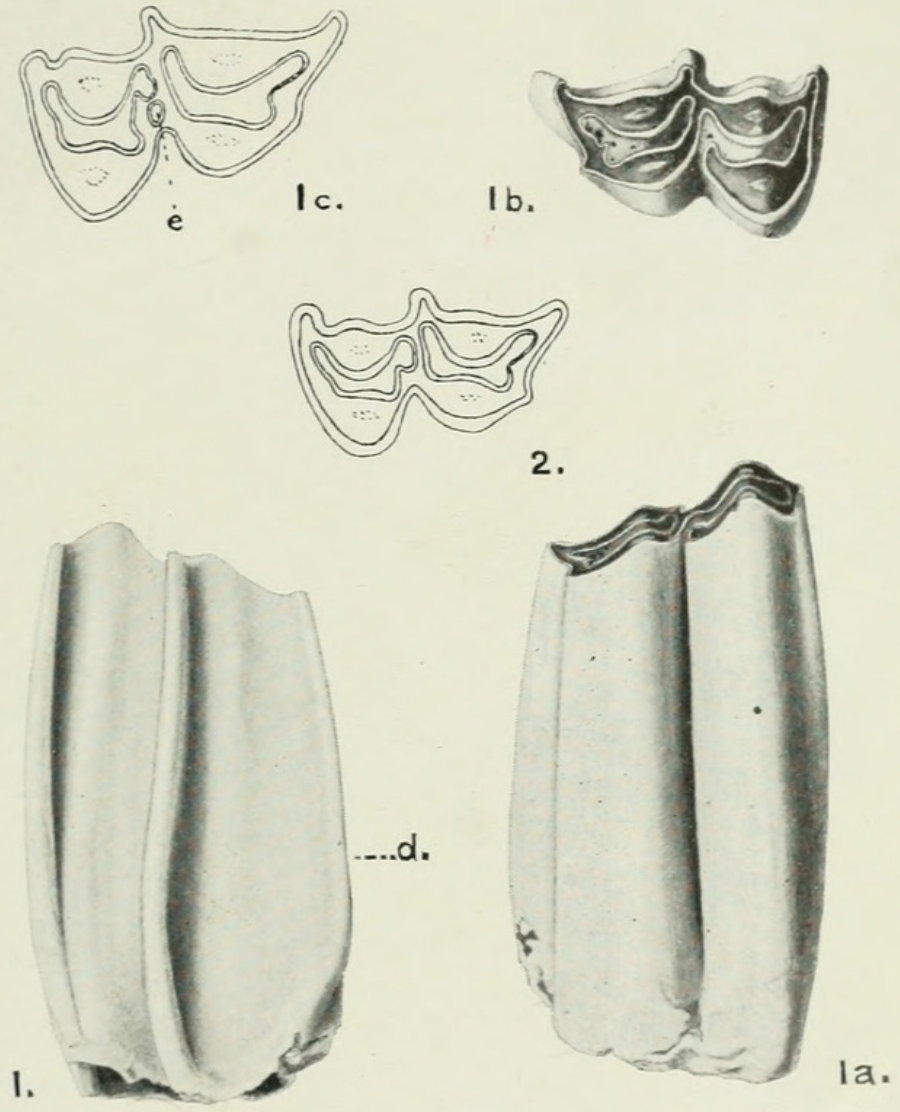
FIGURE 1*a*—The same viewed from within.

FIGURE 1*b*—The grinding surface of the same viewed from below.

FIGURE 1*c*—Transverse section of the same at *d*, fig. 1.

FIGURE 2—Transverse section at mid-height of the crown of the corresponding tooth of an adult mountain sheep (*Ovis montana*, Cuv.) *e*.—"Small accessory valley."

All the above figures are of natural size.



Fossil tooth from Rock Creek, B.C.

Lambe, Lawrence M. 1907. "On a Tooth of Ovibos, from Pleistocene Gravels near Midway, B.C." *The Ottawa naturalist* 21(1), 15–18.

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