

MUSK-OX, also known as musk-buffalo and musk-sheep, an Arctic American ruminant of the family Bovidae (*q.v.*), now representing a genus and sub-family by itself. Apparently the musk-ox (*Ovibos moschatus*) has little or no near relationship to either the oxen or the sheep; and it is not improbable that its affinities are with the Asiatic takin (*Budorcas*) and the extinct European *Criotherium* of the Pliocene of Samos. The musky odour from which the animal takes its name does not appear to be due to the secretion of any gland.

In height a bull musk-ox stands about 5 ft. at the shoulder. The head is large and broad. The horns in old males have extremely broad bases, meeting in the middle line, and covering the brow and crown of the head. They are directed at first downwards by the side of the face, and then turn upwards and forwards, ending in the same plane as the eye. The basal half is dull white, oval in section and coarsely fibrous, the middle part smooth, shining and round, and the tip black. In females and young males the horns are smaller, and their bases separated by a space in the middle of the forehead. The ears are small, erect, pointed, and nearly concealed in the hair. The space between the nostrils and the upper lip is covered with short close hair, as in sheep and goats, without any trace of the bare muzzle of oxen. The greater part of the animal is covered with long brown hair, thick, matted and curly on the shoulders, so as to give the appearance of a hump, but elsewhere straight and hanging down—that of the sides, back and haunches reaching as far as the middle of the legs and entirely concealing the very short tail. There is also a thick woolly under-fur, shed in summer, when the whole coat comes off in blanket-like masses. The hair on the lower jaw, throat and chest is long and straight, and hangs down like a beard or dewlap, though

there is no loose fold of skin in this situation. The limbs are stout and short, terminating in unsymmetrical hoofs, the external being rounded, the internal pointed, and the sole partially covered with hair.

Musk-oxen at the present day are confined to the most northern parts of North America, where they range over the rocky Barren Grounds between lat. 64° and the shores of the Arctic Sea. Its southern range is gradually contracting, and it appears that it is no longer met with west of the Mackenzie river, though formerly abundant as far as Eschscholtz Bay.



The Musk-ox (*Ovibos moschatus*).

Northwards and eastwards it extends through the Parry Islands and Grinnell Land to north Greenland, reaching on the west coast as far south as Melville Bay; and it also occurs at Sabine Island on the east coast. The Greenland animal is a distinct race (*O. m. wardi*), distinguished by white hair on the forehead; and it is suggested that the one from Grinnell Land forms a third race. As proved by the discovery of fossil remains, musk-oxen ranged during the Pleistocene period over northern Siberia and the plains of Germany and France, their bones occurring in river-deposits along with those of the reindeer, mammoth, and woolly rhinoceros. They have also been found in Pleistocene gravels in several parts of England, as Maidenhead, Bromley, Freshfield near Bath, Barnwood near Gloucester, and in the brick-earth of the Thames valley at Crayford, Kent; while their remains also occur in Arctic America.

Musk-oxen are gregarious in habit, assembling in herds of twenty or thirty head, or sometimes eighty or a hundred, in which there are seldom more than two or three full-grown males. They run with considerable speed, notwithstanding the shortness of their legs. They feed chiefly on grass, but also on moss, lichens and tender shoots of the willow and pine. The female brings forth one young in the end of May or beginning of June, after a gestation of nine months. The Swedish expedition to Greenland in 1899 found musk-oxen in herds of varying size—some contained only a few individuals, and in one case there were sixty-seven. The peculiar musky odour was perceived from a distance of a hundred yards; but according to Professor Nathorst there was no musky taste or smell in the flesh if the carcase were cleaned immediately the animals were killed.

Of late years musk-oxen have been exhibited alive in Europe; and two examples, one of which lived from 1899 till 1903, have been brought to England. The somewhat imperfect skull of an extinct species of musk-ox from the gravels of the Klondike has enabled Mr W. H. Osgood to make an important addition to our knowledge of this remarkable type of ruminant. The skull, which is probably that of a female, differs from the ordinary musk-ox by the much smaller and shorter horn-cores, which are widely separated in the middle line of the skull, where there is a groove-like depression running the whole length of the forehead. The sockets of the eyes are also much less prominent, and the whole fore-part of the skull is proportionately longer. On account of these and other differences (for which the reader may refer to the original paper, published in vol. xlviii. of the *Smithsonian Miscellaneous Collections*)

its describer refers the Klondike skull to a new genus, with the title *Symbos tyrrelli*, the specific name being given in honour of its discoverer. This, however, is not all, for Mr Osgood points out that a skull discovered many years ago in the vicinity of Fort Gibson, Oklahoma, and then named *Ovibos* or *Böotherium cavifrons*, evidently belongs to the same genus. That skull indicates a bull, and the author suggests that it may possibly be the male of *Symbos tyrrelli*, although the wide separation of the localities made him hesitate to accept this view. Perhaps it would have been better had he done so, and taken the name *Symbos cavifrons* for the species. A third type of musk-ox skull is, however, known from North America, namely one from the celebrated Big-Bone Lick, Kentucky, on which the genus and species *Böotherium bombifrons* was established, which differs from all the others by its small size, convex forehead and rounded horn-cores, the latter being very widely separated, and arising from the sides of the skull. This specimen has been regarded as the female of *Symbos cavifrons*; but this view, as pointed out by Mr Osgood, is almost certainly incorrect, and it represents an entirely distinct form.

This, however, is not the whole of the past history of the musk-ox group; and in this connexion it may be mentioned that palaeontological discoveries are gradually making it evident that the poverty of America in species of horned ruminants is to a great extent a feature of the present day, and that in past times it possessed a considerable number of representatives of this group. One of the latest additions to the list is a large sheep-like animal from a cave in California, apparently representing a new generic type, which has been described by E. L. Furlong in the publications of the University of California, under the name of *Preptoceras sinclairi*. It is represented by a nearly complete skeleton, and has doubly-curved horns and sheep-like teeth. In common with an allied ruminant from the same district, previously described as *Eucera-therium*, it seems probable that *Preptoceras* is related on the one hand to the musk-ox, and on the other to the Asiatic takin, while it is also supposed to have affinities with the sheep. If these extinct forms really serve to connect the takin with the musk-ox, their systematic importance will be very great. From a geographical point of view nothing is more likely, for the takin forms a type confined to Eastern Asia (Tibet and Szechuen), and it would be reasonable to expect that, like so many other peculiar forms from the same region, they should have representatives on the American side of the Pacific.

*(R. L. *)