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**THE CHALICOTHERES AS A BIOLOGICAL  
TYPE.**

**A. BORISSIAK.**

**TRANSLATED BY I. P. TOLMACHOFF.**

# THE CHALICOTHERES AS A BIOLOGICAL TYPE.

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**E**XTINCT animals occur in the strata of the earth's crust only as skeletons, often fragmentary. The restoration of an animal on the basis of such remains is a difficult task requiring great erudition in the student. It is still more difficult to write the history of the group to which the animal belonged, and the difficulty increases in proportion to the differences of the extinct animal from animals still living. Extinct animals with skeletons very unlike those of recent animals are often a real enigma.

For a long time when only limb bones of *Chalicotherium* were known, the animal was placed among Edentata because its powerful claws suggest those of a sloth. When other parts of the skeleton were found, *Chalicotherium* was placed among the Ungulata in the Perissodactyla, although it differed from all other fossil and living Ungulata [then known] in having claws, not hoofs.

Holland and Peterson (1913) in their monograph bring together a complete list of literature on chalicotheres for the period of 1825-1913. Their detailed quotations give a good idea of previous knowledge of this group of animals. In following years the Chalicotherioidea continued to be studied chiefly by Americans (e.g. Matthew, 1929; Colbert, 1935a, b). Russian literature on Chalicotherioidea is very small in amount for until lately only a few chalicothere bones had been found in Russia. Quite recently, however, the bones of chalicotheres have been found in large numbers in the Tertiary deposits of the Golodnaya Steppe in Southern Kazakhstan. Here the Lower and Upper Tertiary strata are separated by a layer of conglomerate with abundant bones and teeth of mammals. The great majority of these bones belong to a large chalicothere. It has been possible to assemble an almost complete although composite skeleton, to study its elements in detail, and to come to conclusions about the habits of the animal and its phylogenetic relations (Borissiak, in press).

In the skeleton of chalicotheres (Fig. 1), striking features are the rather long neck, the small skull, the comparatively long and thin fore limbs, and the short, massive hind limbs. The feet were digitigrade and the replacement of hoofs by claws was especially well developed on the fore limbs.

In some species of chalicotheres the skull is long and low (like the skull of the horse), but in other species it is short, resembling, in these instances, the skull of a bear. The skull

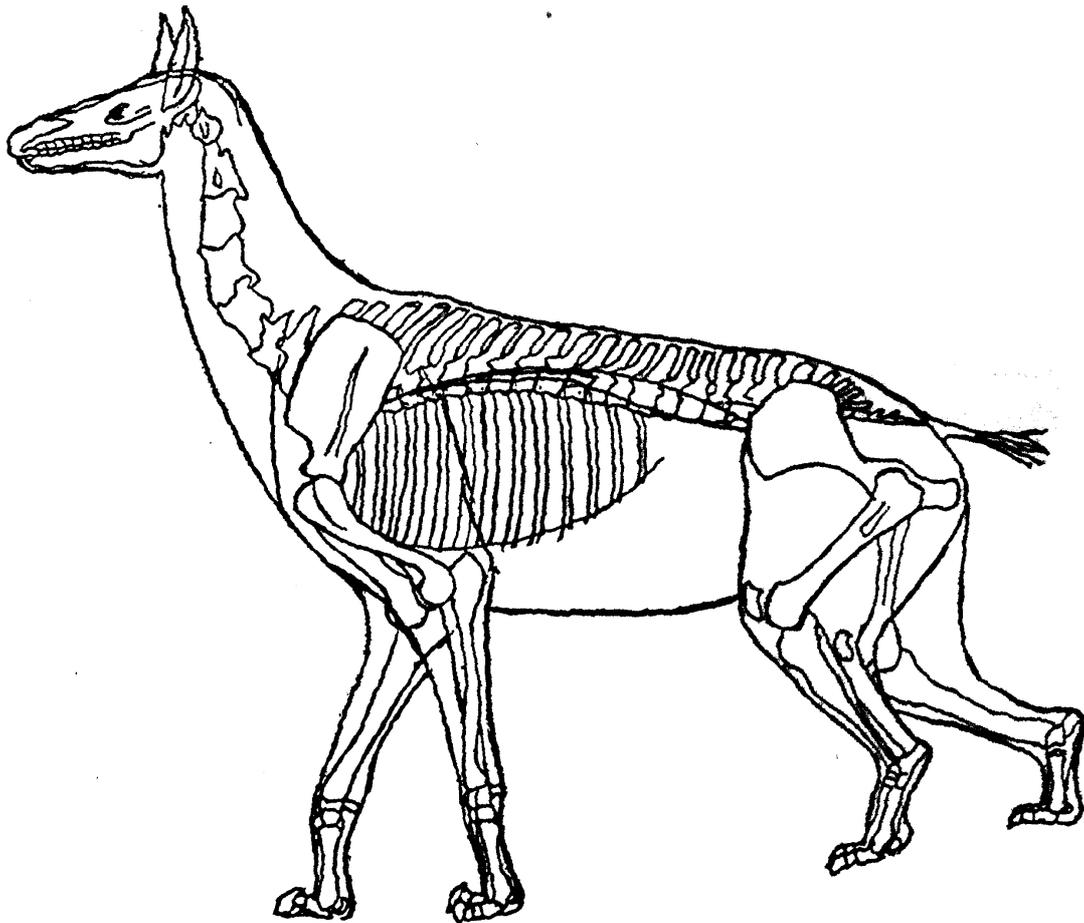


Fig. 1. Restored skeleton of *Phyllotillon betpakdalensis* (Flerov) from the Tertiary of the Golodnaya Steppe.

has characters of primitive Perissodactyla (tapirs, early titanotheres) but also a few characters known only in chalicotheres (e.g. two deep impressions on the sides of the presphenoid). The structure of the cervical section of the vertebral column was very peculiar. It was rather long and at the same time very massive, especially in comparison with the small skull. The vertebral centra were reduced relative to the well developed, flattened neural arches, which bore strong zygapophyses. Such