Evolution of the Horse

M. R. Benson
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THE phylogeny of the horse family is perhaps the most complete record of organic evolution that modern science has discovered. This article is an attempt to show briefly the outstanding steps in the development of the modern horse.

Most investigators agree that the horse tribe originated during the Eocene epoch. Luxuriant forests grew in the warm, humid climate which characterized this era in North America. Numerous streams and lakes gave rise to sedgy meadows and extensive grass lands.

Eohippus

Eohippus (A), the four-toed horse, represents the first stage in equine evolution. It was a slender, lithe creature, averaging about 12 inches or 3 hands in height at the withers. In fact, the general proportions were similar to those of a dog of the fox terrier type. The fore foot bore four complete toes, each terminating in a hoof-like nail (a). The rear foot had three similar toes with remnants of the first and fifth.

Orohippus

Orohippus (B), the next stage, showed an advance in adaptation by the loss of the splint of the fifth digit in the rear foot. The digits of the fore foot still numbered four, but the middle digit became more prominent. The animal's skeleton, as mounted at Yale University, measures 13½ inches in height.

The Oligocene period was a time of increased aridity due to changes in continental contour, which gave impetus to the development of broad meadows and true prairie lands.

Mesohippus

Mesohippus (C) attained the size of a collie dog and had three functional digits (c) on both fore and rear feet. The animal was more adapted for speed. Many representatives of this group have been discovered, ranging from 18 inches to 24 inches, or 6 hands in height. This animal is usually considered as a transitional type between the earlier forest-dwelling animal and the later plains-inhabiting creature.

The Miocene era was a time of great topographical change during which our highest mountain ranges were formed. Great increases of prairie lands and a decrease of forest lands resulted from these physiographical alterations. As a result of these land changes, many browsing animals perished, but the grazing types, horses, camels, deer and antelope, adapted themselves to the new conditions and became the dominent forms of mammalian life. This period saw a wide dissemination of the horse tribe, spreading to the European continent by means of newly formed land bridges.

Merychippus

Perhaps the best example of the horses of this period is Merychippus (D), which marks the transition from horse-like forms of the past with short-crowned, uncemented teeth to the true horses, whose long-crowned, fully cemented molars and premolars are more suited to the harsh vegetation of plains areas. Merychippus was three-toed, but the lateral toes did not reach the ground so the animal was functionally one-toed.

Pliohippus

Pliohippus (E) was the first one-toed horse. It is the direct ancestor of the prehistoric wild horses of Eurasia from which modern breeds are descended. This animal had a shoulder height of some 40 inches, or 10 hands. The skeletal remains of this animal show an adapta-

A.
B.
C.
D.
E.
(a)
(b)
(c)
(d)
(e)
A. Eohippus (after Lull)
B. Orohippus " "
C. Mesohippus " "
D. Merychippus " "
E. Pliohippus " "
(a) Fore foot Eohippus (after Marsh)
(c) Fore foot Mesohippus " "
(e) Fore foot Pliohippus " "
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tion of the one-toed structure (e) as found in modern horses, although the terminal phalange retains a cleft in its anterior border, as was common in previous genera.

Prejvalski horse

Several species of horse-like animals are yet alive in their wild condition in Asia and Africa, all of those of Europe and the Americas being either domesticated or of domestic ancestry. Of the true wild horses but one remains: the Mongolian or Prejvalski horse, which inhabits the Gobi desert of central Asia and the neighboring regions. "It is a small animal standing but 12 hands, of a yellow dun or 'buckskin' color, with black mane, tail, and legs and a white muzzle. There is no forelock, the mane is short and upright and there is a decided beard beneath a relatively large head." (2)

Many other genera and species of extinct equidae have been discovered and described by various authors, and several extinct examples of the genus Equus have been found in North America. However, the modern horse, as we know it, is descended from European and Asian forms.

Bibliography

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FOXES—

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Paratyphoid Infection

This is a disease which was very prevalent in Iowa in 1925 and again in 1938. It is an infection especially of young animals. The course of the disease varies greatly, the sick animal living from one week to eighteen days. The mortality rate is extremely high in some cases, reaching sixty per cent of all puppies born during the year. The disease usually occurs as an epidemic.

Symptoms: The symptoms are marked weakness, loss of weight, rough coat, diarrhea, and occasionally convulsions. In outbreaks that occur during the winter a pus-like discharge is noticed from the eyes and nostrils. In summer outbreaks this symptom has never been noticed.

Post Mortem Lesions: The eyes are markedly sunken, the spleen is much enlarged and usually a very dark color. The intestines are greatly inflamed. In cases showing a nasal or eye discharge the upper respiratory tract is inflamed and frequently pneumonia is present. In those cases that fail to show an eye or nasal discharge, the lungs and respiratory tract appear to be normal.

The paratyphoid organism can be isolated from the spleen of fatal cases and when injected into healthy foxes will produce the disease with the same symptoms as found in ranch cases. The organism can be passed serially from fox to fox—usually killing them in eighteen days.

Vaccination with a product prepared from the specific organisms causing the disease appears to be effective in controlling the disease in some cases. This, along with proper sanitation, hygiene and isolation of infected cases, tends to control the infection.

Fox Encephalitis

This disease became very prevalent in 1926-1927 and was known to have been introduced on a number of farms in several states by foxes that had been exhibited at fox shows. Fox encephalitis is due to a filtrable virus which especially effects the nervous system. The disease appears to attack young and old animals in about the same proportion, the mortality rate ranging from fifteen to forty per cent. Death usually occurs early in the disease and for this reason the dead fox is usually in good flesh.

Symptoms: Most animals dying during an outbreak will be found dead, and usually it is reported that the fox was seen some hours before and appeared perfectly healthy. When symptoms are observed on ranches there are usually