

The Origin of the Horse

Equine Science – Chapter 1

Preface

Horses have been a part of civilization, interacting with and serving mankind, for an estimated 5,000 years. The number of horses in the world has varied greatly since domestication of the horse first took place. Over the ages, the number of horses bred and raised by man has been dependent upon those horses' uses.

The major uses of horses throughout history have included:

- food
- transportation
- work
- war
- recreation
- and more.

Horses are an important part of the economy in the United States. According to the 2004 American Horse Council (AHC) study *The Economic Impact of the Horse Industry in the United States*, this industry “contributes approximately \$39 billion in direct economic impacts to the U.S. economy on an annual basis.” The study, conducted by Deloitte Consulting, LLP, showed the following numbers for 2004:

- Number of horses in the United States – more than 9 million
 - Recreational – 3,906,923
 - Showing – 2,718,954
 - Racing – 844,531
 - Other – 1,752,439
 - Total – 9,222,847
- Number of horse-industry participants -- more than 4 million
 - Owners – 1,955,827
 - Family members and volunteers – 2,001,946
 - Total = 4,659,719
- Direct, indirect and induced economic impact (combined) - \$101.5 billion
- Number of full-time-equivalent jobs – 1.4 million
- Not all horse people are rich, with horse-owning households' incomes breaking down as follows:
 - 11% under \$24,999
 - 23% \$25,000 to \$49,999
 - 22% \$50,000 to 74,999
 - 16% 75,000 to \$99,999
 - 10% 100,000 to 124,000
 - 5% 125,000 to 149,999
 - 9% over %150,000
 - 4% not reported
- Tax revenue generated annually: approximately \$1.9 billion

In addition to its economic impact, the horse industry has a positive impact on the quality of life for a large number of Americans. Many people live in the country, own land, and have horses on their own property. For these people – and many others – involvement in the horse industry promotes physical exercise, gives recreational value, provides entertainment, creates social opportunities, and increases overall quality of life.

The trend in the number of horses in the United States began declining by the 1920s, with the advent of tractors, automobiles, and machinery that replaced the horse for farming, transportation, and military use. According to the United States Department of Agriculture (USDA), the population of horses declined to an all-time low of 3 million in the 1980s.

Year	Estimated number of Horses (Millions)
1920	25
1940	14
1960	3
1980	9

Since then, numbers of and interest in horses have begun to rebound. Today there are more than 255 schools, colleges, universities, and certificate programs in the United States with equine courses as part of their curriculum. The number of employment opportunities in the horse industry is increasing, as are the kinds of expertise needed. The industry today required equine-knowledgeable lawyers, tax consultants, farm managers, writers, editors, marketing specialists, insurance specialists, computer experts, sales managers, scientists, and educators, as well as workers in the more traditional types of horse-related jobs.

The number of breed associations and youth-related horse organizations in the United States is high and continues to grow. The number of youth involved in 4-H, breed associations, Pony Club, and other youth groups is an indicator that the outlook for growth in the United States horse industry is indeed strong.

The Origin of the Horse

The horse has been on the earth for a very long time. Well-preserved fossils document that members of the horse family roamed the earth as long as 60 million years ago. Fossil evidence, in the form of bones and teeth, has been found along river valleys, embedded in sand and sandstone. These early horse remains were found in what are currently the Great Plains of the United States.

However, when Columbus discovered America in 1492, there were no horses present in the North American continent. Why these early ancestors of the modern-day horse disappeared from North America is still a mystery.

Early Horses and the Horse Family

The modern-day horse is a member of the larger "horse" family known as "Equidae". Fossil evidence indicates that the earliest members of this family had 4 toes in each foot. These early horses were small and primitive animals compared to the horse as we know it today.

The horse then evolved into an animal with 4 toes on the front feet and 3 toes on the hind feet. Its natural habitat and feeding area during this period was in the swamplands.

As the horse evolved and grew in size, it changed into an animal with 3 toes on both the front and hind feet, and it reached an adult height of about 24 inches: approximately the size of the modern-day miniature horse.

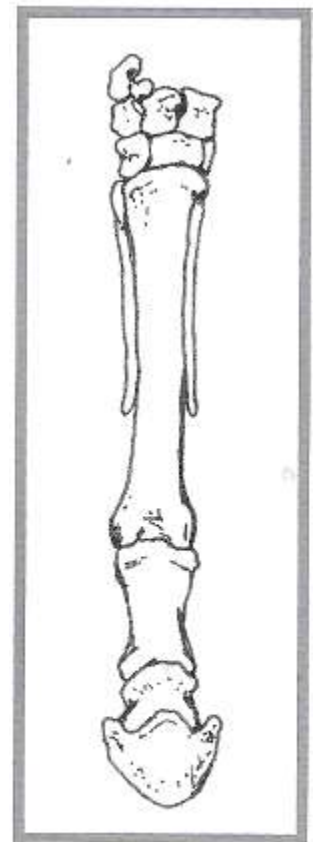
Over time, the early horse evolved from a swamp browser to an animal that could survive in the forest, and eventually to a grazing animal of the grasslands or prairie. The horse is a herbivore (a grass-eater) and a simple-stomached, non-ruminant (non-cud-chewing) animal.

Equus was the first "true horse". It appeared on the earth about 1 million years ago. Equus had 1 toe and 2 side bones on each foot. These side bones are known today as splint bones and are positioned on either side of the cannon bone of the horse. The horse and its close relatives are the only single-toed animals in the world today.

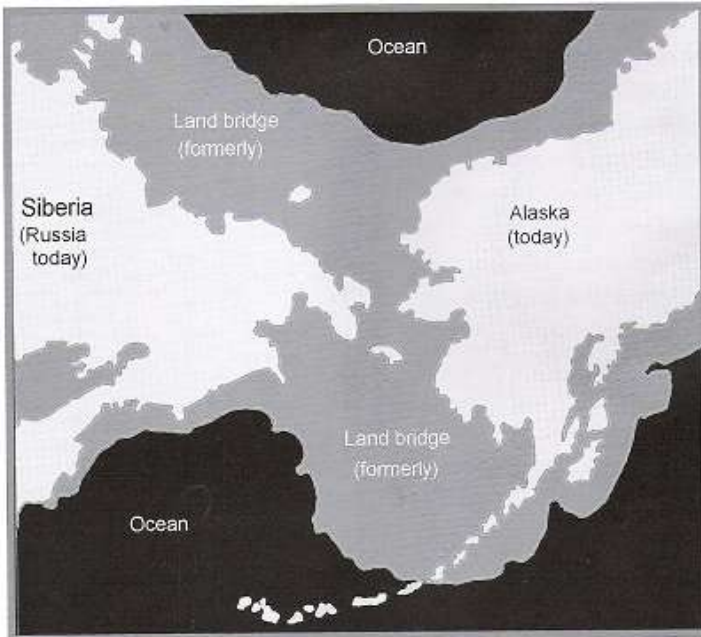
As far as scientists can document at the present time, the modern-day Equus originated in North America but disappeared from the continent during the end of the ice age. Prior to the ice age, scientists hypothesize, the horse may have migrated across a land bridge that connected today's Alaska to Siberia, but that today is under water. This area of water is now known as the Bering Strait. After making their way to Siberia, horses migrated from Siberia into Asia and Europe.

There are many theories about why the horse disappeared from the North American continent during this period, including

- drastic, sudden climate change
- disease or parasite epidemic
- competition for available food sources
- failure to adapt to the environment



Modern horse — a single toe and 2 side or splint bones.

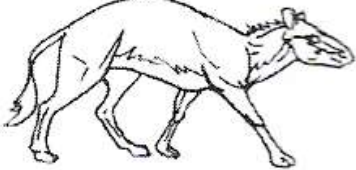
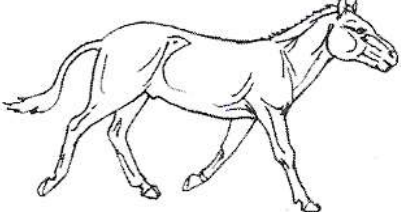
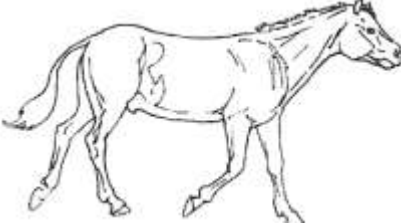
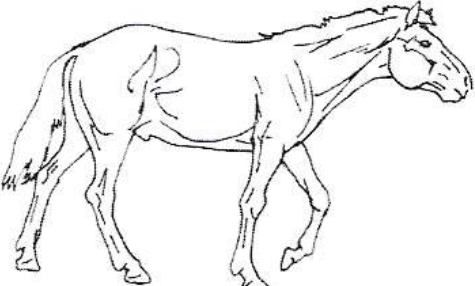


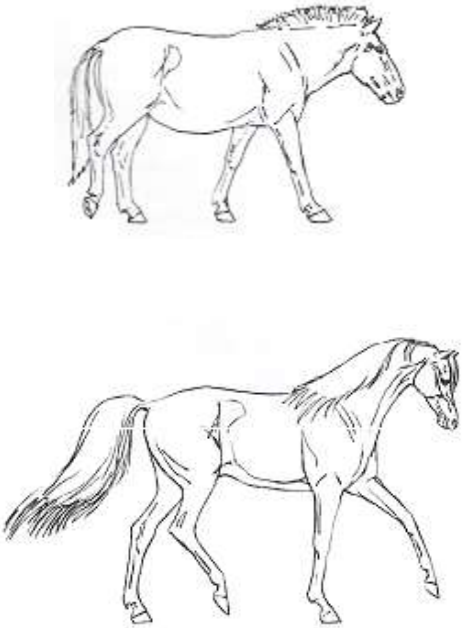
Bering Land Bridge, which once connected Alaska to Siberia (indicated in medium gray).

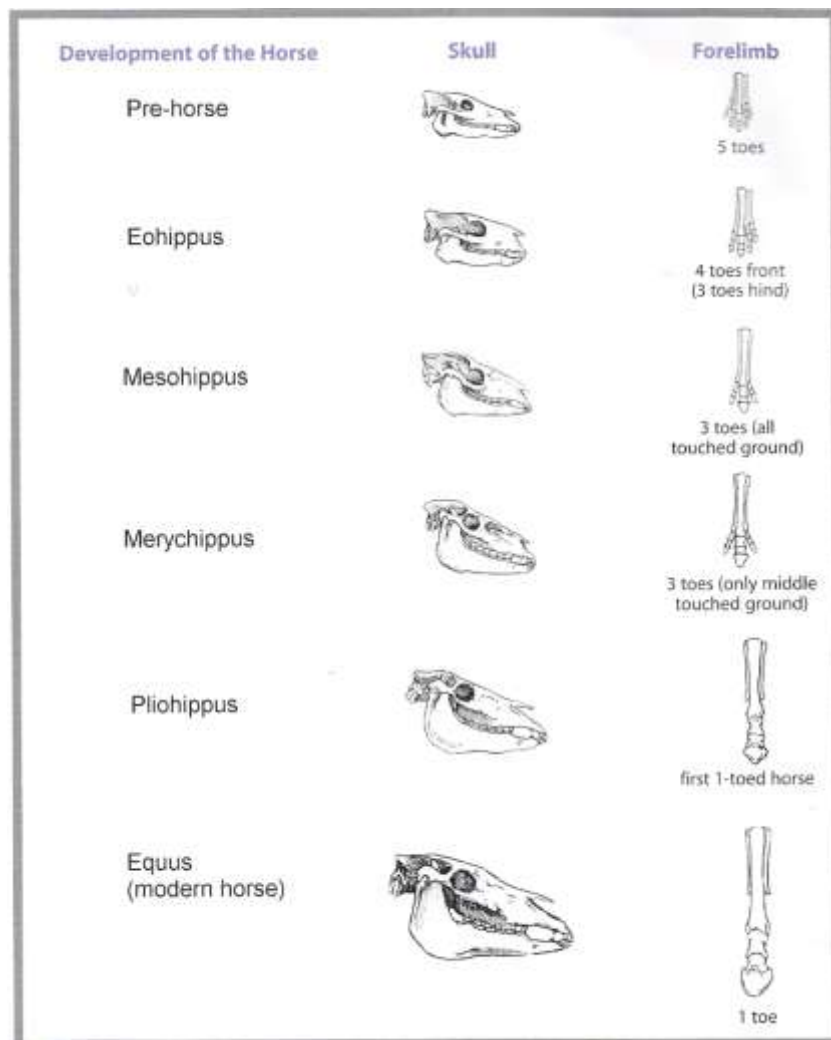
Scientists postulate that the extinction of the horse in North America is not directly attributed to the ice Age because many part of North American were not covered with ice during this period of time—and fossil evidence indicates that the horse did not become extinct until after the ice masses of the ice Age had begun receding. Numerous other species of animal also became extinct on the North American continent during this time period. Some of them are:

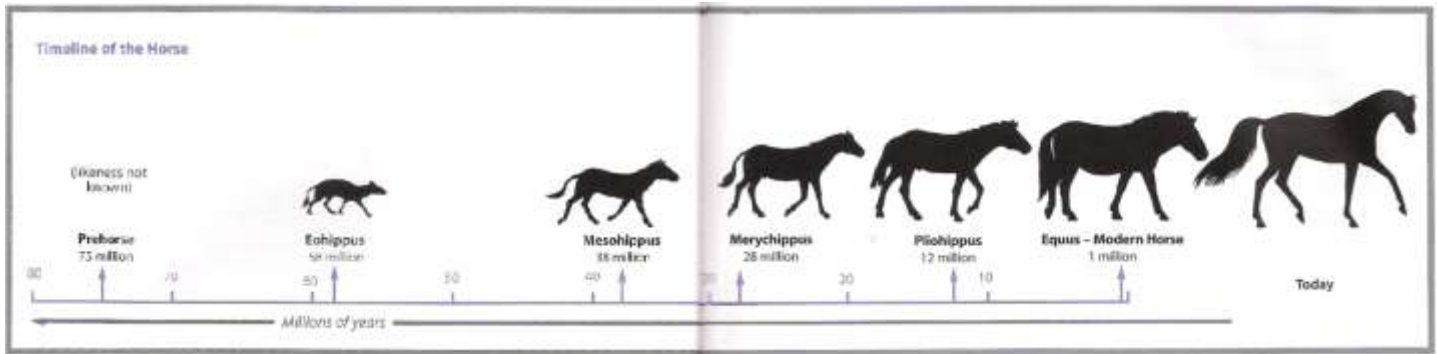
- camel
- mastodon
- rhinoceros
- saber-toothed tiger.

The following table names and summarizes the five major forms of the horse over the long process during which it evolved from the earliest equine into the modern-day horse, as documented by fossil remains.

Name of the Horse	Drawing of the Horse
<p>Prehorse – (early ancestors of the horse)</p> <ul style="list-style-type: none"> • Approximately 75 million years ago • 5 toes on front feet and probably on the hind feet as well; one of the front toes may have been a splint • Teeth were low-crowned 	
<p>Eohippus</p> <ul style="list-style-type: none"> • Approximately 58 million years ago • 4 toes on front feet and 3 toes and a splint on hind feet • About 1 foot tall; the size of a beagle dog or a large horse cat • Teeth were low-crowned 	
<p>Mesohippus</p> <ul style="list-style-type: none"> • Approximately 38 million years ago • 3-toed animal; middle toe definitely bigger; all 3 toes touched the ground and carried animal's weight; 4th toe on front feet was reduced to splint • About the size of a Collie dog or miniature horse • Most likely a browsing animal • Teeth were low-crowned 	
<p>Merychippus</p> <ul style="list-style-type: none"> • Approximately 28 million years ago • 3-toed animal; middle toe bigger and touched the ground; toes on either side did not touch the ground • About the size of a Shetland pony • A grass-eater • Teeth were high-crowned and hard-surfaced 	
<p>Pliohippus</p> <ul style="list-style-type: none"> • Approximately 12 million years ago • The first 1-toed horse; 2 side toes reduced to splint bones • The forerunner of the modern-day horse • Thought to be about the size of a pony • A grazing animal • High-crowned teeth 	

Name of the Horse	Drawing of the Horse
<p>Equus – Modern Horse</p> <ul style="list-style-type: none"> ■ Approximately 1 million years ago <ul style="list-style-type: none"> ○ Further developed into an animal with 1 toes, the 2 side toes evolving into 2 side bones, known today as splint bones ○ A full-sized horse ○ A grazing animal ○ High-crowned teeth ■ Approximately 25,000 years ago <ul style="list-style-type: none"> ○ (in the Stone Age), man hunted the horse and used the horse as a source of food ■ Approximately 6,000 years ago <ul style="list-style-type: none"> ○ The horse was first domesticated by man and was used for travel; man could now travel across land that he could not cross before, and could travel farther and faster than he had ever been able to do by foot. ■ Approximately 5,000 years ago <ul style="list-style-type: none"> ○ Domestication of the horse had spread throughout Asia, North Africa, and Europe; the horse was used for travel, transportation and war ■ Approximately 500 years ago <ul style="list-style-type: none"> ○ Columbus discovered America in 1492; horses were brought to the “New World” shortly afterward by Spanish explorers ■ In the period approximately 400 years ago (1500-1650) <ul style="list-style-type: none"> ○ Spanish explorers imported large numbers of livestock, including horses, to the missions and settlements being built in the Rio Grande Valley of North America ■ By approximately 300 years ago (1650-1750) <ul style="list-style-type: none"> ○ The horse was reestablished in the Great Plains of North America, where its ancestors are thought to have originated about 60 million years before! 	





Domestication of the Horse

The original use of the horse by man was as a food source. In order to survive, man hunted and ate the horse as he would any other game animal.

One of the earliest locations known where evidence clearly documents human/horse interaction is in what is modern-day France, where the bones of thousands of horses were found close to a rock cave near Solutre. From this evidence, it is estimated that horses and man coexisted in this area about 25,000 years ago! Primitive drawings of the horse have been found on the rock walls in several other caves in France.

There is little scientific evidence to document clearly when and where the horse was first domesticated. The domestication may have happened simultaneously in several parts of the world as man and man's different civilizations developed. There is evidence indicating the domestication of the horse as long as 6,000 years ago in:

- The Ukraine
- Western Europe
- Central Asia

What has been documented is that horses were being used for work by humans about 5,000 years ago in the Near East, an area of the world known as the "Cradle of Civilization". The horse was used as a draft or work animal, and also as a means of transportation.

From there, the use of the horse quickly spread across Asia and Europe as part of the development of modern civilizations.

As developing civilizations came into conflict with each other, the horse began to be used in warfare. From these ancient times up until World War II (1939-1945), the horse played a significant role in most wars, being utilized as a means of transportation for humans, supplies and war-related equipment. It is estimated that over 2 million horse were used in World War II. The horse is still used for warfare in some countries of the world today.

In most civilizations, the horse became very useful and important to man. Horses have been used throughout history for:

- A source of food (meat and milk)
- Transportation
- Work
- War
- Recreation

An interesting part of the story is that as civilizations developed and the world was explored, the horse returned to North America, reintroduced to the continent by the early explorers and settlers in the time after Columbus's discovery of America in 1492. As noted previously, scientists postulate that North America is where the early ancestors of the horse originated almost 60 million years earlier.

The Scientific Nomenclature of the Horse

Scientific nomenclature is the naming system by which all plants and animals are classified and given scientific names. All animals, including the horse, belong to the “animal kingdom” and are defined by a zoological classification. The following table gives the zoological classification of the modern-day horse.

Kingdom	Animalia	All Animals
Phylum	Chordata	Have a backbone
Class	Mammalia	Warm-blooded animals that have hair and give milk
Order	Perissodactyla	Odd number of toes; hoofed animals; non-ruminant animals; this order includes the horse, ass, zebra, tapir, rhinoceros
Family	Equidae	All evolutionary ancestors and members of the horse family; includes the horse, ass and zebra; does not include the tapir and rhinoceros
Genus	Equus	Close ancestors and modern-day horse family; includes horses, asses and zebras
Species	Equus caballus	Modern-day horse family and close wild relatives; have “chestnuts” on the insides of both front and hind legs; does not include asses and zebras

A Few Words About Asses and Zebras

The donkey (also known as the ass) and the zebra are part of the scientific “family” of horses known as Equidae.

The scientific classification of the “domestic” ass is *Equus asinus*. As far as can be documented, the donkey was domesticated in the Middle East, most likely in Egypt. Well-preserved drawings of donkeys appear beginning around 3400 BC, or approximately 5,400 years ago. Donkeys are genetically similar to the horse; however, they have one fewer chromosome pair.

- Horses and ponies – 32 chromosome pairs (64 “diploid” chromosomes)
- Donkeys – “domestic” donkeys have 31 chromosome pairs (62 “diploid” chromosomes)

Donkeys have chestnuts on the insides of only the front legs, not on the hind legs.

Even with these differences, donkeys are very close relatives to the horse. In fact, the donkey can successfully be bred to the horse.

Zebras are somewhat mystifying to many. Their stripe patterns amaze even the most knowledgeable of horse persons. The scientific classification of the “true” zebra is *Equus zebra*.

Although zebras are close relatives to the horse and the donkey, they are also very different from horses or donkeys. The several types of zebra that exist vary in their genetic makeup. The “common zebra”, known as Grant’s zebra, has 44 diploid chromosomes. Hartman’s mountain zebra has only 32 diploid chromosomes – which is half as many as the horse. Other zebra family members have diploid chromosome numbers of 45 and 46. In scientific classification, these close family members have different names. But zebras, like donkeys, have chestnuts on the front legs only.

Wild Horses

When most people think about wild horses, they think of the mustangs of the West in North America. However, long before horses were reestablished in North America during the 1500s and 1600s, wild horses existed in Russia, Asia and Europe. Some past and present wild horses are:

- Oriental light-legged horses
- Wild black horses of Flanders
- Predecessors to European draft and pony breeds
- Tarpans
- Przewalski’s Horse
- Mustangs.

The “Origin Story” or the Horse

The origin of the horse is a long and interesting story that began an estimated 60 million years ago, and that has brought this magnificent animal to all parts of the world.

There are many different breeds and types of horse today in the United States and the rest of the world. Among them all, at least one is well-suited to almost any modern use or purpose for the horse.