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The Horse Evolution Icon Exposed

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Abstract

The "horse series" icon of evolution was one of the most commonly cited "proofs" of evolution for over 150 years (Janis, 2008, p. 251). Due to new research and newer discoveries, the popular horse series diagram used in many science textbooks to document straight-line (orthogenetic) horse evolution is now widely acknowledged as inaccurate. It is now recognized that the fossil record documents only that an enormous amount of morphological variety exists in horses, not their gradual evolution from a common ancestor (see Figure 1). Although gradual Darwinian evolution has been rejected, horse evolution has been revised in an attempt to document a scenario more similar to Gould's Punctuated Equilibrium theory and/or Mayr's saltation theory.

Key Words: evolution, fossil record, horse evolution, horses, mammal evolution

Introduction

The many examples of bias and even fraud used to document human evolution have included Piltdown Man, *Hesperopithecus* (Nebraska Man), and Java Man (*Pithecanthropus erectus*). One other often-ignored example of bias that has misled many people relates to horse fossils. Beginning in the 19th century, presentations pictured a simple, gradual, and progressive straight-line horse evolution from the small mammal *Hyracotherium* to the modern *Equus* (see Figure 1). *Hyracotherium,* also once known as *Eohippus* (meaning 'dawn horse') was a small, cat-size mammal, 10–20 inches at the shoulder (Paselk and Lindguist, 2005). So different was *Hyracotherium* from the horse family that *w*hen the "fossils were discovered, *Hyracotherium* was thought to be a monkey" (Jones, 2023). Soon other ideas of what it was surfaced; so many that "scientists in the nineteenth century fought very bitter battles with each other over horse evolution in general. Paleontological disagreements could be nasty, and understanding the evolution of the horse was particularly vexing to European researchers" (Williams, 2015, p. 62). Eventually, *the ladder model* dominated which postulated a steady, gradual evolutionary progression from a "small cat-sized animal" to the modern horse. As will be discussed, the evidence is that *Hyracotherium* was not a horse ancestor due to the enormous morphological difference between *Hyracotherium* and the horses in the ladder model. All, or most, of the other claimed horses that are classified as part of the horse family, illustrate the enormous horse diversity; diversity similar to that of dogs and cats.

The horse family was an important icon because "the so-called progression of horses was considered for a very long time the prime example of evolutionary biology.…'for the truth of evolution,' as George Gaylord Simpson once phrased it" (Franzen, 2010, p. 100). As late as 1997, this progressive evolution claim was still in some textbooks: "The horse provides one of the best examples of evolutionary his-

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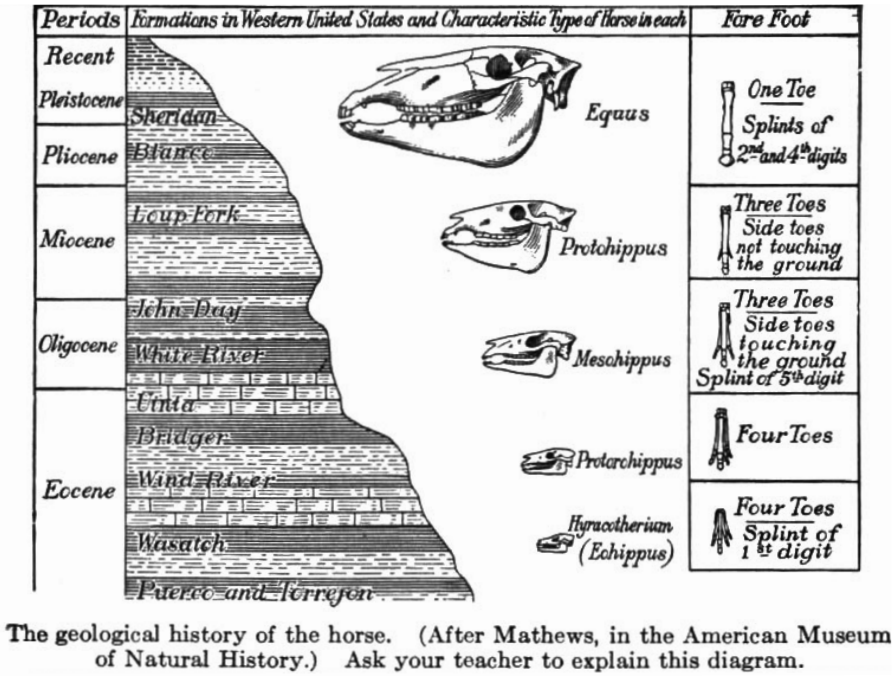


The geological history of the horse. (After Mathews, in the American Museum of Natural History.) Ask your teacher to explain this diagram.

Figure 1. From: Hunter, William. 1914. *A Civic Biology: Presented in Problems.* American Book Company, New York, NY, p. 193. This was the same book that was at issue in the 1925 Scopes Trial. This 1903 diagram by William Diller Matthew was part of a 1920s display at the American Museum of Natural History in New York City. Although widely reproduced, it displayed a "misleading linearity" (Clark, 2008, pp. 28, 145).

tory (phylogeny) based on an almost complete fossil record found in North American sedimentary deposits from the early Eocene to the present" (Soper, 1997, p. 890).

In a chapter titled, "*The Bizarre Course of the Horse* [evolution]," Professor Von Fange observed that these drawings were "copied with some variation in the sequence in museums everywhere as a prize exhibit of evolutionists 'proving' their theory" (Von Fange, 2006, p. 183). The dean of paleontologists, George Gaylord Simpson, wrote that the "beautiful series of ancient and modern horses displayed in many museums are still the simplest way to convince any open-minded person that evolution is a fact. You can see it with your own eyes" (Simpson, 1961, p. xxxiii).

One major problem with horse evolution was the claim that its evolution consisted of a gradual, progressively increased body size. Most horse evolution illustrations show both a steady increase in body size and the alteration of various traits, including the forefoot, hindfoot, forearm, leg, and upper and lower molars (Mather and Chubb, 1924). The gradual increase of horse body size claim was evaluated by Bruce MacFadden of the Department of Vertebrate Paleontology at The American Museum of Natural History. His team analyzed dental and skeletal traits of 40 fossil horses to determine the horses' size changes. The MacFadden study concluded that

> for horses, the traditional interpretation of gradual increase in body size through time is oversimplified because: (1) although the exception to the rule, 5 of 24 species lineages studied are characterized by dwarfism; and (2) the general trend seems to have been a long period (32 ma) of relative stasis followed by 25 ma of diversification and progressive (although not necessarily gradual) change in body size. (MacFadden, 2016, p. 355)

His 32 ma and 25 ma (millions of years) dates were based on several evolutionary assumptions. Nonetheless, it supports my point that a long period of stasis occurred.

Creationists Challenged

The horse evolution icon was also touted as a "nightmare for creationists" by evolutionists as recently as 2016 (Yalmaz, 2016, p. 148). Ex-creationist Aaron Yalmaz even claimed that "The fossil record of horse evolution is by far the most complete of any animal, with almost all of the intermediate species linking the primitive *Hyracotherium* to modern *Equus* known through an excellent series of fossils" (Yalmaz, 2016, p. 148). Ruse, after admitting that the "fossil record has many gaps," added: "It would be nice to see the creationists take on the question of the horse, which is one of the best documented cases of evolutionary change" (Ruse, 1982, p. 311). This review does just that.

The History of the Horse Evolution Story

The horse evolution series was born when Yale professor Othniel Charles Marsh, "one of America's greatest paleontologists, set out to confirm Charles Darwin's evolutionary hypothesis by working out the evolution of the horse" (Milner, 1990, p. 222). To do this he

> collected a magnificent set of American fossil horses and published a paper in 1874 tracing its development from a small three-toed

> animal "the size of a fox" through larger animals with progressively larger hooves, developed from the middle toe. Darwin thought Marsh's sequence from little *Eohippus* ("Dawn horse") to the modern *Equus* was the best evolutionary demonstration anyone had produced in the 15 years since the *Origin of Species* (1859) was published. (Milner, 1990, p. 222)

Inspired by Marsh, the parade of horses from the cat-sized *Hyracotherium* to the modern horse (*Equus caballus*) soon became one of the most well-known textbook examples used to document evolution for almost a century. It has been featured for decades not only in science textbooks, but also in popular mass-market books, and even children's books (Self, 1961, pp. 4–5). This, the "most widely reproduced of all illustrations showing the evolution of horses," was drawn early in the last century for The American Museum of Natural History (AMNH) in New York City, and has been "reproduced hundreds of times since then" (Gould, 1991, p. 174). See Figure 1.

Several leading textbooks used the horse example to illustrate the "slow changes through slight variations" process of evolution to trace the straight-line horse evolution from the simple, primitive, small cat-sized horse to the modern, highly evolved horse (Curtis et al., 1934, p. 615). One textbook described the horse as having

> descended in gradual stages from a creature which existed some sixty million years ago called the *Eohippus*. Within the last hundred years it has been proved that the development of *Equus caballus* took place in what is now North America. (Edwards and Geddes, 1973, p. 14)

Even the book used by the teacher who was prosecuted in the Scopes Trial contained the horse progression illustration (Figure 1) by W.D. Matthew (Hunter, 1914, p. 193). Below the now-infamous horse series drawing, the caption tells students to "Ask your teacher to explain the diagram" (Hunter, 1914, p. 193).

When British scientist Thomas Henry Huxley toured America, he visited Marsh at Yale University and was "mightily impressed with his progressive series of fossil horses" (Milner, 1990, p. 222). When he returned home, Huxley spread the horse progression claim to Europe. Horse evolution supporters claimed that horse phylogeny stretched back over 55 million years,

> From *Orohippus* (Eocene) to *Mesohippus* (Oligocene), to *Miohippus*… (Miocene), to *Protohippus* (Hipparion) and *Pliohippus* (both from the Pliocene), and finally to the Pleistocene and modern day *Equus*. (Franzen, 2010, p. 104)

This was important because the horse family fossil collection was then claimed to show a direct line of evolutionary descent from its precursor animal to the modern horse. To produce an illustration representing his assumption of slow gradual progressive evolution, Marsh selected from a large number of fossils found today in both America and Europe, *some that lived contemporaneously*, to create the illusion of a direct line of evolutionary descent (Chapman, 1992, p. 50).

Although descendants that share common ancestry can live alongside one another, such as the wolf and domestic dog, both are dogs. Marsh selected examples that we now know lived contemporaneously which he dated as having lived, not contemporaneously, but many tens of thousands of years apart. Nonetheless, the success of Marsh's horse example of gradualism evolution made him one of the most prominent paleontologists in the 1870s until his death in 1899.

In 1879, Marsh's work on fossil horses even prompted a letter from Charles Darwin, praising his work as one of the best illustrations of gradualism (continuous progressive evolution) since his [Darwin's] own book, *On the Origin of Species*. Marsh was also one of the first American scientists to embrace Darwin's theory of natural selection and evolutionary gradualism. In turn, Marsh promoted horse evolution to justify his acceptance of Darwinian evolution in contrast to the other theories of evolution, such as Larmarkian evolution, which postulated that organisms altered their behavior in response to environmental changes. Their changed behavior, in turn, modified their body organs, and their offspring inherited these improved structures.

Although Marsh's pictures give the illusion that a slow, gradual evolution of the horse exists from *Hyracotherium* to *Equus*, in fact each of the animals in the illustration abruptly appears in the fossil record, lacking physical evidence of any gradual transitional species. The required evidence which was not found would consist of changes that documented a gradual physical blending from one horse example to the next horse example (see Figure 2, the most recent diagram of horse evolution, discussed below).

Hoof and Toe Evolution

Aside from size, from small to large, one of the changes often used to document horse evolution has been the claimed change of its toe digits from four to the single toe called a hoof. The claimed early horse ancestor, the 'Eocene' *Hyracotherium*, had four front toes, like the modern tapir, compared to the modern horse which has only one (Vincelette, 2023). The horse lineage exhibits the most extreme digit reduction known, from four metacarpals to one, resulting in the *Equus* monodactyl forelimb. The importance of horse-hoof issue was because it was a major part of "evidence" for equine evolution for the reason that the

> traditional story of the evolution of the horse (family Equidae) has been in large part about the evolution of their feet. How did modern horses come to have a single toe (digit III), with the hoof bearing a characteristic V-shaped keratinous frog on the sole, and what happened to the other digits? (Vincelette, 2023)

This change did not involve the evolution of a new trait as required by evolution, but involved the *loss* of its two pairs of side digits. Evidence now exists that they were not lost, but are simply vestigial. Thus the claim that "hooved toes vanished over time, thanks to evolution" (Waugh, 2023). The four toes that are lost in certain non-horse mammals also supports the vestigial theory. Toes vanishing does not support evolution, but rather supports the degeneration theory. Furthermore, because the explanations are driven by an evolutionary ideology, other options are not seriously considered. One such option is that a variety of now-extinct horses once existed in the past, some with several digits, including one with four front toes.

Specifically, the vestigial claim is that the proximal portions of digits II and IV were retained as splint bones and the distal portion was retained as part of the frog. The frog is a tough, thick, V-shaped structure pointing down from the heels which functions to protect the distal cushion beneath it. It also acts as a shock absorber when the horse runs, and aids in both traction and blood circulation in the hoof.

The researchers, by an analysis of the osteology, joint articulations, and both nerve and vessel distribution of the distal forelimb, theorized that

> the *Equus* manus maintains remnants of the 'missing' digits. While it is already known that digits II and IV persist proximally as the splint metacarpals, we propose that digits I and V are also present proximally and that components of all five digits are found distally within the manus. (Solounias et al., 2018)

Professor Solounias et al. concluded that, although "Digit reduction is common among mammals… The horse lineage exhibits the most extreme digit reduction, resulting in the monodactyl" design (Solounias et al., 2018). Furthermore, anatomical and embryological evidence exists for the proximal portions of all the accessory digits (i.e., I and V, as well as II and IV) being retained in the feet of modern horses. Solounias et al. concluded that,

> the evolutionary change to monodactyly is not as dramatic as previously thought and that the horse forelimb is more similar to that of its pentadactyl, tetradactyl and tridactyl ancestors. Although the modern horse maintains only one complete digit, the identities of all five digits are preserved in both the skeletal and soft anatomy as embedded elements into the dominant digit, and the digit positions are consistent with horses in earlier stages of evolution. (Solounias et al., 2018)

Typical of the controversy common in evolution, other paleontologists have marshaled evidence *rejecting* Solounias et al.'s conclusion which was originally published as a paper in the 2018 journal *Royal Society Open Science.* They supported the view that these toes were completely lost in evolution (Vincelette, 2023), and were not retained within the hoof as proposed by Solounias et al. These detractors based their conclusions on their own evaluations of the osteology and metacarpal articulations of the horse and several extinct equids using specimens from the American Museum of Natural History, the Yale Peabody Museum, and the Museum of Comparative Zoology at Harvard.

Their evaluations supported the view that the distant ancestors of modern horses had multiple-hoofed toes which, over time, were lost—leaving the singular hoof existing in modern horses. The advantages of the monodactyly design were detailed by Solounias et al. as follows:

> The reduction of digits in the horse is accompanied by an increase in overall limb length, therefore increasing the distance of each stride. Monodactyly evolves to allow the trot gait characteristic of the modern horse. The limb adapted for the faster trot gait facilitates locomotion in the grassland habitat, as horses are known grazers. The horse limb evolved to move primarily in flexion and extension, and the overall limb structure prevents supination and pronation. In addition, the simplification of the horse hand into a single complete digit stabilizes the limb by reducing the total number of joints. (Solounias et al., 2018)

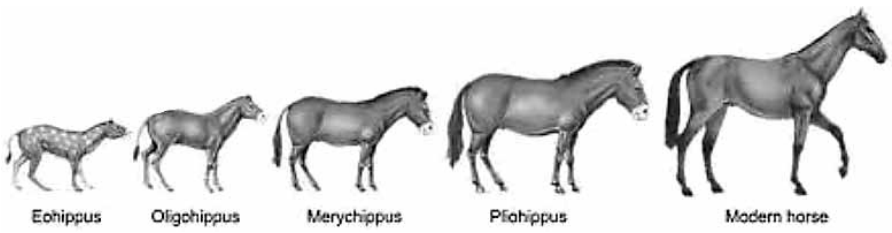


Figure 2. The gradual model of horse evolution. From Wikimedia Commons; https://www.google.com/search?q=modern+horse+evolution+wikimedia+commons.

One of the most extensive studies of horse evolution by George Gaylord Simpson concluded that "the old idea of a steady, uninterrupted reduction in number of toes is, as has lately become clear, not only over-simplified but also essentially false" (Simpson, 1951, p. 193). The reason is because "the reduction was not universal, or constant, and simply counting the toes gives hardly any idea of what is going on in regard to the functioning foot in the animals." In other words, the fossil record of the horse does *not* show a consistent progression from a small, fox terrier-size horse to a modern-size horse, but a great deal of variety. Likewise, the fossil record of the feet does *not* show a consistent progression from three toes to one toe, but a great deal of variety. (Simpson, 1951, p. 193). Modern horses also exist in an enormous amount of variety, as do dogs and cats, but hardly any other modern animal.

There is no agreement among paleontologists on why the loss of toes in modern horses occurred. As described by evolutionary researcher and Harvard graduate, Dr. Brianna McHorse, horses are a classic example of the evolution of "three major traits—large body size, tall-crowned teeth (hypsodonty), and a single toe (monodactyly)—but how and why monodactyly evolved is still poorly understood" (McHorse, 2019). As one headline proclaimed, the evolution of monodactyly is a mystery (Baisas, 2023).

Modern horses have had 3 hooves at least until the 20th century and they are just as much a horse as the 1-hooved majority. This adaptation is thus clearly a microevolutionary change, aka, a variation within their Genesis kind. Furthermore, historically, farmers and ranchers have for centuries surgically removed "extra" toes and selectively bred single-toed horses (Carstanjen, 2007). The reason why is that one big toe provided more resistance to bone stress than many smaller toes, and for this reason were better work horses (McHorse et al., 2017, p. 1).

Of note are the prized horses of Alexander the Great (his horse was named Bucephalus) and Julius Caesar which both had extra toes, indicating that the trait existed for many decades. Neither process is "evolution," and evolutionists appear to be unaware of this human-centric history. The fact that the modern horse hoof provided several advantages supports the view that a variety of designs existed in the past, and horses with multiple digits became extinct for the same reason(s) that many other animals have become extinct.

Harvard's Gould, a Vocal Critic of the Horse Evolution Icon

This staple, ladder-model "proof" for the entire evolutionary theory was described by Gould as the "most common scenario of horse evolution used by Darwinists for decades." He explains that the ladder model was actually "a twisted and tortuous excursion from one branch to another… the path proceeds not by continuous transformation but by lateral stepping with geological suddenness" (Gould, 1991, p. 175).

The horse series that Gould condemned, was the classic *Hyracotherium*, evolving into the three-toed *Mesohippus* (with only one toe touching the ground) which then evolved into the one-toed *Pliohippus*, and lastly ended with the modern horse. The major problem is that the "first chapter in the evolution of the horse—during which all of these developments took place—is missing" (Franzen, 2010, p. 179). In other words, the question of what *Hyracotherium* evolved from was unknown. As University of Chicago paleontologist David M. Raup wrote:

> 120 years after Darwin...the knowledge of the fossil record has been greatly expanded. We now have a quarter of a million fossil species but the situation hasn't changed much.…ironically, we have even fewer examples of evolutionary transitions than we had in Darwin's time. (Raup, 1979, p. 25)

Furthermore, problems also beset the rest of the horse-evolution steps. A specific example is that

> some of the classic cases of Darwinian change in the fossil record, such as the evolution of the horse in North America, have had to be discarded or modified as a result of more detailed information—what appeared to be a nice simple progression when relatively few data were available now appears to be much more complex and much less gradualistic. So Darwin's problem has not been alleviated in the last 120 years and we still have a record which does show change but one that can hardly be looked upon as the most reasonable consequence of natural selection. (Raup, 1979, p. 25)

This problem is not due to lack of research. Bruce MacFadden documented that more research has been completed on horse evolution than all other areas of evolution except human evolution (MacFadden, 1992). Many "new discoveries and reinterpretation of existing museum fossil horse collections have added to the known diversity of extinct forms." For this reason, except *Hyracotherium*, the other examples illustrate the enormous diversity of horses, not its evolution as Darwinists claim (MacFadden, 2005, p. 1729).

The idea of a smooth progression was increasingly called into question as more research was completed. *Pliohippus* (the earliest one-toed horse), was found buried together with *Merychippus* (a three-toed horse from which it supposedly evolved), proving they

lived contemporaneously (Voorheis, 1981, p. 74). Depending on the reference, one or more major links must have existed between *Pliohippus* and *Merychippus*. The reason paleontologists made this judgment was the morphological difference between the two animals was considered too large to bridge the gap between the two horses. This gap was illustrated in the ubiquitous line drawings of horse evolution (see Figure 1) and those based on it (Figure 2).

The Genus *Hyracotherium*

At the base of the evolutionary tree is the animal claimed to be the progenitor of all living and extinct horses, now called *Hyracotherium.* First described by the "great British anatomist" Richard Owen in 1841, Owen named it a hyrax because it "looked" like a cross between a hyrax and pig or *Hyracoidea* (Gould, 1991, p. 60). Owen was a creationist, and therefore did not attempt to link the hyrax animal to horses. Hyraxes were small, rabbit-sized terrestrial or arboreal ungulate mammals. Their blunt heads, short ears and legs, and stubby tails made them look much more like a guinea pig than a horse. Hyraxes, or "rock badgers," still live today in the wild.

Later, Yale paleontology professor Othniel Charles Marsh renamed the hyrax *Eohippus*, meaning "dawn horse," or the "first horse." *Hyracotherium* replaced the term *Eohippus* when the evidence convinced many paleontologists that it was not the progenitor of modern horses, nor a horse ancestor, or even a horse, but a small animal, the specifics of which are still being debated (Gould, 1991 p. 160).

Enormous differences exist between a modern horse and the *Hyracotherium*, not just body size. The *Hyracotherium* was about the size of a house cat, requiring massive changes to evolve to the size of a horse. The changes were from an animal about eight inches tall to one with a height of 1.5 to 2 meters (4.5 to 6 feet), and from an average weight of around 10 pounds to a weight of from 900 to 2,000 pounds (450 to 1200 kg) (Floyd, 2007, p. 102). This weight difference requires a very different skeletal *design* than that of a house cat, specifically one that is strong enough to carry the weight of a 50 to a 180-pound rider (McHorse, 2019, p. 638). Furthermore, *Hyracotherium* had a "primitive," short face, with eye sockets halfway between the back of the skull and the tip of the snout in *Hyracotherium* while in modern *Equus* the eyes are closer to the back.

Paleontologists have many examples to guide them in determining *Hyracotherium* traits because *Hyracotherium* fossils have been found in many Eocene localities both in the western United States and Europe (Solounias et al., 2018). Unfortunately, evolutionary presuppositions dominate the interpretation of the fossil record, distorting the interpretation of the evidence. An example where evolution has been assumed before demonstrated is the following claim: "As the taxa evolved, the forefoot (manus) changed from being tetradactyl to tridactyl and ultimately becoming monodactyl" (Solounias et al., 2018). With the assumption of creation, however, these differences (tetradactyl to tridactyl to monodactyl) are easily explained by designed variations in different animals, as exists today. Furthermore, excluding *Eohippus*, the difference is from tridactyl to monodactyl.

Horse Evolution Not Linear

As illustrated in Figures 2 and 3, what the horse fossil record documents is not linear evolution, but instead an enormous amount of variety, as is true in both horses and dogs today. Nor do the diagrams show an evolutionary tree with connecting branches, but horizontal lines to indicate *possible* or proposed branches. As Gould wrote, the ladder model "is much more than merely wrong. It never could provide the promised illustration of evolution, progressive and triumphant" (1991, p. 180). When the eminent "paleontologist George Gaylord Simpson reexamined horse evolution and concluded that generations of students had been misled.…he showed that there was no simple, gradual unilineal development at all" (Milner, 1990, p. 222).

The Flaws in Gradual Horse Evolution Exposed

In his survey of biology textbooks, Gould wrote that he "found the beam in our own [meaning fellow evolutionists'] eye" and became more distressed by the commonly illustrated parade of horses from a small, dog-sized animal to the modern horse (*Equus caballus*) "than by any capitulation to the yahoos [referring to the creationists]." Gould concluded that the problem with the acceptance of evolution is not based in

> what others are doing to us, but in what we are doing to ourselves. In book after book, the evolution section is virtually cloned. Almost all authors treat the same topics, usually in the same sequence, and often with illustrations changed only enough to avoid suits for plagiarism. Obviously, authors of textbooks are copying material on a massive scale and passing along to students an ill-considered and virtually Xeroxed version with a rationale lost in the mists of time. (Gould, 1991, p. 156)

Gould then discussed in detail what he judged as the most common example of textbook cloning, the section on horse evolution. When textbooks "illustrate evolution with an example from the fossil record, they almost invariably trot out that great-

est warhorse among case studies—the history of horses themselves." Gould adds that the

> standard story begins with an animal informally called *Eohippus* (the dawn horse), or more properly, *Hyracotherium.* Since evolutionary increase in size is a major component of the traditional tale, all texts report the diminutive stature of ancestral *Hyracotherium.* A few give actual estimates or measurements, but most rely upon a simile with some modern organism. For years, I have been much amused (and mildly bothered) that the great majority of texts report *Hyracotherium* as "like a fox-terrier" in size. (Gould, 1991, pp. 158–159)

Even this claim is probably inaccurate—that the average *Hyracotherium* was closer to the size of a house cat. The horse evolution example, although for many decades the primary illustration used to support evolution in high school textbooks, came to an inglorious end. Under the subtitle of horse evolution, "Saddled with Errors," Gould's close colleague and lifetime friend Richard Milner wrote:

> Marsh's classic unilineal (straight-line) development of the horse became enshrined in every biology textbook and in a famous exhibit at the American Museum of Natural History. It showed a sequence of mounted skeletons, each one larger and with a more well-developed hoof than the last. (The exhibit is now hidden from public view as an outdated embarrassment.) (Milner, 1990, p. 222; the statement in parentheses is in the original.)

In 2008 The New York museum totally revised the horse exhibit in an attempt to make it more accurate. However, a search of their website for "*Eohippus*" revealed that the museum continued to teach *Eohippus* as an early pre-horse for decades.

The Enormous Variety of Modern Horses

Horses, like dogs, display enormous morphological variety that is revealed in both living horses and in the fossil record. In size alone, living horses range from the miniature horse, which is about the size of a full-grown German Shepherd and weighs around 200 pounds, to the Shire, which weighs up to 2,300 pounds and stands 68 inches high, close to the size of a small elephant. The world records for size are held by a miniature sorrel brown mare that is only 17.5 inches tall and a Belgian draft horse that is 6 feet 6 inches tall (Campbell et al., 2008).

External morphological differences, including color and hair traits, are other examples of horse variety. The many different horse varieties known today include Fjords, Belgians, and Quarter horses. According to the Swedish University of Agricultural Science, a total of 784 horse breeds exist in the Food and Agriculture database (Horse Breeds, 2022). However, most equine experts recognize close to 200 distinct horse breeds. As far as is known, all are able to interbreed, thus all are part of the horse kind (Moore and Slusher, 2004, pp. 296–297). In short, the pattern of horse evolution "depends to a large extent upon who is telling it." This is because the pattern is

> as chaotic as that proposed by Osborn for the evolution of the Proboscidea [the elephant 'kind'], where, "in almost no instance is any known form considered to be a descendant from any other known form; every subordinate grouping is assumed to have sprung, quite separately and without any known intermediate stage, from some hypothetical common ancestors in the Early Eocene or Late Cretaceous." (Kerkut, 1960, pp. 144, 149)

This same conclusion is still largely valid today. Simpson's study that refuted the ladder theory is still, even now, one of the most authoritative debunkings of the classical horse evolution theory (Simpson, 1951). He showed that some horse types in the series that are now extinct *overlap* in the geological record with other extinct horse kinds that were supposedly their evolutionary precursors. Although they can both have a common ancestor, an animal that lives contemporaneously with another cannot be its ancient ancestor. Gould wrote that each horse genus is actually a

> bush of several related species, not a rung on a ladder of progress. These species often lived and interacted in the same area at the same time (as different species of zebra do in Africa today). One set of strata in Wyoming, for example, has yielded three species of *Mesohippus* and two of *Miohippus*, all contemporaries. (Gould, 1991, p. 179)

A major reason why the multi-branching "bush" view is now the dominant picture of horse history is that the enormous number of horse fossils does *not* show any recognizable pattern supporting gradual straight-line evolution. The bush 'tree' in some ways is remarkably similar to the modern dog family tree. One difference is that the dog "bush" is modern, whilst the source of the horse "bush" is based largely on fossils.

The Extinction Theory

Another position, in horse evolution that is well supported, is that the Eocene *Hyracotherium* was *not an extinct horse* as commonly assumed by evolutionists. Rather, it was an extinct animal that had feet like those of a modern tapir: four toes in front and three behind (Waugh, 2023). Each toe was individually hooved with an underlying foot pad. The extinction theory is supported by the fact that the equid fossil record includes an estimated 50 genera and hundreds

of species, in addition to the extinct Eocene *Hyracotherium*. Thus, the oldest known horse from this view was just another extinct horse-like animal (McHorse, 2019, p. 638). Supporting this view is the finding that many fully modern mammals were found in the same geological strata in which *Hyracotherium* was buried (MacFadden, 1976). If these mammals have not changed since then, why would we expect the *Hyracotherium* to have evolved into a very different animal during the same time?

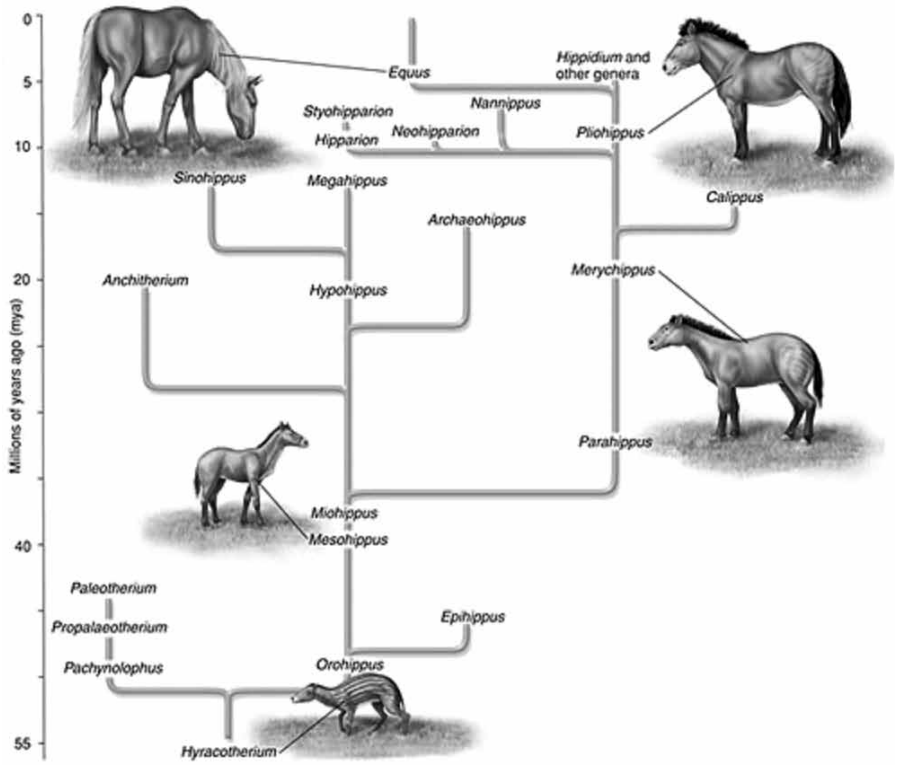


Figure 3. Yet another theoretical horse-evolution tree used in science classes showing these crazy horse fossils. Note again the hypothetical horizontal lines. https://calaski.wordpress.com/science-units/biological-evolution-unit/natural-selection/horse-evolution-tree/.

The Fossil Record

An enormous number of fossil horses exist. An estimated collection of 50,000 are housed in the American Museum of Natural History alone, in addition to the extensive collections of the Smithsonian Institution and several other American and European museums (Janis, 2008, p. 253). A key conclusion of the horse fossil record is that the species that make up these bushes "tend to arise with geological suddenness, and then to persist with little change for long periods" in the fossil record (Gould, 1991, p. 180). The fact that the horse fossil record shows abrupt appearance and stasis, not gradual evolution, is reflected in newer diagrams used to illustrate horse evolution (Janis, 2008, p. 259).

This same existing problem today bothered Darwin. Specifically, the erratic behavior of the horse fossil record "gave Charles Darwin a serious headache. For Darwin, the process of evolution was gentle and even-paced, like a soft English summer rain. Darwin didn't care much for perturbation—when the stress was too great he retired to his favorite health spa… And yet—here were these crazy horse fossils" (Williams, 2015, p. 62–63).

One modern example of these crazy horse fossils is the illustration used in science classes (Figure 3) and the updated horse-evolution tree diagram used at the University of Texas (Figure 4). Note also that the diagram in Figure 6, in dramatic contrast to George Gaylord Simpson's phylogenetic tree (Figure 5), attempts to show horse evolution from a common ancestor. Figure 6 shows 22 different horse-like animals, all of which appeared and disappeared in the fossil record, (shown in black), with no lines showing one ancestral horse evolving into the several new horse varieties via imaginary phylogeny. When the hypothetical horizontal lines are removed, the creationists' "lawn" or "orchard," which is produced strictly by fossil data, is readily apparent. Furthermore, there exists

> no evidence of long-term changes within these well-defined species [of *Mesohippus* and *Miohippus*] through time. Instead, they are strikingly static through millions of years. Such stasis is apparent in most Neogene [later] horses as well, and in *Hyracotherium*. This is contrary to the widely-held myth about horse species as gradualistically-varying parts of a continuum, with no real distinctions between species. Throughout the history of horses, the species are well-marked and static over millions of years. At high resolution, the gradualistic picture of horse evolution becomes a complex bush of overlapping, closely related species. (Prothero quoted in Gould, 1991, p. 180)

Given the standard geological time scale, the fact that many of the animals

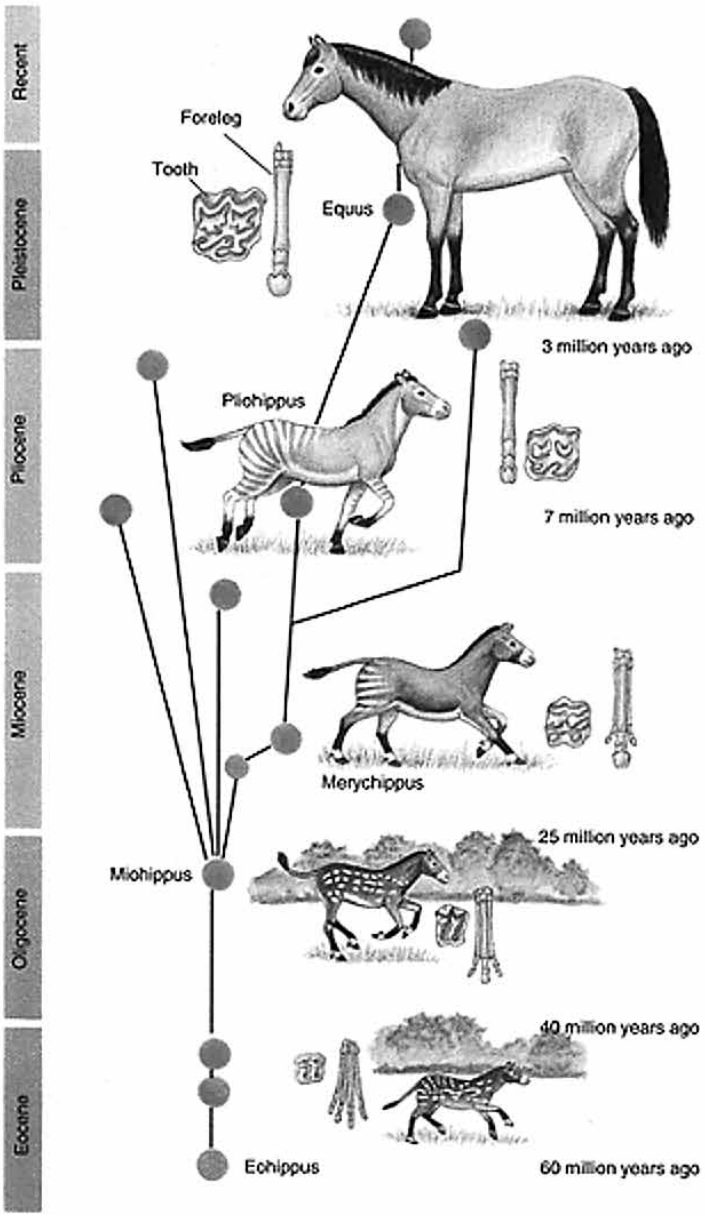


Figure 4. The horse evolution chart used at the University of Texas to teach macroevolution in their Integrative Biology Class. The modern horses are shown to all have evolved from the *Miohippus*. The coloration is conjectural. Note how this is a modification of the now infamous, disproven, 1903 diagram by William Matthew. http://www.sbs.utexas.edu/levin/bio213/evolution/evol.proc.html.

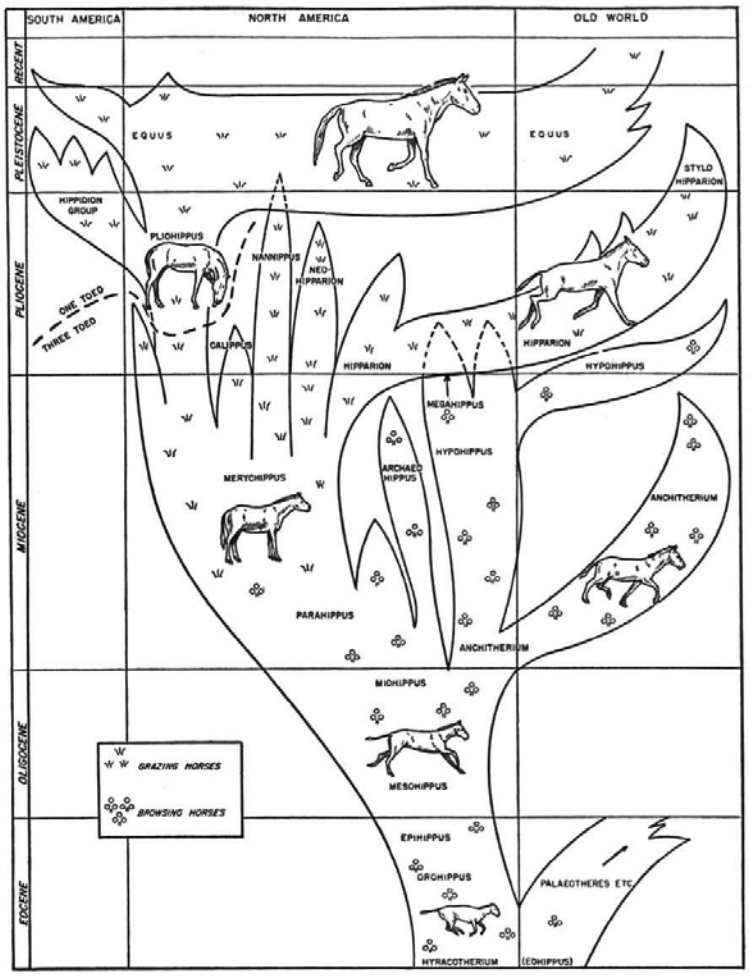
in the horse fossil series are found *in the same strata* is evidence that they lived *at the same general time*, and in the same, or a similar, environment, thus bringing into question whether some were evolutionary ancestors to the other contemporaneous horses in the series. In spite of much speculation, there exists about modern horses

> no unanimity of opinion even among experts concerning the origins of the domestic horse. Debate about it has so far lasted for about 150 years. Even before Darwin's new theories…of evolution, the immense diversity of size, form and color of horses had led inquiring minds to explore the possibility of various primitive races of horse being extinct before the domestication of *Equus caballus*. However, most of these 'primitive races' were supposed to differ from each other in color, and the theorists have therefore been able to draw little support from archaeological remains. (Edwards and Geddes, 1973, p. 14)

Debate on Horse Origins Continues Today

The debate on horse origins continues today, but no dispute remains among experts regarding the fact that the classic horse evolution picture used in the textbooks for the last century is clearly wrong (MacFadden, 1992). See Janis (2008, p. 250) for another conclusion. The main problem

> is the failure of paleontologists to find convincing phylogenies or sequences of organisms demonstrating major evolutionary change. Naturally many will have escaped fossilization or have been subsequently destroyed, but surely one or two should survive? The horse is often cited as the only fully worked-out example. But the fact is that the line from *Eohippus* to *Equus* is very erratic. It is alleged to show a continual increase in size, but the truth is that some of the variants were smaller than *Eohippus*, not larger. Specimens from different sources can be brought together in a convincing-looking sequence, but there is no evidence that they were actually arranged in this order in time. 'Phylogeny is still biology's major unfinished task,' admits Professor Hanson. (Taylor, 1983, p. 230)



13. The lineages of the horse family. The main lines of horse descent and relationships of the more important genera treated in the text. The restorations are to scale.

Figure 5. Diagram showing the evolution tree from the alleged ancestor of all horses, *Hyracotherium*. From: Simpson, George Gaylord. 1951. *Horses: The Story of the Horse Family in the Modern World and Through Sixty Million Years of History*. Oxford University Press, New York, NY, p. 114.

This conclusion is quite in contrast to the paleontological opinion expressed in 1926 which declared: "evolution…from the simple Eocene ancestor to the large and specialized horse of today [demonstrates] a progressive series leading to the living horse" (Loomis, 1926, p. 218). The main cause for this evolution was "apparently…natural selection and mutation" (Loomis, 1926, pp. 218, 224). American paleontologist Frederic B. Loomis concluded that "paleontology proves the fact of evolutionary progress in the horse line…but, as of yet, we know almost nothing about how new mutant types originate" (Loomis, 1926, p. 228).

As early as 1923, George McCready Price concluded that the now infamous 1903 diagram by William Diller Matthew consisted of an arrangement "not found in nature—this is a purely artificial arrangement made up from widely scattered formations with nothing whatever of actual fact." He added that, all these so-called 'horses' may have once been living contemporaneously (Price, 1923, p. 562).

The major well-documented problems of the horse series were reviewed back in 1954 by University of Lund professor Heribert-Nilsson (Cousins, 1971). In 1943, Heribert-Nilsson was elected a member of the Royal Swedish Academy of Sciences, the organization that awards the Nobel Prizes. Nilsson concluded that "The family tree of the horse is…continuous only in the textbooks" (Heribert-Nilsson, 1954).

Evolutionists Deal with the Loss of the Horse Progression Theory

Specifically, evolutionists rejected the "straight shot," "ladder-like," "orthogenic," gradual "Darwinian view" of horse evolution. Consequently, they reject Darwin's theory of evolution by natural selection which taught the gradualistic model whereby "natural selection acts solely by accumulating slight, successive, favorable variations, [and therefore] it can produce no great or sudden modifications; it can act only by very short and slow steps" (Darwin, 1859, p. 471).

Nonetheless, due to the overwhelming evidence against the gradualists' model leading to the rejection of the Darwinian gradualistic model of horse evolution, most committed evolutionists reject creation, and therefore must accept the belief that horses evolved from some hypothetical *Eohippus*-like creature. One alternative that came after rejecting Darwin's view was to replace straight-line, horse evolution with the punctuated-equilibrium evolutionary model.

The Punctuated Model

Over 110 years after Darwin introduced the natural selection theory,

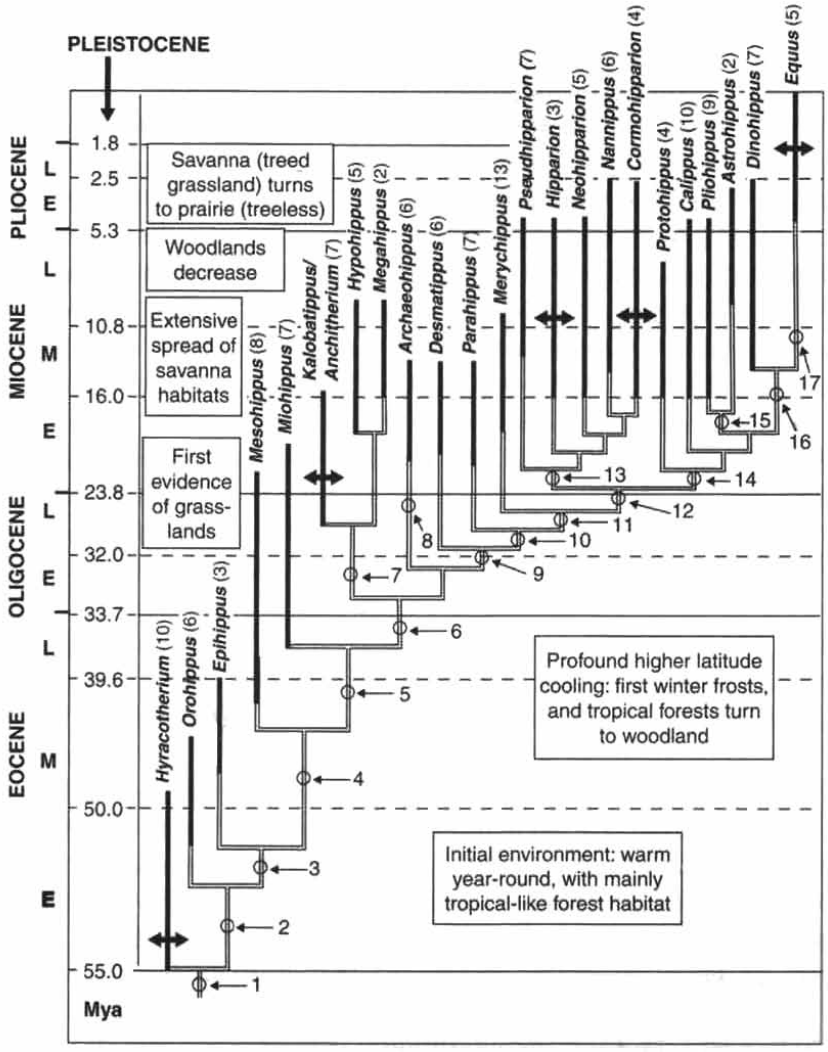


Figure 6. The most detailed horse diagram showing horses appearing in the fossil record and some that became extinct. It does not even attempt to show the tree diagram in contrast to the Simpson diagram (Figure 5). The dark black lines are based on actual fossil data and the light double lines are hypothetical evolutionary lineages. The figure shows 22 different horse kinds. From: Janis, Christine. 2008. "The Horse Series." In *Icons of Evolution: An Encyclopedia of People, Evidence, and Controversies*, pp. 251–280, p. 259. Brian Regal (editor). Greenwood Press, Westport, CN.

Niles Eldredge and Stephen Jay Gould introduced the theory of Punctuated Equilibria to replace Darwin's gradualistic account of evolution. They observed that very little change occurred between speciation events—a phenomenon they referred to as evolutionary stasis. The fossil record often showed rapid bursts of change followed by longer periods in which little or no change occurred. After documenting the problems with the gradualistic model, Eldredge argued that the Punctuated Equilibria model was superior. Referring to the horse-evolution display at the American Museum in the 1920s, based on the 1903 diagram by Matthew, Eldredge observed that

> Undoubtedly one message the exhibit intends to convey is the gradual and even directional nature of horse evolution…the message comes through loud and clear: anyone looking at the exhibit is bound to come away with the notion that evolution is a matter of gradual, or progressive change through time…. [In fact] each specimen represents an entire species that was but one of several species alive at any one time, and when we further recognize that each species tended to remain stable for [at] least a million years, we get the alternative, more 'punctuated' picture of evolutionary change. (Eldredge, 1987, pp. 221–222)

More than 40 years after Gould and Eldredge proposed their theory, "the theory of punctuated equilibria remains controversial, with many biologists still unconvinced as to the value of the theory as a description of how evolution proceeds" (Venditti and Pagel, 2008, pp. 274–275).

Conclusions

The focus of this review has been on the horse evolution "ladder" illustration that was once prominently displayed in the textbooks to prove "molecules-to-man" evolution. This idea, along with the illustration that supports this view, has now been carefully refuted by many prominent paleontologists. Its importance is illustrated by the fact that in the past "apart from human evolution, horse evolution represents the only "classic" example [of evolution] from the mammals" (Janis, 2008).

The fact is "Fossil horses have since become one of the exemplars of evolu-

tion as displayed in the fossil record, endlessly repeated and recycled in textbooks and museum displays (but often with outdated or incorrect information)" (Prothero, 2009, p. 290). As Milner concluded, the history of horse evolution is "saddled with errors" and the gradualism model is only one example (Milner, 1990, p. 222).

What the fossil record shows is an enormous variety in the horse kind similar to what we find in the dog and cat kinds. Likewise, little agreement exists on the evolution-based, phylogenetic trees, as illustrated in Figures 3 to 6. The modern horse kind displays enormous variety, and because, as far as is known, most of the numerous horse species can hybridize, they are a single family. The fact is that the

> evolutionary sequence of fossil horses was the prime example of straight-line evolution, or—more scientifically—orthogenetic or orthoselective evolution. We know today that this concept is wrong. It was based on the few fossil finds known from the end of the nineteenth century….We are still a long way from tracing evolutionary development from species to species. Considering the gaps in the fossil record, it is questionable whether we will ever achieve this aim. (Franzen, 2010, p. 179)

In other words, in spite of over two centuries of research, we have no convincing evidence of the evolution of horses from non-horses, which is the central concern of evolutionists. In contrast, we have a great deal of evidence for genetic stasis and an enormous variety within the horse kind.

Nonetheless, the peer-reviewed literature on this topic is often irresponsible, such as the claim by W.D. Matthew that the horse "fossil record is the most complete among the larger animals" (Matthew, 1926, p. 139). In his 1926 article, Matthew strongly argued against creation, concluding that the evidence is unequivocal: evolution is fact, and creation has been disproved based on the evidence for horse evolution (Matthew, 1926, p. 176).

Christine Janis uses an entire chapter in an attempt to discredit the creation/intelligent design position on horse evolution. Her faith in Darwinism remains intransigent in spite of her inability to document horse evolution from some hypothetical, non-horse ancestor. The late Harvard professor Ernst Mayr wrote:

> one would expect the fossils to document a gradual steady change from ancestral forms to the descendants. But this is not what the paleontologist finds. Instead, he or she finds gaps in just about every phyletic series. New types often appear quite suddenly, and their immediate ancestors are absent in the earlier geological strata… the fossil record is one of discontinuities, seemingly documenting jumps (saltations) from one type of organism to a different type." (Mayr, 2001, p. 14)

History has shown that Matthew's now infamous horse-evolution chart is misleading if not fraudulent (Matthew, 1926, p. 172). Unfortunately, the horse series idea still lives on in the textbooks in spite of its exposure as a myth (Morris, 2008, p. 13). It has to live on because, if creation is wrong, evolution *must* be true. No other option exists. Evolutionists believe that all life has evolved from some simple life-form. Consequently, they have attempted to produce a horse series from the current bush 'horse-tree' to support their view. The attempts proposed are very different and contradictory, being subject at times to the directive whims of a single, horse-series textbook author.

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