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Appendix B: Horses in the Americas

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Abstract: Miller provides a short discussion about the horse in the Americas, and the various indigenous kinds of horses that roamed on these continents.

Appendix B

Horses in the Americas

It's interesting that of the many animals named or implied in the Book of Mormon, it is the horse that has drawn the most attention. From its first printing when the book was distributed throughout a small region of the eastern United States skeptics have used this familiar animal, the horse, as a means to discredit the Book as well as Joseph Smith.

Most critics have been of the opinion that the horse was unknown in the Americas before the Spaniards introduced it at the close of the 15th Century. Of his own knowledge, Joseph Smith could not have presumed that there were Precolumbian horses in America before his translation of the Book of Mormon from the gold plates. The fact that there were horses here before the second voyage of Columbus was not known to science until many years after the death of Joseph Smith.

Of necessity the story of the horse presented in this appendix is much abbreviated and simplified. It starts in North America. By the latter third of the 19th Century, paleontologists had come to realize that various kinds of horses existed on this continent. In fact they found out that the major history of the horse was preserved here as an essentially continuous record of multitudinous fossils, representing many millions of years. We now know that the first horses on earth appeared in North America. The story of their origin and development, though, has become more complex as addi-

tional fossils have been discovered. Ever expanding research over the past several decades has shown that there were more than 40 genera of horses, and many more species, living on this continent. They had adapted to a variety of environments. However, only one genus and a few species are all that remain as living forms on earth now.

Until recently paleontologists suggested that the earliest horse was one named *Hyracotherium* or *Eohippus* (two different names applied to the same genus; i.e., synonymous names). It is now believed by most researchers that two distinct genera are represented. The latter genus is thought to be the possible distant ancestor of the modern horse. *Hyracotherium,* though, appears to be ancestral to a separate, and now extinct, family of horse-like animals native to the Old World.

In the New World the true horse, *Eohippus,* was a small (about one foot tall at the shoulder), forest-dwelling animal. Its teeth show it was adapted to feed on leafy vegetation. The presumed forest environment is based on associated fossils, especially those of forest or woodland plants. Associated animals living with *Eohippus* include primates, deer-like types, primitive tapirs, primitive tree squirrels and many others, all well-suited to forest conditions. In addition, the physical characteristics of *Eohippus* and closely related genera imply this type of an environment that was made up of forests. These earliest horses had four toes on their front feet, and three on the hind feet, ideal for walking on a soft forest floor. Their fossils also show vestiges (splint bones) of additional digits, indicating an ancestor that had five toes in front and in back. The modern horse only has one toe front and back, with splint bones as mentioned in Chapter 7.

Unlike much earlier described scientific histories of the horse, this animal did not consist of just six or seven genera that led directly from *Eohippus* to our modern *Equus* through the Cenozoic Era. It is now known that there were many more genera of horses comprising the history of this animal. Although true horses were originally just in North America, the continued movement of the earth's crustal plates brought some continents into contact, which later separated.

This geologically brief contact allowed some animals, including the horse, to disperse into the Old World. Of course others from the Old World were able to come to the New World in this same manner. Fossils provide an interesting history of animal (and plant) dispersals throughout the world through time. These continental contacts enabled horses to move into Europe, Asia and Africa. In so far as Australia is concerned it was never in contact with any other continent during the time horses were developing, and therefore they were not present until introduced by man.

The horse did not gain access into South America until that previous island continent connected with North America in the Pliocene Epoch about 4.5 million years ago. This occurred when the Isthmus of Panama was first formed (Some of my own research, along with colleagues, has shown that this Isthmus first formed 1.5 million years earlier than was previously reported).

The reason why so many different kinds of horses existed in North America is also related to the movement of crustal plates, moving through different latitudes and hence different climate zones. These climatic zones were also affected by the forming of mountains which largely came about through plate collisions. Size and position of oceans were also affected.

All these changes of course helped to determine the types of climates, and hence vegetation, that would be present in an area. Like many (but not all) other animals, the horse adapted to a fairly wide range of habitats and vegetational zones. In general, though, the earth was becoming cooler and dryer throughout the Cenozoic Era (the last 65 million years of earth's history), the time horses were living on earth. With the cooling and drying, the vegetational zones changed.

Horses and other animals had to adapt, or else become extinct. Study of fossils clearly shows that both adaptations and extinctions occurred. With cooling and drying came extensive grasslands in temperate zones. Many animals adapted to this change, but many did not. The horses that were grazers did very well, but those that were browsers were the ones to become extinct. The one genus that survived, ***Equus***, is the only genus now left on earth. All other genera, over 40, are extinct, known only by fossils.

The modern genus, *Equus*, though, is represented by several species. These include Asian wild horses, asses and zebras. In nature all are well suited to life on prairies or grasslands. Until the end of the Pleistocene Epoch, the horse was one of the best represented mammals in North America. Why it disappeared here in such a short time, still has paleontologists guessing. However, some recent research, not yet completed, suggests that horses might have survived in North America in limited numbers close to the time that they were re-introduced to the New World by Europeans. Reportedly, Columbus brought the first few horses to America on his second voyage in 1493. In following years Spaniards and others brought in more, both to North and South America. The fact that herds of horses now do well on these continents in the wild, makes their earlier disappearance more of a mystery.