

## INTRODUCTION

Providing another witness of Jesus Christ is the primary purpose of the Book of Mormon. His teachings are the central reason for this sacred Book. Within the Book of Mormon itself evidences are provided which attest to its truthfulness. This includes some of the animals mentioned as well as plants, materials (raw and manufactured), culture(s), words used and more. The degree of consistency concerning all these topics *in our view* overwhelmingly indicates that Joseph Smith could not have written the Book of Mormon of his own knowledge. Even the most informed experts of his day would not have known much about the archaeological or other scientific details given in this Book. At age 22, when Joseph Smith Jr. first began translating the gold plates, he had but a smattering of formal education. In his own words, *“Deprived of the bennifit of an education, suffice it to say I was merely instructtid in reading and writing and the ground <rules> of Arithmetic which const[it]uted my whole literary attainments.”*<sup>1</sup> His wife Emma observed that at the time he translated the Book of Mormon Joseph Smith, *“could neither write nor dictate a coherent and well-worded letter, let alone dictate a book like the Book of Mormon.”*<sup>2</sup>

From the time of the Book’s first printing in 1830, people no doubt speculated on many of the things it contained in addition to the doctrines presented. For example some of the plant and animal names were a mystery. Some still are. The fact that horses and asses and elephants are included as indigenous animals has been a challenge to some readers of the Book of Mormon since these animals are generally thought to have been introduced either after the arrival of Europeans in the Americas, or extinct long before Book of Mormon times.<sup>3</sup> The present article will show that the animals mentioned as well as others were native to North America and in all likelihood survived (at least in small numbers) into recent historical times.

Most LDS scholars, recently reporting on the subject, believe that the lands occupied by Book of Mormon peoples were within what is now known as Mesoamerica.<sup>4</sup> This is the premise of the present authors as we see ample evidence for this belief. Many of these evidences will be discussed below. Discussing the animals mentioned in the Book of Mormon requires touching on a variety of disciplines and subdisciplines. These include archaeology, geography, biology, paleontology (including extinctions), geology, taphonomy, zoogeography and others. Terms will be explained as they are used.

## BOOK OF MORMON LANDS

Certainly the testimony and doctrine of Jesus Christ is the paramount reason for us having the Book of Mormon. Nevertheless, from its first printing people have wondered where the events recorded actually took place. That it is well for us to obtain knowledge of all worthwhile information has been told to us by the Lord Himself. “Teach ye diligently,” He said, “and my grace will attend you, that you may be instructed more perfectly in theory, in principle, in doctrine, in the law of the gospel, in *all* [emphasis added] things that pertain unto the kingdom of God .... Of things both in heaven and in the earth and under the earth...” (D & C 88:78-79). Clearly God wants us to study and to learn all that is worthwhile. One important item which has bearing upon the issue of animals in the Book of Mormon has to do with the real world location of the lands described in the text. Sorenson and others have discussed the history and development of Latter-day Saint ideas about Book of Mormon geography, which have been literally all over the map, but no authoritative model exists.<sup>5</sup> Church leaders often remind the Latter-day Saints that the specifics of Book of Mormon geography have not been revealed. However, many have encouraged careful and diligent research by scholars.<sup>6</sup> In our view, the interpretive model which makes the most sense of the information given in the Book of Mormon text is that which posits an ancient Mesoamerican setting for the events described in the

Book. Some of the reasons for our view include the following:

1. Geography: The limited size of Book of Mormon lands is outlined within its text. This has been the almost universal conclusion of scholars who have carefully considered the matter.<sup>7</sup> Information utilized includes positions of the seas and other aquatic features, mountains, the “narrow neck of land,” distances, duration of time of travels and directions traveled by the people. All appear compatible within Mesoamerica. No other geographic location in the New World matches these data as well. The major areas recorded where Book of Mormon peoples lived indicate that this region was relatively small, perhaps no more than 500 miles in length and 200 miles in width, just somewhat smaller in size than the state of California.<sup>8</sup> While some have contended that the “narrow neck of land” refers to the Isthmus of Panama, distances and directions given in the Book of Mormon are not in agreement with this concept. Additionally, some of the native animals in South America do not fit with those given in the Book. For one, elephants (mammoth) did not get to this southern continent.

2. Chronology: Archaeologists have been very interested in civilizations from Mesoamerica since Stephens and Catherwood provided detailed information including drawings based on their travels to this region.<sup>9</sup> Prior to their work, very little was known about this area by the civilized world. People were amazed at the highly developed cultures that existed there. When Joseph Smith was made aware of Stephens and Catherwood’s written work (he was presented with their two-volume book), it is said that he seriously considered Mesoamerica as a possible place for the Book of Mormon lands (Jessee, 1984).<sup>10</sup> Stephens and Catherwood’s work brought to light what would later be known as the Mayan culture. Today, in addition to the Maya, other cultures are known which include the Olmec, the Zoque and others. Mesoamerican culture has generally been divided by archaeologists into different periods; the Pre-classic or Formative, Classic, Post-classic and Colonial. It is the Formative period that is of most interest to us as its duration of c. 2000 B.C. to 250 A.D. largely overlaps the time of Book of Mormon peoples.<sup>11</sup>

3. Geology: Although the Book of Mormon does not contain a great deal of information relating to geology *per se*, it is implied. Much of this is found in 3 Nephi, Chapter 8. Here the account chronicles a series of disasters following Christ’s crucifixion. It begins with a great storm and terrible tempest. This is then followed by exceeding sharp lightnings, cities taking fire, and others sinking or being buried with earth. Severe quaking of the land, breaking it up, and accompanying whirlwinds also occurred. A thick darkness came about in which no candles could be lit nor fires kindled. The only logical explanation of all these phenomena is that of intensive volcanic activity.<sup>12</sup> All the events described above have been noted in historical times relating to volcanic activity. No other combination of events such as the ones described can be accounted for except by vulcanism. Sorenson summarized evidence for such activity and discussed its impact around the time of Christ in Mesoamerica.<sup>13</sup> Geologists have long recognized that the Eastern United States has not experienced volcanic activity for many, many millions of years. On the other hand, Middle America is considered one of the most volcanically active regions in the World.<sup>14</sup>

4. Gold and Silver: These are two precious metals mentioned in the Book of Mormon as coming from the lands of the Jaredites (Ether 9:17, 10:23) as well as those of the Nephites and Lamanites. As given in the Book of Helaman for example (6:9), Lamanites and Nephites had an *exceeding plenty* [emphasis added] of gold and silver in both the land south and in the land north. Gold was discovered in the Promised Land not long after Lehi and his group arrived there. It was apparently abundant to the people from the start of colonization (1 Nephi 18:25). Gold and silver are plentiful in Mesoamerica. Mexico now stands as a significant producer of the World’s gold.<sup>15</sup> It is also especially rich in silver. To the contrary the Eastern United States, including New York, has produced only negligible amounts of gold and silver.<sup>16</sup> There has been no reporting of gold or silver here in pre-Columbian time as well.

5. Pearls: In 4 Nephi (v. 23-24) it's related that the people, "...had become exceeding rich ... were lifted up in pride, such as the wearing of costly apparel and all manner of fine pearls..." While pearl-bearing oysters and other clams occur in both fresh and salt waters the world over, the most precious ("fine") pearls come from tropical to sub-tropical seas. They are known to be abundant off the coasts of southern Mexico and were prized by Mesoamerican peoples from Pre-classic times.<sup>17</sup> An archaeological site in Mesoamerica from the Mexican state of Chiapas has yielded jewelry which includes pearls. This site has been dated at somewhere between 500 and 700 B.C. <sup>18</sup> No precious pearls have been reported from coastal waters of the northeastern United States. None of the freshwaters from this region to our knowledge has produced precious pearls either.
6. Cement: In the Book of Helaman (3:7, 9 & 11) it is stated that those people who went to the land northward were expert in the working of cement. This activity took place about 46 B.C. according to the date given in the above Book. Cement was extensively used in Mesoamerica around this time. The earliest known sample dates to about the First Century B.C.<sup>19</sup> One of the most famous sites for this early cement is at Teotihuacan (located about 30 miles northeast of Mexico City). Margain commented that, "Concrete is encountered in all Teotihuacan constructions of every epoch."<sup>20</sup> He further stated that diverse types of cements were used in the building of the temples and that the working with them exhibited a high degree of engineering skills.<sup>21</sup> Currently, the city of Teotihuacan is considered to have dated back to 100 B.C. for its earliest constructions.<sup>22</sup> Since the cement discovered at this site was fully developed and of high quality, the knowledge of making cement must have preceded that known thus far at Teotihuacan. In any event its date at this site corresponds to that given in the Book of Mormon. One of us (WEM) has visited the Mayan Pyramid sites here on several occasions and has examined this cement. The fact that this cement is still in good condition after 2,000 years attests to its quality and the expertise of its makers.
7. Culture: The fact that the Nephites developed an advanced culture can be seen through several evidences. Even their cement attests to this as noted above. It is of as high a quality as we have today. It's implied in the Book of Mormon that the Nephites possessed a high degree of writing skills. This was not only done by engravings on metal plates, but also presumably with paper and ink (e.g., Mosiah 2:8, Alma 30:51-52). That peoples of this time period used ink (from minerals) and paper (from inner tree bark) for writing has been stated by several archaeologists.<sup>23</sup> Archaeological studies have shown that peoples in Mesoamerica during Book of Mormon times had: A complex society, many large and complex buildings, fortifications, a high degree of art, a good understanding of astronomy, a highly accurate calendar, a sophisticated knowledge of agriculture and husbandry and more.<sup>24</sup> This type of an advanced civilization at the time is not known anywhere else in North America north of Mesoamerica. Certainly the region around the present-day New York state does not contain such evidences. In fact studies show that the people living there for several thousand years until the time of European settlers moved in were tribal hunter-gatherers.<sup>25</sup>
8. Climate: What little has been indicated about climate in the Book of Mormon lands implies year-around warm and mild conditions. There is no mention of snow and ice occurring there, or even of cold. One implication of climate is made in Alma 46:40. In mentioning periodic fevers in the land they, "...were very frequent in the land - but not so much so with fevers, because of the excellent qualities of the many plants and roots which God had prepared to remove the cause of diseases, to which men were subject by the nature of the climate." It has been reported that in the Isthmus of Tehuantepec region (which is possibly the "narrow neck of land" mentioned in the Book of Mormon - e.g., Alma 50:34) medicinal plants to treat fevers are common.<sup>26</sup> In 3 Nephi 6:8 it is stated that, "And there were many highways cast up..." This indicates that they were at least in part causeways. And the reason for this would be because of at least seasonal very wet conditions, such as those in humid areas. While not proof of warm to semi-tropical climate, this combination of factors stated is very suggestive of them. Mesoamerica is compatible with these conditions while New York is not.

The abundance of “fine pearls” mentioned earlier also suggests a warm climate. These and other factors seem to us to make the best sense in a pre-Columbian Mesoamerican setting for the Book of Mormon lands. This setting would apply to the Jaredite record as well.

## BIBLICAL ANIMALS

In considering the types of animals given in the Book of Mormon, it might be well to mention references from the Bible. Are there more listed in the former scriptures or in the latter? The Bible has by far the most listed animals. However, this includes insects and many other invertebrate animals, reptiles and birds as well as mammals. The total number of different kinds of animals is more than 130.<sup>27</sup> In the Book of Mormon it is primarily mammals that are given, with a total of different types indicated as only 14 (in repeating Isaiah statements in 2 Nephi (30:12-14), a few Old World animals are also included). One problem that exists with the Book of Mormon animals lies in naming. In listing cattle, oxen and cows (Ether 9:18-19; 1 Nephi 18-25; Enos 1:21), this could possibly mean one to three different kinds of animals.

Animals (mammals) in common between the Bible and Book of Mormon are the horse, ass, cattle (steer, cow), ox (oxen), swine, goat and wild goat. It’s interesting that the elephant can be found in the Book of Mormon, but not in the Bible. However, an inference to this animal can be found in I Kings (10:18). Here it is stated that Solomon had a great throne of ivory. Caution must be taken when identifying animals in either of these two scriptural Books, though. Some of the names given in both represent animals for which we cannot be sure of their true nature. A few of these given in the Bible are the behemoth, cherogrillus, unicorn and pygarg. In the Book of Mormon there are the curelom and cumom. Part of the problem in taxonomy is in translating from one language to another as is true for both Books. Commonly people will name an unidentified animal in a newly settled region after a similar looking animal with which they are familiar. This happened on many occasions when Europeans colonized on foreign lands. For example the true buffalo is an Old World bovid whose name was applied to the American bison. And the American pronghorns are commonly called antelopes as they resemble these Old World animals. The North American moose is known as an elk in Europe. Even in the same language, a given animal can have various names (e.g., mountain lion, cougar, puma, mountain cat, catamount, etc.). All this serves to point out the need for caution in identifying animals in scriptures.

“For the Bible translator perhaps no aspect of his work is more complex, confusing, and time consuming than the problems encountered in attempting to render satisfactorily the terms for differing plants and animals of the Scriptures.”<sup>28</sup> Edward Hope observes, “In the Old Testament it is extremely difficult to decide with any certainty the animals (or birds) referred to by their Hebrew names. In some cases the range of suggestions is staggering.”<sup>29</sup> One challenge has to do with identifying the animals named in the Hebrew text. One approach is to simply follow previous translations. This, however, “sometimes introduces into the text animals which were not found in Biblical times in the ancient Middle East, as far as we know.”<sup>30</sup> Still, this may at times be the best approach, hence, “a translator should, carefully consider the existing tradition in translating, that is, the practice of other translations of the Scriptures into this receptor language.”<sup>31</sup> Similarly, Joseph Smith may have simply followed the King James rendering of animal terms for some Book of Mormon animals, even if the association with some animals in the American land of promise may not have been precise.

Another approach taken by translators is to derive a meaning from the Hebrew root of the animal name and then associate it with an animal that has characteristics or behavior that fits with that meaning. But this approach has had limited success. In a third approach to this challenge, “One would start from animals known to have lived in the area and period as evidenced from the

archaeological findings. Then a Hebrew name would be associated with an appropriate animal, bearing in the mind the known habitat, characteristics and behavior of the animal chosen. Another important factor would be the relative 'prominence' the animal was likely to have had."<sup>32</sup> Our archaeological knowledge, however, is limited by what scholars have found, which may or may not be an accurate reflection of the animal history of the region.

A second challenge for Bible translators has to do with translating animal names in the Biblical languages into target languages. In some languages this poses fewer difficulties, but in others this can pose interesting challenges. As an example from the New Testament, Jesus is said to have been moved with compassion on the multitude because "they fainted, and were scattered abroad, as sheep having no shepherd" (Matthew 9:36). A Greenlandic translation made in 1744 renders sheep as "small animals which are nearly like caribous." Inge Kleivan explains that, The comparison may at first sight appear astonishing, but in fact Poul Egede [the 1744 translator] has chosen the animal which is nearest to the sheep in size, appearance, and behavior if he wanted to compare the sheep with an animal which the Greenlanders knew. There were only the following land animals in West Greenland: hares, foxes, caribous, and polar bears. The comparison is, however, unsatisfactory at a very important point, because the caribous are not tame animals and the pastoral culture which pervades the Bible was quite unknown to the Greenlanders.<sup>33</sup>

Translators find that in certain cases, "one may have to employ a term for something belonging to quite a different species, but having some of the same essential features."<sup>34</sup> No one solution is always completely satisfactory. The biblical terms "dragon" (e.g., Psalms 74:13; 91:13; Isaiah 27:1; 51:9) is applied to certain animals known to the writers of the Book of Mormon (e.g., Mosiah 20:11; Alma 43:44). The references are used metaphorically in describing the fierceness of warriors in battle, but this presumably refers to an animal that was known to them (The Hebrew word for "dragon" ("tannin") can refer to any great monster). Crocodiles live in warm waters of both the Middle East (Egypt for example) and in Mesoamerica. The American Crocodile (*Crocodylus acutus*) is the most numerous of extant crocodiles here, and can reach a length of more than 20 feet. It can be a ferocious predator, with large individuals even attacking full-grown cattle and humans. While the mention of dragons is made metaphorically in scriptures, it seems reasonable to assume that a known type of animal was represented. Sorenson is one who has earlier made the connection in reference to the crocodile's presence in the Book of Mormon. Hellmuth in discussing the portrayal of such species in Pre-columbian Mesoamerican art states, "actually, 'dragon' is a term that is not always inappropriate" in describing such creatures.<sup>35</sup>

## DOMESTICATION OF ANIMALS

A majority of animals mentioned in the Book of Mormon are domesticated ones. This makes sense because these represent ones most useful to man. It's true that "beasts" (Enos 1:3) and "beasts of prey" (Alma 2:37) have been listed in the Book, but they are not specifically named. When a reference is given about domesticated animals, it is usually associated with the Nephites. However, the Lamanites did at least maintain flocks, presumably of sheep (Alma 17:25), and had horses (Alma 18:9). The Jaredites were the earliest peoples mentioned in the Book of Mormon to have domesticated animals in what's now America. They brought the most useful ones practical to bring in their barges from the Old World (Ether 6:4). Although no specific kinds of animals are listed, most likely the animals would have included sheep and goats under the heading of "flocks and herds." Since, "...whatsoever beast or animal" is also given, the Jaredites must have carried several types of useful animals on one or more of their eight barges on their voyage to America. In addition to sheep and goats, the later mention in the Jaredite record of cattle, oxen, cows, horses and asses (Ether 9:18-19) presents the possibility that these animals were brought along too. It might have been that the larger animals (e.g., horses, asses and cattle types) were carried across as juveniles. This would

have alleviated space and food problems.<sup>36</sup> What we don't know is what kinds of animals they found native in the New World, with the probable exceptions of the elephant, curelom and cumom. Some of these could well have been domesticated, and apparently were (Ether 9:19).

There is no mention in the Nephite record of animals being brought to America by Lehi and his group, although they might have done so. It is stated, however, that they found animals upon their arrival in the Promised Land. Ones mentioned are the cow, ox, ass, horse, goat and wild goat. It was further noted that, "...there were beasts in the forests of every kind..." (I Nephi 18:25). Based on animals now living in North America (including Mesoamerica), there would have been many, many other kinds of mammals alone when both the Jaredites and the Nephites arrived. So, the Book of Mormon account of kinds of animals brought over or found native to the New World is extremely incomplete. To illustrate this, North America has 474 indigenous species of mammals.<sup>37</sup> Mesoamerica has a large majority of these species within its borders.

All the animals except the "wild goat" in either the Jaredite or the Nephite record could represent domesticated forms. A problematic one, though, is the elephant (Ether 9:19). The earliest descriptions of the mammoth in the scientific literature have referred to this pachyderm as an elephant - which indeed it is.<sup>38</sup> Although mammoths characteristically were considered to be extinct for 10,000 years, new discoveries show that they lived on in North America far beyond this date.<sup>39</sup> As will be explained later, extinction dates for species do not represent their latest existence on earth. We consider that the "elephants" cited in the Jaredite record was accurately identified. The most widespread and abundant North American mammoth was *Mammuthus columbi*. This in all probability was the elephant referred to in Ether 9:19. This particular mammoth shows a very close relationship to the Indian (or Asian) elephant, *Elephas maximus* (the circus elephant). These two proboscideans have a closer relationship to one another than either has to the African elephant, *Loxodonta africana*. The potential significance of this is that the Indian elephant is fairly easily tamed and trained (but not actually domesticated), while the African elephant is not. Therefore, it seems reasonable to assume that *Mammuthus columbi* could also be domesticated. Archaeological evidence supports the fact that the Indian elephant was domesticated back to at least 2500 B.C. in the Indus Valley.<sup>40</sup> Coincidentally this is the approximate time that the Jaredites arrived in North America. If these people traveled through Asia as thought by Hugh Nibley<sup>41</sup> Jared and his group possibly observed men working elephants. They would have seen how useful these large mammals were.

It should be realized that there is a fine line between taming and domesticating. Most mammals (as well as some other animals) can be tamed if raised from babies. However, relatively few can be truly domesticated.<sup>42</sup> As far as a definition of domestication, it means to cause an animal to adapt to a life which is in intimate association with, and to the advantage of, man. Taming simply means to make an animal docile and submissive. Scientifically, domestication is the process of changing an animal genetically through selective breeding to the benefit of man. Taming is the process whereby an animal simply becomes accustomed to a human(s).

## CULTURAL NAMING OF ANIMALS

It needs to be kept in mind when discussing Book of Mormon animals that the Lehiite, Mulekite and Jaredite migrants may have applied Old World terms to New World species. Thus when in 1 Nephi 18:25 mention is made of the "wild goat," it might actually be a type of deer that resembles a goat. This will be explained in a following section. Many migrant peoples through time have commonly applied familiar names to animals on lands where they immigrated.<sup>43</sup> This system of course would apply to plants as well as to animals. As far back as 1885, Edward Vining regarded this as a natural thing to do. He put it this way, "The natural tendency of a man who arrives in a new country [is] to

assimilate the animals he finds there to those which he sees in his native land."<sup>44</sup> What would Nephi have called a peccary or a bison if he sighted one? What we learn from cross-cultural encounters with strange or unfamiliar animals suggests that the answer may not always be clear. An example is when Europeans first began coming to the Indies. Regarding this Nicholson said, "It should be mentioned that at this early period, before the newcomers became better acquainted with the resources of the 'Indies,' many European terms were applied to things which had no exact counterpart in the Old World."<sup>45</sup> Some examples of the names are turkeys which are native to the Americas, being called "peacocks,"<sup>46</sup> \*peccaries being called "hogs" or "pigs,"<sup>47</sup> and alpacas being called "sheep."<sup>48</sup>

Sometimes the uniqueness of the animal poses even greater difficulties of description. According to one early description of tapirs found in the jungles of Central and South America, tapirs are, "...beasts that be as big as an ox or a cow and be of great color."<sup>49</sup> Another early explorer in describing tapirs indicated, "They are as big as small cows, and have no horns."<sup>50</sup> Yet another person called the tapir, "A species of buffalo of the size and somewhat looking like an ass."<sup>51</sup> A final description given here is of a tapir seen in Chiapas, Mexico. It was stated that, "Without doubt it is an elephant."<sup>52</sup> The latter description refers to the tapir having a proboscis, albeit a very short one.

## EXTINCTIONS OF ANIMALS

It seems prudent to discuss extinctions in this article as this relates to some of the Book of Mormon animals. Extinction is a topic that has been extensively dealt with in the scientific literature. Of specific interest here are the widespread extinctions that occurred at the close of the Pleistocene (or Ice Age) Epoch, especially throughout North America.<sup>53</sup> The mammoth (elephant), horse and ass are animals listed in the Book of Mormon that presumably became extinct in North America at the close of the Pleistocene, about 10,000 years ago. Cureloms and cumoms mentioned in the Book of Ether (9:19) probably represent extinct animals, too. This seems likely as Joseph Smith apparently wasn't able to relate them with any living animals. He seems to simply have transliterated the words on the gold plates from which he was translating.

While figures will vary among researchers, probably the total number of plant and animal species living today is no more than 1% of all those that ever lived on earth.<sup>54</sup> This means that about 99% of all life that ever lived on earth is now extinct. Sometimes extinctions will affect a single species, but more often they affect many because of interconnections of life forms. In the history of the earth there have been times of mass extinctions in a short period of time.<sup>55</sup> Dinosaurs have often been used as a classic example of this. It should be realized that extinctions are a natural process in the history of the earth. As conditions are ever changing on earth, life forms are forced to adapt, or else die out (i.e., become extinct). The dying out of the mammoth, horse and ass in North America presents only a small part of the mass extinctions that occurred at the end of the Pleistocene. This particular extinction event affected mostly large mammals.<sup>56</sup> It is this extinction which is most relevant to the present article.

What causes organisms (plant and animal) to become extinct? Basically it is a change in the environment, usually sudden in the geologic sense, to which organisms cannot adjust. This might be due to climatic changes, changes in worldwide sea level, volcanic activity, atmospheric changes, bolide impacts, new, more competitive species arriving in the area, a disease for which the organism has no defense, as well as many other possibilities. In recent times man has caused the extinction of many organisms. Animals include the passenger pigeon, the dodo (bird), the quagga (type of zebra), Tasmanian "Tiger" (or Tasmanian "Wolf"), and many others. While some Pleistocene extinctions were possibly caused by man (this is still a hotly debated topic), most extinctions apparently have been due to environmental factors such as those named above.

The fact that the mammoth (elephant), horse and ass were supposed to have been extinct in North America during Book of Mormon time has caused many to doubt, if not disbelieve, this Book's authenticity and Divine origin. It is therefore vital to have a clear understanding of when these animals actually became extinct on this Continent. It should be realized that obtaining an exact date for the last surviving member of any extinct species would be next to impossible. Winning the lottery would be thousands of times more likely. As one team of scientists has observed, "The youngest reliably dated macrofossil (usually a bone or tooth) of an extinct species is commonly taken to represent the approximate time of its disappearance. In practice, however, there is a very low probability of discovering fossil remains of the last members of any species, so ages for extinction based on dated macrofossil finds will likely be [show as]older than the true ages."<sup>57</sup> Only a miniscule number of the animals that have lived on earth have become fossilized or preserved. And even though an animal might have been abundant in an area in the past, its remains (including fossils) could well go undetected, or not even exist. The Central Asian and Eastern European Huns reportedly had hundreds of thousands of horses. Yet remains of these horses are now nearly nonexistent.<sup>58</sup> Archaeologists were earlier convinced that camels were not present in Egypt during the time of Abraham. However, it was later found that they were indeed continually present from prehistoric times to the present. The tapir (a relative of the horse and rhinoceros) is known from the famous Pleistocene deposits of Rancho La Brea in Los Angeles, California. However, only three small foot bones attest to its presence there.<sup>59</sup> It was just fortuitous that these bones were found among the more than one million fossils collected. Otherwise the existence of this animal there would have been unknown.

The fossil record clearly shows that extinction is fact; but extinctions are not limited to the distant past. Numerous extinctions have occurred in recent times as well, and are continuing. More than 339 animal species (not including insects and fish) are known to have become extinct in just the last four hundred years (most of these during the 19th and 20th Centuries).<sup>60</sup> Additional species have also disappeared in the past 45 years plus since this assessment was made. A lesser known, but more positive, factor is that new species are still being discovered today in various parts of the world. One estimate has been made that in excess of 400 new species have been discovered since the beginning of the 20th Century - including more than 150 mammals!<sup>61</sup>

From the above information it should be seen that populations of animals (or plants) could be living for prolonged periods, and then later show little or no evidence of their existence. A classic example of this is the coelacanth. This is a rare fish which can reach lengths over six feet, and weigh nearly 200 pounds. It was once considered to have become extinct over 65 million years ago. Then in 1938 it was found to still be living in the ocean off the coast of eastern Africa!<sup>62</sup> This fish has now also been found in the seas of Indonesia. Additional examples of animals thought to be extinct for thousands to millions of years, but then were found to be still living, could also be cited. Therefore, it is certainly possible for an organism to live on a few thousands of years after their last recorded appearance. This undoubtedly has happened in the case of Pleistocene vertebrates, as more recent last occurrence dates have been coming out in the scientific literature.<sup>63</sup> This includes the horse and mammoth in North America. As indicated above, extinctions of species are rarely instantaneous; it only appears so in the geologic sense. Usually it takes thousands to more than a million years for this to happen. In the case of Pleistocene vertebrate extinctions, it's likely that it took thousands of years to eliminate a species. This can be explained by unfavorable environmental conditions developing for certain species. This undoubtedly occurred at the close of the Pleistocene Epoch (Ice Age) when much of the world's climate was changing in a short period of time. Applying this situation to Pleistocene mammals, as the climate and environment changed it would cause them to move into more restricted areas where they could still survive. As favorable areas further diminished in extent, the populations of a given species would also decrease as food supplies lessened. Finally a point would be reached where the breeding population would become too small to sustain itself for

long. Extinction of the species would then occur. It should be readily seen that as dwindling of numbers within a species was taking place over a prolonged period, that the numbers of potential fossils would also be reduced. One reason why more recent dates of extinct animals are now being discovered is that more and more scientists are searching for them. Mammals other than the mammoth and horse in North America now have more recent last occurrence dates. For example the mastodon was considered to be extinct at the end of the Pleistocene, 10,000 years ago. But this presumed last occurrence date had to be revised with more recent finds. One was that of two individuals discovered in Utah that were dated at 7,070 years before the present (Miller, 1987). A date of less than 6,000 years before the present was given by Mead and Meltzer (1984). The mastodon should have survived even later than this.

## RECORD OF PAST LIFE

Evidences of distant past (prehistoric) life are generally known as fossils. A common definition of a fossil is: The trace or remains of a prehistoric organism. "Prehistoric" in this definition is post-Pleistocene (Ice Age) or roughly more than 10,000 years ago. Most ancient animals and plants are only known through their fossils. Although the abundance of fossils numbers in many trillions, the percentage of organisms that lived on earth since they first appeared that have become fossilized is minute - probably much less than a tenth of one percent. Therefore, most ancient animal remains have not survived into modern times and are not available for study. In some instances extinct animals, or those that are no longer extant in a region, have been found associated with man. This holds true of some of the animals mentioned in the Book of Mormon such as the elephant, horse, ass and probably the curelom and cumom, and possibly even others. In the case of animal remains at archaeological sites it has been stated that, "The remains of all animals used by people living at the site will not be recovered from the site, because either their remains were discarded beyond the excavated portion of the site or their remains did not survive deposition."<sup>64</sup> Another factor has to do with bone and tooth preservation. It has been stated that the bones [and teeth] that survived to become [part of] the archaeological record are only a tiny proportion of the original sample.<sup>65</sup> One of the goals of the archaeologist is in trying to obtain accurate dates for the artifacts or fossils uncovered. One of the most precise methods of obtaining dates for the past 70,000 or so years is by Carbon-14 dating. However, many if not most of the bones and teeth tested lack sufficient collagen (an animal protein useful in C-14 dating) for this. So it is indeed fortunate when a date for a given sample yields usable results.

The Book of Mormon includes animals that became extinct in North America. Those specifically named include the elephant (mammoth), horse and ass. While the horse and ass belong to the same biologic genus, *Equus*, they are separate species. Both are known to be native to North America during the Pleistocene Epoch and earlier. It is likely that the curelom and cumom represent extinct species as well, as mentioned above. Have these animals been found based on their remains in ancient deposits? Probably they have, but under different names; ones known to scientists. There are records of extinct animals in North America being associated with man.<sup>66</sup> However, the dates of these associations either predate Book of Mormon peoples, or else they are not known. So, why are there no dates that do correspond to the time Jaredites and Nephites inhabited North America? As discussed above it was shown that species on their way to extinction would continue to live on, but in greatly reduced numbers, beyond their last *recorded* date of existence. The problem is finding specimens immediately prior to their extinction. It is a serious problem, as with fewer and fewer animals finding their remains is ever more difficult. Concomitantly, the area(s) where they still survive would almost always be more restricted. And if these areas are in highlands the problem is exacerbated. Highland areas are ones undergoing erosion with a lesser chance of preserving animals living in them. It should be kept in mind that Mesoamerica consists of many highland (mountainous) areas. Additionally, this area is mostly humid, especially in its southern extent with sub-tropical to

even tropical conditions. In areas such as this animal and plant remains quickly decompose and are destroyed without leaving a trace. Even if an organism is buried before it decomposes, the commonly acidic soils continue the process. With the generally abundant vegetation in a region, there would be very limited areas of exposed ground where bones or teeth might be observed. This combination of factors shows that a significant record of past life in Mesoamerica would be very difficult to uncover. As archaeologists as well as paleontologists have discovered, most animal remains are not preserved and are lost for all time.<sup>67</sup> In large part this is due to the conditions listed above. The best opportunity appears to be finds in caves. Some caves in the Yucatan have yielded human artifacts associated with an extinct horse.<sup>68</sup> Verification of more associations of Book of Mormon peoples and animals listed in this Book can be expected at some future date.

Barley is a grain mentioned in the Book of Mormon (e.g., Mosiah 9:9). It's an Old World grain that Book of Mormon critics claimed did not exist in America before the time of Columbus. Despite numerous archaeological digs by thousands of archaeologists for more than 100 years, it still wasn't identified on the North American continent. Then, beginning in the 1980's, discoveries of pre-Columbian barley started to be made, substantiating the Book of Mormon claim.<sup>69</sup> Wheat has also been used by critics to discount this Book. It, like barley, was said to be absent in America before 1492. In addressing this criticism Ball and Hess said, "The cultivated species of wheat and barley the Lehighites would have had available to them were already highly domesticated by the seventh century B.C. Domesticated plants generally cannot survive without human intervention."<sup>70</sup> Therefore, these plants could easily have gone undetected as once present in America. In an article entitled, "Pre-Columbian Discovery of America" given in the Catholic Encyclopedia, it is stated that wheat was present in America when the Vikings arrived in the year 1000 A.D.<sup>71</sup> Different types of plants, like some animals, existed in a region and seemingly left no evidence of their former presence. Yet with sufficient searching it later became known that they in fact did live there. Also, while the Book of Mormon makes reference to wheat (e.g., Mosiah 9:9), it might have been another grain translated as "wheat."

## **INDIRECT MENTION OF ANIMALS IN THE BOOK OF MORMON**

Animals are mentioned in the Book of Mormon in different contexts. On the one hand they have been directly cited as animals with which there was an interaction with Jaredites, Nephites or Lamanites, or else it was implied. On the other hand indirect references to given animals were also made. Examples of this include Mosiah 12:5, "... they shall be driven before like a dumb ass." Alma 5:59, "For what shepherd is there among you having many sheep doth not watch over them, that the wolves enter not and devour his flock?" Helaman 7:19, "... behold he shall scatter you forth that ye shall become meat for dogs and wild beasts." Reference is also made to lions. In Mosiah 20:10 it's stated "...for they fought like lions." And in Alma 14:29 it is recorded that "...they were struck with great fear, and fled from the presence of Alma and Amulek even as a goat fleeth with her young from two lions." These statements indicate that the people of the times represented were aware of at least lion-like animals. The mountain lion is and would have been common in Mesoamerica, as well as most all North and South America. The jaguar, relatively abundant in Mesoamerica, could be interpreted as a lion. Other examples might also be given. The point to be made is that the animals mentioned in this manner must have been familiar to those who were hearing the preaching. In other words these were animals which most likely lived in the area and with which the peoples had an interaction. This same inference can be made with animals given by name in the Bible.

## DIRECT MENTION OF ANIMALS IN THE BOOK OF MORMON

We again emphasize that the Book of Mormon is primarily meant to provide another testament of Christ and to proclaim His doctrines. Additionally, though, there is a significant amount of information provided about what the peoples in this Book did and the environment in which they lived. This includes some of the animals with which they interacted, giving us a deeper look into their lives. Many readers are interested in these “side” topics as they help in better relating with the people in the Book of Mormon. When properly understood, knowing the animals useful in their cultures provides valuable evidences for the veracity of the Book of Mormon. B.H. Roberts stated, “Secondary evidences in support of truth, like secondary causes in natural phenomena [science], may be of first rate importance and mighty factors in the achievement of God’s purposes.”<sup>72</sup> This is true in that science when properly understood can help to substantiate information given in the Book of Mormon.

Regardless of the location of Book of Mormon lands, there had to be far more kinds of animals there than those listed. It seems that the record keepers, especially Moroni, chose to provide only the names of animals that they thought important or useful. In several verses where “beasts” are mentioned, it’s apparent that different types of animals are meant. In Ether 10:26 a statement is made that the Jaredites, “... did make all manner of tools with which they did work their beasts.” Here the indication is that some animals were worked with plows or other such contrivances in the growing of crops. In verse 25 of the same chapter it states, “And they did make all manner of tools to till the earth, both to plow and to sow, to reap and to hoe, and also to thrash.” What animals did the term “beasts” have reference to in verse 26? Based on those listed in Ether 9:18-19, they could best include oxen (cattle and/or cows), the horse and ass, the elephant, and probably the curelom and cumom. These latter two animals along with the elephant were deemed especially useful. The elephant is currently used in Southeast Asia for logging and as a beast of burden. In Thailand the elephant has been used since ancient times to plow paddy fields. “Beast” as used in the Book of Mormon could also mean a different type of animal entirely. For example in Mosiah 8:21 it is said, “... and [wild sheep] are devoured by the beasts of the forest.” In this instance “beasts” has reference to one or more types of carnivore (In the modern sense a “beast” is commonly used to denote any kind of mammal). Carnivorous mammals are also implied for the term “beast” in 2 Nephi 5:24. It’s stated in this verse that the Lamanites, (... did seek in the wilderness for beasts of prey.” The beasts here could well have had reference to the jaguar and/or cougar, or possibly the bear.

## DISCUSSION OF SPECIFIC ANIMALS IN THE BOOK OF MORMON

Since the Book of Mormon was first published in 1830, to the present day, many critics have claimed it to be untrue based on some of the animals listed therein. Most specifically references were (and are) made regarding the horse, ass and elephant. And even if the elephant mentioned is regarded as a mammoth, they say that that animal along with the horse and ass became extinct in America 10,000 years ago. Critics have further stated that it was only since Columbus’ time that the horse, ass and cattle were brought to the Americas. These animals along with others were said to have first come over from Europe on the second voyage of Columbus in 1493.<sup>73</sup> Continuing research in the fields of paleontology and archaeology has shown that the above-mentioned animals lived on longer in America than was once thought. Some dates given below show that the chronologic ranges of some extinct animals lived into Book of Mormon time.

The mammals spoken of in the Book of Ether are: Cattle, oxen, cows, sheep, swine, goats, horses,

asses, elephants, cureloms and cumoms (9:18-19). Those listed in 1 Nephi, which were already present in the Promised Land when the Lehites first arrived, are: Cow, ox, ass, horse, goat and wild goat. Both lists of animals are obviously incomplete. Even in the above two records it's given that there were other animals of use to man. In Ether (9:18) the comment is made, "... and also many other kinds of animals which were useful for the food of man." 1 Nephi 18:25 informs us, "... and all manner of wild animals, which were for the use of men." In each record we see that there were many unnamed animals useful for man. No mention is made of the untold kinds of animals that were not useful.

Certainly problems exist in correctly identifying the animals listed in both the Jaredite and Nephite records. As discussed above, we can't be positive that some of the animals stated equate with our present-day understanding of that animal. This relates to translated names. In our opinion, though, the animals in both records are at least close approximations. Sorenson (1985) felt that some of the animals given in the Book of Mormon might not be what we think. But he did say, "Present knowledge of the species in Mesoamerica indicates there were enough of the right sorts of animals in that setting that all twelve of the Book of Mormon beasts can be plausibly accounted for."<sup>74</sup>

Some of the items that will be addressed in this article are: Which native American animals have historically been considered extinct before reintroduction by the Spaniards (beginning in 1493), and those thought not to have been present in the New World before man brought them in from the Old World. It is unfortunate that the record of Ether does not give us more information on specific kinds of animals that they brought over on the barges with them. We only learn of some types of animals after the Jaredites had lived in America for a long period of time. And some of these might well be animals that were native to their Promised Land. All we know for certain about transported types is, "... and also [took] food for their flocks and herds, and whatsoever beast or animal or fowl that they should carry with them (Ether 6:4). We do know that the number of the vessels used to transport the people along with their belongings, food and animals was eight (Ether 3:1). Their size is unknown other than they were said to be the length of a tree (Ether 2:17). Of necessity the trees selected for their sea-going vessels (or barges) had to be reasonably large. In checking on types of trees that probably would have been available to them, some could have been at least 100 feet in length and of six feet or more in diameter. These trees most likely would have been cut into planks or sections to be constructed as barges. A possibility does exist, though, that large trees could have been hollowed out to form the barges. But they would have had to be of sufficient diameter for the people to stand inside them. It's difficult to imagine the people in the barges not being able to do so for the journey of 344 days. (Ether 6:11) It's likely, too, that the people made landfall at some points along their voyage to replenish food and water.

Contemplating which animals the Jaredites brought with them from the Old World, and which ones they found living in America, presents some complex problems. Sheep, goats, swine, and even cattle, horses and asses could all have conceivably been brought with them in the barges. Conversely, all these types of animals could have been found by the Jaredites upon their arrival in America. The term "flocks" used in Ether (6:4) probably referred to sheep and/or goats. Flocks could also refer to types of birds like geese. However, the latter seems less likely. "Flocks" as used in the Old Testament does not include birds as it does now. The term "herds" probably included just cattle. While this term could mean horses and asses, it doesn't seem to fit with Old Testament usage. In addition to "flocks" and "herds," the statement is made, "... and whatsoever beast or animal or fowl that they should carry with them-." Again, it's not known specifically what these animals were. Swine was probably one of these animals as they are named (Ether, 9:18) and could have been brought over with them. Although we don't know what the ranges of sizes and numbers were for the animals involved, the mention of "herds" connotes something about this. If cattle, horses and asses are included in the term, what numbers could be carried? There would have had to be enough to

insure that breeding populations could be established and maintained once in the Promised Land. This certainly would mean more than one male and female of each species. A few of each sex would have been wise. Concerning the larger animal species, probably younger individuals were chosen in order to conserve limited space. In having younger individuals, it would require less food for them. With the above factors in mind, cattle, sheep, goats, swine, asses and horses could all have conceivably been brought over on the barges. While very unlikely, it might have been possible to even bring over very young elephants. Their size and food requirements are what make this so unlikely. The cow, ox, ass, horse, goat and wild goat were all animals that the Lehighites found in America when they arrived (1 Nephi 18:25). Whether any of these animals were descendants of those known to the Jaredites is unknown.

Both paleontologists and archaeologists have, and are, finding more associations of animals in early human cultures. Mostly these are extant animal species. However, there are instances of extinct animals being associated with pre-Columbian man in America. These finds are increasing as more field studies take place.<sup>75</sup>

## CATTLE, OXEN AND COWS

Cattle, oxen and cows are some of the animals listed in the Book of Mormon. They could be ones we envision with these names today. However, these names could possibly apply to other closely related forms. As Sorenson noted, some early Spanish explorers in America, called the bison or American buffalo “vaca,” which means cow in Spanish.<sup>76</sup> Hernando De Soto, Francisco Coronado and their contemporary Spanish explorers related the American Bison as “cattle” “cows” and “bulls.”<sup>77</sup> In Finland and Sweden even reindeer have been called “cow” and “ox” in the past. The word translated as “wild ox” in Deuteronomy 14:5 can also be applied to the gazelle, antelope, or some other species of deer.<sup>78</sup> It is unclear in Book of Mormon scriptures whether more than one species is being referred to by “cattle,” “oxen” and “cow,” or just one. It seems likely, though, that there is more than one kind of animal indicated. Why list three separate names for just one kind of animal? In any event good explanations exist for separate types of bovids being present. Different kinds of these animals could have been brought over by the Jaredites. However, in the Book of Ether (9:18) it’s simply stated long after they were in the New World that they had ...“all manner of cattle, of oxen, and cows...” The text does not say if these were introduced by the Jaredites or if these were native to the Land of Promise. Much later, in the land southward as they journeyed in the wilderness, Lehi and his group encountered, “... both the cow and the ox...” among the beasts of the forests (1 Nephi 18:25). The American Bison apparently survived throughout various regions of Mexico and as far south as Nicaragua until fairly recent times.<sup>79</sup>



Figure 1. Wild cattle include living and extinct species of bison as well as other

extinct closely related types. Shown here are two extinct species, *Bison latifrons* (left) and *Bison antiquus* (right). Illustration courtesy of the George C. Page Museum in Los Angeles, California.

Different species of bovids are and have been native to the New World. The bison (misnamed, buffalo) is one, for which there are different species (see Figure 1). Although now extinct, the shrub-ox and southern woodland muskox could have survived well past the end of the Pleistocene. When first described by paleontologists, these animals were placed in the same genus as modern cattle (*Bos*). This is similar to the mammoth (*Mammuthus*) being placed in the same genus as the elephant (*Elephas*) by early paleontologists. Current practices show that the American bison can be semi-domesticated. Certainly it is conceivable that both the woodland muskox and shrub-ox were capable of this as well. This is substantiated by some living northern muskoxen being semi-domesticated.

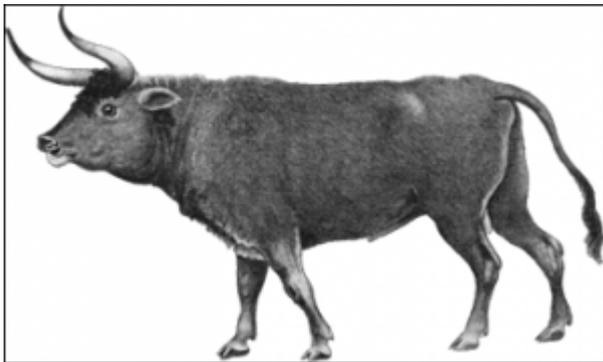


Figure 2. *Bos taurus* is a basic type which represents cattle in general, and apparently the species from which most of our modern cattle descended. Its remains have been identified from a number of archaeological sites including some from the Yucatan Peninsula. This figure comes from Amazonwiki.

Bones of domesticated cattle (*Bos taurus* - see Figure 2) have been reported from different caves in the Yucatan Peninsula of Mexico.<sup>80</sup> In one instance these bones were found with those of an extinct horse, *Equus conversidens*. It is especially interesting that along with these cow and horse remains, human artifacts were found in association with them! The indication is that domesticated cattle and the horse coexisted with humans in pre-Columbian time.<sup>81</sup>

## SWINE

Swine are mentioned as being among those animals known to the Jaredites which these non-Israelites found “useful for the food of man” (Ether 9:18). The only references to swine in connection with the Nephites are negative and proverbial which indicates that they were known to them, but were considered unclean or unfit for eating, at least in times of righteousness when the Nephites were keeping the law of Moses (3 Nephi 7:8; 13:6). They may also have been familiar to them through their contacts with the Lamanites and other indigenous peoples who raised and kept them.

No evidence for Old World pigs (true swine) has been found showing that they were present in the Americas before the time of Columbus. If we assume swine were brought over by the Jaredites, we still do not know how long they might have survived before becoming extirpated. Being in limited numbers in a restricted region, any evidence of their former existence might not have been detected to date. The widespread and intensive battles between different Jaredite factions could have been instrumental in their demise in Mesoamerica.

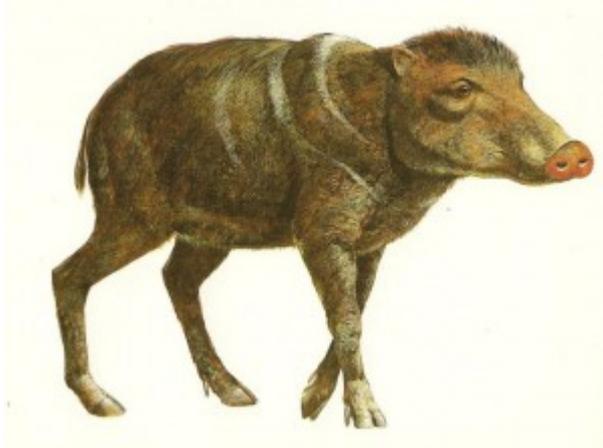


Figure 3. *Platygonus* shown here is an example of an extinct peccary that might have been present when man was in Mesoamerica. It was somewhat larger than the peccaries that live in the region today. It can be seen that both types are very pig-like and they both could easily be called a pig. Illustration courtesy of the George C. Page Museum in Los Angeles, California.

Another reasonable possibility is that references to “swine” do not refer to the Old World species at all, but to American peccaries. While not a true pig, the peccary, known throughout much of Mesoamerica and South America, is most definitely a pig-like beast and is closely related to it. The early Spanish who encountered them called them “pigs.” In regions of Mesoamerica where peccaries are found today, they are almost always called “wild pigs” “wild hogs” or their equivalents in Spanish.<sup>82</sup> “The peccary,” argues Lyle Sowls, “if properly treated, could perhaps become a domesticated animal.”<sup>83</sup> Brian Dillon has recently summarized evidence that the Maya may have captured and tamed peccary and concludes that it is “probable” that “the modern Maya pattern of peccary taming owes much to Precolumbian tradition.”<sup>84</sup>

Presently two distinct species of peccary live in Mesoamerica. These include the Collared Peccary (*Pecari tajacu*) and the White-lipped Peccary (*Tayassu pecari*), both of which can be found in the tropical regions near the Tuxtla Mountains of the Yucatan.<sup>85</sup> The Jaredites as they presumably established settlements in Mesoamerica no doubt would have encountered them. They were hunted and eaten as early as Olmec times. Remains of these animals have been found associated with man for several thousands of years. There is a paleo-Indian carving of an extinct camel sacrum in the shape of a peccary. A Picture of this bone is shown by Evans.<sup>86</sup> The bone of this extinct camel came from deposits in central Mexico, and shows ancient interaction between this extinct animal and Pre-columbian natives. Remains of Pre-Columbian peccary have been found finds in Loltún Cave in the Yucatan<sup>87</sup> and in several other caves in the region associated with human artifacts.<sup>88</sup> There is no question that peccaries (“wild pigs”) and man shared this area since prehistoric times.

## SHEEP AND GOATS

Sheep and goats are very closely related animals, and can be confused with each other.<sup>89</sup> As we have discussed, problems *sometimes* arise in understanding exactly how we should interpret Book of Mormon animals. It might not be wise to take all those named at face value. Yet, most could well be the animals we think they are. Sheep mentioned in the Bible were probably like sheep in the Book of Mormon. Of course it needs to be kept in mind that world-wide many different species exist. The Jaredite record (Ether 9:18) lists “sheep” by name. The Nephite record does not. However, it seems most likely that they raised these animals. Whenever “flocks” are mentioned (e.g., Enos 1:21; Alma 17:27) it’s generally understood that these are of sheep. References to “sheep” among the people of Lehi appear in a metaphorical context too (e.g., Alma 5:38; Helaman 15:13; 3 Nephi 15:17).

Sheep were probably among the animals brought to America by the Jaredites, although they were not stated explicitly by name (Ether 6:4). They most likely are to be included in the term “flocks,” and are mentioned by name in Ether ( 9:18) several generations later. Sheep have been useful to man for many centuries and were probably man’s first domesticated animal<sup>90</sup> (along with the dog). They are useful for both food and clothing. In addition to Old World sheep, apparently brought to the New World by the Jaredites, there are sheep native to America. The most common type is the Mountain Sheep, *Ovis canadensis*. Their current geographic range extends south only to northern Mexico. However, their past range was more extensive, as was their habitat before human settlements expanded.<sup>91</sup> They are an animal that can be tamed or at least semi-domesticated. According to Geist , “It is hard to imagine a wild animal more readily tamed than mountain sheep.”<sup>92</sup> Sorenson noted the apparent recovery of sheep wool from a pre-Columbian burial site near Puebla (southeast of Mexico City).<sup>93</sup> Petroglyphs from Mexico and the southwestern United States show many prehistoric depictions of sheep. It appears certain that the association of sheep and man occurred in America before this animal was brought over beginning in 1493 with Columbus’ second voyage.

Goats are mentioned among the animals once had by the Jaredites (Ether 9:18). Later, after their arrival in the land of promise Lehi’s family encountered “the goat and the wild goat” as they traveled in the wilderness in the land southward (1 Nephi 18:25). Sometime after the death of his father Jacob, Enos wrote that the Nephites raised “flocks of herds, and flocks of all manner of cattle of every kind, and goats, and wild goats” (Enos 1:21). During Alma and Amulek’s miraculous escape from the prison in Ammonihah, their terrified persecutors are said to have fled “even as a goat fleeth with her young from two lions” (Alma 14:29). There is no indication in the text that the Lehites brought goats with them to the land of promise; however, it is possible that they may have been included among those flocks and herds brought by the Jaredites in their journey over the sea (Ether 6:4). If so, it is possible that some of those encountered later by Lehi’s people were descendants of those had by the Jaredites. They would have been a useful animal to both the Jaredites and Nephites, just as they have been for man through the ages in the Old World. Evidence of goats associated with pre-Columbian man also comes from caves in Yucatan.<sup>94</sup> It was not made clear whether this was a wild or a domesticated type of goat.

Mention of the “wild goat” may at first seem peculiar. Biblical animals that could be eaten under the Law of Moses included the “goat” and the “wild goat” (Deuteronomy 14:4-5). In post-biblical Jewish literature some Jewish writers distinguished between wild and domestic cattle such as goats. Both were considered clean and could be eaten, but only the domestic variety was thought acceptable for sacrifice.<sup>95</sup> The variety that lived in the wild was hunted, while the tame animal was raised in flocks by the community. This literature, however, dates to centuries after the texts of the Hebrew Bible were first written and to a time after the destruction of the temple when the practice of animal sacrifice had been discontinued. We do not know if this later distinction was applied in earlier times.

Another possibility for the “wild goat” is that upon arriving in the land of promise two different animals were encountered, one perhaps with long horns and one with shorter ones. Both of them were probably of comparable size to Old World goats. These might have been identified as “wild goats” and “goats” respectively, simply because the terms fit the vocabulary of migrating Book of Mormon peoples. A third option is that the terminology of “goat” and “wild goat” referred to a domesticated and a wild variety of a single species (whether an actual goat or not). In this case, the Lehite’s encounter with the domesticated animal would imply that the land, at the time of their arrival, was already populated by other indigenous groups (including Jaredite survivors who had previously tamed, husbanded or domesticated the animal in question).

The only native wild goat in North America is the Mountain Goat, *Oreamnos americanus*. Its geographic range, though, currently only extends south from southwest Alaska down to the northwest United States. Even with a possible extended range for this animal during Book of Mormon time, it is extremely unlikely it got as far south as Mesoamerica. A closely related, but extinct, species is *Oreamnos harringtoni*. This goat did have a much more southerly distribution, extending into Mexico. While this goat might have survived much past the terminal Pleistocene along with other animals, there is not sufficient evidence yet for this.

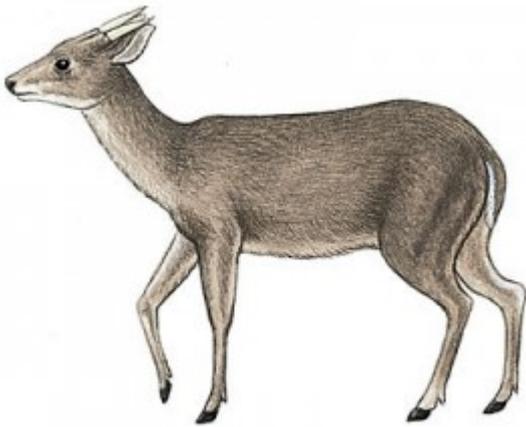


Figure 4. The animal shown here is *Mazama americana*, or the Red Brocket deer, that is a common mammal found in Mesoamerica. It can readily be seen how this animal could be confused with a goat. Its single “horn” on each side of the head is really an antler. Antlers are shed each year, while horns are not. This illustration is from Amazonwiki.

It has already been indicated that a referenced animal in the Book of Mormon could actually be something somewhat different, but had a similar appearance. There is an animal now living in Mesoamerica that fits this description, the Red Brocket deer, *Mazama americana*. Unlike other deer it has but a single goat-like horn - which is really an antler that is shed and regrown annually like other cervids. <sup>96</sup>

Although surprising to us today, evidence suggests that some species of Amerindian deer may have been raised and shepherded as “flocks” in pre-Columbian times. When the early Spanish explorers first visited what is now the southeastern United States, they encountered Native Americans who raised semi-domesticated deer. Men from De Soto’s expedition reported that in Ocale, an Indian town in northern Florida, “there is to be found . . . fowls, a multitude of turkeys, kept in pens, and

herds of tame deer that are tended.”<sup>97</sup> According to the 16th-century Spanish historian Gómara, in Apalachicola (that is now the state of Florida), “there are very many deer that they raise in the house and they go with shepherds into the pasture, and they return to the corral at night.”<sup>98</sup> Another early historian of Spain, Peter Martyr d’Anghiera, recorded:

In all these regions they visited, the Spaniards noticed herds of deer similar to our herds of cattle. These deer bring forth and nourish their young in the houses of the natives. During the daytime they wander freely through the woods in search of their food, and in the evening they come back to their little ones, who have been cared for, allowing themselves to be shut up in the courtyards and even to be milked, when they have suckled their fawns. The only milk the natives know is that of the does, from which they make cheese.<sup>99</sup>

Additional evidence suggests that deer may have been tamed or semi-domesticated in pre-Columbian Mesoamerica as well. According to Diego de Landa, Maya women “let the deer suck their breasts, by which means they raise them and make them so tame that they never will go into the woods, although they take them and carry them through the woods and raise them there.”<sup>100</sup> When the Spanish passed through the region of Guatemala and Honduras, they likewise encountered and easily killed fallow deer that were not afraid of them.<sup>101</sup> Their tameness seems to have been due to the Maya practice of taming or husbanding them. Some Mesoamerican scholars, “... are convinced that small herds of tamed or semi-domesticated deer ranged through Maya sites, with a result not dissimilar in some respects to the ‘deer parks’ of European royalty.”<sup>102</sup> When they entered the region of what is modern El Salvador, the Spaniards encountered a native people known as Mazahuas, who took their name from the practice of possessing and shepherding herds of “white deer,” which disappeared shortly after the Conquest.<sup>103</sup>

Ethnohistorical sources also mention the Mesoamerican custom of caring for deer. Anthropologist Mary Pohl notes that the term “ah” in the Motul dictionary refers to “venadillo pequeño criado en casa,” that is, “a little deer raised in a house.”<sup>104</sup> Also related is the Maya term Mazatenango (from Mazatl-tenen-co), which means “en la cerca o muralla del ciervo,” that is, “inside the fence or wall of the deer.” One researcher suggests, “Perhaps the name originated in the custom of fencing or corralling deer to care for them.”<sup>105</sup> Deer were an important animal in many pre-Columbian rituals and were often sacrificed.<sup>106</sup> In the Guatemala highlands today, some Indians believe that deer are intermediaries between men and the gods and that they speak with the gods in order to cleanse the sins of men.<sup>107</sup>

In light of the evidence for deer shepherding in pre-Columbian times, it is interesting that early Spanish colonists in Mesoamerica associated native Mesoamerican brocket deer with the goat. Friar Diego de Landa noted, “There are wild goats which the Indians call *yuc*. They have only two horns like goats and are not as large as deer.” He likewise described the small brocket deer as “a certain kind of little wild goats [sic], small and very active and of darkish color.”<sup>108</sup> In the late 16th century, another Spanish friar reported that in Yucatán “there are in that province . . . great numbers of deer, and small goats”—the latter again apparently referring to the red brocket deer native to southern Mesoamerica.<sup>109</sup>

In post-Columbian times the Maya, recognizing a similarity between the European goat and the New World brocket deer, gave the European animal the name *temazate* from the Nahuatl word for brocket deer (*tamazatl*). Since some Mesoamerican deer could fulfill many of the same purposes as goats, it is quite possible that Mesoamerican deer acquired a similar designation among peoples in the Book of Mormon.

Another possibility for the wild goat is the American Pronghorn, known exclusively from North

America. It has a single horn (single in females but bifurcated in males). Its scientific name, *Antilocapra*, means “antelope-goat.” This animal was, and is, abundant in much of western North America, with its present range extending into Mexico.<sup>110</sup> Historically, its range extended to just north of Mexico City.<sup>111</sup> A related genus, *Capromeryx*, had a geographic range further south well into central Mexico. While extinct, it is known from latest Pleistocene sediments and could certainly have co-existed with man. This antilocaprid is smaller than the extant form, but is more goat-like in appearance. If known to the Jaredites in the land northward, the pronghorn might well have been considered to be a goat. Since this animal was not known in the Old World, it is likely when encountered it would be called after a similar-looking Old World animal.

## ELEPHANTS



Figure 5. This figure of a late Pleistocene landscape in North America shows two Columbian mammoth on the right with extinct bison on the left in the background. Good evidence shows that these extinct forms were contemporaneous with man on this continent. Illustration from Karen Carr in *North American Pleistocene landscape*.

Only in the record of the Jaredites in the Book of Mormon is there a mention of elephants. As explained earlier, this undoubtedly referred to the mammoth which is a true elephant. Distant relatives, the mastodonts which represent other types of proboscideans, have lived in North America but were probably not the animal to which reference was being made. Joseph Smith most likely knew what an elephant was at the time he did the translating from the gold plates. However, not much was given about this animal in his translation of the Book of Ether. It was said to be an especially useful animal to man (Ether 9:19). Uses of the elephant for man have already been stated. Presumptively this elephant as previously stated was the Columbian Mammoth, *Mammuthus columbi*. This animal ranged over most of North America, including Mesoamerica. Its fossils are numerous throughout northern Mesoamerica.<sup>112</sup> Many people think of the Woolly Mammoth, *Mammuthus primigenius*, when they think of mammoths. But this species was limited to the northern areas of North America and Eurasia.

Evidence for the survival of the elephant can be found in Native American myths and traditions. Some of these traditions may be rooted in Native American discoveries of the bones of extinct fauna, while other myths could be founded on actual encounters with living species which had notable elephant-like characteristics. Indigenous people along the northern coast of the Gulf of Mexico have traditions of giant beasts with long noses that could trample people and uproot trees.<sup>113</sup> Abenaki tradition tells of a great "elk" that could easily walk through more than eight feet of snow, whose skin was said to be tough and had "a kind of arm which grows out of his shoulder, which he makes use of as we do ours." The Naskapi people tell of a large monster that once trampled them and left deep tracks in the snow had large ears and a long nose with which he hit people. The Penobscot culture hero Snow Owl is said to have gone on a long journey to a far valley in search of his missing wife. When he reached the valley he saw what appeared to be hills without vegetation moving slowly about. Upon closer inspection he found that these were the backs of huge animals with long teeth which drank water for half a day at a time and when they laid down could not get back up. Snow owl was able to trap the large beasts by making them fall on sharpened stakes where he then was able to shoot and kill them.<sup>114</sup> Similar traditions have been documented for Native American groups from Canada to the Gulf of Mexico persuading some scholars that they are based upon a core memory of actual historical encounters with elephant-like species who may have survived into the region as late as 3,000 years ago.<sup>115</sup>

Pre-Columbian traditions from Mexico tell of monstrous ogre-like giants who once inhabited the region and were subsequently killed following the arrival of Aztec ancestors. These tales attribute some human characteristics to these legendary giants, while other ones seem less so. The giants were said to have long tapering arms and could tear up trees as if they were lettuce.<sup>116</sup> These legends say, notes Adrienna Mayor, "... that the giants destroyed by the ancestors pulled down trees and ate grass, elephant-like behavior." and she suggests that these stories may reflect "a vague memory of prehensile trunks, something like the 'extra arm' of the Giant Elk in Abenaki and Iroquois myth." While this cannot be proven, she thinks it possible that "...localized mammoth species (and other large Pleistocene animals and birds) may have survived to later dates in the Valley of Mexico and the Southwestern United States." ... and also that "some aspects of the legendary giant-ogres may have originated in ancestral memories of Columbian mammoths and may have been later confirmed by discoveries of fossils."<sup>117</sup>

Along with a number of large mammals thought to have become extinct about 10,000 years ago, it's now known that the mammoth survived for a few thousand years longer. This was long enough to bring them to the time of the Jaredites. A date for a mammoth in northern North America was cited at 3,700 years before the present.<sup>118</sup> An Alaskan mammoth was dated at 5,720 years ago.<sup>119</sup> In the contiguous United States Mead and Meltzer provided an age of 4,885 years for a dated mammoth specimen.<sup>120</sup> As more mammoth (elephant) finds are made, even younger dates will no doubt arise. Generally, when animal species' populations decrease, they survive longer in southern refugia. Small populations could well have survived in Mesoamerica well past the close of the Pleistocene. The fact that known dates of mammoths in Mesoamerica are numerous up to the end of this epoch helps support this view. It should be pointed out that the mammoth never did range as far south as South America.

Man and mammoth have been found in association with each other at a number of Mesoamerican localities.<sup>121</sup> Johnson stated that, "There can no longer be any reasonable doubt that man and elephant coexisted in America."<sup>122</sup> Since this statement was made even more sites showing this coexistence have been discovered. Several petroglyphs dating to ancient times in Mesoamerica depict elephant-like animals. Martin reported that spear points have been associated with fossil mammoths at a number of sites, some still embedded in bones.<sup>123</sup> Mammoth kill sites are known from Mesoamerica.<sup>124</sup> Martin also reported a spear shaft straightener made from a mammoth bone. The

usefulness of the elephant has previously been given.

## CURELOMS AND CUMOMS

Of all the animals named in the Book of Mormon, cureloms and cumoms have to be the most peculiar – and mysterious. While all the other animals seem familiar to us, these two definitely are not. Apparently cureloms and cumoms were not animals known to Joseph Smith as well. It seems that they were outside his realm of experience. Quite possibly these are extinct forms. Although we don't have all the details regarding his translating procedures, the prophet Joseph most likely transliterated certain words, those with which he was unfamiliar. This seemingly applied to "cureloms" and "cumoms." What could these two animals have been? Well, they had to have been animals that lived in Book of Mormon lands, ostensibly in Mesoamerica, and during the time that the Jaredites lived there. LDS archaeologist, John Sorenson was of the opinion (1992) that cureloms and cumoms were probably large animals. This seems reasonable as in Ether 9:18-19 they are grouped with the elephant, and designated as being especially useful. Among other things, they likely were beasts of burdens. Using limited criteria we will try to narrow the search for identifications to the most probable animals.

One relatively large animal currently living in Mesoamerica (and also now living in South America and Southeast Asia), but doubtfully known to Joseph Smith, is the tapir. In the past this animal had a much greater northward geographic range in North America. It lived all through Mexico and north well into the United States. At least one species of Pleistocene tapir somewhat exceeded the living form in size. A large extant individual can grow to 600 pounds or more, and reach a height of three and one-half feet. The problem with this animal qualifying as a curelom or cumom is its usefulness. They are not noted as an especially good food item and more importantly are not easily tamed for use.

Another animal to consider is the American Pronghorn (often mistakenly called an antelope). Its current geographic range is from Canada to central Mexico. They are occasionally tamed, and sometimes even semi-domesticated.<sup>125</sup> However, even if they were tamed, it is hard to imagine them being used for any serious type of work. There is apparently no record of this. These are only deer-sized animals, which includes extinct species. While known from northern Mexico, it appears that they did not inhabit Mesoamerica proper. They are a plains type of animal.

The edentates, or xenarthrans as they are known scientifically, are a relatively diverse group of New World mammals. With the exception of the armadillo which ranges into the southwestern United States, these animals presently live in Mesoamerica south to South America. Anteaters and tree sloths belong to this group. All these are animals with which Joseph Smith would probably have had no acquaintance. While living forms are all relatively small, many extinct species were large. The extinct ground sloths for example were very large, the largest being 18 feet in length and approaching the size of a small adult elephant. Some of these ground sloths lived in Mesoamerica to the end of the Pleistocene, and probably longer. There are several localities where ground sloth hair and dung are abundant in caves, some with associated human artifacts. Additionally, even skin and nail materials are known.<sup>126</sup> Even if these mammals had lived long enough to have been known by Jaredites, their role as a curelom or cumom is highly unlikely. Based on brain size (determined from endocranial dimensions of the skull), ground sloths would not likely have been sufficiently intelligent to train for work. Additionally, they walked on the back of their "hands" and feet based on their foot structure. The locomotion of these large beasts must have been very slow and awkward. With these factors in mind it's difficult to see how they could have been very useful animals to man.

So, what other Mesoamerican animals are left from which to choose for a curelom or cumom? One

good candidate in our opinion is a member of the camel family. The present New World members of this family are the llamas. It is extremely doubtful whether Joseph Smith would have known about these animals in the early 1800's. In fact the knowledge of them was not known to the general public in North America until the late 1800's. Now, would a llama, either an existing or recently extinct species, have been an "especially useful" animal to the Jaredites (Ether 9:19)? It seems quite likely that they would have been. Although llamas are no longer native to North America, extinct species were. And like other large mammals thought to be extinct by the close of the Pleistocene Epoch, some probably lived on much longer. To illustrate this, an undated skull of a llama from a lava tube (cave-like cavity) in Utah was recovered with dried muscle tissue intact and an oily residue in the bone.<sup>127</sup> This animal certainly must have survived the late Pleistocene extinction event. Several archaeological sites, including some in Mesoamerica, have yielded co-occurrences of llamas and man.<sup>128</sup> Dates recorded in North America showing late survival of extinct species include 3800 years ago,<sup>129</sup> 8240; 8527 and possibly 3000 years ago,<sup>130</sup> 7432 years ago,<sup>131</sup> and 7400 to 8200 years ago.<sup>132</sup> There are also petroglyphs in the American Southwest which show very llama-like animals. One of us (WEM) saw the figure of a llama carved in a stela from an archaeological site in central Mexico. Again it should be emphasized that the last recorded date for an extinct animal does not mean it vanished from earth at that time. Undoubtedly small populations survived for at least hundreds if not thousands of years later.

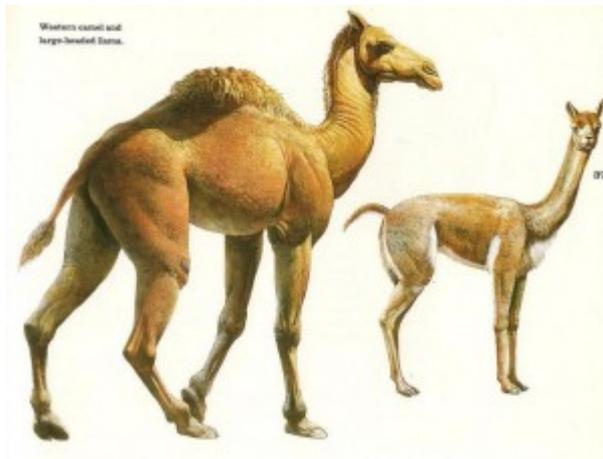


Figure 6. Two extinct species of llama (a type of camel) are shown here. Either could conceivably be a "Curelom" or "Cumom" as explained in the text. Both are known from Mesoamerica and probably existed when men came into this region. Illustration courtesy of the George C. Page Museum in Los Angeles, California.

Some of the extinct llamas were considerably larger than living forms. One type stood seven feet tall at the shoulder, and another species six feet. Not only is there good evidence for the co-existence of American llamas and man, but also that these animals could be domesticated. It was stated by anthropologist Ricardo Latham that New World camelids (the llamas) were domesticated in pre-Columbian times.<sup>133</sup> Archaeologist Jane Wheeler claimed that the domestication of the llama goes back several thousand years.<sup>134</sup> This would take in the time of the Jaredites in America. As far as being an especially useful animal, consider the uses for which the llama has been put by man. As stated by Walker et al., "It is easy to realize the importance of the llama to the Indian, as he utilizes it almost 100%, from its smallest hairs to its most insignificant droppings. Jerked llama meat nourishes the Indian; its woven fleece keeps him warm; its hide is made into the crude sandals with

which he is shod; its tallow is used in making candles; braided, the long hairs serve him as rope; and the excrement, dried, constitutes a fuel..."<sup>135</sup> Additionally the llama makes a very good beast of burden, and its pelt is used for blankets and outerwear. It has also been shown that they are good at guarding flocks. All these items make the llama an extremely useful animal for man. With the larger size of the extinct llamas this would have been especially so. Their fossils are known from Mesoamerica. It seems to us that this animal could well be either the curelom or cumom mentioned in the Book of Ether.



Figure 7. The American Mastodon (*Mammot americanum*) is the elephant-like animal shown here. It is only a distant “cousin” as both these proboscideans have long separate histories. With its clear association with man in Mesoamerica, it is a candidate for either a “Curelom” or “Cumom.” This illustration is by Charles R. Knight, a famous illustrator of past life. Courtesy of Wikipedia Commons.

If the llama in fact represents a curelom or cumom, what could the other one be? Again, it has to be one which lived in the right place at the right time; that is, when and where the Jaredites were living. And it also must be an animal especially useful to man. Although now extinct, two viable candidates are ones related to the elephant. They belong to the same group (Order Proboscidea). The two species involved superficially look quite similar, but have long separate histories. One is a gomphothere with the genus name of *Cuvieronius*, and the other a mastodon named *Mammot*. The latter is the American Mastodon. Like the elephant, both *Cuvieronius* and *Mammot* are very large animals having tusks and a proboscis, or trunk. Both of these were intelligent animals based on the size and configuration of their braincases as determined from fossils. Consequently, it can be seen that they were capable of being tamed and trained, but probably not domesticated. One, or both, of these could qualify as a curelom or cumom. This is a distinct possibility. But if the llama is one of these animals, then a pick needs to be made between the gomphothere and the mastodon as a curelom or cumom. This pick is not an easy one to make. However, there is a possibility that with such similarity in appearance, that these animals might have been called by the same name (curelom or cumom). In the case of the living proboscideans, both the Asian and African forms go by the same general name, “elephant” despite belonging to two separate genera.



Figure 8. *Cuvieronius* shown here is also a good candidate for a “Curelom” or a “Cumom.” It, too, has been shown to be associated with man in Mesoamerica. This figure is by courtesy of Wikipedia Commons

*Cuvieronius* and *Mammut* coexisted into the late Pleistocene in Mesoamerica, with the former being more common in the southern part of this land and the latter in the more northern part. In fact *Cuvieronius* is fairly well known in South America where there is no record of *Mammut*. According to Scott Drennan (personal communication) there are several associations of *Cuvieronius* and man in that continent. Not as much detail is known about the detailed age and distribution of *Cuvieronius* in North America, however.<sup>136</sup> The American Mastodon has several dates placing its terminal existence well past the close of the Pleistocene.<sup>137</sup> There is also evidence of some associations with it and man.

As far as usefulness of either the American Mastodon or *Cuvieronius*, both would have made a good beast of burden and one that could move large objects. They could probably rival the elephant (mammoth) in this. While the mastodon was shorter, it was also stockier. Other potential uses for either proboscidean would be similar to the elephant as well: meat for food, leather for footwear or outerwear, tallow from fat for candles, droppings for fuel, ivory for tools and objects of art, along with other possible utilizations. That the elephant and mastodon were used for food has been shown by various prehistoric kill sites. One such site demonstrated a projectile point embedded in a mastodon rib.<sup>138</sup>

While it may never be known which animals are the ones designated as “cureloms” and “cumoms” by the Jaredites, we have listed some very likely candidates. That man in pre-Columbian time was associated with extinct llamas, elephants, mastodons and gomphotheres is a matter of record. That the non-elephants in this group could represent a “curelom” or “cumom” is a distinct possibility.

## HORSES AND ASSES

The horse and ass, like sheep and goats, are very closely related mammals. This can be seen in the biological classification of the former two, both belonging to the genus, *Equus*. Equid fossils are one of the most common and diverse of large vertebrates throughout the Pleistocene of North America, including Mesoamerica. Many species have been named. Horses first came into being in North America (one of the earliest records coming from Baja, California), and from there spread to the rest of the world through natural dispersals. The fossil history of the horse (including the ass) shows that this animal was most numerous and varied in North America. It has not been satisfactorily explained why after so much success here, they became extinct. After being re-introduced they have done well in a feral state. Although it is commonly held that both the horse and ass became extinct in the Americas at the close of the Pleistocene (c.10,000 years ago), a growing body of evidence indicates that at least some survived on this continent much longer.

Some researchers in the past have suggested that references to horses in the Book of Mormon could refer to other animals in the land of promise which had characteristics which in certain ways resembled those of the horse or the ass.<sup>139</sup> While this is possible, we believe that it is most likely that the horse mentioned was the horse as we know it. However, this does not mean that they survived everywhere in the Americas or that they were numerous. Growing evidence, though, supports a post-Pleistocene survival of very small populations. Therefore, references to horses in the Book of Mormon text seem very plausible. We feel that there is a strong case for the survival of the horse well past the close of the Pleistocene Epoch into the limited regions occupied by Book of Mormon peoples in the Formative Mayan Period. Horses are not mentioned in the Book of Mormon after the time of Christ (3 Nephi 6:1). It is possible that the subsequent disasters associated with the death of Christ (3 Nephi 8-10) or the wars and famines of later years (Alma 45:11; Mormon 2:8) may have led to their final extinction. It's possible, too, that horses just were not mentioned in the limited commentary of 3 Nephi. If there were limited numbers of horses and asses in Nephite or Lamanite cultures, it would not be surprising that evidence for them could be very difficult to find.

The horse and the ass along with other animals dispersed more than once between Asia and North America via Beringia (This was a very large late Pleistocene land bridge that existed between Asia and Alaska). The Beringia land bridge formed and reformed throughout much of the Pleistocene Epoch. This produced common species between the two continents. As many began adapting to new environments, new species came into being. The horse was one of these animals so affected. Similarity has and still does cause confusion as to which species are valid.<sup>140</sup> Therefore, ones reintroduced by the Spaniards would be difficult if not impossible to distinguish from native forms based on their bones and teeth. If the Jaredites did bring horses to America from Asia, it would be very unlikely if they could be told apart from those that came through by natural dispersals. According to Azzaroli, a noted expert on Pleistocene horses, *Equus ferus* (a modern caballine horse) was widespread in the Pleistocene of Eurasia and well represented in North America during the latest Pleistocene.<sup>141</sup>



Figure 9. Horses were extremely abundant in all North America prior to the close of the Pleistocene, about 10,000 years ago. However, evidence clearly shows that horses lived on well past this time. Some datings on horses indicate they were around in Mesoamerica about 2,000 years ago. Of course their numbers were vastly diminished by then. The illustration here is by courtesy of Wikipedia Commons.

It seems reasonable to assume that the Jaredites had domesticated horses. Certainly they were

present among the Nephites and Lamanites (Enos 1:21; Alma 18:9). Their domestication by these peoples should not be surprising. The horse has been domesticated by various peoples for millennia. Evidences for this keep pushing the date back. Outram and others placed this date to about 3500 B.C. This is based on discoveries in Eastern Europe and central Asia.<sup>142</sup> The 3500 B.C. date well predates the Jaredite record. An even earlier date was suggested by Achilli et al. based on DNA.<sup>143</sup> If, as Nibley argued, the Jaredites journeyed through central Asia, this could be relevant.<sup>144</sup> They surely would have seen the value of horses as they must have come across some of the peoples of that land using them. Whether they obtained horses along the way and brought these with them is not that important. As noted above, there were horses native to America which were most likely in existence then.

It cannot be overstated that extinctions take time. Too often the impression left when extinctions are discussed is that they were all very sudden. Almost always with groups of organisms the extinctions took place over thousands to many thousands of years. And as already noted, some plants and animals thought to be extinct turned out to still be living even millions of years later. Until the past few decades almost all researchers on the subject thought that the majority of North America's large mammals became extinct at the end of the Pleistocene. This of course excludes modern species of the bison, elk, moose and bears. The proboscideans and horses, thought to have become extinct at that time, have now been shown to have lived on much past the 10,000 year limit that was placed on them. In the past few decades an ever increasing body of evidence shows that some of these taxa survived much longer. It should be kept in mind, though, that these animals were being restricted to various refugia. In time the refugia would disappear and the animal would finally become extinct. As an example the Woolly Mammoth thought to be extinct by the close of the Pleistocene, survived much past this event on Wrangle Island northwest of Alaska. Radiocarbon dates demonstrate that this animal was still living until approximately 2000 B.C.<sup>145</sup> Proboscideans and horses also survived past the terminal Pleistocene (c. 10,000 years ago) much further south in North America, extending into Mesoamerica. Of course their populations were ever dwindling.

A reason more is not known about the horse and other extinct animals in Mesoamerica is that their remains are much less likely to be preserved and also less likely to be found when they are. In general organisms do not preserve well after death in subtropical and tropical environments. This is because of a high rate of decay in them. Even bone decomposes very quickly. Therefore all evidence of previous life is soon destroyed. Another problem is that in these environments vegetation usually thickly covers sediments that might contain fossils. This makes them very difficult to find when they do exist. One exception is caves. Here organisms stand a much better chance of preservation in humid regions. This is true in Mesoamerica. The caves found in the Yucatan Peninsula have produced some rare and important finds. Both extinct and extant faunas have been discovered with human artifacts.<sup>146</sup>

There are a few post-Pleistocene, pre-Columbian dates for horses that have come to light in the past several years. A recent discovery in southern California serves as an example. Philip Ireland reported, "Archaeologists working against the clock in Carlsbad have unearthed another nearly intact skeleton of a horse that may have lived and died 50 years before the Spanish began their conquest of California." In this article it was said remains of another horse and a burro (ass) were buried at the same level.<sup>147</sup> Archaeologist John Sorenson relayed two radiocarbon dates for horses from Beringia of 2600 and 200 B.C.<sup>148</sup> In an unpublished article three other pre-Columbian dates were given for horses. One was from a cave near El Paso, Texas. The date here was determined to be between 6020 and 5890 B.C. Another radiocarbon date was from a cave in Colorado, providing an age of 1260 to 1400 A.D. A third date on horse bone from a cave in the Yucatan has been dated between 1230 and 1300 A.D.<sup>149</sup> If these last ages, and the one from Carlsbad, California prove valid, it presents evidence that some horses still survived in western North America even at the time

Spaniards first reintroduced them in 1493! Horse teeth from another cave in the Yucatan which remain undated were said to be pre-Columbian in age.<sup>150</sup> These teeth were reported to be part of a large collection made near Mayan ruins at Mayapan. Here the extinct horse identified as *Equus conversidens* was found associated with pot shards and other artifacts of man. According to Velázquez-Valadez, "... a good number of bone instruments was found directly associated with remains of Pleistocene megafauna, principally the horse (*Equus conversidens*) and animals now extinct." An age of 1805 B.C. ( $\pm 150$  years) was given in this article.<sup>151</sup> Some of the radiocarbon ages given above demonstrate that the horse existed in North America during the time of both the Jaredites and the Nephites.

Positive post-Pleistocene to pre-Columbian ages for horses in America are admittedly few. Nevertheless, more continue to be added to them. How many it will take to convince the major body of scientists, especially paleontologists and archaeologists, to accept this new paradigm is unknown. However, there are more horse specimens from Mesoamerica that are presently being run by the current authors for additional radiocarbon ages.

## CONCLUSIONS

As the Book of Mormon boldly proclaims, it is another "Testament of Jesus Christ." This is the foremost purpose of the book. It teaches His doctrines and shows Him to be our Savior. In addition to this, the Book of Mormon contains many interesting facts concerning the lives of its peoples. With sufficient study much information is provided to tell us where and how they lived. While it has not been revealed just where these peoples lived, a majority of LDS scholars believe this was in Mesoamerica. Certainly there is much supportive evidence for this view as reviewed in this article.

As in all cultures throughout history, animals are intricately associated with man. In the Book of Mormon relatively few are mentioned. However, these are ones which the Jaredites, Nephites and Lamanites found useful to them, and were an integral part of their lives. Some of these animals, such as cattle, elephants, horses and asses, have been claimed by critics not to have existed in America prior to the coming of Columbus and later explorers. It is a major purpose of this article to show that these animals were indeed present during the time that Book of Mormon peoples lived on this land as the Book states. As a matter of interest it also provides possible identifications for those mysterious animals, "cureloms" and "cumoms." It is our hope that future researchers will continue to study the issue of animals in the Book of Mormon and that future discoveries will increase our understanding of the areas in which they lived as well as the Book of Mormon itself.

### Notes

<sup>1</sup> Karen Lynn Davidson, David J Whittaker, Mark Ashurst McGee, Richard L. Jensen, eds., *The Joseph Smith Papers: Histories Volume 1: Joseph Smith Histories, 1832-1844* (Salt Lake City: Church Historian's Press, 2012), 11.

<sup>2</sup> Joseph Smith III, "Last Testimony of Sister Emma," *Saints' Herald* 26 (October 1, 1879), 289-90.

<sup>3</sup> H. Stevenson, *Lecture on Mormonism* (Newcastle, J. Blackwell and Company, 1839), 9-11.

<sup>4</sup> John L. Sorenson, *An Ancient American Setting for the Book of Mormon* (Salt Lake City, Deseret Book, 1985), *Mormon's Codex: An Ancient American Book* (Ibid, 2013); John E. Clark, "Archaeological Trends and Book of Mormon Origins," *Brigham Young University Studies* 44/4 (2005), 83-104; Brant A. Gardner, *Second Witness: Analytical and Contextual Commentary on the Book of Mormon* 6 vols. (Salt Lake City: Kofford Books, 2007).

[5](#) John L. Sorenson, *The Geography of Book of Mormon Events: A Source Book* (Provo: FARMS, 1992); Matt Roper, "Limited Geography and the Book of Mormon: Historical Antecedents and Early Interpretations" (Provo *FARMS Review*, 2004), 225-75.

[6](#) Matt Roper, "Limited Geography and the Book of Mormon Historical Antecedents and Early Interpretations" (Provo *FARMS Review*, 2004), 255-60.

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[11](#) John E. Clark, "Archaeological Trends and Book of Mormon Origins," (Provo, *BYU Studies*, 2005), 89-91.

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- [28](#) *Fauna and Flora of the Bible* (published by the United Bible Societies, 1972), vii.
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- [49](#) Wilma George, "Sources and Background to the Discoveries of New Animals in the Sixteenth and Seventeenth Centuries," *History of Science* 18/ (June 1980), 83.
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- [51](#) Pierre Francois Xavier de Charlevoix, *Historia de Paraguay*. Pablo Hernandez Translator (Madrid: Libreria General de Victoriano Suarez, 1912 [1756]), 51.

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Williams, "Geologic Observations on the Ancient Human Footprints near Managua, Nicaragua," *Carnegie Institution of Washington, Contributions to American Anthropology and History*, 52 (Washington 1952), 28; Doris Stone, *Pre-Columbian Man Finds Central America*. Cambridge: Peabody Museum Press, 1972, 21-22; Bryan suggests a date of around 3000 B.C. based upon recent radiocarbon dating Alan L Bryan, "New Light on Ancient Nicaraguan Footprints," *Archaeology* 26/2 (April 1973), 147.

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