

BACKGROUND

Mammoths: Giants of the Ice Age Exhibition Walk Through

Mammoths: Giants of the Ice Age will transport people back to a time great beasts dominated the world and ancient peoples struggled to survive in a rapidly changing environment.

During the Ice Age, mammoths would have existed right here in British Columbia. The Royal BC Museum's refreshed Natural History gallery, opening at the same time as the feature exhibition, will help tell this story, linking the rise and decline of mammoths around the world to mammoths here in BC.

The exhibition gives visitors unique opportunities to:

- **Discover Mammoth and Mastodon Origins and Evolutionary Adaptations**

The family tree of elephants, mammoths, and mastodons can be traced back 55 million years when the proboscidean (pronounced *pro-bo-SID-e-an*) order originated in Africa. Trunks and tusks are the hallmark of proboscideans. In the first section of the exhibition, visitors encounter a full-size model of *Moeritherium* (*Mer-i-THER-ee-um*), an ancient cousin of mammoths, mastodons and elephants, displayed as it might have looked grazing in a North African wetland some 35 million years ago. Surprisingly, *Moeritherium* did not resemble its later cousins – it was somewhat larger than a modern-day [tapir](#), but with short legs, a relatively long body, and a short tail.

This introductory section also features a proboscidean family tree with touchable scale models of family members, including a woolly mammoth, a Columbian mammoth, and an American mastodon. The family tree illustrates how mastodons split off, forming the Mammutidae family – now extinct – while mammoths and elephants are part of the Elephantidae family.

Visitors can examine skull casts and fossil jaws, teeth, and tusks to learn more about early evolutionary adaptations. Hands-on interactive displays teach visitors about two distinctive features of proboscideans: trunks and tusks. Visitors can try their hand at picking up objects by manipulating a mechanical trunk. In another interactive, visitors can help a mammoth balance the weight of its tusks.



- **Marvel at Lyuba, the Best-Preserved Baby Mammoth**

The centrepiece of *Mammoths: Giants of the Ice Age* is Lyuba (*Lee-OO-bah*), the remarkably well-preserved, 40,000-year-old baby mammoth found in 2007 by a Siberian reindeer herder and two of his sons. The exhibition marks the first time Lyuba has been shown in Canada, and she is sure to inspire what Dan Fisher, PhD, guest curator The Field Museum in Chicago, calls “a visceral awe” among museumgoers.

Amazingly, Lyuba was preserved with most of her features intact, including internal organs, making it possible for scientists to perform several tests including DNA analysis and CT scans. Lyuba’s intestinal contents provide excellent information about what mammoths in Siberia ate during the Ice Age. The baby’s intestine also contained traces of adult faeces, probably her mother’s, confirming that baby mammoths, like modern elephant offspring, eat their mom’s excrement to ingest the bacteria needed for proper digestion and a healthy gut.

Discoveries of preserved mammoths, of which Lyuba is the finest example, have greatly supplemented clues already gathered from other fossils to give scientists a better picture about how these animals lived.

(See separate Backgrounder on Baby Lyuba for additional information.)

- **Examine Mammoth’s Social Organization and Behaviour**

Mammoths and mastodons displayed social organization and behaviour patterns similar to those of today’s elephants. Exhibition visitors can discover more about social hierarchy and behaviour by viewing a video that compares evidence found in the mammoth fossil record with modern-day elephant behaviour. The video will introduce excavation sites where scientists have found entire mammoth family groups that died all at once in single catastrophic events. The sites show a range of age and gender within the group, dominated by adult females, suggesting that mammoths – like modern elephants – lived in matriarchal groups that excluded sexually mature males.

Also featured in the video will be fossil evidence of adult male mammoths sparring for dominance. Nearby, in a fun learning activity, exhibition visitors are invited to joust with tusks, imitating behaviours of the beasts seeking to win breeding rights as they roamed the landscape of Siberia thousands of years ago.

- **Explore Diverse Ice Age Ecosystems**

Even though mammoths and mastodons lived during the Ice Age, and many species inhabited colder, northern territories, the beasts also thrived in different ecosystems throughout the world.



“Ice Age” is a popular term for what scientists call the Pleistocene (*Plice-TOE-seen*) Epoch, a long period of hundreds of thousands of years when continental ice sheets extended over large areas of the Northern and Southern Hemispheres. Yet despite the increased ice coverage, there was still a diversity of environments and climatic regions throughout the world during the Pleistocene Epoch. An interactive allows visitors to match several species of proboscideans with their respective Pleistocene habitats.

In this part of the exhibition, visitors walk through a gallery that evokes western North America as it appeared 20,000 years ago. Here, visitors are greeted by a full-scale replica of a Columbian mammoth, one of the largest mammals to roam North America (standing nearly 4 meters (14 feet) tall at the shoulder). Nearby are full-scale replicas of a saber-tooth cat and a short-faced bear (both now extinct). The diversity of plant life in this ecosystem provided a veritable salad bar for mammoths. A display of plant specimens features six different kinds of grasses and plants that mammoths once feasted upon. An interactive display enables visitors to calculate how much a mammoth had to eat, an estimated 500 pounds of vegetation per day!

Fossils and life-sized replicas of other Ice Age animals and examples of their tracks and dung provide a picture of life in that era. Here, visitors can even see real mammoth dung, preserved for thousands of years in the dry caves of southern Utah.

- **Learn the Difference Between a Mastodon and a Mammoth**

In North America, mastodons lived side-by-side with their cousins, the mammoths. Mastodons were shorter and stockier than mammoths, with thicker bones and differently shaped tusks. Diet, however, was the major difference between the two animals. Mammoths grazed largely on grasses while mastodons browsed on leaves, twigs, and bark. Differences in the molars found in fossils show how mammoth molars, with low ridges, were well suited for grinding grasses, while the bulbous cusps of mastodon molars were perfect for shredding bark, twigs, and leaves. Because the two animals ate different diets, they did not compete with each other for food and therefore could share the same environment.

Exhibition curator Dan Fisher, PhD, guest curator at The Field Museum, is an expert on mastodons and has excavated several from his home state of native Michigan. As part of his research, Dr. Fisher examines and analyses hundreds of mastodon tusks. A video presents some of Dr. Fisher’s findings, including how mastodon (and mammoth) tusks grow in layers over time, like ice cream cones stacked one upon another. Dr. Fisher examines tusk growth patterns that give clues to how the animals lived and died. The thickest growth occurred in summers when food was more abundant, while winter growth layers were thinner.



- **Discover Thomas Jefferson's Favourite Enigma**

After Lewis and Clark made their famous expedition across North America to the Pacific Ocean, U.S. President Thomas Jefferson sent William Clark back on the road in 1807 to find and collect mastodon bones. Jefferson was intrigued by this mysterious beast, and Clark was successful in finding mastodon bones for Jefferson's own personal collection at Big Bone Lick in Kentucky, the birthplace of American palaeontology. Clark also found spear points at the site, suggesting that ancient peoples had once hunted these large beasts. In this part of the exhibition, visitors can see some of Jefferson's own mastodon bones and ancient spear points collected by Clark during this expedition.

- **Learn About Human Interaction and Artistic Inspiration**

Unlike dinosaurs and other prehistoric creatures, mastodons and mammoths lived side by side with humans for thousands of years. Some people hunted the big-tusked animals and found that killing a mammoth in the autumn was good insurance against starving over the winter. This section of the exhibition gives visitors a chance to examine spear points (called Clovis points) used by early hunters of North America. A small-scale diorama re-creates a mastodon hunting scene at the site of Kimmswick, Missouri, where scientists discovered the remains of mastodons and Clovis points. In an adjacent display case, visitors can see actual bones and points excavated from the Kimmswick site.

Mammoths and mastodons were not only a source of food. In Europe, early people were inspired by these impressive beasts and depicted them in cave paintings and miniature carvings made of bone, stone, and mammoth ivory during Palaeolithic times. Mammoths even provided building material for houses. After viewing a display of figurines made from mammoth ivory in Palaeolithic times (including some of the oldest art in existence, dating from between 35,000 and 10,000 years ago), visitors can discover a touchable scale model of a mammoth "bone hut."

Nearby is an interactive display featuring prehistoric depictions of mammoths painted on cave walls in southwest France.

- **Investigate the Extinction Mystery**

Here, visitors are introduced to different theories for explaining the extinction of mammoths and mastodons. Theories abound, but not one explains the extinction to everyone's satisfaction.

Climate change is a strong contender. The biggest die-off seems to have occurred about 10,000 years ago as the Ice Age ended and temperatures rose. Did this cause mammoth and mastodon habitats to shrink, stressing populations?



In some areas, including North America's Great Lakes region, fossils suggest that these creatures continued to thrive, despite a warmer climate. Some scientists believe mammoths and mastodons eventually were done in by humans who hunted them.

Other theories posit that a meteorite hit the Earth, altering the environment enough to trigger a great die-off, or that some kind of cross-species disease infected the animals. Some scientists think that various combinations of these events wiped out the great beasts.

Even though most mammoths and mastodons went extinct as the Ice Age ended, radiocarbon dates on some fossils show that isolated populations lived until about 4,000 years ago.

Some of these creatures lived on remote islands and were much smaller than their huge cousins that lived in mainland environments. The exhibition features specimens of dwarf mammoths from Wrangel Island in the Arctic Sea off the coast of Russia, representing the last mammoths on Earth.

- **Ponder the Fate of the Survivors**

At the close of the exhibition, visitors discover more about today's elephants in Africa and Asia and how they are threatened. This section addresses the questions: What can these elephants tell us about their extinct cousins? And, what must be done to save modern elephants from extinction?

Only three species of elephants survive today: the Asian elephant, which is the closest relative to the mammoth, and the savannah and forest elephants in Africa. Diminished habitat and ivory hunters are two major threats to elephants now.

Mammoths: Giants of the Ice Age opens June 3 and runs until Dec. 31, 2016.

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