

Fossils In North Dakota

FIND is a newsletter dedicated to helping young readers (in age or spirit) express their love of fossils and paleontology, and to help them learn more about the world under their feet. Each issue will be broken up into sections including Feature Fossils, Travel Destinations, Reader Art, Ask Mr. Lizard, and more!

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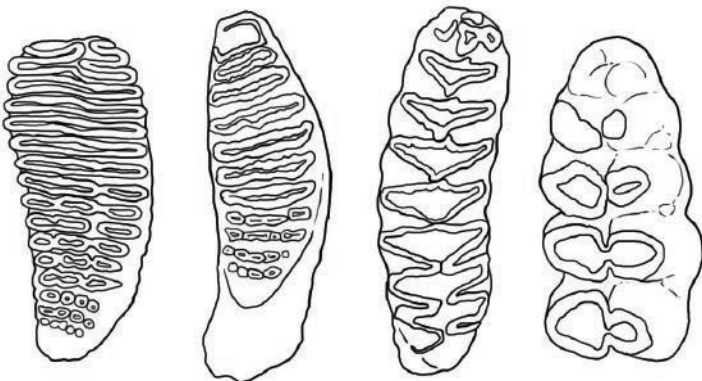


Mammoth or Mastodon?

It's winter break, and you decide to visit the Heritage Center. Walking in the big glass Atrium, you pass by the Hub of History, and stop in your tracks. There, before you, is a massive fossil skeleton. What is it? You look close, and see large tusks, and four pillar-like legs. Your first guess is an elephant, but that can't be right... maybe a *Mammoth*? A *Mastodon*? Other than the signs near the feet of the ice age titan, how can you tell?

Teeth

The fastest way to tell is to examine the teeth. *Mammoth* (Siberian *mamma* = "earth") teeth are very similar to modern day elephant teeth. The **occlusal** (grinding) surface looks kind of like the bottom of a sneaker, narrow and long, with many ridges to mash their food into pulp. You can see a *Mammoth* tooth inside the Geology gallery. *Mastodon* teeth look like a gathering of little mountains, or cone-like ridges - what you will find in the hallway skeleton.



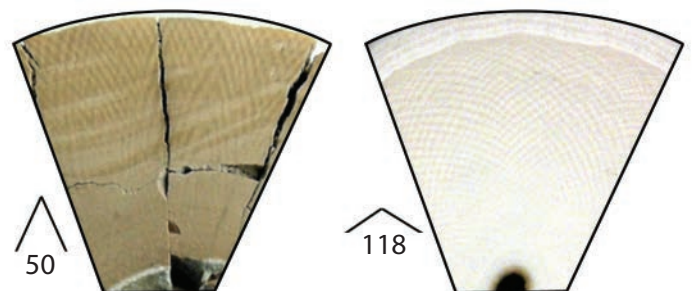
Left to right: *Mammoth*, Indian elephant, African elephant, *Mastodon*

So why the difference in teeth? Different teeth mean a different food source. These two large, similar-looking animals could live at the same time and not compete with each other, because they ate different things. The teeth of a *Mammoth*, with that multi-ridged grinding surface, is perfect for mashing rough grasses and **forbs** (like carrots and alfalfa) to a pulp. Meanwhile *Mastodons* apparently sought out lush greens like leaves, moss, sedges, or other wetlands vegetation. Stomach contents of both *Mammoth* and *Mastodon* have been found in well preserved carcasses.

Tusks & Ivory

The tusks, which are also teeth (modified incisors) are different between elephants and their extinct relatives. Indian elephants (*Elephas maximus indicus*) have narrow, shorter tusks, with only some of the males exhibiting them. Both male and female African elephants (*Loxodonta africana*) have larger tusks. Both Indian and African elephant tusks have a slight curve to them, but are much less curved than *Mammoths* and *Mastodons*, which could sometimes even cross each other! The highly curved shape might have been useful for sweeping away snow from potential food.

Ivory, which generally means a tooth large enough to carve or **scrimshaw** (etch designs in), can come from many animals including: elephant, walrus, *Mammoth*, warthog, narwhal, hippo, and more. It has been used in carvings and artwork for thousands of years. Many modern artists steer clear of using ivory today, as killing a creature only for its teeth is very unethical. The use of prehistoric ivory, where the animal has died of natural causes however, is far less problematic. So how can you tell the difference between modern and prehistoric **pachyderm** (large mammal with thick skin) ivory carvings? Schreger lines! If you look at the cross section of the ivory, you may notice a faint cream colored geometric pattern. These lines intersect each other at specific angles. *Mammoth* and *Mastodon* lines have a less than 90 degree angle average. Elephant lines have more than a 115 degree angle average.



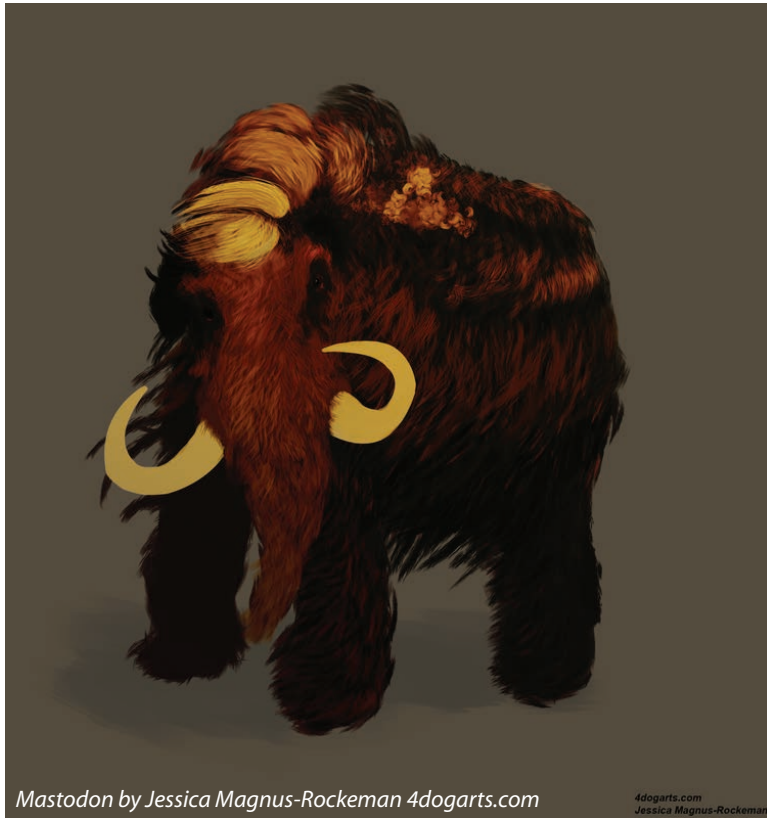
Tusk cross sections showing Schreger lines. *Mammoth* (left), elephant (right).

Head & Body

The bones of *Mammoths* and *Mastodons* are more **robust** (heavier, thicker) than modern elephants. The head and shoulder region of **proboscideans** (modern and extinct elephant family, named for their long trunks) is a great place to look for differences. Indian elephants have two humps on their head, while African elephants have a more rounded head with one bump. *Mammoths* stored excess fat and muscle on their head and shoulders, giving them a humped appearance, while *Mastodons* exhibited a more flat head.

The highest point on an Indian elephant is a peak on the middle of their back. African elephant shoulders and hips are the highest point. Because of the massive shoulder hump on a *Mammoth*, the head and shoulders are much taller, sloping down towards the rump. *Mastodons* show a body similar to the African elephant, with shoulders and hips framing a swayed-back.

African elephant ears are the largest, able to fan themselves in the summer heat to keep cool. Indian elephants and *Mastodons* had medium sized ears, while *Mammoths* had very small ears covered in hair to help keep them warm. Both *Mastodons* and *Mammoths* were covered in shaggy coats to help them keep warm in the tundra and taiga environment.



National Fossil Day Report

National Fossil Day was held on October 12th this year. Events during the day included mask-making, mobile coloring, gallery tours, a fossil identification table, and a presentation of a Prehistoric Fishing Trip. About 75 people attended, bringing in many rocks and fossils for identification.

