For 40,000 years, she remained frozen on the Arctic tundra of Siberia—until two brothers walked by and soon discovered they had found something truly special. Read the passage and answer the questions that follow.

from MAMMOTHS AND MASTODONS

by Cheryl Bardoe

Surprise in the Snow

Kostia Khudi and his father, Yuri. Kostia follows reindeer herds across the tundra with his family during spring and summer and attends a town boarding school during fall and winter.

1 Ten-year-old Kostia squinted through the snow that blows across northern Siberia even in May. He and his brother Edik had just loaded their reindeer sledge with firewood when they noticed an odd lump by the river. Kostia guessed it was an injured reindeer. But when the brothers drew closer, Kostia could hardly believe his eyes. The strange dead animal had no antlers—but it had a trunk like an elephant. Kostia and Edik poked at the animal and then hurried home.

2 Their father, Yuri, was troubled when he heard about the mysterious creature. Kostia's family is of the Nenets people, who live a nomadic life herding reindeer across the arctic tundra. Yuri believed the animal his sons saw came from the underworld below the Earth's surface—anything from underground could bring terrible luck. Yuri hiked to a sacred place on the tundra, marked by a pile of reindeer antlers. There he made an offering to the spirits and pondered what to do.

3 Sometimes a Nenets person would come across a mammoth tusk jutting from the ground and could transform a bad omen into good fortune by sharing the valuable ivory with others. Yuri decided to do the same with his sons' discovery. He had heard how others had found tusks, bones, and such, which attracted scientists from all over the world to the icy arctic. Yuri hiked 73 miles over four days to the nearest village to report the sighting of the creature.

Lyuba was found north of the Arctic Circle. Winter in this part of Russia can last up to eight months, and temperatures can dip as low as –59°F, or –50°C.

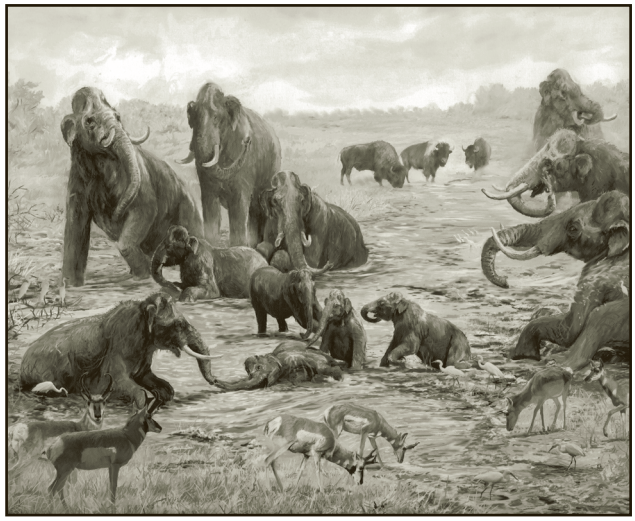
4 Kostia and Edik's find was big. More than once-in-a-lifetime big. More than once-in-a-millennium big. They had discovered a frozen baby woolly mammoth! People had discovered the bones of mammoths before. They had even found large parts of frozen mammoth bodies. Never had anyone found a mammoth—or any other extinct, prehistoric animal—that was completely whole and so well preserved. This baby mammoth died about 40,000 years before she was found in 2007. Yet wrinkles still creased her skin and taste buds dotted her tongue. Her eyeballs rested in their sockets, and her internal organs had retained nearly all their original shapes. Scientists call the baby mammoth Lyuba and study her in hopes of learning secrets from the past.

Mammoths Are Extinct, but Their Story Isn't Over

5 Scientists have long figured that if a mammoth's skeleton looked like an elephant's, then it probably walked like an elephant. And if a mammoth's teeth looked like an elephant's, then it probably ate like an elephant. And if a mammoth walked and ate like an elephant, then it probably did other things like an elephant, too. Without physical, hold-in-your-hands evidence, however, these theories are just guesses about how mammoths may or may not have acted.

Scientists examine the baby woolly mammoth named Lyuba. If she had not been found, the spring thaw and a flooding river might have washed Lyuba out to sea.

6 "As a paleontologist, my job is to search the fossil record for clues to what mammoths did," says Dr. Daniel Fisher, a world-renowned mammoth expert and professor at the University of Michigan. For instance, scientists found dung in Lyuba's intestine. They know baby elephants nibble on poop to get bacteria into their stomachs to help digest leaves. Now they have proof mammoths did, too.



More than 10,000 years ago, Columbian mammoths enjoyed water holes in North America. Scientists believe mammoths acted like elephants, in addition to looking like them.

7 Enough clues have piled up to convince scientists that mammoths and their lesser-known cousins the mastodons did act a lot like elephants. Scientists' guesses were correct—they can study the living creatures to learn about the extinct ones. This is truly amazing because scientists know most long-lost animals only from their bones. Compare mammoths to amphicyonids, mammals that lived about 15 million years ago. Dr. Fisher helped unearth a set of five amphicyonid footprints, which had hardened into siltstone, on a school field trip when he was 14 years old. "This animal was as big as a bear," Dr. Fisher explains. "But no animal alive today is anything like it." As a result, scientists know little about how this animal ate, slept, and reared its young.

TREASURES FROM PERMAFROST

Near the Arctic Circle, the summer sun's rays often thaw only the top few inches of soil. A deeper layer of soil, called permafrost, may stay frozen for thousands of years. Massive woolly mammoths were more likely than smaller animals to induce a mudslide or crash through ice into rivers. There they could be blanketed by mud and frozen quickly after death.

8 Having only bones to examine also means that scientists must guess at what most prehistoric creatures looked like alive, in the flesh. Discoveries like Lyuba show us the hulking muscles and shaggy fur that covered mammoth skeletons. They reveal that mammoth trunks worked like elephant trunks and that mammoths (like elephants) had thick, spongy tissue on the soles of their feet to help support their massive weight. Usually the soft parts of an animal's body rot after death, but a deep freeze puts the brakes on decay.

Because woolly mammoths were enormous and lived in an arctic climate, they were the most likely animals to be preserved as prehistoric popsicles.

9 Scientists also learn about mammoths through clues left by humans. Our ancestors speared mammoths for supper and stacked their bones to build shelters from the wind. They painted mammoth pictures on caves and carved mammoth figurines from ivory (similar to art inspired by elephants).

10 With data from so many sources, scientists know more about mammoths and mastodons than about most other prehistoric creatures. Yet we don't know why these animals died out. Solving this mystery becomes even more urgent as elephants struggle to survive today.

11 Dr. Fisher hopes his research can help save elephants. "This is part of why I do this work," he says. "Part of me looks backward and tries to understand the past. And part of me looks around and tries to understand the animals of the present."

DID DINOSAURS AND MAMMOTHS LIVE AT THE SAME TIME?

Answer: No! Dinosaurs were a group of reptiles that included the largest animals ever to live on land, and they died out 65 million years ago. At that time, mammals—animals covered with fur that give birth to live young—were not much bigger than cats. Mammoths and mastodons were among the largest *mammals* ever to have lived on land. The first mastodons appeared around 25 million years ago, and the first mammoths appeared around 5 million years ago. Elephants appeared at the same time as mammoths. They were all still tromping around when modern humans appeared about 100,000 years ago.