This month's theme:
Mammoths

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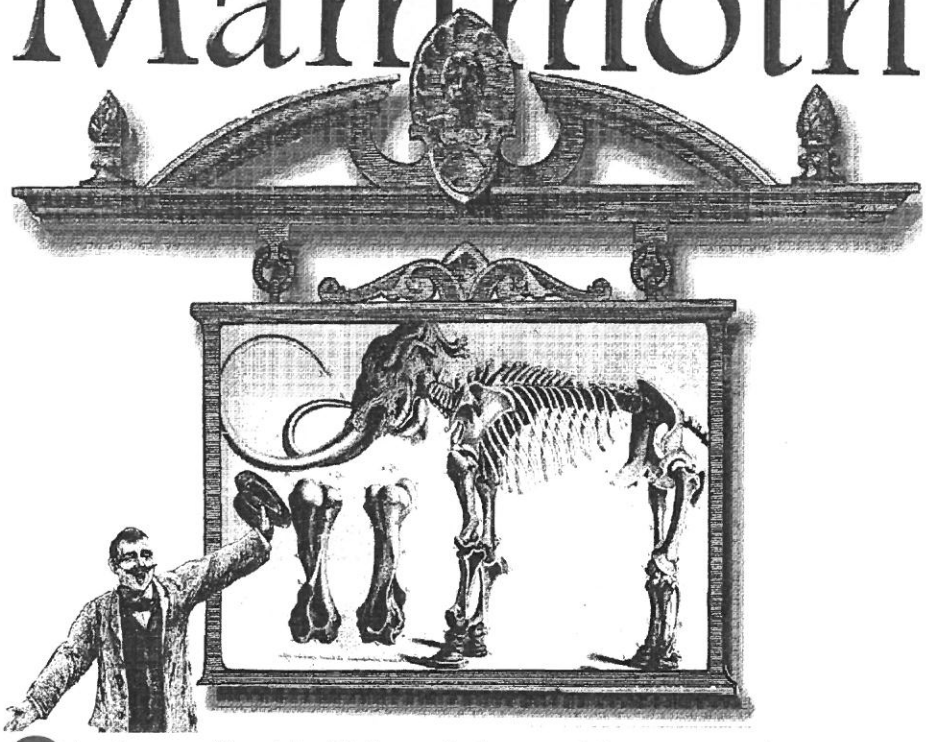
The Newsletter of the Idaho State Historical Society's Junior Historian Program

PROSPECTOR

October, 2003

Mammoth



Giants once lived in Idaho. Looking around your busy home town, it might be difficult to imagine a time without roads and buildings, let alone a world where creatures as big as locomotives roamed the Earth. But, if you could go back in time a million years, you might see footprints as big as dinner plates in the mud at the edge of a lake, or forests with trees and bushes uprooted and smashed by creatures with the power of a bulldozer. Incredible as it may seem, Idaho was once the home of the mammoth.

Of course, Idaho looked much different back then. Mammoths lived in North America during the Pleistocene Era, a time period about 2,000,000 years in length that ended 10,000 years ago. Back then the Earth was locked in an Ice Age. Over and over again, sheets of glacial ice crept down from the arctic and covered most of northern North America, Europe, and parts of Asia under thick ice. In some places, the layers were over two miles deep! Scientists estimate

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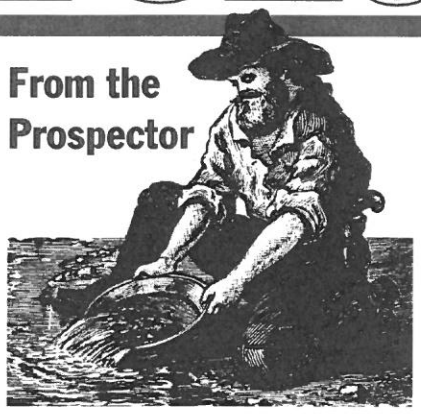
From the Prospector



Howdy New Prospectors!

Welcome to the fourth grade and the Prospector Club Junior Historian Program. My name is Lucky Noah and I'm in charge of writing your monthly newsletter. Although most of the time I'm out in the mountains looking for gold, my mule and I have an office in the basement of the state historical museum, which is located in Boise, our state's capital city.

This is the first of eight newsletters you will receive as a prospector. Each issue will have exciting stories on a different Idaho history topic and fun activities for you and your class to do. For this month's theme, prepare to go way back in history to ancient Idaho, when giants walked the earth.

I love sharing Idaho's rich history with the schools, but writing a newsletter is hard work. That's where you come in. Each month, I'll ask for submissions for the next issue. As official junior historians you can write stories, draw pictures, and turn in projects that we'll print right here in the magazine. I can't wait to see what you come up with! ✪

MAMMOTHS IN ANCIENT IDAHO

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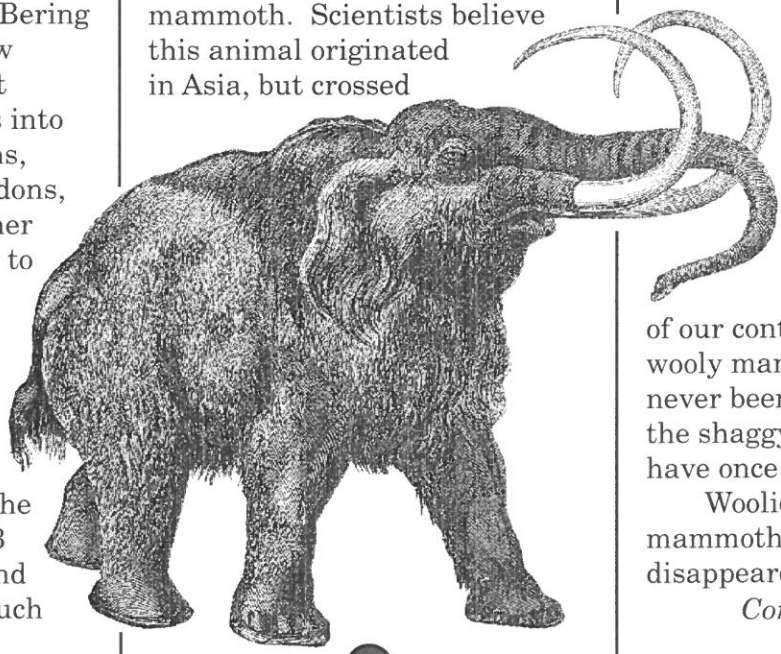
that this ice covered almost one third of the Earth's surface, compared to only one tenth today. With so much of Earth's water frozen into ice, our planet's sea level actually fell—about 350 feet—enough to expose the shallow area between Alaska and Russia called the Bering Strait. During the Ice Age, the Bering Strait became the Bering Land Bridge, allowing new animals and later the first Native Americans to cross into North America. mammoths, saber-toothed cats, mastodons, dire wolves, and many other creatures found their way to what is now Idaho.

To try to imagine what a mammoth looks like, the best thing to do is picture its nearest living relative, the Asian elephant. The largest of the mammoths stood about 13 feet tall at the shoulder and might have weighed as much as 10 tons. Like today's elephants, mammoths had massive tusks which grew up to 13 feet in the largest animals. The gigantic tusks first curved outward, then turned inward near the end, and were actual teeth extending from the mammoth's mouth. We know from studying the mammoth's other teeth that it was a vegetarian. The tusks were probably used to dig and root for food or as defense against other mammoths and predators.

Three types of mammoths lived in North America during the ice age. The oldest fossils found are from the southern mammoth. Scientists believe this animal originated in Asia, but crossed over to America on the land bridge about 1.5 million years ago. Closely related to the southern mammoth is the Columbia mammoth. These gigantic creatures were the largest of the mammoths that inhabited North America. Their fossils have been found all across our country from Oregon to Florida. Most of the mammoths bones discovered in Idaho are from Columbia mammoths. The third type of mammoth that roamed North America was the wooly mammoth. These small furry mammoths were common inhabitants of the colder regions of our continent. Although wooly mammoth remains have never been discovered in Idaho, the shaggy creatures might have once lived in Idaho.



Woolies were the last of the mammoths to die off. They disappeared about 10,000 years

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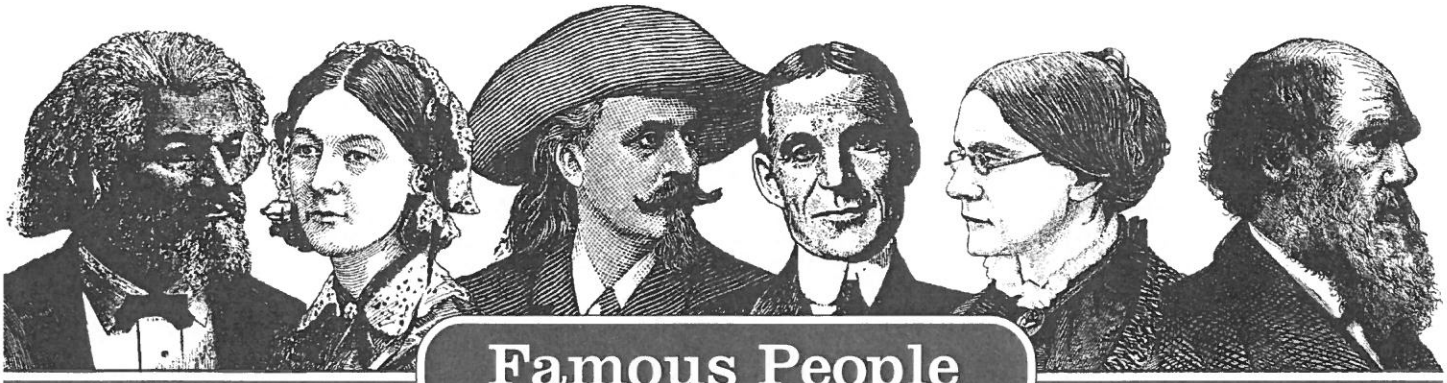

Famous People

Thomas Jefferson, Paleontologist

Most people remember Thomas Jefferson as the celebrated third president of the United States and the author of the Declaration of Independence, but did you know he was also one of our first paleontologists? Paleontologists are scientists who study fossils. Nowadays there are thousands of fossil experts around the world, but in the late 1700's there were very few.

Jefferson had a large fossil collection that he displayed at his home in Monticello. One of his prized specimens was a creature he named Megalonx or "great claw." Jefferson believed these fossils came from a giant predator related to the tiger. Scientists have since discovered that the bones belonged to a

giant sloth, a huge ancient plant eater that probably used its powerful claws to strip the leaves from trees.

Jefferson was also interested in mammoths. In Jefferson's time, many mammoth bones were being discovered in Europe and the new United States. He believed that living mammoths might still exist in the unexplored areas of the North American continent.

In 1803, when Jefferson sent Lewis and Clark on their expedition west, he instructed them to look for rare creatures like the mammoth. Of course, Lewis and Clark never found a mammoth. The gigantic animals had long since become extinct. Even though he made a few mistakes, later scientists honored Jefferson's work as a pioneer paleontologist by naming a newly found subspecies of mammoth, the Jefferson Mammoth, after him. ✪

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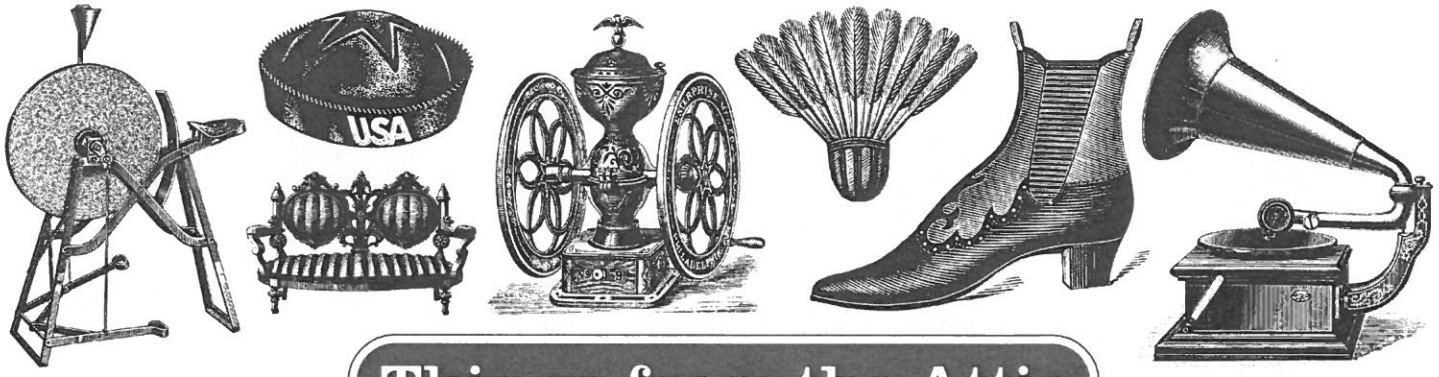
ago when many other ice age animals became extinct. Scientists aren't sure why so many of the ice age creatures died off at the same time. Some scientists believe the animals were affected by a severe change in the climate. Other scientists believe that well-armed human hunters entering North America from Asia might have contributed to the creatures' extinction.

In Idaho, we have evidence that early people known as Clovis wanderers lived here from about 11,000 years ago. Clovis sites have been reported in various locations throughout Idaho, such as Hells Canyon, Cascade Reservoir, Lapwai, and near Fairfield. Perhaps the flaked-stone spearheads found in the Clovis sites may have been fashioned and used by these early humans to hunt Idaho's giant Pleistocene-Age animals.

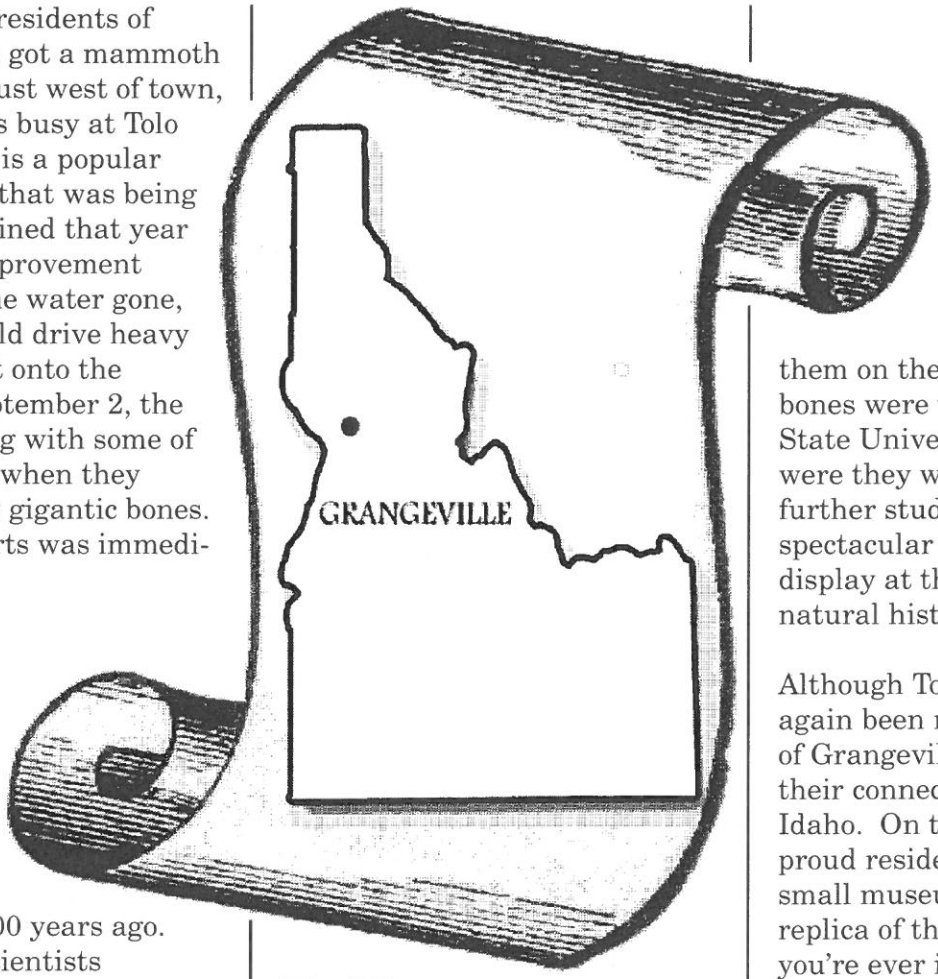
We probably will never know for sure why these fantastic animals disappeared from the Earth. Luckily, fossil mammoths continue to be uncovered around the world, allowing scientists to study the mysteries of these great animals. ✪



Things from the Attic

Digging up Idaho's Tolo Lake Mammoths

In 1994 the residents of Grangeville got a mammoth surprise. Just west of town, a work crew was busy at Tolo Lake. The lake is a popular recreation area that was being temporarily drained that year for a wildlife improvement project. With the water gone, the workers could drive heavy equipment right onto the lakebed. On September 2, the crew was digging with some of these machines when they uncovered a few gigantic bones. A group of experts was immediately called in.



A close study of the bones revealed that they were from a Columbia Mammoth, a creature that had lived in Idaho over 11,000 years ago. Excitedly, the scientists expanded their investigation. Nearby, there were more fossils. The remains of possibly eight mammoths and three ancient bison were found buried beneath the lake.

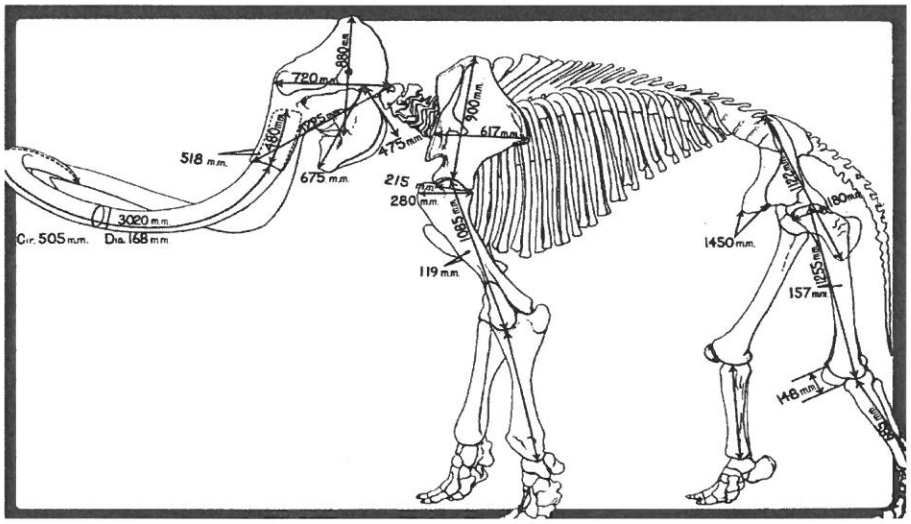
No one knows how these great creatures died. But scientists think that Tolo Lake was once a busy watering hole for ice age animals, including meat eaters like saber-toothed cats and dire wolves, and plant eaters like the mammoths and bison.

Professional paleontologists and volunteers carefully removed the bones from the lake mud. Fragile pieces, like tusks, were wrapped in plaster jackets to protect them on their journey. The bones were then moved to Idaho State University in Pocatello were they would be stored for further study. Some of these spectacular fossils are now on display at the university's natural history museum.

Although Tolo Lake has once again been refilled, the citizens of Grangeville won't soon forget their connection with ice age Idaho. On the edge of town, the proud residents have built a small museum with a full size replica of the mammoth. If you're ever in the area, stop in and take a look. ✪

The Fun Page

Measuring the Mammoth



There are not any animals living in Idaho today that are even close to the size of a Columbia Mammoth. In fact, except for the African elephant, there aren't any living land animals on the entire planet that are even close to the size of a mammoth. Just how big was a mammoth? Since most of you don't have a pet mammoth that you can measure, the best way to get an idea of its size is to compare it to things you have in the classroom. Get a few tape measures, yardsticks, or rulers and compare your world to the great Columbia Mammoth.

Height

An average Columbia Mammoth was 12 feet tall from the bottom of his foot to the top of his shoulder.

How tall are you?
How tall is the person sitting next to you?
If you could stand on your neighbor's shoulders (you don't really have to do it) would you be as tall as a mammoth? Add your height to your neighbor's height and compare it to the mammoth.

How tall is your teacher?
If you could stand on you teacher's shoulders would you be as tall as a mammoth? Add your height to your teacher's height and compare it to the mammoth.

How tall is the ceiling in your classroom? Could a mammoth fit in the room?

Tusks

A Large Columbia Mammoth could have had tusks as long as 13 feet in length.

Measure out 13 feet on the floor and mark it with tape or measure and draw it on the chalkboard.

How long is your desk?
How many desks would it take put end-to-end to equal one mammoth tusk?

Is there anything in the classroom or outside that is about as long as a tusk? The teacher's desk? The bike rack in front of school? A car? Take your tape measure or rulers and try to find an object that is about as long as a tusk.

Weight

A mature Columbia Mammoth probably weighed 6 tons. One ton is the same thing as 2,000 pounds, so a mammoth weighed about 12,000 pounds (2,000 x 6 = 12,000).

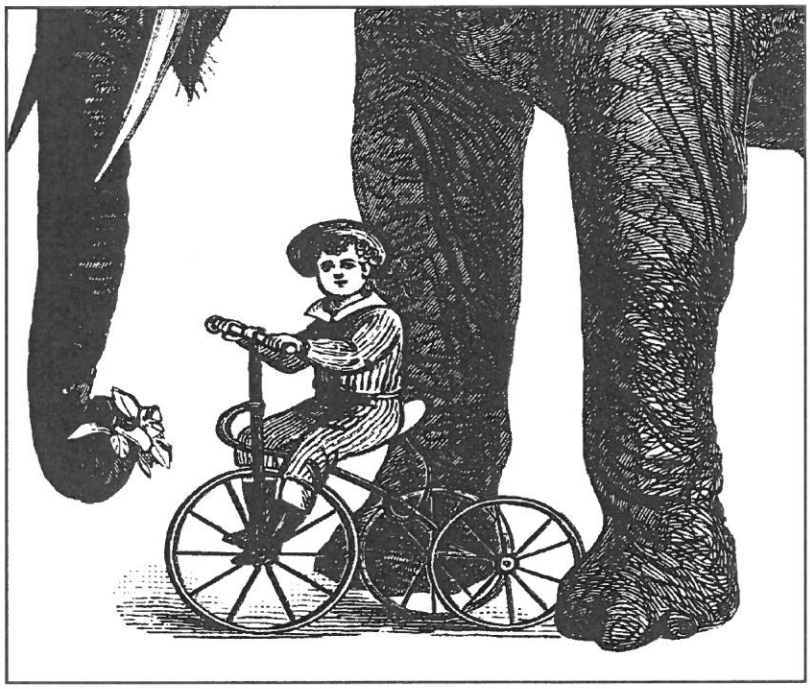
About how much do you weigh? How much does the whole class weigh? Add everybody's weight together.

Does your class weigh as much as a mammoth? ✪

Next Month's Activities

Send us your mammoth project!

Now it's your turn prospectors. We've told you all we know about mammoths in Idaho, but we need your help so that we can learn more. Pick from one of the activities below or make up your own mammoth project and send it in to our prospector headquarters. We'll take some of your best work and print it in next month's magazine. Remember to include your name, where you're from, and the name of your prospector club. We can't wait to see what you send in.



A Mammoth in my Backyard: The last mammoths in Idaho died off thousands of years ago. Can you imagine what would happen if they were still around today? Write a short story, poem, or draw a picture showing what would happen in your town if you woke up one morning and found a living mammoth in your backyard.

Ice Age Zoo: Mammoths are only one of a large group of fantastic creatures that used to live in Idaho during the ice age. Giant sloths, saber-toothed cats and even camels could once be found in our state. What can you find out about some of these other animals? Look in the library or on the internet and write a short paragraph describing one of these ice age creatures. If you're an artist, draw a picture of your extinct animal so the rest of the prospectors can see how it looked.

Reports from the Field: There are fossils and replicas of mammoths all over the state of Idaho: Grangeville and the Idaho Museum of Natural History in Pocatello have exhibits on the Tolo Lake Mammoths, The Museum in Idaho Falls has a great mammoth model in their foyer, Bruneau Dunes State Park visitor center has mammoth remains, including some you can touch, and at the Boise State University Biology Building they have mammoth tusks in a glass case on the ground floor. Any prospectors out there who live close to one of these sites? Go visit with your class or family and write us a short report on what you saw.

Send in your work by November 7th to:

Prospector Club
Lucky Noah
Idaho State Historical Museum
610 North Julia Davis Drive
Boise, ID 83702

Or email it to us at
kzwolfer@ishs.state.id.us ✪

Resources for Teachers

Dear Idaho Teachers,
Welcome to the new prospector club newsletter. I hope you like our new format. Each month, in addition to the articles and student sections, we'll try to include a short lesson plan pertaining to that month's theme. We'll also include a bibliography of the resources we used to put together that issue.

Please feel free to use this latter section of the newsletter to share your ideas with other educators across the state. Do you have a sure-fire activity you do in class to teach the fur trade? Do you have a great field trip for a class that is studying the history of gold mining? Have you heard about a great training opportunity at a local university? We want to hear from you.

Kurt Zwolfer, Education Specialist
Idaho State Historical Society

Field trip ideas

Boise State University Biology Building
The University has a pair of Imperial Mammoth tusks on exhibit on the first floor.

Bruneau Dunes State Park
HC 85, Box 41
Mountain Home 83647
208-366-7919
The small visitor center has a pelvis, femur, tooth, and vertebrae of a Columbia Mammoth.

Tolo Lake Mammoth Exhibit
In Eimer's Park off Highway 95 in Grangeville
Contact the Grangeville Chamber of Commerce for details.
208-983-0460

Idaho Museum of Natural History
Campus Box 8096
5th Avenue and Dillon Street
ISU Building 12, Room 205C
Pocatello, ID 83209
208-282-3168
Using its research collection as a base, the museum has recently created an extensive exhibit on the Tolo Lake mammoths.

Museum of Idaho
200 N. Eastern Ave.
Idaho Falls, ID
1-800-325-7328
Featuring an exhibit on the Columbian Mammoth through Jan 31, 2004.

Books and articles (suited for adults)

Cohen, C.
The Fate of the Mammoth: Fossils, Myth, and History
Chicago: University of Chicago Press. 2002.
A unique book that explores the scientific and cultural impact of the mammoth. It has an interesting section On Thomas Jefferson's paleontological work.

Haynes, G.
Mammoths, Mastadonts, and Elephants: Biology, Behavior, and the Fossil Record.
New York: Cambridge Press. 1991.
An academic work, using the behavior of elephants today to analyze the extinct mammoth.

Kurten, B.
Before the Indians.
New York: Columbia University Press. 1988.
A great review of the ice age fauna of North America

Lange, I.
Ice Age Mammals of North America: A Guide to the Big, the Hairy, and the Bizarre
Missoula: Mountain Press Publishing Company. 2002
An easy-to-read summary of the ice age and the mammals who inhabited it.

Osborn, H.
Species of North American Mammoth, Elephas jeffersoni, New Species.
1922, American Museum Noviates 41:1-16.
The paper in which a new species of mammoth was named after Thomas Jefferson.

Ward, P.
The Call of the Distant Mammoth: Why the Ice Age Mammals Disappeared
New York: Springer-Verlag. 1997.
Explores the probable causes of mammoth extinction.

Web resources

Thomas Jefferson, Paleontologist
http://earlyamerica.com/review/2000_fall/jefferson_paleon.html

Origin and Evolution of Mammoths
http://mammuthus.chat.ru/eng_evol.html

Excavation in Idaho Lake Bed Yields Mammoth
http://www.peak.org/csfa/mt11-2.html

Mammoths at Tolo Lake
http://radio.boisestate.edu/information/otherprojects/mammoth/intro.html

Thomas Jefferson, Lewis and Clark, and Megalonyx
http://www.l3-lewisandclark.com/ShowOneObject.asp?SiteID=29&ObjectID=455

People

Thanks to Hezy and Sandra Shoshani of the Elephant Research Foundation, William Akersten of the Idaho Museum of Natural History, Denny Diveley of the American Museum of Natural History, and Christopher Shaw of the George C. Page Natural History Museum in Los Angeles for taking time to answer our questions.

Lesson Plan

Mammoth Dig

Goals of Lesson

By taking part in a mock fossil dig, students will gain a better understanding of the difficulties faced by paleontologists in the real world. Working in groups, the students will start by using visual/spatial skills to match the bones they have with a complete museum mounted skeleton, and conclude with critical thinking and discussion to explore how scientists utilize fossil clues to interpret the past.

Inventory

Copies of museum mount, worksheet, fossil inventory A, B, and C, and scissors.

Activity

Start off by setting the stage with a background story. "Recently, during the construction of a shopping mall in your town, a number of large bones were uncovered. The construction crew called the closest university and immediately your team of paleontologists was sent in to investigate. After looking at the site, your team concludes that you have found a large number of Columbia Mammoth bones in the dried-up remains of an ancient pond. That was the easy part. Now you have to carefully remove the fossils from the ground, transport them to your laboratory, and study them so that you can try to understand something about these ancient creatures. Even though the skeletons are incomplete and few of the bones are connected, your team thinks it can sort through the bones by comparing them to a full mammoth skeleton at a local museum. Using this museum mount, you should be able to identify the bones you found at the pond site and then make some very basic judgments as to what happened to the giant creatures."

Break the class into small groups of 2-5. Pass out a museum mount, a worksheet, and a copy of the fossil inventory (A, B, and C) to each team. The students should carefully cut out the bones (remove them from the surrounding rock) and then compare them to the bones on the museum mount. After tallying the fossils, the team should try to answer the questions on the worksheet and then the class can discuss the scientists' findings.

Discussion

Bone Count: 1 mammoth skull, 3 tusks, 3 ribs, 3 vertebrae, 4 humerus, 3 femur, 2 scapula, 1 set of tail vertebrae, and 1 unknown bone (the skull of a saber-toothed cat).

How many mammoths died in the pond? 2 is the most logical answer. There are too many tusks and leg bones for there to be just one.

Could there have been more? It is possible that the bones came from more than two animals, but it is difficult to say how many. Discuss how a scientist would figure out if bones came from the same creature. One way is to look at how they were found in the ground. If bones are grouped together in a logical way, a paleontologist might conclude they came from the same animal. If the fossils were too scattered or jumbled, the researchers might be able to compare the sizes of the bones. A femur from an adult male and a baby mammoth would be very different.

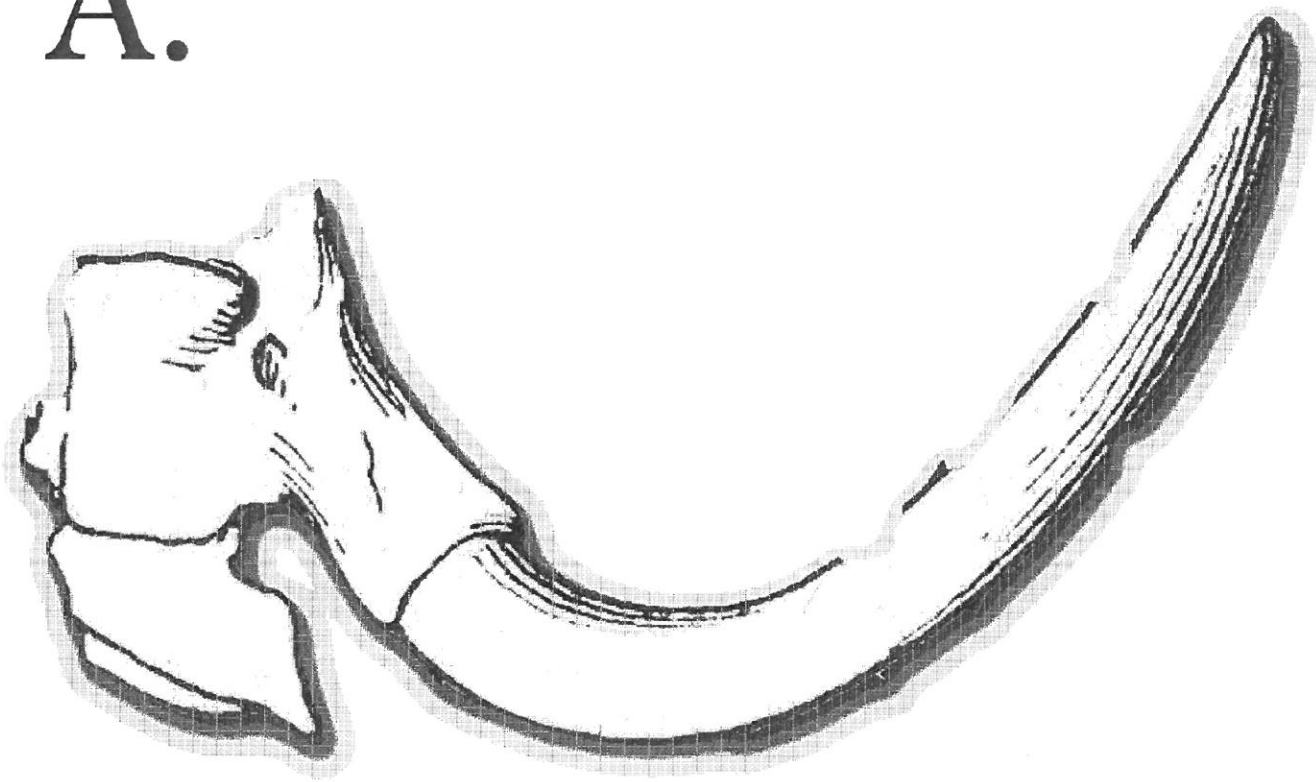
What happened to the mammoths? It is important that you emphasize that there are many possibilities. Scientists can't say for sure what happened; they only make a guess based on the evidence. Since the site was an ancient pond where food and water were available, it was probably a gathering area for mammoths. If that was the case, the bones could be from animals that died of natural causes, like old age or disease. Another possibility is that they were killed by a predator. If they haven't already figured it out, reveal to them that the unknown bone is from a saber-toothed cat. Making the connection, they will probably conclude that the mammoths were killed by the saber-toothed cat, but explain to them that it's not that easy. Although it is possible that the mammoths were eaten (we

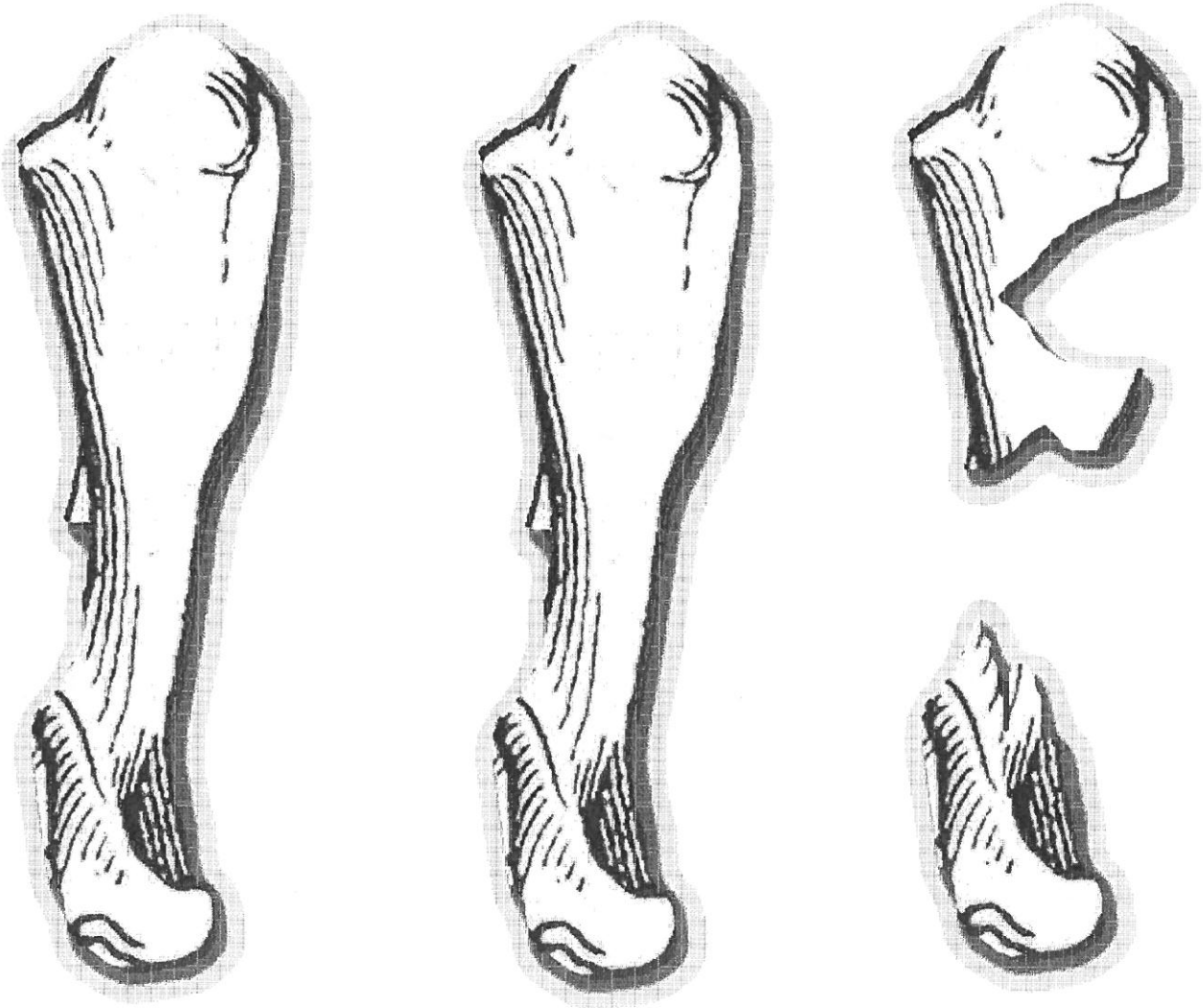
could look on the bones for scratches or teeth marks to confirm this) there are other possibilities. Predators also use watering holes to drink, maybe the saber toothed cat also died of natural causes. Maybe there was a drought year and many animals came to the watering hole hoping to refresh themselves, but died when they found the pond dry. Even if scratch marks are found on the bones that match predator teeth, we can't come to any firm conclusions. Mammoths are big animals, in most cases it would be difficult for a predator to harm them. It could be that the mammoths died of natural causes and scavengers fed on the carrion. This is why many fossils sites are incomplete. Hungry animals often carry off or scatter bones while they are feeding.

Could humans have been involved? There is evidence that early ice age people hunted the great mammoths. Again, we have to be careful in our conclusions. If a cutting tool was found at the site, we first would have to make sure it came from the same time period as the mammoths. In some cases, we can use chemical dating techniques, but in this situation we'd probably try to see if the tool was in the same soil layer as the mammoths. If this was true, it could be evidence that people used the pond as an ambush site to kill large prey. Or, it might have been that early man used the pond as a camping site without even coming in contact with the mammoths. We could look for evidence of sharp tools on the bones we found, but just like predator teeth marks, this would be inconclusive. An ice age man might have scavenged a dead mammoth to get the meat.

Conclude with a discussion on the difficulties paleontologists face. Is it easy to reconstruct the past? What would a scientist or historian do differently if she was trying to study something that happened 100 years ago rather than 15,000? Why is it important to study something that happened such a long time ago? ✪

A.





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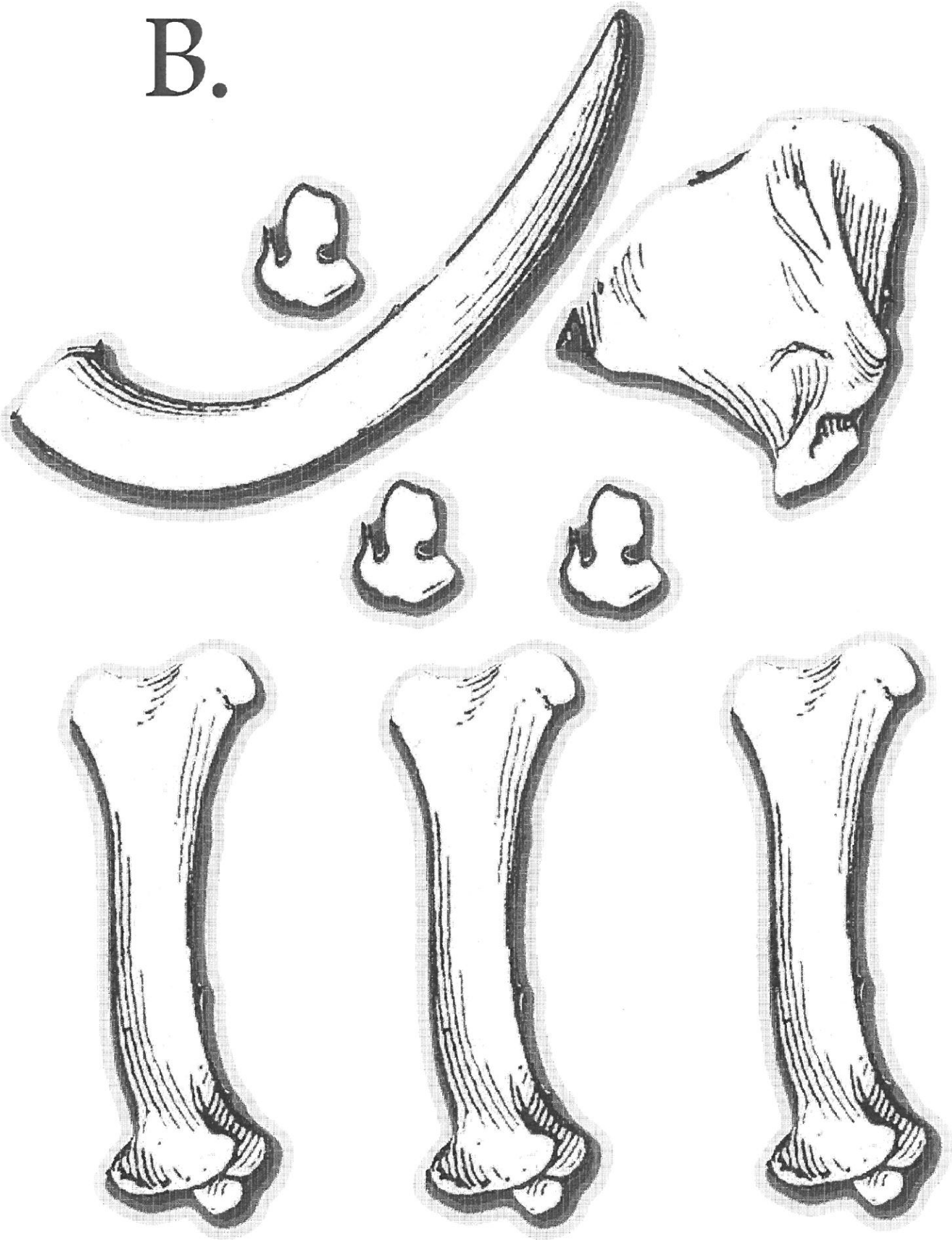

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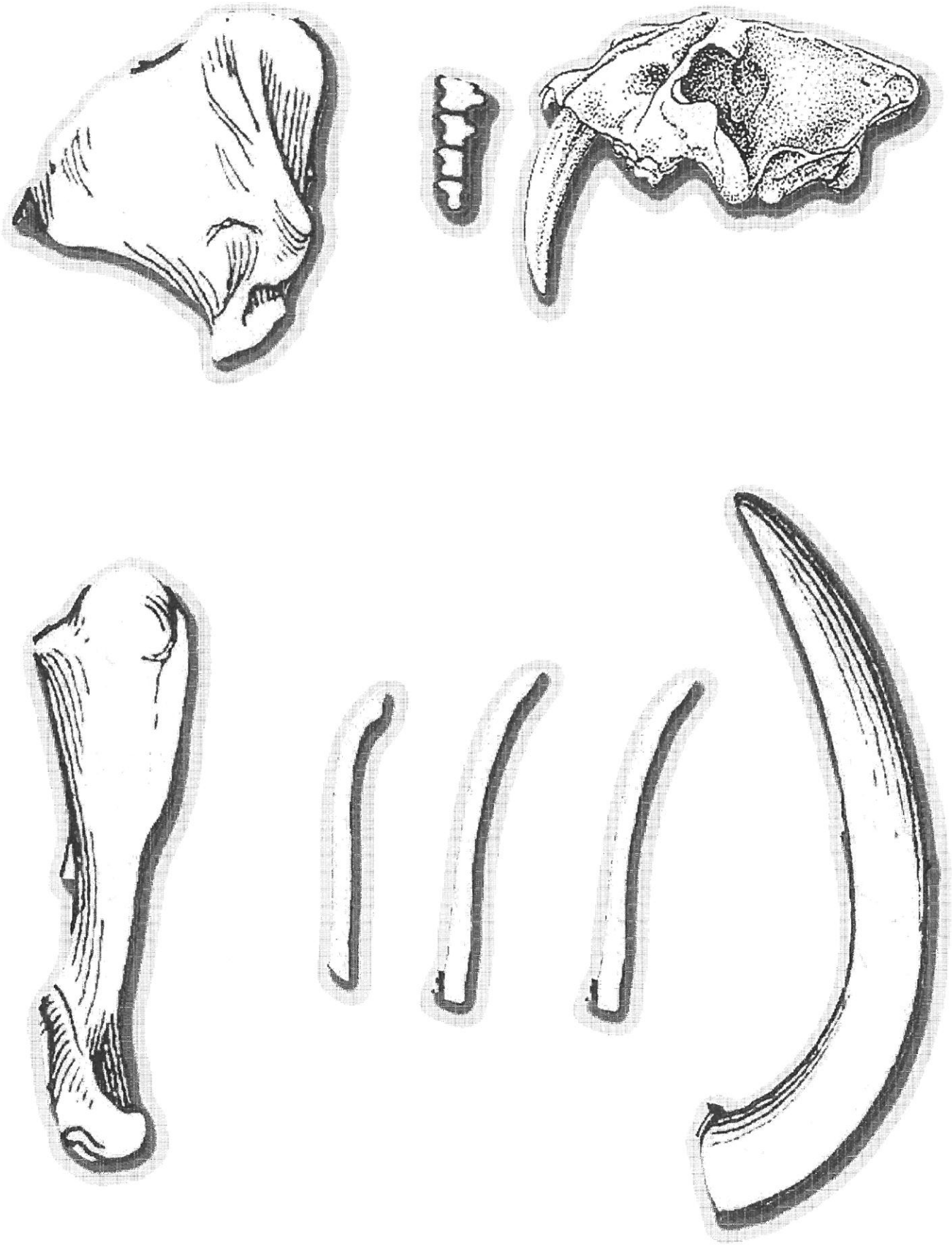


Mammoth Dig Worksheet

How many of each type of bone did you find?

Skull

Rib

Humerus

Scapula

Unknown Bone

Tusk

Vertebrae

Femur

Tail Vertebrae

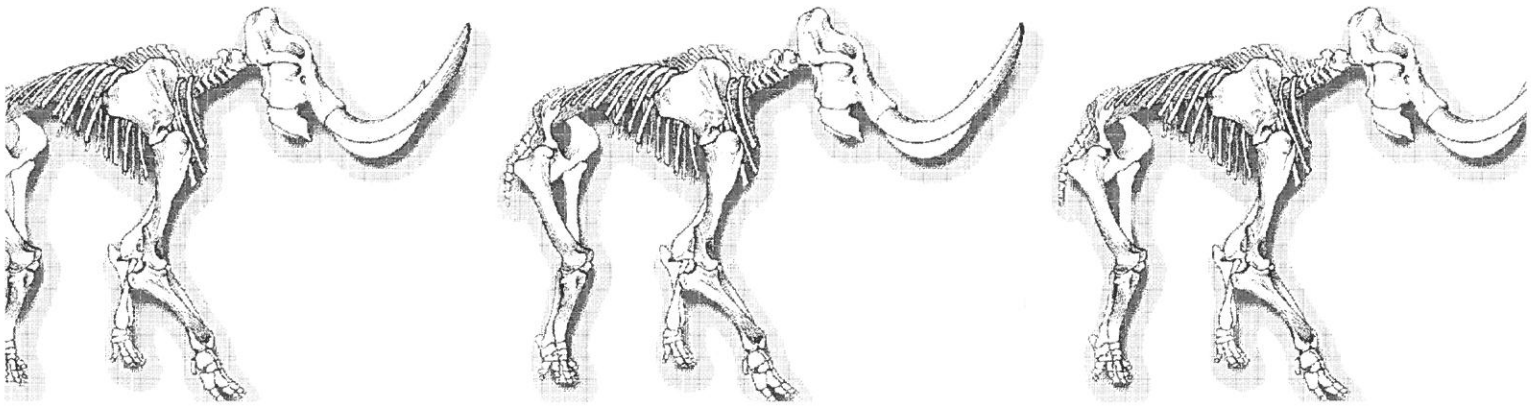
How many mammoths do you think died in the lake?

Could there have been less?

Could there have been more?

How do you think the mammoths died?

A stone cutting tool is found by some of the mammoth bones.
Does this change your opinion of how the mammoths died?



Mammoth Museum Mount