TeacherLore

Exploring deep time

Building knowledge, step by step

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We don't know for sure when people first arrived in Montana, or where they came from. What we do know is that someone made careful funeral preparations and buried a baby on a bluff near Livingston, 12,800 years ago, at a time when the world was getting warmer and the Ice Age was ending.

Who were those people who once fished in rivers and walked mountain trails in the places that today we think of as our places. Looking at their meticulously made spear tips and arrow heads, we can be sure that their skill was earned through hours of experimentation and practice. It is not easy to strike one rock with another just hard enough and at just the right angle to chip away a flake, bit by bit turning stone into an elegant, leaf-shaped point with razor-sharp edges.

It's easy to imagine an older man teaching the secrets to a boy. We can almost picture them sitting side by side on a hill, maybe with a bundle of cores carried from a distant quarry and meticulously chipping away bits of stone to form long grooves down both sides so a split wooden shaft can be forced over it and wrapped tightly with buffalo tendon to make an elegant and deadly weapon.

We see evidence of their camps and kill sites, and so we think they lived and traveled in small family bands, moving often to hunt wild game and to gather wild plants. We think that they lived in simple shelters of brush, poles, and hides, and that sometimes they made camp in existing rock shelters and caves. We see evidence of their spirit quests high in the mountain country and of their stone cairns stretching away to the landscape and pointing toward mystery. We know what they ate at different sites, so we know that some of them were in the broad valleys in the spring time and in the foothills in the fall. They moved seasonally, following food sources.

In late prehistoric times in the Northern Rockies, grizzly bears came out of caves in the high country in late winter, ravenous and searching the lower slopes for winter-killed carrion. In early spring, sunflowers bloomed on the south slopes of foothills and later in the spring the Bitterroot's bright fuchsia blossoms adorned the valleys. In mid summer, huckleberries ripened on mountains slopes in the mottled light under Ponderosa stands that were kept thinned by regular fires. As summer days waned, antelope gathered into large herds, posting sentries and grazing on the golden grass, and as the air became cold, bull elk became belligerent and reckless, descending from high ridges, bellowing challenges.

Some of what we think is based on what we know of peoples in the recent past. The Salish moved in family groups to different areas in different seasons based on their knowledge of plants and animals. From time to time, small groups of Salish gathered together into larger groups at places where food was abundant, such as the camas fields that made spring meadows look like blue lakes. At such gatherings, they greeted relatives and old friends, shared hunting information, got married, and danced and prayed together.

Such lifeways are similar in important ways to many peoples throughout the world, and so we draw on them in making educated guesses about deep time. Salish oral traditions say they have been in western Montana since time immemorial and this is true, in the sense that we have no memory of a time when they were not here. Oral traditions preserve an important kind of knowledge, passing on cultural understandings that help people decide who they might to be.

People digging in the earth for knowledge are generally preoccupied with insight of a different order. Archaeologists study the past by looking carefully at material evidence such as tools, bones, shelters, clothing and jewelry.

In the summer of 1927, Carl Schwachheim found something that he knew was going to create a stir. In Wild Horse Gulch, eight miles west of Folsom, New Mexico, about eight and a half feet beneath the surface, the amateur naturalist found a spear point lying amid the ribs of a bison. What was especially strange was that the bison was of a species that had been extinct for millennia. Most professional archaeologists believed that humans had not been in the Northern Hemisphere until thousands of years after those

Unless otherwise noted, all photos in "Exploring Deep Time" and "The Old North Trail" are courtesy of the State Historic Preservation Office, Montana Historical Society.

ancient beasts had vanished.[1]

When he knew for sure what he had found, he stopped digging. He got his camera and photographed the spear point where it lay with the bones. That picture is somewhat famous in archaeological circles. It changed our understanding of deep time.

Schwachheim next sent a telegram to professional archaeologists, asking them to come examine the site before he disturbed it any more. If the spear point had once been embedded in the bison's flesh, it was clear that humans had hunted these beasts.

The place where he was digging had been known to the rancher who owned the land for eighteen years, but most professional archaeologists did not take reports of what had been found there seriously. Because Schwachheim left the point where he found it, the archaeologists who came in 1927 were convinced. Further excavations helped them piece together more of the story.

We now know that on a fall day 11,000 years ago (we know it was fall by the developmental stage of fetal remains), a group of hunters trapped a herd of buffalo (*Bison antiquus*) in that southwestern arroyo. Using stone-tipped spears, they killed about thirty animals and butchered them where they lay.

In further study at the site, archaeologists found over twenty of the distinctive spear points embedded in the bison skeletons. Many points of the same style—now called Folsom points—have since been found at other sites. They are usually about two inches long with grooves, or flutes, for the spear shaft cut into each side, and they are extremely sharp, with 100 or 150 sharpening flakes removed from their edges.

They are examples of high-quality stone age technology. With these elegant weapons, hunters killed bison that are much larger than modern buffalo.

The Folsom discovery quickly changed our understanding of the distant past. It was clear that humans had been in America far longer than most scientists had thought. Researchers began searching for evidence—which they found—that people had been here during the Ice Age more than 10,000 years ago, at the same time as sabertooth tigers, dire wolves, giant ground sloths, wooly mammoths, mastodons and the other dramatic giants—the so-called megafauna of the Pleistocene ("Pleistocene" means "most recent," and it refers to the last ice age).

Small discoveries can change our understanding of the distant past in large ways, partly because so little is known that any new fact can make a big difference. This is because a lot of what we *suppose* is based more on logic and reasoning than on physical evidence. Since there are many more possibilities than we can imagine, merely logical theories are likely to be based on mistakes. This is why scientists do not think far without hankering for observations.

But how can we observe events that occurred twenty or thirty or a hundred centuries ago? Faced with that challenge, archaeologists, geologists, and other scientists interested in deep time have come up with hundreds of clever strategies, some of which I'll talk about. They figure out these strategies by playing around with ideas—using their imaginations and speculating on what might have happened. This is normal for young sciences such as archaeology. The speculations help researchers form plans for systematic observations. Then their findings and their reasoning are published so other people can check them out. These other people agree sometimes and add more information. But they also disagree sometimes, pointing out flaws in the research methods or suggesting different explanations.

How Do We Know?

The world of the distant past doesn't give up its stories easily. You can't run simple experiments or interview witnesses to learn about the way things were thousands of years ago. But careful examination of what survives from the

Montana State University archaeologists raised private funds in order to conduct systematic excavations and analysis at this privately-owned site. It dates to 9,410 BP, making it one of the oldest sites in Montana and certainly one of the oldest to benefit from careful study.

past allows us to make sense of what has happened. In 1797, Englishman John Frere discovered a collection of what he thought were probably hand axes made of chipped flint buried twelve feet deep in a layer of gravel. Above them in a layer of sand he had found the bones of extinct animals.[2]

Frere realized that if the layers of sediment had accumulated naturally through time, the deeper layers would be older than the higher levels. When students turn in their textbooks at the end of the year, each one might set his or her book on a pile beside the teacher's desk. If someone came in after all the books were returned and tried to guess which book was turned in first, he could reasonably assume it would be the one on the bottom of the pile. Nature works in a similar way. As leaves fall and dust settles, older layers are buried by later layers. If you dig down a few feet, you'll see the various layers or what scientists call strata. The deepest strata are the oldest.

This simple insight led Frere to think that whoever had made the axes had lived earlier than the extinct animals. If this reasoning were correct, then humans had been living in England much longer than most people had thought. This was an early example of an important archaeological method: gathering information by excavating sites (digging into the earth and making a systematic record of what is found). Before any soil is moved, archaeologists lay out a grid of squares with stakes and string, so the precise location of any object that is found can be recorded. Using notebooks, graphs, and cameras, archaeologists patiently document what they find as they work by using such tools as trowels, whisk brooms, screens, buckets, transits, tape measures, and rulers.

Archaeologist, and Chester native, Steve Aaberg and other supervising archaeologists, learned that this site had been used continuously for thousands of years. Unusual conditions helped preserve evidence of ongoing human occupation in spite of changing environmental conditions.

In a typical excavation pit, you can see the differences in color and texture of the soil in every stratum as well as the different kinds of artifacts or features found at each level. Artifacts are the material objects; features are the evidence of cultural activity, such as the way shelters are arranged in relation to each other. The patterns found at sites can provide insight into how people lived or worked. How many buildings or tents are there in one settlement? What were they used for? Why are they where they are? Where are the middens (garbage piles) and what do they contain? If debris left from manufacturing tools is outside rather than inside stone circles that were once shelters, it might indicate that the place was used in warm weather.[3] The floor of a small hut in South America, where people lived nearly 13,000 years ago was littered with many plants that we know have medicinal properties. This led researchers to speculate that the village had a drug store of sorts. In Montana, we've found traces of ancient camping spots, kill sites and butcher sites. We've located quarries where stone tools were made, burial spots, and vision-quest sites.

Since excavating a feature destroys it, researchers go to great lengths to create a detailed record for further study. For every hour spent

Context and Consideration

No self-respecting archaeologist patterns his work after Indiana Jones. In fact, we suspect that those competitive "cops and grave robbers" movies have triggered far more harm to Montana's prehistoric sites than provoked interest.

Archaeology is not a treasure hunt. When you and I scramble after artifacts such as arrowheads (projectile points) or dig around a tipi ring or a buffalo jump, we ruin information for archaeologists and hence for everyone. We may also have violated the law since the public's interests are protected on public land.

Why can't we have this kind of Indiana Jones type fun? There are some good reasons.

Let's talk context first. Artifacts by themselves may provide a tiny bit of information. The style of a projectile point or a bone tool will let an archaeologist peg it to a broad time period. But that's all. On the other hand, artifacts in their complete context begin to tell us something. The relationship of point or tool to a tipi ring, to trail ruts, to soil and ash layers, to sources of water, to fire-cracked rocks, to other remaining tools or lithic scatters, or to surviving bones and seeds begins to provide professionals with a substantive picture to analyze. Most components of prehistoric sites are buried beneath more recent soil layers. Professional excavation is painstakingly careful so that the relationships among artifacts, soil,

digging, a researcher might spend several hours in the laboratory, in the library, or at the computer trying to understand and interpret what was found.

Archaeologists also develop ways to get information without digging. They call these "noninvasive" approaches. For example, by using ground-penetrating radar they can "see" some of what lies beneath the surface without disturbing the earth. We have developed sensors that allow us to identify landscape features from aircraft and satellites that we cannot see with our eyes. Images gathered by radar mounted on a satellite can reveal archaeological features hidden by dense jungles or desert sands. Using computers to enhance such images, we can bring out poorly defined features and relationships so they are easier to understand. Looking for patterns similar to those found at known Paleoindian quarries, researchers recently used satellite images made in 1985 to locate eight previously undiscovered quarries in the Horse Prairie Valley in southwest Montana.

This deliberate alignment of rocks points travelers toward Ear Mountain, located in the Rocky Mountain front.

Even microscopic pollen has stories to tell. Each year pollen from plants falls into bogs, which are wetlands with poor drainage. At the end of the Ice Age, melting glaciers left shallow, wet areas where plants decayed slowly or incompletely because not much oxygen was available. Dead vegetation accumulated, forming peat.

Such peat bogs have preserved a detailed record of the past. Since different plants thrive as the climate gets wetter or drier, or warmer or cooler, and since the pollen grains from each plant look different, archaeologists can study the pollen in each layer, "reading" the climate year by year, almost like turning back the pages in a history book. Through such studies we have developed information about what plants were growing at various times in the past, and this in turn tells us how the climate has changed in Montana since the last Ice Age.[4]

Similarly, each year's snowfall in the Arctic forms a new layer on the glacial ice, and these layers can be counted like tree rings. The thickness of each ring gives some indication of how much snow fell that year.

Also, since water contains two oxygen isotopes (atoms with different numbers of neutrons), and since how much of each isotope is present changes with the temperature, measuring the ratio between isotopes in each layer lets us estimate how warm or cold it was that year. We now have estimates for annual average temperatures going back about 200,000 years.

Of course, it's not quite that simple. Since these isotope ratios are also affected by latitude, altitude, the time of year, and long-term climate changes, the temperatures we have are only estimates. A lot of knowledge is this way. We make assumptions or educated guesses and do calculations, but the final results include errors. It's common for scientists to try to estimate even how much error their findings might contain by reporting them with a "plus or minus" range.

Our knowledge gets more accurate as we

and other artifacts can be documented and studied. Prehistoric sites are, in fact, like a multi-layered salad in which the location of every ingredient is important for the recipe to be understood. In other words, the context of any manmade or man-affected material explains far more than the item itself ever will.

While an archaeologist enjoys excavating sites, he's not going to do very much of it himself. Archaeologists anticipate that technology will keep improving our ability to "see" what is in the ground without disturbing the site. They want to keep research options open for their successors.

The principle of preserving prehistoric materials in context explains why federal and state laws prohibit the public from disturbing any archaeological evidence on public land. Those same laws require an archaeologist to obtain a permit before disturbing the ground. They must present a plan that justifies removing artifacts or disturbing their context.

We also need to talk about consideration and respect. The artifacts that we find on Montana fields or in our river bottoms are not just evidence waiting for professional examination. They are the remains of someone's life. They are the keepsakes and the mementos of real people and cultures. We understand so clearly the power of our own grandparents' letters or paintings or dishes. Our consideration for prehistoric artifacts needs to be built on the possibility that these items are powerful to people now. Whatever respect we want to be accorded to our own family treasures, we will want to give to those of others.

Where to find information

To get oriented, it's hard to beat an interview with someone for whom Montana's prehistory is the foundation of his cultural knowledge or his profession or both. Think about visiting with an archaeologist or a member of a tribal culture committee.

About three dozen professional archaeologists work in Montana for agencies such as universities and colleges, the U.S. Forest Service, the Bureau of Land Management, state natural resources agencies, and private consulting firms. The Montana Archaeology Education Resource Catalog (http://www.his.state.mt.us/departments/shpo/archaeology/archaeology.html) provides names, addresses, and phone numbers. You can also call the State Archaeologist, Stan Wilmoth, at (406) 444-7719, for help in finding contacts in your area. In addition, most Montana Indian tribes have Culture Committees whose main focus is to preserve their tribe's culture and to pass on their history and knowledge.

Much archaeological research does not involve digging up sites, but researching records of sites that have already been examined. We have not been studying prehistory for very long so less than five percent of the state has been examined for prehistoric sites. For some places, information is still scarce.

All archaeological surveys in Montana are stored in a data base maintained by the State Historic Preservation Office within the Montana Historical Society. Most of the information that they've

develop more information, more sophisticated theories, and better ways of making measurements. Usually, the intent is to get closer to the truth rather than to reach certainty. Few things are certain.

But some things are more certain than others. For example, about 6,800 years ago, Mount Mazama in the Cascade Mountains of Oregon erupted throwing tons of pumice over vast areas of the Northwest.[5] The crater that it left is now called Crater Lake. The ash covered the landscape for hundreds of miles, and archaeologists still find Mazama ash when they do excavations.

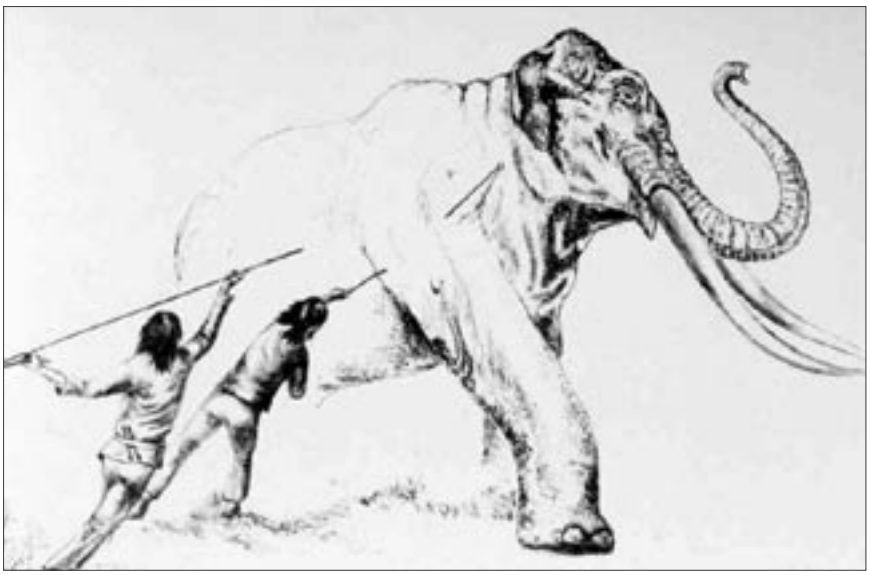
Since volcanic ash can be carbon dated more accurately than many other things, when archaeologists find a white or gray band of volcanic ash in the sediment, they can date that stratum with confidence. Its presence is a good time marker.

Two other volcanoes in the Cascades have left ash in Montana soils that are also important for archaeologists: an eruption of Glacier Peak 12,000 years ago and an eruption of Mount St. Helens 3,400 years ago. As with other forms of evidence, archaeologists need to be a bit cagey to avoid being tricked. Soils can be moved by wind and water, and geological structures can slump and slide.

Some research methods don't involve studying the landscape at all. Linguists and geneticists have been especially helpful. Careful examination of the Salish language spoken by the Flathead Indians has been used to shed light on disagreements among scholars about where their ancestral homelands might be. Some early twentieth century scholars said that they once lived east of the Continental Divide near today's Three Forks. Others suggested that they came from farther west, nearer the Coastal Salish in today's Washington State.

One approach to forming answers to such questions is to analyze the language that the Flatheads spoke. Since new words are often formed by using parts of older words, linguists have reasoned that the oldest words in a language would probably not be made up of smaller parts. Or, as the linguists say, they would be "irreducible" to smaller words. In 1916, linguist Edward Sapir argued that words such as "bow, arrow, spear, wheel…belong to a far more remote past than… such words as railroad, insulator, battleship, submarine…"[6] By figuring out which words are not made up of simpler parts, we may get an idea of which words are oldest.

In a silly example, if the oldest words in Sal-



Department of Fish, Wildlife, and Parks employee Dick Ellis drew this image of a prehistoric hunter attacking a mammoth with an atlatl. It reminds us that Montana's earliest hunters had to get very close to their prey.

This sketch originally illustrated a November–December 1986 article in *Montana Outdoors* titled "In Search of Early Elephants" by Montana State University scholar, Dr. Les Davis.

collected comes from federal and state agencies that are required by law to minimize the impact of their actions on significant historic and prehistoric places. Before a road is relocated, for example, a survey will be done to determine if important cultural sites will be affected. Agencies write reports that describe the archival and field research that has been done to understand how an area was inhabited or used in the past. Periodically, agencies prepare "overviews," or summaries, of all that they know about a region. These overviews can be especially valuable for later researchers.

Because the data base contains information about sensitive sites, it is not accessible by the public. But Damon Murdo, Sites Records Manager, can run a search for you if you provide him with the legal description of the area that you're interested in. He can also search a more broad area such as a county. You may also want to talk to him about your research interests and the questions you are exploring.

Federal and state regulations don't allow the Office to give you information on the exact locations of specific sites to protect areas from vandalism or pot hunting. But Damon can match you up with general descriptions that archaeologists have written about Montana regions, with archaeological overviews, and with published articles on the topics that relate to your interest.

You can reach Damon at the State Historic Preservation Office, P.O. Box 201202, Helena, Montana, 59620-1202; (406) 444-7767, or by email at dmurdo@state.mt.us.

ish included names for such things as "cactus," "sand dune," and "armadillo," we might suspect that a long time ago the Flatheads lived much farther south or that the climate in Montana was once much warmer.

Of course, the Flatheads did not have lots of words for desert plants and animals. However, they did have irreducible words for animals such as moose, that are native to Montana but not to Washington. This evidence supports those, including the Flatheads themselves, who believe the Flatheads have been in Western Montana for many centuries.

It doesn't prove it, though. Not all irreducible words are ancient, and some words are simply taken from other languages. The farther back in time we go, the less information we have. For many questions, there are so few facts available that explorers of deep time can rarely be certain of their interpretations. Disagreements among scientists about how various facts might be explained happen all the time. In fact, such disagreements are what science is all about.

Nonetheless, error is slowly replaced by knowledge, and weaker interpretations give way to stronger interpretations. Some questions get settled to everyone's satisfaction, and we all move on to new questions.

While forming questions and playing with possible answers, scientists sometimes stand on mountains and look at the landscape, visualizing how the hills and valleys could have been shaped and formed, feeling the wind and rain and sun, and thinking how the forces that operate in the world today might have operated in the distant past. Their thought processes are the same as the thought processes we all use every day. What's different is that they work systematically in a larger community of others who share the same questions and the same data.

What do we know about Montana?

The last Ice Age reached its peak about 20,000 years ago, and after that the huge ice sheet covering Canada and extending into Montana began melting. It took thousands of years for the ice to retreat to near its present extent. The glacier was gone from Lost Trail Pass in the Bitterroot Mountains by 12,000 years ago, which left a lake surrounded by a short grass prairie dense with sage brush. The lake eventually became Lost Trail Bog. From pollen fossils we know that within another 500 years forests of whitebark pine mixed with some fir and lodge-

This tipi ring site is unusual for the internal feature within it. Contemporary Blackfeet people tell us that this is likely a marker commemorating an important family event.

pole pine replaced the prairie.

For decades, most archaeologists believed that the first inhabitants of America came through Beringia from Asia into Canada, dropping down into Montana. "Beringia" is the land, now under the waters of the Bering Strait, between Alaska and Northern Asia. During the Ice Age thousands of miles of forests grew there. The dry land was exposed because enormous ice sheets, spanning entire continents, had locked up so much water that the sea level fell.

For most of the Ice Age, Canada was covered by a vast layer of ice—the Cordilleran (mountain) Glacial Complex west of the Continental Divide and the Laurentian (continental) Ice Sheet east of the Divide grew together and formed a single sheet of ice thousands of miles across and thousands of feet deep.

During warmer periods enough ice melted to open a passage a few hundred miles wide between these two ice sheets, leaving a wide swath of land on the east slope of the Canadian Rockies. This ice-free corridor led from the far north directly into Montana. Many archaeologists thought it probable that bands of hunters moved south through the cold, wet landscape between the giant glaciers. This is the route referred to as "the Old North Trail."

Photo by Christa Umphrey

Organized buffalo hunting, including the use of landforms to kill or cripple large numbers of bison, became more common on the High Plains about 1,500 years ago. This buffalo jump, Ulm Pishkun, is located south of Great Falls.

Scientists estimate that one of the times the ice-free corridor opened was near the end of the Ice Age about 14,000 years ago when the ice was melting. But this wouldn't leave time for people to have populated South America by the time evidence of human presence begins to appear. Linguist Johanna Nichols claims that the languages spoken by Native Americans differ from each other too much to have come from a common tongue so recently. She believes that people might have had to be here by 35,000–50,000 years ago for the 143 Native American languages she has studied to be as different from each other as they are. Even if there were several migrations from different areas, she believes that people would need to have been here far more than 14,000 years.[7] Her theories are not widely accepted though they steadily attract new people who find them plausible.

More recently, some archaeologists have theorized that early people skirted the glaciers by traveling south along the Pacific coast, maybe in skin boats, before dispersing into North and South America. This would have allowed faster movement south. However, no one has uncovered much tangible evidence to support this idea, which might not be too surprising since sea

Reading and talking about Montana's prehistory gets much easier with a few facts tucked away:

Time: The amount and sequences are daunting. We peg the earth's beginning trillions of years ago. Plants and some animals arrive billions of year ago. Humans arrive in Montana 10,000 to 20,000 years ago. In the big scheme of earth time, humans arrived just yesterday.

Everything changes: When we talk about prehistoric people, we are talking about people who lived over a span of 10,000 years or more. There is no easy way to characterize simply what people, plants, animals, or tools were like for that long. Everything kept changing. And, just as is true today, the people who inhabited Montana at any given time in prehistoric times were not necessarily alike.

Dinosaurs and people: They did not live during the same period of time. Dinosaurs were mostly gone about 65 million years before humans arrived.

Generalizations and simplifications: We're still missing useful words to describe the people who lived here in prehistoric times. They hunted animals and gathered plants, roots, and berries. They weren't farmers. But identifying these humans as hunters and gatherers leaves out a lot of their lives: family life, spiritual practices, play, politics. The word nomad is tricky, too. Prehistoric people in Montana did not, to the best of our knowledge, build and live in one dwelling or place for their whole lives. But neither did they move aimlessly.

Tribes and prehistoric people: Are the tribes who live in Montana today the descendants of prehistoric people? We don't have a final answer. The origin stories and histories of many Montana tribes place them back into an indefinite and long past. Archaeologists trace some tribes back through other means into the Late Prehistoric Period. And we also know that tribes and the territories they occupied shifted considerably in the last several hundred years.

levels were much lower then. What was once the coast is now under water.

Many archaeologists now believe there isn't a simple story that will explain what happened. Researchers have suggested that various groups migrated from various places over various routes and at various times (some genetic evidence indicates that Native Americans came not only from Asia but also from Africa, Australia, and Europe). Multiple migrations would help explain why Native American languages are so different from each other. Some spear points found in ancient France are similar to some found in America. This suggests that people migrated to America from Europe.

We are on a little firmer ground in trying to reconstruct the ecology of the past. The high water run-off caused by melting glaciers deposited large piles of gravel that remain today. As the ice retreated between 13,500 and 11,800 years ago, the climate, though warmer than it had been, was still cooler and wetter than today. As the world warmed, cold-climate plants and animals in Montana were gradually replaced by other species familiar to us today, but this transition took several thousand years to complete.

Much of Montana changed from semi-arid to arid. Depending on location, this change occurred between 11,000 and 8,000 years ago. At the Indian Creek Site, located in the Elkhorn Mountains of Montana near Townsend, an abrupt change from coniferous forest to sagebrush steppe occurred approximately 9,400 years ago.

Western Montana stayed cooler than present until about 7,000 years ago. Timber line occurred about 2,000 feet lower than it does today, and many of today's forests today existed as sagebrush steppes. A steppe is a cold, dry landscape, usually with strong winds and frequent droughts. Steppes are also called shortgrass prairies. In the Northern Rocky Mountains, west of the Continental Divide and north of Helena and Missoula, ice-age conditions lingered longer in some of the more sheltered mountain canyons than on the prairie.

Most of the plants and animals we know today, such as pronghorn antelope, elk, and deer, existed then. But the world of the past also included many animals that have vanished—species like the giant short-faced bear, a very large type of bison called *bison antiquus*, and several species of camels. Wooly mammoths were here—fourteen feet high at the shoulder—and people hunted them with atlatls, or spear-throwing sticks.

The changing climate and possibly increased hunting pressure led to a sudden die-off of the Ice Age Megafauna. Sudden, that is, in geologic time. Most of the die-off occurred between 12,000 and 7,500 years ago. Camels and mammoths were gone by 11,000 years ago. Ground sloths and saber-tooth tigers may have lasted until 9,500 years ago. By 8,000 years ago, horses were gone. Altogether, thirty-three percent of existing mammalian species were lost.

The warming and drying trend intensified about 8,000 years ago, causing a great drought known as the "Altithermal." It reached its peak about 7,000 years ago but lasted about 4,000 years. Its effects, including its local variations, aren't well understood. But most researchers think that as this great drought continued, the Great Plains supported fewer grazing animals and thus fewer humans who depended on them. We find little evidence of human presence on the Great Plains during this period. Some of what we have found, though, such as mortars and pestles, suggest that people were processing more plants for food.

Evidence of human activity greatly increases for periods later than 3,500 years ago. Tipis became common and tipi rings are found in many places on the Montana landscape. Bows and arrows replaced atlatls, and small projectile points and stone quarries are found in many places. Communal hunting techniques, such as driving buffalo off of jumps or into corrals, became widespread. These have left large accumulations of bones and other artifacts.

For the most part, we go about our lives unaware of the mysterious presences in the landscape. But our own lives are richer and deeper when we invite thoughts about the other people who once hiked these mountain passes, built hunting camps along creeks, mined quarries for good stone, traded with others for goods not available near at hand, and worked together to corral wild bison. Their cairns and shelters and tools linger in the landscape, for the most part unnoticed by we moderns, whirring by on highways that, in whisking us from point to point, often narrow our view.

If we consider the 150 centuries since the first human came to America to be a day, then the American Revolution was thirty-six minutes ago. Interstate 90 has been here less than five minutes, less than a flicker in the earth's history. Our lives are formed in part of patterns and forces we do not entirely, or even mostly, see. Interestingly, our knowledge of deep time increases every year, and so as the future unfolds so does the past.

Year by year, we move closer to, rather than farther from, those ancient fellows.

[1] Thomas, D. (2000). *Skull Wars*. New York: Basic Books.

[2] Ibid

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[4] Mehringer, P, S. Arno, K. Peterson (1977). "Postglacial history of Lost Trail Pass Bog, Bitterroot Mountains, Montana." *Arctic and Alpine Research* 9(4):345-368.

[5] Gilsen, L. (1999). "Early archaic period," *Oregon Archaeology: Prehistory.* <http://www.ncn.com/~gilsen/webdoc7.htm>.

[6] Sapir, E. (1916). *Time perspective in aboriginal American culture: A study in method.* Canada Department of Mines, Geological Survey, Memoir 90, p. 54.

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