REVISING THE HISTORY OF THE AMERICAS

Introduction

Focus
This *News in Review* story looks at some recently discovered ancient artifacts that are causing archaeologists to rethink their theories about when people first began to arrive in the Americas and how they may have come here.

Newly discovered artifacts have shaken the widespread consensus among archaeologists about when and how the first inhabitants of the Americas arrived in this hemisphere. A 14 000-year-old coprolite—or chunk of fossilized human excrement—found in a cave near the town of Paisley, Oregon, may not sound very glamorous, but it is causing a great deal of excitement among archaeologists. This is because human DNA has been extracted from it suggesting that people were already inhabiting the west coast of what is now the United States at least one full millennium before the first migrants were believed to have arrived via a land bridge that once linked Siberia to Alaska.

In addition to raising speculation about how long humans have been present in the Americas, recent discoveries have led scientists to rethink the route the continent's first inhabitants might have taken in order to arrive here. A land bridge between Russia and Alaska is not believed to have existed at the time the coprolite was formed. This means that the individual who produced it, and other prehistoric people who formed part of his or her group, had to reach North America from Asia by a different route, probably by sea over the ice-strewn waters of the Pacific.

Other discoveries point to the presence of human beings in the farthest southern tip of the Americas around 14 000 years ago. For example, a rare variant of human DNA that is found among Aboriginal people in Alaska and California has been traced to some Aboriginal people from Mexico, Ecuador, and Tierra del Fuego, the remote peninsula that forms the southern tip of the Americas shared by Chile and Argentina.

Such discoveries have raised some questions in the minds of traditionally minded archaeologists who still believe that the first inhabitants of the Americas arrived via the Beringia land bridge. Instead, the new theory of a series of coastal migrations, predating the overland route by at least one millennium, is beginning to take hold and is causing a great deal of excitement and controversy in archaeological circles worldwide.

To Consider

1. What have you been taught about when and how the first human beings arrived in what is now Canada, the United States, and other parts of the Western Hemisphere?

2. Does the newly discovered archaeological evidence cast this information into question?

3. Why do you think archaeologists are so excited about the coprolite recently discovered in Oregon's Paisley Cave? Do you find it interesting? Why or why not?

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Video Review

Definition
Berengia is the name given to the land bridge that connected Russia to Alaska thousands of years ago. The name came from the fact that the land bridge crossed the Bering Strait.

Further Research
Learn more about archaeology by checking out *Archaeology* magazine at www.archaeology.org.

Pre-viewing Questions

With a partner or in a small group discuss and respond to the following questions.

1. How much do you know about when and how the first inhabitants of the Americas arrived in the Western Hemisphere?

2. Are you aware of any new archaeological findings that might lead scientists to rethink their theories about the arrival of the first peoples in the Americas?

3. Do you think it is important for archaeologists to continue to search for clues that might help them in their search for evidence regarding this question?

Viewing Questions

Respond to these questions as you watch the video.

1. What is the commonly accepted theory about when and how the first peoples arrived in the Americas?

2. What is a coprolite? Where has one been recently discovered?

3. Why is a coprolite such a rare archaeological find? What else has been found at the same site where the coprolite was discovered?

4. What did a Danish geneticist discover when he examined the coprolite? Why was this so controversial?

5. What was the Clovis culture? What does the coprolite suggest about human presence in the Americas prior to this time?

6. In addition to the coprolite, what human artifacts are archaeologists unearthing in the Paisley Caves?

7. What is Arlington Springs Man? Why was his discovery on Santa Rosa Island, off the coast of California in the 1950s so important?

8. What theories are archaeologists proposing to explain alternative routes that early settlers may have taken in order to reach the Americas from Asia?

9. How do the discoveries at the Paisley Caves and Santa Rosa Island relate to other artifacts found in Monte Verde, Chile?

10. How has recent DNA evidence served to bolster the theory of a series of prehistoric coastal migrations to the Americas from Asia?

Post-viewing Questions

1. Now that you have watched the video, revisit your response to the Pre-viewing Questions. How has watching the video helped you to respond to the questions in greater depth?

2. Do you think that the coprolite discovered in the Paisley Caves, along with other artifacts presented in the video, provides sufficient evidence for a rethinking of the commonly accepted theory about the arrival of the first peoples in the Americas? Why or why not?

3. Do you think these discoveries will prove to be of much interest to the general public, outside of the narrow circle of archaeologists and scientists? Why or why not?

4. Many First Nations peoples believe that their ancestors have lived in the Americas "from time immemorial." How do you think they might react to these new archeological discoveries?

REVISING THE HISTORY OF THE AMERICAS
What We Thought We Knew

Definition
Cold War: A period of hostility that followed the Second World War when the United States and the former Soviet Union amassed nuclear weapons to try to deter one another from attacking any other country

Focus for Reading
In your notebook, create an organizer like the one below. As you read the following information on the early settlement of the Americas, record key points in your organizer. You should be able to enter at least two or three points in each section of your chart. You will be using this information in the activities that follow the text material.

The Land Bridge • In prehistoric times Siberia and Alaska were joined by a land bridge called Beringia. •
Paleoamerican Societies • •
The Significance of the Clovis Culture • •

The Land Bridge
The Bering Strait is a frigid body of water that separates Russia from Alaska. The International Date Line runs through the strait, dividing the globe into two different time zones. During the years of the Cold War it was a significant and sometimes dangerous flashpoint between the United States and the former Soviet Union, two superpowers that were in conflict. To this day, it remains one of the most sparsely inhabited and forbidding regions of the world.

Many millennia ago, the Bering Strait did not exist. Instead of being separated by a narrow body of water, the Eurasian and North American land masses were actually linked by a land bridge called Beringia. Until recently it was believed that the first inhabitants of the Western Hemisphere migrated from Asia via this land bridge around 13 000 BCE.

Those early peoples would not have been aware that they were entering a new continent as they followed herds of long-extinct prehistoric animals such as woolly mammoths and giant mastodons over the land bridge. These beasts and other now-vanished species were an important food source for the first human residents, who also supplemented their diet by foraging for nuts and wild grains, and catching fish. As hunter-gatherers, these nomadic people were constantly on the move in search of dependable food supplies, especially in the warmer months.

Paleoamerican Societies
The journey across Beringia into the new continent would be only the first leg of an epic odyssey that would take many thousands of years to complete. But when it was done the descendents of these travellers—known as Paleoindians or Paleoamericans —would have established their presence throughout the Americas, a distance of approximately 14 000 kilometres—the longest continuous land mass on Earth.

In environments as radically diverse as northern ice fields and tropical jungles, they would eventually create myriad different cultures, languages, and ways of life. Their ability to adapt

to and flourish in such a wide variety of challenging natural habitats is one of the most remarkable stories in the development of humanity over the millennia of prehistory.

For many years, archaeologists who have studied the prehistory of the Americas have believed that the continent's first peoples began to migrate after the vast sheets of ice that once formed impenetrable barriers to settlement began to melt along the Pacific shoreline and the interior valleys between the western mountain ranges of the continent. This glacial process of climatic and topographical change took millennia to complete, and probably occurred between 18 500 and 15 500 years ago. The early migrants probably travelled on foot, moving slowly through the mountain passes, or may have used small boats to advance southward along the shoreline in slow but steady stages.

Paleoamericans are also known as the "lithic" peoples, referring to the flaked stone tools they used for hunting. Archaeologists have identified clear similarities between relics of prehistoric stone points and other tools found in various sites in the Americas with similar artifacts discovered in eastern Siberia. Along with these links, other connections between ancient peoples on both sides of the now-vanished land bridge have been established. Among these are common linguistic patterns, blood types, and genetic composition. In addition, prehistoric skulls unearthed in sites throughout the Americas have shown themselves in some cases to be similar to those discovered in Siberia.

The new arrivals would have moved south, following the big game in bands of between 20 and 60 members of an extended family group. During the short period between spring and fall, food would have been readily available in the form of wild land animals, fish, and birds. While the men hunted, women and children would have been busy gathering nuts, berries, and edible roots and plants in the forests and by the shore. When the weather turned colder, the bands would occupy themselves by storing food supplies and fashioning warm clothing from the animal hides and furs they would need during the long winter months. At that time of the year, the bands would probably break up into smaller groups to hunt and trap food and furs. In order to sustain themselves, these bands probably had to change locations every few days.

The Significance of the Clovis Culture

For many years, it was believed that the oldest example of human habitation in the Americas was the Clovis culture—made famous by its distinctive fluted stone projectile point, the Clovis point. These highly effective points, along with many other prehistoric artifacts, were originally discovered in the area around the small town of Clovis, New Mexico, in the 1930s. Archaeologists exploring other sites were later to find similarly shaped points in a number of locations throughout the Americas, leading them to conclude that the people responsible for making them were either offshoots of the original Clovis culture or separate groups who adopted its superior form of hunting technology.

From radiocarbon dating of Clovis culture artifacts, archaeologists were able to determine that this early human society in the Americas probably began around 13 500 years ago. It lasted for at least 3 000 years, until it eventually gave way to other prehistoric cultures such as the Folsom people, North America's first bison hunters. A number of theories have been advanced for the disappearance of the Clovis culture, including gradual climate change, overhunting of now-

extinct animals, territorial clashes with other groups, or possibly even a cataclysmic extra-terrestrial event.

Until recently, the majority of archaeologists who study the early peoples of the Americas have been confident in their support of the "Clovis first" theory, meaning that the Clovis culture was clearly the first form of human society to emerge anywhere in the Americas. Their main argument in support of this belief was the fact that no verifiable archaeological sites or artifacts that pre-date the Clovis culture had ever been unearthed. However, by the early years of the 21st century, this theory was to face a serious challenge, as archaeologists working in a number of places in both North and South America were discovering some very interesting and controversial finds that were beginning to call the validity of the "Clovis first" theory into question.

Follow-up

1. With a partner or in small groups, compare the information in your summary chart. Help each other to complete any missing information.

2. Why do you think the emergence of so many different societies throughout the Americas is such a major achievement in the development of humanity?

3. What are the main strengths of the "Clovis first" theory in explaining the origins of human societies in the Americas? How might this theory be challenged or disproved?

REVISING THE HISTORY OF THE AMERICAS
New Evidence

Focus for Reading
As you read this section, make a list of what you consider to be the main arguments supporting each of the three theories concerning the arrival of the first human beings in the Americas and from where they may have originated.

The Coastal Migration Theory
In places such as the Channel Islands off the coast of California, Monte Verde in Chile, and a scattering of sites across the U.S., Mexico, and Brazil archaeologists are finding new evidence strongly suggesting the presence of humans well before the Clovis culture took root. The new hypothesis has come to be referred to as the "coastal migration theory," and it proposes that there was not one, but a number of different migrations from various parts of Asia to the western coast of the Americas in the millennia prior to the time when the Beringia land bridge would have been a viable entry point.

Scientists who study coastal marine life in the area believe the first migrants may have reached land after a long sea voyage over the Pacific, based on the presence of plants they would have relied on as sources of food. DNA evidence has also been found in support of the coastal migration theory, with recent studies of the genetic make-up of some First Nations peoples suggesting that they may have diverged significantly from the prehistoric inhabitants of Siberia as early as 20 000 years ago. Some prehistoric skulls unearthed in a remote part of Mexico inhabited by a long-isolated tribe are quite different in shape from those found in Asia, while more closely resembling those from Australia.

The Solutrean Hypothesis
The Solutrean culture is the name given to a prehistoric society that flourished in what is now southwestern France and northern Spain during the coldest period of the Pleistocene—dating from 24 000 to 19 000 years ago. The Solutrean people painted murals, used bone needles to produce tight-fitting garments made from animal skins to repel the cold, and wielded weapons with stone points shaped like a laurel leaf in order to hunt prehistoric big game.

In 1999 Dennis Stanford and his colleague Bruce Bradley, two archaeologists working at the prestigious Smithsonian Institution in Washington, D.C., advance a startlingly controversial theory. Even more radical than the "coastal migration" idea, Stanford and Bradley's "Solutrean hypothesis" proposed that the first inhabitants of the Americas might not have come from Asia after all, but from southern Europe, many millennia before their successors arrived on the continent either via the Beringia land bridge or the sea route across the Pacific. They based this stunning theory on what they claimed were remarkable similarities between the stone projectile points dating from the Solutrean and Clovis eras. The two archaeologists also suggested that the Solutrean peoples might have been able to cross the vast, icebound North Atlantic in stages, using small boats and stopping to camp on the edges of the vast sheets of ice that once covered this body of water on their epic trans-Atlantic trek.

"Beyond the Fringe" Theories
Probably the most radical, if not bizarre theories about the early inhabitants of the Americas come from a highly unorthodox school of archaeologists

who call themselves the "cultural diffusionists." They believe that there may have been a whole series of intentional contacts between peoples living in the Americas, Europe, and the Pacific during the late Stone Age, the period dating from 7 000 to 3 000 BCE, well after the Western Hemisphere was inhabited. Cultural diffusionists believe that a number of different visitors in prehistoric and historical times actually reached not only the coasts but even the interior regions of this vast continent and left traces of their presence in the form of stone carvings and other evidence that traditional archaeologists find embarrassing and hard to explain.

For example, who could have carved the inscriptions found in a stone at Grave Creek, West Virginia, that closely resemble writing from the Phoenicians, a seafaring Mediterranean people who flourished in pre-Roman times? How did a large stone block with medieval Norse runes dating from the time of the Vikings make its way to Kensington, Minnesota? What is a rough version of the Old Testament Ten Commandments written in Hebrew script doing on a boulder-sized stone tablet near Las Lunas, New Mexico? How did the sweet potato, a plant believed to be unique to the Americas, migrate to Polynesia as early as 400 CE? And how can one explain depictions of what appears to be maize, another Western Hemisphere crop, on temple carvings dating from the 13th-century CE in Karnataka in southern India?

Perhaps the most controversial example is the case of Kennewick Man—the skeleton of a 9 300-year-old man unearthed in Washington State in 1996. When the archaeologists researching this find reported that Kennewick Man's skull bore Caucasoid rather than Mongolian features, the alarm bells went off. If true, this would suggest that the First Nations peoples—whose ancestors are believed to have originally migrated to the New World from Asia—might not have been the continent's only inhabitants. But scientific investigations of the skeleton were abruptly halted when members of the native tribe on whose land it had been unearthed announced their intention of reburying Kennewick Man, claiming him as their ancestor and not a fit subject for any further archaeological research, including DNA testing.

Follow-up

1. With a partner or in a small group, share your lists of arguments supporting each of the three theories about the arrival of the first peoples in the Americas. Which of them do you find to be a) most and b) least credible, and why?

2. What archaeological evidence do you think would have to be discovered in order to prove any of these theories to the satisfaction of most archaeologists? Do you think this is likely to happen? Why or why not?

3. Many First Nations people believe that their ancestors have lived in the Americas from time immemorial and did not migrate from anywhere. The term *aboriginal*, actually means "from the origins." How do you think First Nations peoples in Canada today would respond to the theories advanced in this section?

4. Do you agree with the decision of the native tribe to rebury Kennewick Man before archaeologists had the opportunity to examine him in detail? Why or why not?

REVISING THE HISTORY OF THE AMERICAS
How is the past uncovered?

Did you know . . .
In 1949 an American scientist named Willard Libby—who had worked on the development of the atomic bomb—published the first set of radiocarbon dates in history.

Focus for Reading
As you read this section, make notes on how archaeologists are using radiocarbon dating and DNA research as tools in their investigation into the prehistory of the Americas.

To many, the image of the archaeologist is that of an Indiana Jones figure exploring fascinating ancient sites in exotic locales around the world. However, as most working archaeologists will attest, the reality is much different and far less glamorous. The process of searching for clues about humanity's past through layers of earth, or under water, can be tedious, laborious work, and the odds of ever finding anything remarkable are very slim. This is why the discovery of a human coprolite in the Paisley Caves was such an unusual discovery, one that has the potential for dramatically transforming the way archaeologists and anthropologists view the prehistory of the Americas.

Radiocarbon Dating and Archaeology
Radiocarbon dating is a technique archaeologists can use to determine the age of any object containing organic matter, such as bones, hair, or plants. Discovered by William Libby in 1949, radiocarbon dating radically transformed the world of archaeology and became the main tool scientists use to date objects up to 50 000 years old.

Prior to radiocarbon dating, archaeologists mainly had to rely on the use of relative dating techniques to determine how old the artifacts they were investigating really were. Relative dating involves placing objects in context and estimating their age relative to other artifacts unearthed either above or below them in an archaeological site. Generally speaking, the farther an object is from the surface, the older it is. This is why archaeologists are very careful not to disturb the objects they uncover while working on a dig, so that they can compare them with others either above or below them in what they refer to as the stratigraphic sequence.

Radiocarbon dating is a much more exact and reliable method for determining the age of organic objects. Carbon is an essential element found in all living things. Carbon-14 is a radioactive isotope because it contains an extra neuron. It is produced in the Earth's atmosphere when nitrogen-14 isotopes are bombarded by cosmic radiation from space. Plants then absorb it through photosynthesis, from where it is passed on to animals and humans.

For this reason, every living thing has a certain amount of carbon-14 in it. When a plant, animal, or human being dies, the amount of carbon-14 gradually decreases through the process of organic decay. The speed at which this decay takes place is referred to as the half-life of the isotope, meaning how long it takes for half of the atoms to decay. In the case of carbon-14, the half-life is about 5 730 years. It is this benchmark that is used to date organic matter.

Radiocarbon dating was essential in the determination of the age of the human coprolite found in the Paisley Caves in Oregon. Because it is composed of organic matter, it could easily be subjected to radiocarbon dating, which revealed that it is 14 300 years old—which is at least one thousand years

Quote
"Archaeology has the ability to open unimaginable vistas of thousands, even millions, of years of past human experience."
— Colin Renfrew, archaeologist, 1973

before the first human beings were believed to have migrated from Asia to the Americas.

DNA Research and Archaeology

In recent years the field of archaeology has also been dramatically altered as a result of the application of DNA sequencing to analyze both ancient human remains and groups of people living today. DNA, or deoxyribonucleic acid, is a material found in living organisms passed on from parents to child. Almost all the cells in a human body contain the same DNA, which is found in the cell nucleus. This is known as nuclear DNA.

Another kind of DNA is found in the mitochondria—structures within the cell that convert the energy derived from food into a form that the cell can use. Every cell contains thousands of mitochondria, which are found in the fluid that surrounds the nucleus of the cell, known as the cytoplasm. Unlike nuclear DNA, mitochondrial DNA, or mDNA, is passed down only from the mother to her children.

DNA provides the genome or genetic code for every human being who has ever lived on Earth. Almost all of it is identical from person to person, but a fraction of a percentage of it accounts for all of the differences among human beings, such as eye or hair colour or resistance to diseases. Very rarely a random genetic mutation occurs, which is then passed down through the generations and can be traced in the DNA of the descendents of the person in whose body it first occurred. By identifying these DNA similarities, scientists can determine whether or not individuals, or even groups of people, share the same ancestor.

Recent DNA research has fairly conclusively proven that everyone living today is the descendent of a single ancestor, a woman who has been named Eve, who is believed to have lived in Africa between 180 000 and 90 000 years ago. This theory supports the "out-of-Africa hypothesis" because it claims that the African continent was the original home of all members of the species *Homo sapiens sapiens*—that is, modern human beings.

DNA evidence has been critical in the examination of the coprolite found in the Paisley Caves. After archaeologist Dennis Jenkins and his team discovered it, they asked Eske Willersley, a Danish geneticist, to examine it. He was able to extract human DNA from it, proving that the person who had produced the coprolite was in fact living in the Americas well over one thousand years before it would have been possible for him or her, and his/her group, to have arrived in North America via the Beringia land bridge. This discovery is a dramatic example of how important a tool DNA has become to archaeologists, and how it may open even more doors to long-unsolved mysteries regarding the early prehistory of humanity.

Follow-up

1. With a partner or in a small group, compare the notes you made on the importance of radiocarbon dating and DNA research tools for archaeologists, especially as they relate to the prehistory of the Americas.

2. Discuss with your partner or group whether you would like to pursue a career in archaeology and why or why not.

REVISING THE HISTORY OF THE AMERICAS

YV *Activity: Establishing Historical Significance*

The presence of modern humans on this planet dates back more than 100 000 years, but only a small fraction of this immense span of time can be considered to fall into the category of "history." This is because it was only a few thousand years ago that people began to record their history in written form. Prior to that, the only traces our ancestors left were artifacts, ruins of dwellings, or human remains. Archaeologists and anthropologists study the prehistory of humanity and from these traces from the long-distant past attempt to piece together an understanding of what life might have been like for human beings living in prehistoric times.

Discoveries such as the prehistoric coprolite found in Oregon's Paisley Caves are an example of how one new discovery can cause a major re-evaluation of archaeologists' thinking about the earliest human inhabitants. That is, a discovery such as this is significant.

But can an archaeological discovery be historically significant? It may be, depending on how it and other similar discoveries impact archaeologists and anthropologists who study the prehistory of the Americas. To respond to that question you need:

a) a definition of historical significance
b) criteria to help you determine when something is or is not historically significant

Your Task

Consult the section of the CBC Learning Web site containing the worksheet on Historical Significance: http://newsinreview.cbclearning.ca/worksheets/historical_significance/.

Read the material about historical significance and then download the worksheet. With a partner or in a small group, complete the worksheet, using information from this *News in Review* story in your research.

When you have finished the worksheet, share your ideas and information with the rest of the class. Discuss whether or not you think the discovery of the prehistoric coprolite in the Paisley Caves meets the criteria of a historically significant event, based on the categories outlined in the worksheet.