Digging into Archaeology:

A Teacher's Guide to Archaeology in the Classroom

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by

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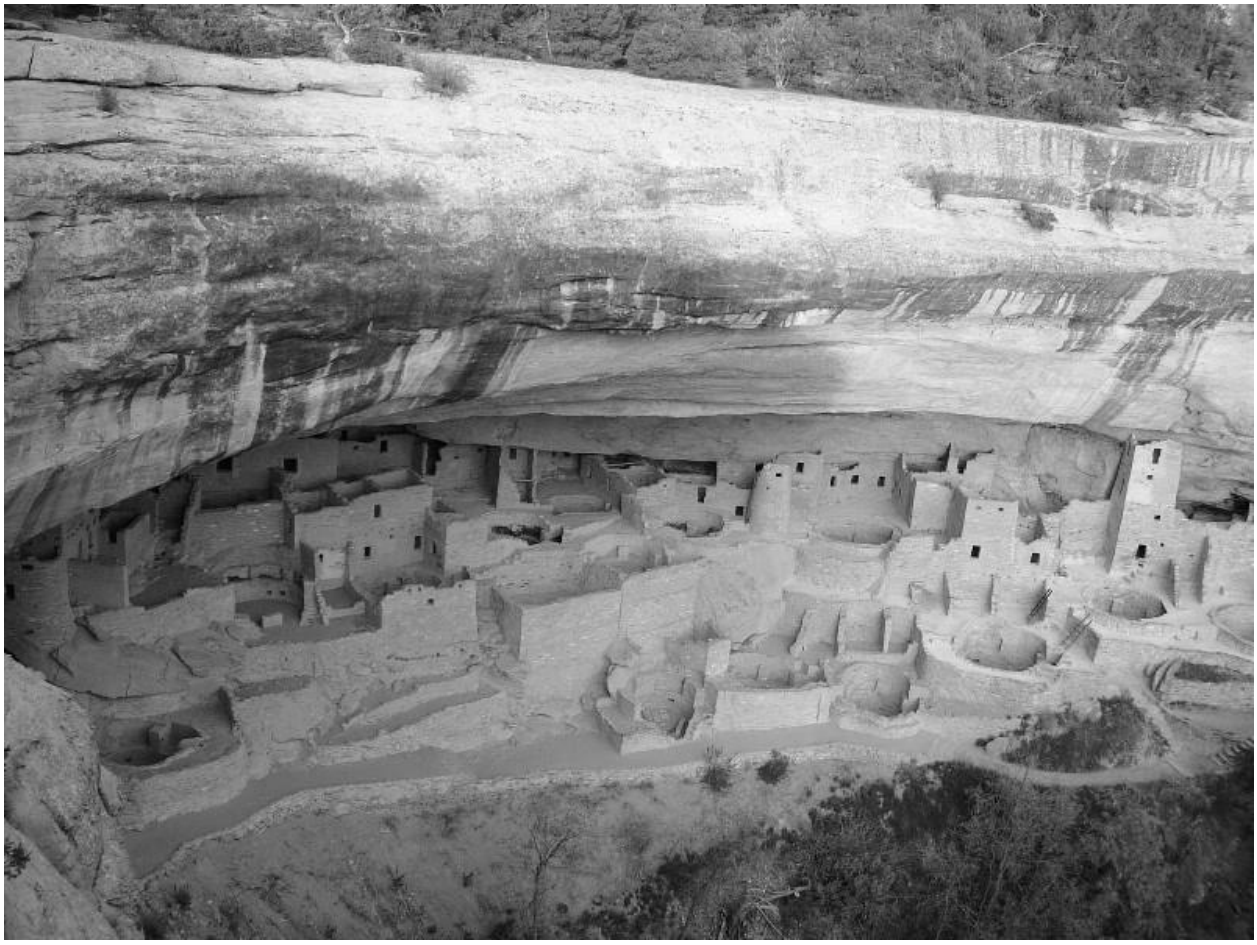
How Archaeology Can Fit Into the Classroom

A great deal of thought and conversations with educators went into the creation of this Teacher's Guide for Archaeology. The El Paso Museum of Archaeology is dedicated to the education of the public about archaeology and the Indians who lived in this area in the past and the present. Since teachers are required by the State of Texas to cover certain material to prepare students for the Texas Assessment of Knowledge and Skills, or TAKS, we have attempted to make the subject matter and the activities in the guide compatible with the Texas Essential Knowledge and Skills, or TEKS, curriculum. Most of what is discussed in the guide fits into the Social Studies curriculum, covering historical issues and events, geographic influences on those issues and events, economic and social influences, and political influences. But there are aspects of the material and activities that could fit into the Science and Math sections as well. Archaeology is, after all, a science. We study the people who lived in the past instead of other living organisms or fossils. We study how people adapted to their environment, how they interacted with the world around them, and how they modified it to meet their needs. We use the scientific method, observation, analytical mathematics, and statistics. Many aspects of the methods used by archaeologists in the field and in the laboratory are discussed in this guide and included in the activities.

The archaeology of the Southwest is very rich, spanning thousands of years and encompassing a tremendous variety of cultures. Naturally, our goal is to not only familiarize students with archaeology, but also to spark the interest of those young scientists of the future.



Cliff Palace at Mesa Verde, an Anasazi site occupied in the 13th century.

What is Archaeology?

Archaeologists have not always been very good at explaining what archaeology is and what archaeologists do. The popular image seems to be of treasure hunters or dusty professors commanding an army of laborers in the excavation of a lost civilization in a strange and exotic land. That sounds exciting, but it is not exactly accurate. Perhaps we should start with what archaeology is *not.* It is not "Indiana Jones" or "Tomb Raider," and it is not pot hunting or grave robbing. None of that is science. It is not geology, the study of the earth and its mineral components, and it is not paleontology, the study of plant and animal fossil remains. Although these are scientific disciplines, and archaeologists do sometimes deal with rocks and fossils, they are not archaeology.

A scene from a Maya ceramic vessel depicting a king looking into a mirror held by an attendant.

So what *is* archaeology? *Archaeology* is the study of cultures that lived in the past. It is a subfield of anthropology, the study of human cultures. The other subfields are cultural anthropology that studies living cultures, physical anthropology that studies human biology and where humans fit among the living and extinct species of our family tree, and linguistics that studies human language.

Archaeology is primarily concerned with reconstructing extinct cultures from the material remains of past human behavior, or the things people made or used and left behind. These remains are called *artifacts*. Much of what we see around us – computers, clothing, food, books, and buildings – are artifacts. Even natural objects, like a stick of wood or a piece of bone, are artifacts if humans have used them for some purpose. From these artifacts archaeologists build a model of what a culture was like. Archaeologists look for patterned behavior in the artifacts they study and try to understand the lifeways of the people who made or used the artifacts. For instance, the way people made pottery in the Southwest changed over time, reflecting their skill, different technologies used to produce it, the ways they used designs and decorative motifs, and how the pottery was used.

While cultural anthropologists can talk to members of the culture they are studying, archaeologists cannot. By examining the artifacts a culture left behind, archaeologists interpret the behavior of the culture that made them. This can be both an advantage and a disadvantage. Members of a

long dead culture cannot tell the archaeologists if they are interpreting their culture correctly, but neither can they argue with the interpretations.

There are several different kinds of archaeology: *prehistoric*, historic, classical, and underwater, to name a few. These often overlap. For instance, when archaeologists studied the wreck of the Civil War ironclad, the Monitor, they were doing both historic *and* underwater archaeology. The two main types are prehistoric and historic archaeology. Prehistoric archaeology refers to the study of human prehistory, or the period of human history before written records existed. This comprises most of our human past. The human family can be traced back at least five million years. The first modern humans appeared about fifty thousand years ago. Humans did not start writing things down until 5,200 years ago. That leaves many thousands of years of human experience that was not recorded.

Archaeologists record a pithouse uncovered during an excavation in the El Paso area.

Stonehenge on the Salsbury Plain in southern England, now a World Heritage Site.

Historic archaeology studies that portion of the human past that has written records. While it shares many of the techniques used in prehistoric archaeology, written records give historic archaeology an advantage in its research. In Europe, archaeology is not a subfield of anthropology, but of history. This is because most cultures in the Old World had written languages. But archaeologists in the New World do not usually have that resource. With the exception of Mesoamerican archaeologists studying the Maya, whose hieroglyphic language has only recently been deciphered, archaeologists in the Americas do not have written records of the cultures they study. Because of this difference, New World archaeologists have more in common with anthropologists than they do with historians.

Classical archaeology may be considered a branch of historic archaeology that studies the ancient civilizations of Mesopotamia and the Mediterranean, including ancient Greece and Rome. Egyptology can also be considered a branch of historic archaeology. In North America, historic archaeologists study colonial sites like Jamestown or Salem, or Civil War sites like the Gettysburg Battlefield.

Prehistoric archaeology has similar divisions. There are Paleoindian archaeologists who study the first populations that migrated to the

Americas during the *Pleistocene* ice ages. There are Mesoamerican archaeologists, Southwestern archaeologists, South American archaeologists, and many more who concentrate on specific cultures and time periods. But when all the various branches are boiled down, they all must rely on evidence from the archaeological record. This brings us back to artifacts, the place they were found, and with what they were found. Even in sites for which there are written records, there is a great deal of information left out. For instance, Thomas Jefferson kept meticulous records for his Monticello estate, but what was life really like for one of his slaves? How did the field hands live? It was the archaeological excavations of slaves' quarters at Monticello that helped to shed light on the lives of those who could not tell their own story. Another example is the ruins of the Roman cities of Pompeii and Herculaneum. We have the dramatic accounts from the Roman historians about what happened to these communities when Vesuvius erupted, but it was not until archaeologists began to uncover Pompeii and Herculaneum that we really began to understand this catastrophic event, and perhaps more important, how Romans lived their everyday lives. Archaeologists use many kinds of evidence to reconstruct the past. The excavators at Pompeii utilized the classical written accounts and state of the art geology to understand the layers of volcanic debris. They used physical and forensic anthropology to study the human remains, and art conservation to uncover and preserve the beauty of a two thousand year old Roman city frozen in time.

Archaeologists excavating a pueblo in southwestern New Mexico.

The Record of the Past

So how do archaeologists study the past? The record of the past, or archaeological record, is fragmentary at best. Most of the material objects left behind are perishable. Organic materials like food or clothing decay and disappear. But some artifacts, such as pottery, stone, bone, and shell are not as perishable, and a great deal of information about past cultures can be gleaned from them. Stone tools, or *lithic* materials, can tell archaeologists about types of food resources utilized – flaked stone *projectile points* for hunting, ground stone for grinding corn. Different types of structures can tell archaeologists about social organization. A pithouse, for instance, indicates a small family unit while a pueblo indicates a much larger and more complex social group. And an understanding of when certain artifacts appear in the archaeological record tells archaeologists when a site was occupied.

Artifacts and features can be dated using several dating techniques. These techniques fall into two categories: *relative dating* and *absolute dating*. Relative dating determines the approximate age of an object by finding its place within a known chronological sequence of related objects. This technique, called *seriation*, places objects without known dates into sequences, from oldest to youngest. Seriation was used during the early years of archaeology, especially with ceramics and lithic or stone materials, and each new find was fitted into the larger picture. However, relative dating cannot give an exact date of when the object was made, or its exact age. It can only show where an object fits in with other objects in a chronological series.

Absolute dating techniques, including radiocarbon dating and dendrochronology, were developed within the last century and offer more accurate and precise ages for objects in calendar years. Radiocarbon dating (also known as Carbon 14 dating) measures the amount of carbon decay in organic objects, like those made of wood or bone, from the moment the tree or animal died. This rate of carbon decay is known, and the measured amount of decay will give an age range for the sample. This method is very accurate (if the sample is not contaminated), but it is not very precise. It can only give an age range, not an actual date. Dendrochronology, or

tree ring dating, determines the date of tree cross sections by measuring the annual growth rings and comparing the sample to others whose age is known. All trees within a region will have similar annual growth rings, and if the sample still has bark, it can give a precise year when the tree was died.

The most basic place archaeologists study is called the *site*. A site is any location where there is evidence of human activity. This can be a small campsite with a scatter of flaked stone indicating tools were being manufactured or modified, or it can be as large and complex as Chaco Canyon or Cahokia with hundreds of structures and millions of artifacts. One kind of archaeological evidence is called a *feature* by archaeologists, and is a non-portable group of artifacts. Features can be hearths, storage pits, architectural structures, burial mounds, or a cluster of *petroglyphs* or *pictographs* at a rock art site. Evidence can also be gathered from seeds, pollen, snail shells, or animal bones that were not directly used by humans but can tell archaeologists about the diet of the people who occupied a site and what the environment was like when they lived there.

Perhaps the most important part of understanding the past is how artifacts are placed in time and space. This relationship is called *context*. It is based on the geological *law of association*, which states that objects found in the same geological level are contemporary with each other. Also, according to the geological *law of superposition*, objects found in lower layers are older than those found in layers above them. These laws help the archaeologists to establish artifacts within a framework of time and space. Context is everything to an archaeologist. Finding an artifact *in situ*, or in the natural and undisturbed position, means its context is still intact and can provide meaningful information. Without it, artifacts are just objects that provide little more than general information about their function or the people who made them.

Archaeologists are like detectives. They use artifacts and the sites the artifacts come from as clues to the past. By definition an artifact is something either made or used by a human, so archaeologists try to determine what its function or purpose was in a variety of ways. For example, the form of a ceramic vessel can indicate its function. A jar could have been used for storage or cooking. Where the jar was found – near a

hearth – could further point toward a cooking function. Some artifacts, like projectile points, stone knives, or ax blades demonstrate their function more clearly, but the function of others can be much less clear – at least to modern eyes. The famous "Venus" figurines manufactured by the first modern humans in Europe twenty to thirty thousand years ago are a good example of enigmatic artifacts whose function is unclear. Animal effigies made of stone, bone, or ceramic are also. These artifacts are often referred to as ritual, ceremonial, symbolic, or artistic by archaeologists for lack of a better word. Archaeology may never be able to explain such artifacts to any greater degree, but there are instances when new evidence sheds light on an artifact, turning a strange lump of etched rock into a Rosetta Stone, and broadening our understanding of a past culture.

The following pages contain several activities created with the goal of encouraging interest and helping students understand archaeology. These activities are designed for specific ages and are listed with the amount of time required for the activity as well as the supplies needed. Background information about the activity is also given to help students understand the concepts involved.

Pueblo Bonito at Chaco Canyon.

Potsherds, or pieces of pottery from around the Southwest.

Activity 1: What is an Artifact?

Grade Level: 5-up

Time: 1 hour.

Goal:
In this exercise, students will learn that an artifact is any object made or used by humans. They will learn that the exact function of many artifacts cannot be known. Students will learn to identify the possible uses for artifacts, utilizing the same interpretive processes archaeologists use.

Supplies:
Put together a collection of objects, at least a dozen for each group. These should be a variety of objects, some that the students are familiar with, some they *may* be familiar with, and at least one object that is not familiar to them. The students could help with this exercise by bringing objects from home to create or add to the collection. Rulers or measuring tapes, paper or index cards, and pens or pencils will also be needed. Below is a list of suggestions for objects that could be included in the collection, but really, any object will do.

Christmas tree ornament	Spool of thread
Post card	Compass
Golf tee	Tinker toys
Garlic press	Mortar and pestle
Thimble	Scissors
Potato peeler	Dice
Croquet ball	Foreign currency
Glue stick	Sunglasses
Popsicle stick	Belt buckle
Staple remover	Whisk
Door stop	Allen wrench
Horseshoe	Typewriter ribbon
Antique nutcracker	Kaleidoscope
Hood ornament	Eraser

Activity Preparation:
Discuss with the students how the basis of any scientific discipline is the ability to describe observations. Emphasize that the observations should include size, shape, color, and the material type (metal, wood, ceramic, stone, etc.). Explain that in archaeology, size descriptions must include actual measurements.

Activity Information:
An *artifact* is anything made or used by humans. Artifacts provide archaeologists information for reconstructing how people lived, what they ate, where they traveled, what they enjoyed, and what they considered

sacred. Archaeologists study the past by learning how humans in the past made, used, and discarded artifacts. Each artifact has a life-history. One possible life-history for a Mimbres Black-on-white pottery bowl could go something like this: it started out as clay in a riverbank, was excavated by a human, mixed with crushed rock for *temper*, rolled into long ropes, coiled into a bowl shape, smoothed, painted on the inside, polished, fired, used to serve food, traded to a nearby village, used for religious offerings, dropped and broken, discarded in a trash midden, eroded by natural processes in the ground, and finally found during excavation. This could even be extended further by including what happened to the bowl after it was excavated, including being glued back together, analyzed by graduate students, taken to a museum, spending years on a shelf in a collections room, and then being put on display with other Mimbres pottery in an exhibit.

This dramatization illustrates how artifact uses can change over time. The potter probably never imagined her bowl would end up on display in a museum as a piece of American Indian "art." Each stage along the artifact's life-history is a time when humans used it, often in very different ways. To understand artifact life-histories, archaeologists look at the objects used now and in the past to determine how observations of artifacts can best explain the behaviors of the humans who made and used them. Physical descriptions of artifacts are one of the basic measurements archaeologists use to try to understand these past behaviors.

Activity:

1. This activity can either be done as a large group or with the students divided into smaller groups of four or five students, with each group receiving about a dozen objects. Have the students create index cards or a separate sheet of paper for each object.
2. Have the students describe each object in their collection by listing its attributes, including color, material it is made of, size, and any addition information such as writing on the object or other usual characteristics. They could also draw a simple illustration of the object to help with their descriptions. Note: Archaeologists use metric measurements to keep measurements standard, but this exercise, regular inch rulers will work fine.

3. Have the students come up with names for the objects based on the descriptions.
4. Have the students discuss how the objects might be used based on their descriptions.
5. If the activity was done in small groups, have the groups share their descriptions and findings. Have the students discuss other possible uses for the objects, and share the *real* name and function of the object, if it is known.
6. Many of the objects archaeologists find have no parallel in modern culture and archaeologists are unable to discover their original function. Introduce the familiar objects, discuss how they are used in our culture and then discuss possible alternate uses based on their descriptive attributes that someone from another culture or an archaeologist a thousand years from now might provide. How might the future archaeologist be able to discover the correct function of the object? For example, where would the object be found? In a kitchen or an office? And with what other objects would it be found? Would it be found with children's toys or in a toolbox? Sometimes archaeologists will attempt to determine the function or the method of production of an artifact through experimentation. They will try to reproduce or replicate the object using the materials and tools the culture under study would have used. They may also try using the artifact for the function suggested by its attributes or its similarity to another object whose function is known. Discuss with the students how the use of one of the objects might be discovered through this process.

Projectile points and other types of flaked stone tools.

Enigmatic petroglyph of a dancing bighorn sheep from Frying Pan Canyon, New Mexico.

Activity 2: Symbolic and Practical Artifacts

Grade Level: 5 – up

Time: 1 hour.

Goal:
The students will learn the difference between practical and symbolic objects, and how the meaning of symbolic objects can vary from person to person and from culture to culture.

Supplies:
Paper, pencils, or pens will be needed and some objects from the list in the previous activity can be used with some more symbolic additions. Here are some suggestions for the additions:

Menorah
Crucifix
Flag
School mascot
Christian fish bumper sticker
Darwin fish bumper sticker
Peace sign
Smokey the Bear

In addition to objects, pictures of objects in magazines or newspapers can be used. For instance, an advertisement for a chain restaurant with a recognizable logo can be used, or a picture of a public restroom sign, a no smoking sign, or a traffic sign.

Activity Preparation:
Discuss with the students the difference between symbolic and practical objects. A *symbol* is defined as an image or object that represents something else, especially a material object used to represent something immaterial. Discuss some examples from geographic places, like states, or religious institutions, or the symbols used for traffic signs or to signify poison or commercial logos. As part of the discussion, students could be shown pictures of various symbols and try to recognize their meaning.

Activity Information:
The word "symbol" has a very broad meaning and therefore in some ways can be difficult to define, but we all know a symbol when we see one, even if we have trouble defining it. For instance, the English alphabet is really just a series of symbols that we use to represent sounds that we string together to form words and sentences. There is nothing about the shapes of the letters in the English alphabet that would tell us what they sound like. We have simply agreed that those shapes will mean specific sounds. The same can be said for numbers. There is nothing about the number 8

that would indicate the amount it signifies. There are examples everywhere of symbols we use everyday that have meanings we have agreed on, but whose image often has nothing to do with that meaning. Think of the symbols for male and female, or the Christian fish. There is nothing about the shapes of those symbols that would infer their meaning. We know that the simple fish shape was a coded symbol for the early Christians. It was a way for them to communicate an idea without putting themselves or their fellow Christians in danger, because there is nothing about the symbol that would indicate it means Christianity.

Archaeologists look at symbols made by past cultures and try to decipher them, but as we have seen, symbols often represent objects or ideas for which they have no obvious link. Rock art is found throughout the American Southwest, and is one of the most contentious areas of study in Southwest Archaeology. How do we find the meaning of the abstract symbols left behind by these past cultures? Symbols are a way of communicating ideas in cultures that have no written language. And just as they are in our culture, some symbols have meaning for people outside a culture, and some only have meaning for people within the culture.

Activity:

1. This can be done either in small or large groups. Ask each student to make a list of ten objects in each category - symbolic and practical.
2. Have the students look through the newspapers, magazines, and books and around the classroom for symbolic objects. Have them think about objects around the school or around their homes that are symbolic. Have the students share their findings with their groups. Discuss how some of the symbols have national meaning, and some have meaning for fewer people, like a school mascot. Discuss the reasons why some would have national or even global recognition and others would not (TV and other media, travel, etc.).
3. Ask the students to think of events which have meaning in our culture but that might have a different meaning or no meaning at all in another culture. Some examples are: July 4th, Thanksgiving, Washington's birthday, or Columbus Day. Point out that American Indians certainly have a different view of Columbus than most Americans. Also ask the students if they can think of events that

have meaning in our region but not in other parts of the country. Examples could be the Mexican holidays that are celebrated here on both sides of the Border like Cinco de Mayo or the regional religious celebrations like La Posada.

Extension Activity:
Divide the students into a "tribes" that have no written language. How can they communicate information to people within their tribe or to the other tribes? What if the other tribes speak a different language? Have the students come up with symbols for their tribes for important ideas and objects, such as water, home, danger, food, rain, etc., without using a written language. Have them decide what kinds of ideas need to be expressed and invent a symbol to express them non-verbally. Then, have them share these symbols with the other tribes to see if these symbols would work to communicate ideas.

Image of a traveler or merchant from a classic Mimbres Black-on-white bowl.

Archaeologists at work excavating a pueblo room in Southern New Mexico.

What Archaeologists Do

Archaeologists don't just dig things up. They collect information. This is an important distinction. Pothunters and looters collect artifacts, but they do not collect any information about where they were found, at what depth in the ground, and what other artifacts were found with them. Aside from the site being destroyed by looters and the artifacts being sold off to private collectors on the black market, the archaeological information about the culture that created the site is also destroyed.

Archaeologists use a variety of methods to gather archaeological information. The first is *survey*, or the examining of an area for evidence of human activity. Survey can involve surface inspection, subsurface testing, remote sensing, and aerial photography. Here in the Southwest, all of these techniques are used, but the most common is surface inspection. This simply means a crew of archaeologists spreads out in a line along one end

of the area to be surveyed, several meters apart, and then walks forward in a straight line looking at the surface of the ground for evidence of human activity. Evidence of human activity could be stone tools or flakes from tool manufacture, *sherds*, or potsherds, from a broken pot, or fire-cracked rock from a hearth.

Finding only an occasional isolated artifact does not mean the area is a site. The evidence has to be stronger than that. Groups of stone flakes indicate a site where stone tools were being used, manufactured, or modified. When an artifact is found during a survey, a survey flag is stuck into the ground next to it. At the end of the survey, there will be many flags across the survey area if there is an archaeological site located there.

If there is a site within the survey area, a *grid* is then superimposed over it, giving the archaeologists a framework in which they can record the artifacts that were found. As each artifact is recorded, including its exact location within the grid and its association with other artifacts, the flag next to it is removed. Sometimes the artifacts are collected for further analysis, but often they are left where they were found. Remember, it is the *information* from the artifacts that must be collected, not necessarily the artifacts themselves.

Subsurface testing can also be done as part of the survey. Subsurface testing involves digging small test holes, often with a post-hole digger. This can yield information about a variety of research questions, such as the *stratigraphy* of a site, without having to do extensive excavation. Remote sensing and aerial photography also offer information of varying degrees of detail that can often take the place of more invasive methods, such as excavation. Remote sensing techniques are used to collect data from a site in a non-invasive manner that avoids disturbing a site or its artifacts through even limited excavation. These techniques include magnetometry, electrical resistivity, ground-penetrating radar, satellite imagery, seismic and acoustic techniques, thermal sensing, and metal detectors, among others.

Archaeologists using a Ground Penetrating Radar system.

Archaeologists examining stratigraphic levels in an excavation.

The second major method archaeologists use to gather information is *excavation*. Excavation is the process of exposing archaeological deposits by digging. Because excavation is both expensive and destructive to an archaeological site, it is often the last method used to gather archaeological information. Excavation remains the most important method for two reasons: first, because it can be used to obtain information on human behavior from a particular period of time in the past; and second, because it can be used to obtain information about changes in human behavior from one period to another. Human behaviors that take place at the same time will be seen *horizontally in space*, while changes in human behavior will be seen *vertically through time*. This gives a three-dimensional picture, called the *provenience*, of where an artifact was found.

Excavations are subjected to a grid framework. It may be the same grid used for the original survey, but this grid functions both horizontally and vertically. The squares within the grid, called *units*, are carefully excavated, often in arbitrary levels. This means that the archaeologists dig down a prescribed number of centimeters, and then the new surface of the unit is leveled and measured in all four corners. All the soil removed from the unit to the new level is screened for artifacts as it comes out. The unit and the depth are then recorded for each artifact recovered from the level. This process is repeated for each descending level until sterile soil, or soil that has no evidence of human activity, is reached.

Artifacts are never just pulled out of the ground. Shovels may be used to begin an excavation and remove the topsoil, but as archaeological levels are reached, shovels are often traded for smaller tools, such as trowels. When an artifact is uncovered, trowels are then traded for dental picks, paint brushes, and even tooth brushes and shish kebob sticks to expose the artifact as carefully as possible.

Students doing an archaeological survey.

Activity 3: What is Archaeology?

Grade Level: 5 – up

Time:
Best accomplished over 2 – 3 hours or 2 to 3 class periods.

Goal:
Students will learn how archaeologists gather information by collecting materials from the surface of the ground. They will record the exact location of the material found and understand why that location is important. They will interpret past human activities on the basis of the material collected.

Supplies:
Survey flags, measuring tape, large paper or plastic bags, zip lock bags, permanent felt-tip marker, old toothbrushes, plastic tubs, water, notebooks or writing paper, pencils, graph paper, and clipboards. Survey flags can be made from small wooden sticks (like shish kebab sticks) or stiff metal wire cut into 25 to 30 centimeter lengths. The flag can be cut from construction paper and taped onto one end of the stick. Flags could also be obtained from local survey companies. Artifacts can either be what is already on the ground, i.e. "trash," or a bag of prehistoric artifacts can be picked up at the El Paso Museum of Archaeology and sprinkled over the activity site prior to the students' arrival.

Activity Preparation:
Pick an area of the schoolyard or playground that can be measured by the students to create a grid of meter-square units. Discuss what surface collection is and what kinds of questions could be answered from surface collection. Explain what steps are involved in surface collection.

Activity Information:
Archaeologists use several types of measurements for studying the artifacts found on a site. The first is frequency measures – how many of a kind of artifact are present. The second is spatial measures – the location of the artifact on the site. The third is relational measures – what other objects were found with the artifact. These measurements are combined to give context to an artifact. The last form of measurement is the formal measure, or the physical characteristics of the object, including size, shape, color, and of what material it is made. These measurements, however, are usually taken after the artifact has been removed from the site.

Surface collection is the recovery of archaeological material from the surface of a site. It is often conducted before excavation begins and sometimes instead of excavation. This is because excavation is inherently destructive to a site. Once a site has been excavated and the artifacts have been removed, they will never again be in their original context, either in depth or spatial location. This is why archaeologists must record each site and the artifacts found there including their exact locations as accurately as possible. Once an artifact is moved, the only record of where it was in the

site and its proximity to other artifacts will be the site record. Surface collection is also destructive for these same reasons, but to a lesser degree because it removes artifacts from only one level: the surface.

Activity:

1. Have the students measure off five square meters, creating a grid of twenty-five units. The four corners of the grid and the meters can be marked off with survey flags, perhaps by using a different color. Note: each square unit in this grid should be a meter on each side and should measure 141 centimeters diagonally. Doing this diagonal measurement from both directions will ensure each unit is square.
2. Give each student a handful of survey flags.
3. Line the student up along one side of the grid.
4. Have them walk slowly forward, examining the ground for objects. When an object is found, have them stick a flag in the ground next to it. Do not let the students pick up the items at this time.
5. Have the students make a map on the graph paper of the grid, showing the location of each flag. Assign a number to each flag and corresponding artifact, and make sure they are all on the map. The measuring tape can be used to make sure the location of each artifact is accurately recorded.
6. As each artifact is recorded on the map, pick it up and place it in a separate zip lock bag marked with the appropriate number. Pull the flag out and proceed to the next artifact.
7. Gather all the artifacts recovered at the end of the collection process so all the student can see the range of items – duplicates, one of a kind items, etc. Return to the classroom.
8. Have the students think about the artifacts collected in relation to the questions archaeologists may ask about them, such as their function and what they can tell archaeologists about the people who made them.
9. Have the students clean the artifacts, keeping the identification number by using yellow stick-on tags or index cards and then lay them out with their identification number on a table with adequate space.

10. Have the students identify as many of the artifacts as possible and begin to group like items together. Sketches can be made of the artifacts, perhaps on the index cards.
11. Record and count items in groups for total artifacts in each group. Use the sketch map to determine if artifacts of a certain type were close together or far apart.
12. Discuss the artifacts in relation to what they are, what they were used for, where they were found on the map, what this tells us about the people who made them, and what they used this area for.

Sample Form

Grid Level Form

Grid _____ Date _____

Unit _____ Excavator _____

Level_____ Recorder _____

Corner Measurements from the Top of the Unit Level:

N_____S_____ E_____W_____

Corner Measurements from the Bottom of the Unit Level:

N_____S_____E_____W_____

Soil Condition: _____

Artifacts: _____

_____

_____

_____

_____

Comments: _____

_____

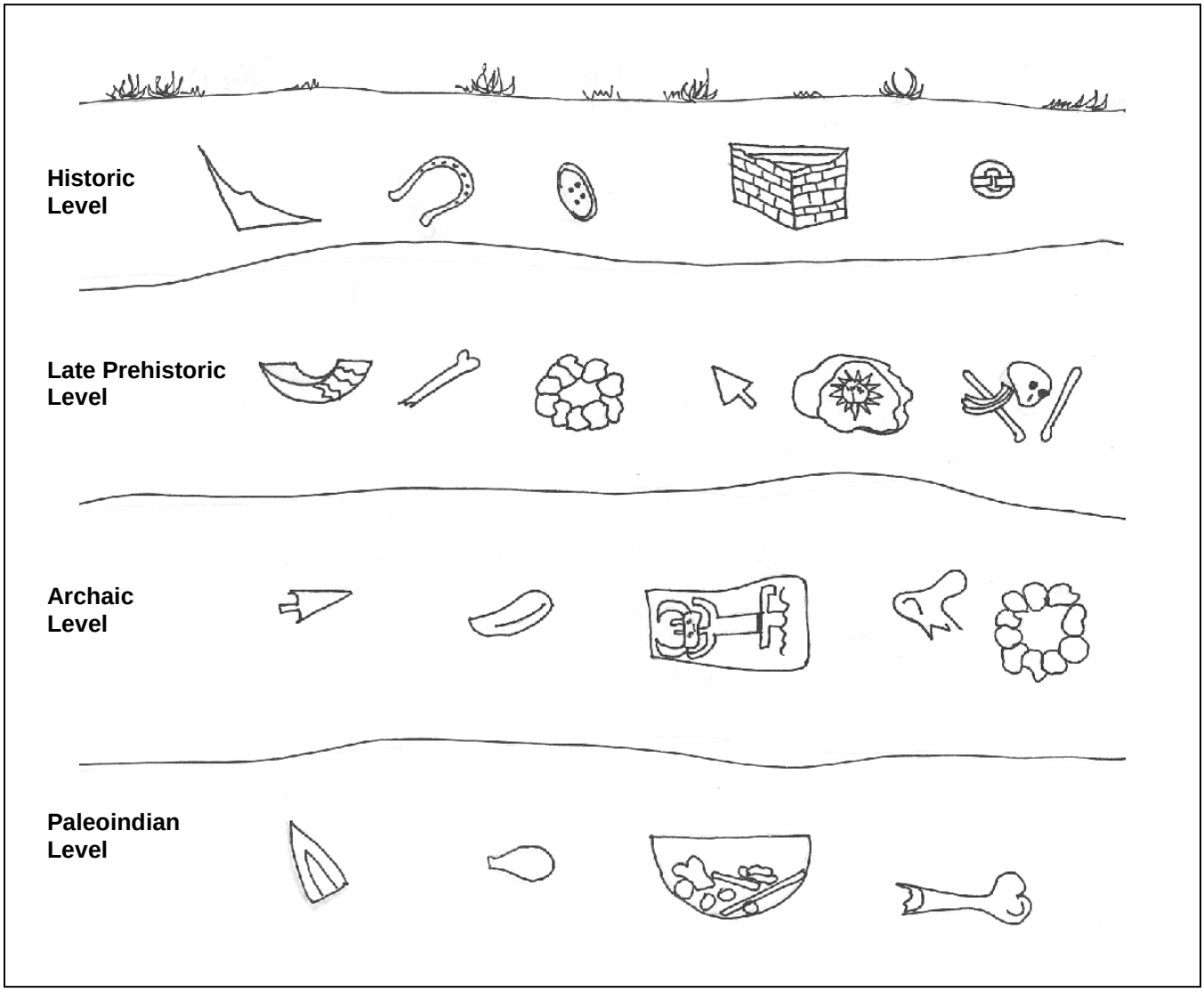
_____

Sample Form

Artifact Recording Form

Artifact Number	Level	Artifact Type	Artifact Name	Size	Color	Comments

The Archaeological Record: A Stratigraphic Cross-section



Drawing by Casey Jensen

Students learning how to excavate.

Activity 4: Simulated Archaeological Dig

Grade Level: 5 – up

Time: 2-3 hours or class periods

Goal:
The students will learn one of the most basic principles of stratigraphy, the law of superposition, which states that objects found in lower levels were deposited earlier and are older than those found in the levels above them. They will learn how to excavate an archaeological unit properly, including taking simple field notes and recording and sketching artifacts.

Supplies:
A large aquarium, or any other large-sized container around which several students can work simultaneously will work. The benefit of an aquarium is the students will be able to see the levels of strata through the glass. Three different types of soils are needed for the different levels, such as sand, potting soil, cat litter, or aquarium gravel, to distinguish each of the levels clearly. The following excavation tools are needed: trowels (or large spoons), paint brushes, shish kebob or Popsicle sticks, measuring tape, copies of the two sample forms, plastic zip lock bags, Sharpie or magic markers, graph paper, clip boards, pencils, and a large sieve or colander with holes large enough for the soil to fall through. A simple screen can be constructed using ¼ inch steel mesh mounted on a square wooden frame. Also, a large plastic tub or trashcan will be needed to catch the soil as it is screened so it doesn't go all over the floor. And finally, artifacts for the three levels will be needed.

Objects in each level should be related to each other in some way, such as being from the same time period or associated with a particular activity. Using parts of objects or broken objects will more closely simulate a real excavation experience as well as the incompleteness of the archaeological record. The objects from the earlier activities could be used for the top level. Additional artifacts can be borrowed from the El Paso Museum of Archaeology to lend authenticity to the activity. Here is a list of objects that could be used for the other two levels, grouped by time period:

Historic Ranch (AD 1900)
.45 caliber cartridge casing
Piece of barbed wire
Old square nails
Old dishes or cans
Broken antique bottle
Horseshoe
Old coin
Railroad spike
Cavalry button

Prehistoric Village (AD 1000)
Broken pottery (potsherds)
Small imitation projectile points
Hammerstone
Mano
Metate fragment
Shell bead
Stone ax head
Arrow shaft straightener

Activity Preparation:
Prepare the excavation unit in advance: Put one of the three soils on the bottom with the artifacts that should be considered oldest, followed by the second soil with the second oldest group of objects, and finally the third soil with the newest or youngest objects. If an aquarium is used, the three levels, or strata, should be clearly visible. Discuss archaeological excavations and the techniques used to conduct them. Discuss why and where archaeologists excavate and what they hope to learn from an excavation. Explain the geological laws of association and superposition and discuss how they pertain to an archaeological excavation. Where would the oldest artifacts be found? Where would the youngest be found?

Activity
1. Assign various jobs to the students, or groups of students, such as excavator, recorder, lab technician, etc., perhaps rotating them so that everyone has a chance to dig or draw or describe what is found. Students could also be divided into three groups – one for each level of the excavation.
2. The students should begin filling out the first grid level form, i.e., date, unit and grid (they can make these up), level, who is doing the excavating, who is doing the recording, and soil condition. Have the students describe in the soil condition section what the soil looks like.
3. Have the students also begin a scale map of the unit on the graph paper – one map for each level.
4. Have the students take measurements in centimeters of the top of the first level in all four corners with the measuring tape. Use the top of

the aquarium as "0" and count down from there to the top of the soil. The recorder should then record the four measurements on the form.

5. Begin excavating the first level with the trowels, spoons, or whatever tools are being used. The soil should be screened for artifacts over the collection tub or trashcan as it is removed from the unit.
6. Artifacts found in the screen should be recorded on the form. The "artifacts" section on the form should be a list of the types of artifacts found, e.g. pottery, metal, glass, stone, wood, etc., and hash marks should be placed next to each type indicating how many artifacts of that type were found.
7. Artifacts found in the soil should be carefully freed from the surrounding soil by removing the soil with the smaller tools like paint brushes, shish kebob or Popsicle sticks, etc. The exact location of the artifact within the unit should be drawn on the graph paper map of the unit before it is removed from the soil. The artifact should then be recorded on the form as it is removed from the unit.
8. Artifacts should be put into plastic bags and labeled with the unit, level, type of artifact, and date. More than one artifact of the same type can be put into the same bag if they are from the same level. For instance, if two pieces of pottery are found in the second level, they should be put in the same bag.
9. When the bottom of a level is reached, corner measurements should be taken again and recorded on the form. Comments on the bottom of the form should include a description of the soil in the next level.
10. This process should be repeated for all three levels.
11. The lab technician can analyze the artifacts as each level is finished and the bags for that level are completed. Each artifact should be recorded on the artifact recording form, one line for each artifact, including the level the artifact was found in, the type (metal, glass, pottery, etc.), the name of the artifact if known (bottle cap, potsherd, etc.), the size in centimeters, and the color. Comments should include any writing found on the artifact or anything unique or different about it that may make it more easily identified.
12. Drawings should be made of each artifact on graph paper. They can be either sketched or traced so that the picture is the same size as the artifact.
13. Count the number of artifacts of each type.

14. Discuss the artifacts with respect to what they are, what they were used for, and what they tell us about the people who made them. For instance, if there are a large number of kitchen utensils in one level, it could be inferred that the site was used for cooking.

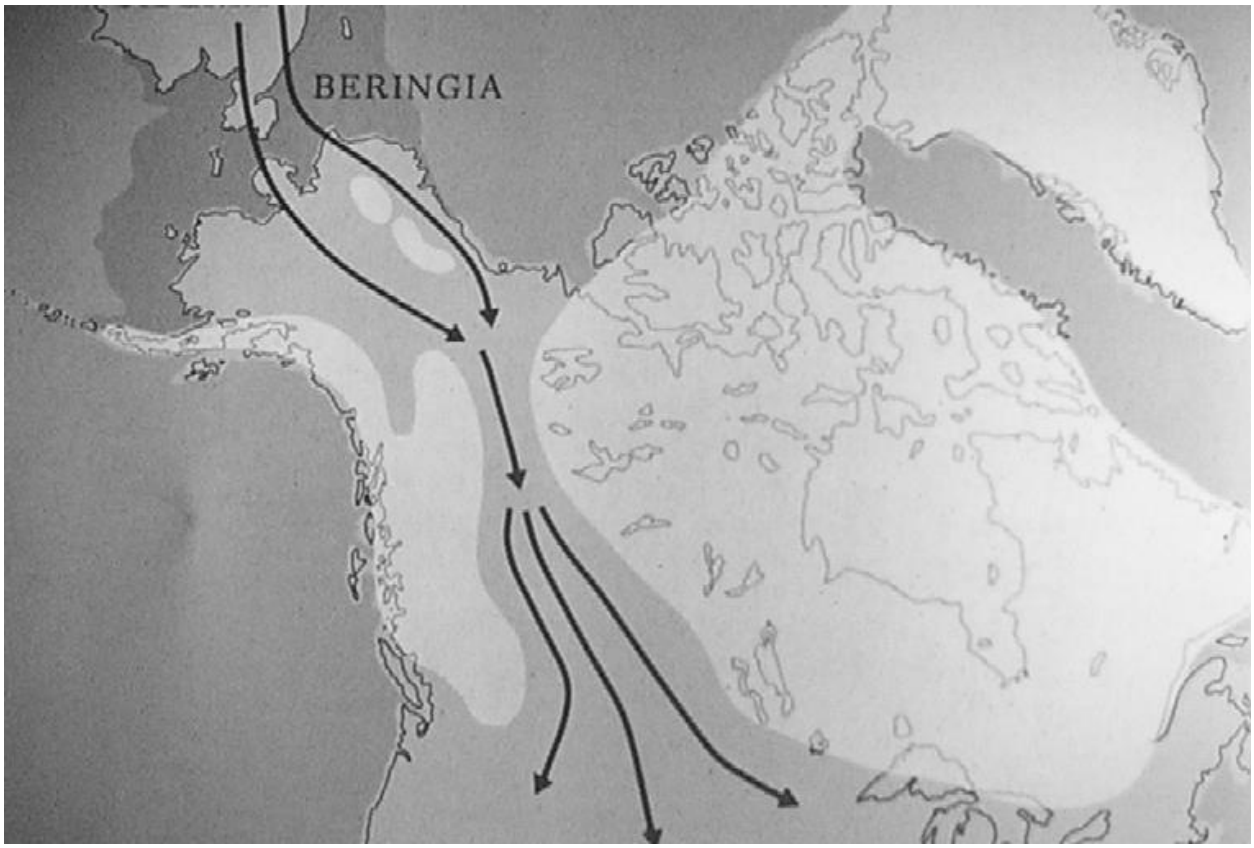
Archaeologists using a grid frame over an excavation unit.

The first Americans, called Paleoindians,
crossing the Bering Land Bridge from Siberia to Alaska.

The Prehistoric Southwest

The Paleoindian Period 13,000 – 8000 B.C.

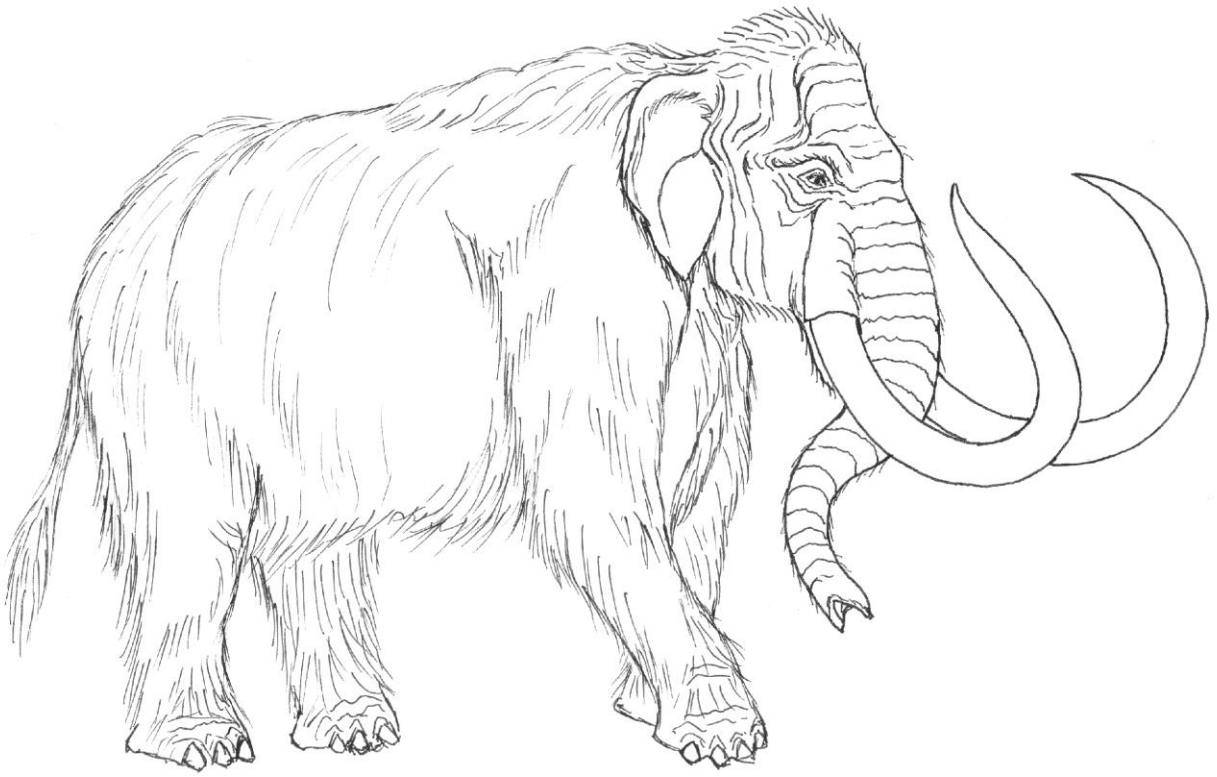
The Southwest has a long and rich human history, spanning thousands of years. This history began more than 14,000 years ago, during the last ice age of the Pleistocene Epoch (the geological age that ended 10,000 years ago before the beginning of our own), when Paleoindian hunters first migrated into the region. They were part of several migrations from Asia to the Americas across the Bering Strait that took place over thousands of years as ice sheets advanced and receded. The glaciers that covered huge sections of North America during the last ice age caused sea levels to drop enough to create a land bridge joining Siberia and Alaska that was thirteen hundred miles wide. This land bridge, called Beringia, allowed both herds of animals – and the humans who hunted them – to cross over into the Western Hemisphere. The first migrations of animals and humans into Alaska may have occurred as early as 40,000 years ago.



The Beringia migration route and the ice-free corridor between the two North American ice sheets.

As sea levels dropped and the glaciers advanced, the narrow corridor between them, leading from Alaska to the rest of North America, would close. As a result, human and animal migrations into the rest of the Americas occurred in waves. First, the land bridge had to be above sea level, allowing free movement into Alaska, and second, the ice-free corridor between the Laurentide and Cordilleran glaciers had to be open, allowing movement south into the rest of the continent. Several of these intervals occurred during the Pleistocene, and gave the first Americans the opportunity to move south. The last instance, called the Two Creeks Interval, was 12,000 years ago. Since the ice-free corridor had been closed from about 20,000 years ago to the Two Creeks Interval, if people had used the corridor to migrate south, they either did it before 20,000 or after 12,000 years ago.

These first Americans, called Paleoindians, were fully modern humans. They were sophisticated hunters and problem-solvers, who understood and were well adapted to the complexities of their environment. Living in an arctic landscape of ice, snow, and water, these people traveled not only on foot, but probably also in small boats made of wood and animal skins to neighboring islands along the coast, just as their Inuit (Eskimo) and Aleutian descendants do today. Many archaeologists now believe the primary migration route into the Americas may not have been through the ice-free corridor, but instead along the western coast of North America by boat. Regardless of the routes they took, or how long ago they started their journey, by 13,000 years ago they had populated most of North and South America, adapting to each new environment they encountered.

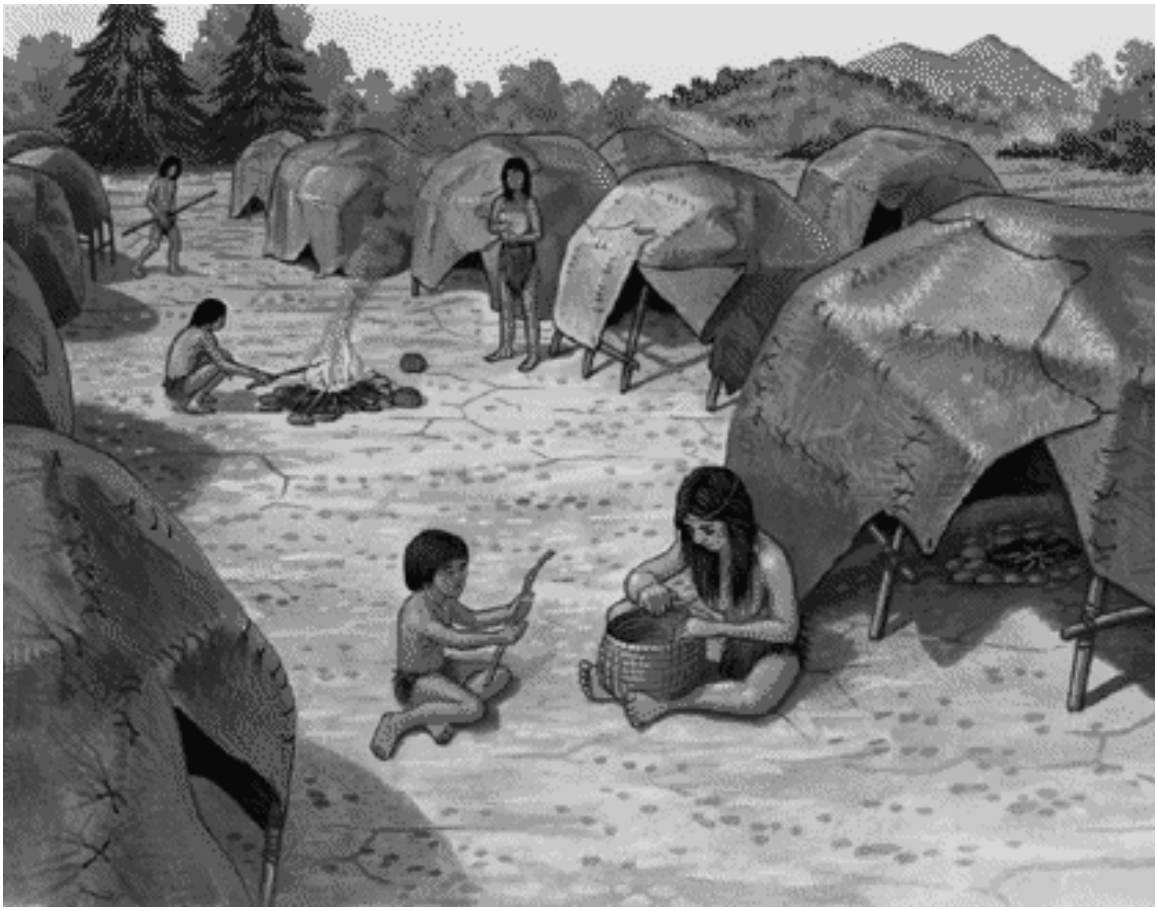


The Wooly Mammoth (Mammuthus primigenius).

The Big-Horned Bison (Bison antiquus):
A primary food source for Paleoindian hunters.

Although the glaciers of the last ice age did not extend into the Southwest, the climate here was still considerably cooler and wetter than it is now. Rivers and lakes were plentiful and herds of woolly mammoth, mastodons big horned bison, and other cold-adapted megafauna (a Latin term meaning "big animals") roamed the forests and grasslands. These animals provided rich hunting for the Paleoindians in the Southwest. In addition to meat, animals also provided hides, bones, tusks, horns, and antlers. Hides were used for both clothing and shelters. Bones, tusks, horns, and antlers were fashioned into a variety of tools from sewing needles to lance foreshafts, and were even used for the framework of ice age dwellings in Asia. Paleoindians also gathered wild plant foods, such as berries, seeds, nuts, and roots. They lived in caves, rock shelters like Meadowcroft Rockshelter in southern Pennsylvania that dates to 12,900 years ago, or built simple rock-walled dwellings, such as the one found recently near Gunnison Colorado. An ice age village dated to 13,500 years ago has been found in southern Chile, at a place called Monte Verde. This site is interesting for a number of reasons. First its date is definitely earlier than the Two Creeks Interval. Second, its extreme southern location indicates that not only did people arrive in the New World earlier than had once been assumed, but also that they were well settled at the southern tip of South America by 13,500 years ago, and even living in villages. Third, the wood frame and animal skin homes are very similar to the wood frame and hide or brush dwellings constructed by people for the next 11,000 years.

Versions of these small brush huts were still being built by some cultures of the Southwest into the 20th century.



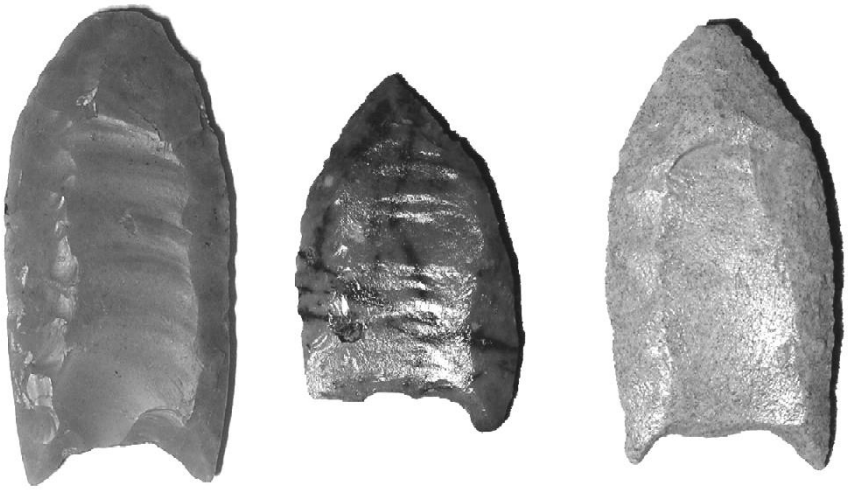
An illustration of what the Paleoindian camp at Monte Verde in southern Chile might have looked like.

The tools used in hunting Pleistocene megafauna were large projectile points hafted onto hardwood or bone *foreshafts*. The foreshafts were inserted into a socket at the end of a very long wooden lance. These weapons were not thrown like a spear; they were used to impale the prey animal – a *very* dangerous way to hunt. The hides and fur of mammoths, mastodons and other Pleistocene megafauna were so thick that throwing a spear would not have killed them. The socketed foreshaft and stone point remained in the animal, and the lance could then be pulled away and reloaded with a new foreshaft and point. This kind of close-in hunting would have required a great deal of skill and cooperation between members of the hunting group.

Two large Clovis points.

The first recognizable stone tool *tradition* in the Americas appears in the archaeological record about 11,500 years ago, and is named for a projectile point called Clovis. The Clovis Tool Tradition and the projectile point were named after the town in New Mexico near where the first example of this type was found. Clovis points were very large – often several inches in length – with fluted or indented sides near the base where the foreshaft was hafted to them with sinew. They have been found between the ribs of mammoths, giving clear evidence of when and how they were used. This type has been found in every part of North America, and while people were undoubtedly here before the Clovis point was in use, it was the first projectile point type to be produced across the continent. A slightly later

type, usually associated with the hunting of extinct forms of Pleistocene bison, was the Folsom point. It was also named after a town in New Mexico where it was first found, and dates from 11,000 to 10,500 years ago. Folsom points are smaller than their predecessors, and are typically two to three inches long with fluted sides.



Three Folsom Points.

By 8000 B.C., the final ice age of the Pleistocene came to an end and the climate began to change dramatically. Sea levels rose as the climate became warmer and drier. The megafauna gradually became extinct, probably hastened by the efficiency of the Paleoindian hunters. The mega fauna were replaced by the animals we are familiar with today, many of which had been around during the Pleistocene Epoch. These animals were simply better adapted to the new climate and survived.

Illustration of Archaic people constructing a brush hut.

The Archaic Period 8000 B.C. – A.D. 1

In the centuries following the last ice age, people continued the nomadic hunting and gathering life way of their Paleoindian ancestors, but with increasing complexity. This period is called the Archaic by archaeologists. The environment was much like it is today, with deserts and grasslands, river valleys and forested mountains. The animals and plants were also much as they are today. Archaic people continued to utilize the resources of their environment, but in new ways and with new tools. The first *ground stone*, or tools used for grinding plant seeds and nuts, appeared during this period. A tool called the *atlatl*, used with a long dart, replaced the lance for hunting and protection. This enabled hunters to keep some distance between themselves and their prey, giving them the element of surprise and eliminating the danger of close-in hunting. Dart points were smaller and shaped differently than Clovis or Folsom lance points of the Paleoindian hunters because they had to fly, and the variety of projectile points in the Archaic period increased from a few tool-making traditions to dozens.

Boy throwing a dart with an atlatl, or throwing stick.

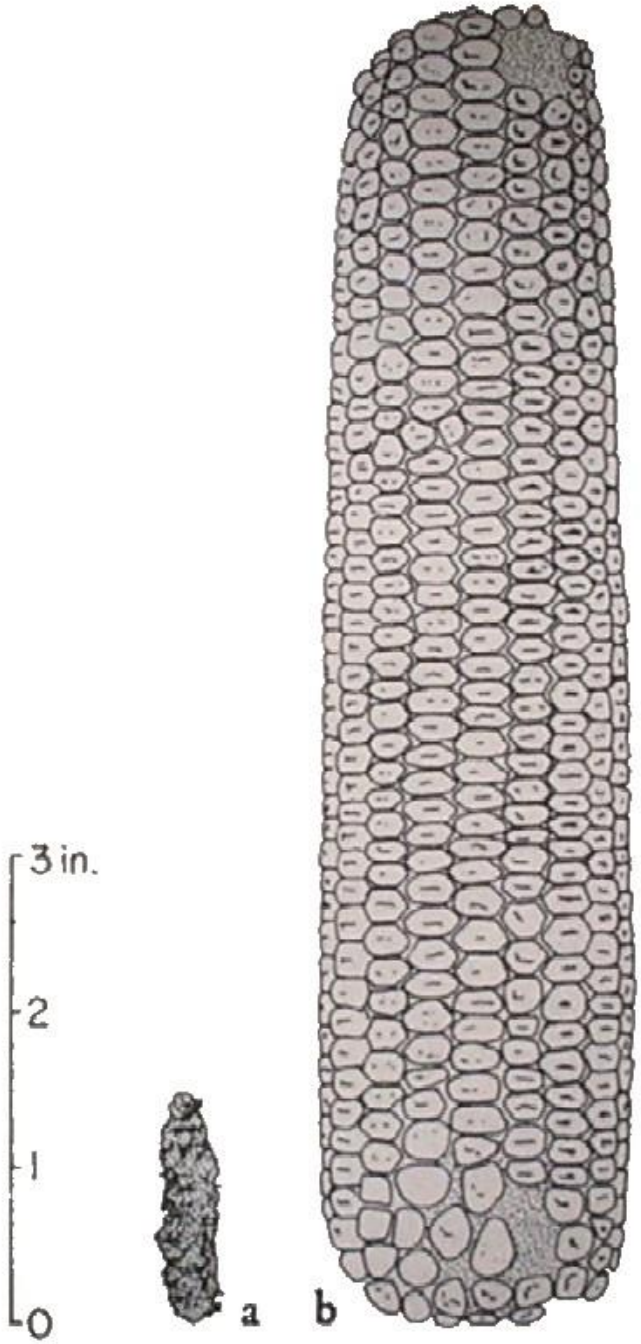
A bedrock mortar.

Archaeologists find evidence for other skills and traditions, including basketry, boneworking, and woodworking. People of the Archaic period wove plant fibers for many purposes, including baskets, burden baskets, nets, mats, bags, sandals, and clothing. Archaeologists have found examples of these artifacts in dry caves here in the Southwest, demonstrating the skill of these prehistoric weavers and the complexity of their craft. The recovery of possible digging sticks, in addition to the groundstone and other evidence, suggests Archaic people of the Southwest experimented with horticulture and plant domestication as early as four thousand years ago.

Archaeologists generally divide the Archaic period into three temporal phases called Early, Middle, and Late. In the Early Archaic, from 8000 to 4300 B.C., people lived in small temporary settlements on a seasonal basis, as migrating herds of animals or certain plant foods in the area became available. These people probably returned to the same areas at the same times of the year again and again, but did not settle in one place for more than a couple of months at a time. They built small branch-framed huts, covered with brush, grasses, or animal skins on the desert floor or near playas (depressions that filled with rainwater), or sometimes lived in rock shelters or small caves. Grinding stones first appear in the Early Archaic, including bedrock *mortars*, *pestles*, simple *metates* and *manos*. The bedrock mortars were used to pulverize seeds and nuts, such as acorns, walnuts, and mesquite beans.

The Middle Archaic, from 4300 to 2500 B.C. is much like the earlier Early Archaic, but with the addition of settlements of hamlets consisting of wood-framed dwellings covered with brush and grasses, then coated with mud to make them warmer inside during the winter months. The floors of these structures were dish-shaped and slightly concave, but not dug into the ground. The Keystone Dam Site, just north of El Paso in the Río Grande Valley, is an excellent example of a Middle Archaic village, with 23 known dwellings, storage pits, hearths, trash *middens*, and other features, revealing a remarkably sedentary existence. Middle Archaic villages seem to have been occupied primarily in winter, but could have been used as a base for hunting and gathering excursions into other areas during the rest

of the year. The dwellings were homes to small nuclear family units, and the village probably reflected the extended family of parents, brothers and sisters, grandparents, aunts and uncles and their families.



(a) Proto-Maiz de ocho was discovered in the Organ Mountains of New Mexico and is 2500 years old.
(b) A modern ear of corn.

The Late Archaic, circa 2500 B.C. to A.D. 1, marks the introduction of the first maize into the Southwest and reflects the revolutionary changes to the lives of Archaic people this development brought about. The number and size of settlements increased dramatically during the Late Archaic. Settlements were now occupied year-round instead of on a seasonal basis as they had been in the past. New types of sites also appeared during the late Archaic, including rock-lined roasting pits used to cook leaf succulents like agave and sotol. Animal bones found at late Archaic sites show an increase in rabbit hunting over larger game such as deer and pronghorn, and include fish and turtle bones for the first time. Early evidence of *domestication* and cultivation reveals that Archaic people were growing pumpkins, beans, squash, amaranth, and two varieties of maize (Proto-Maiz de Ocho and Chapalote). Manos and metates for grinding maize became more common than mortars and pestles for the first time, suggesting a trend toward the grinding of the new domesticated maize over acorns, wild barley, black walnuts, tornillo, and mesquite beans.

Photograph of a Mescalero Apache woman harvesting agave, circa 1900.

Indians throughout the Americas used digging sticks instead of plows to plant a variety of cultigens, including maize, pumpkins, squash, beans, amaranth, goosefoot, potatoes, and sunflowers. Some of these New World domesticates are quite old. Maize, for example, was first cultivated *nine thousand years ago* in the Balsas River Valley of Central México. By the time of European contact, maize was grown in nearly every environment found in the Americas, with over two hundred distinct varieties. Potatoes, domesticated by the early cultures of South America, boasted over three hundred varieties by the time of European contact.

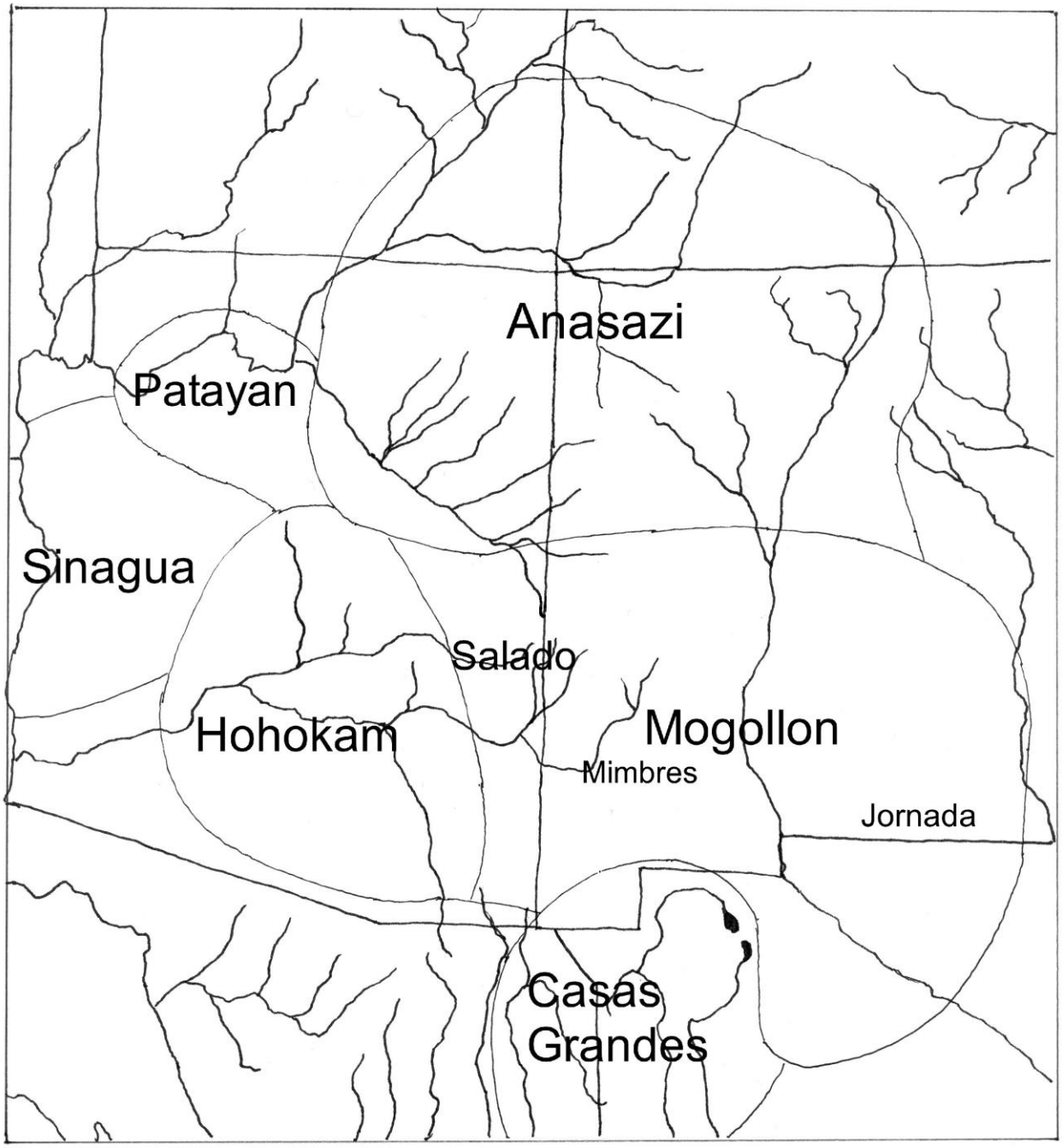
The trend in the Middle and Late Archaic toward larger and more numerous villages and base camps over time, becoming permanent settlements by the end of the Late Archaic, reflects the shift from the nomadic lives of the Early Archaic hunters and gatherers to the much more settled lives of the first farmers. The settlement patterns of the Formative period that followed the Archaic, with well established *pithouse* villages and later *pueblos*, grew out of this shift toward sedentism, made possible by the adoption of agriculture.

This seems as good a time as any to explain the meanings of the abbreviations B.C. and A.D. B.C. is the abbreviation for the words "Before Christ." B.C. always follows the number date, as if you were saying this event took place this many years before the birth of Jesus. Because of this, these dates are counted backwards from 1 B.C. (the year before Jesus was born), so that 2000 B.C. would be 4000 years ago. A.D. is the abbreviation for the Latin words *Anno Domini*, which mean "In the Year of Our Lord." A.D. always precedes the date, just as the words "In the Year of Our Lord" would precede the date.

The Formative Period A.D. 1 – 1450

The primary characteristics identified with the Formative period in the southwest are the appearance of *pottery* and permanent architecture. The Formative period began about A.D. 1, although this date differs from region to region. As farming took hold in the Southwest as a more reliable food source than just hunting and gathering, people began to live in more

permanent communities near their fields. For the first time they built permanent dwellings call pithouses. As a result of this new sedentary life, cultural differences developed in regions of the Southwest.



Map of prehistoric culture regions.

Pottery is the other major introduction that distinguishes the Formative period from the earlier Archaic phases. The importance of pottery cannot be overstated. Cultures in México had been making pottery for many centuries before the technology arrived in the Southwest, and its arrival in the Southwest following the adoption of horticulture proved to be essential. Some new cultigens, such as beans, could not be cooked on a stick over a fire like other foods. Pottery enabled people to cook and eat foods that would have been inedible before. But there was more to it than that. A pot could be balanced on three hearthstones over a fire, filled with water, a bone, and a few vegetables to feed the entire family. A pot could keep vermin out of the seeds for next year's planting or this year's harvest and a pot could store water – an important adaptation in the arid Southwest. Pottery also served additional ornamental, symbolic, and even ritual purposes. Southwest Indians embraced this new technology and adapted it to meet their specific needs.

Casa Grande in Arizona, inhabited by the Hohokam.

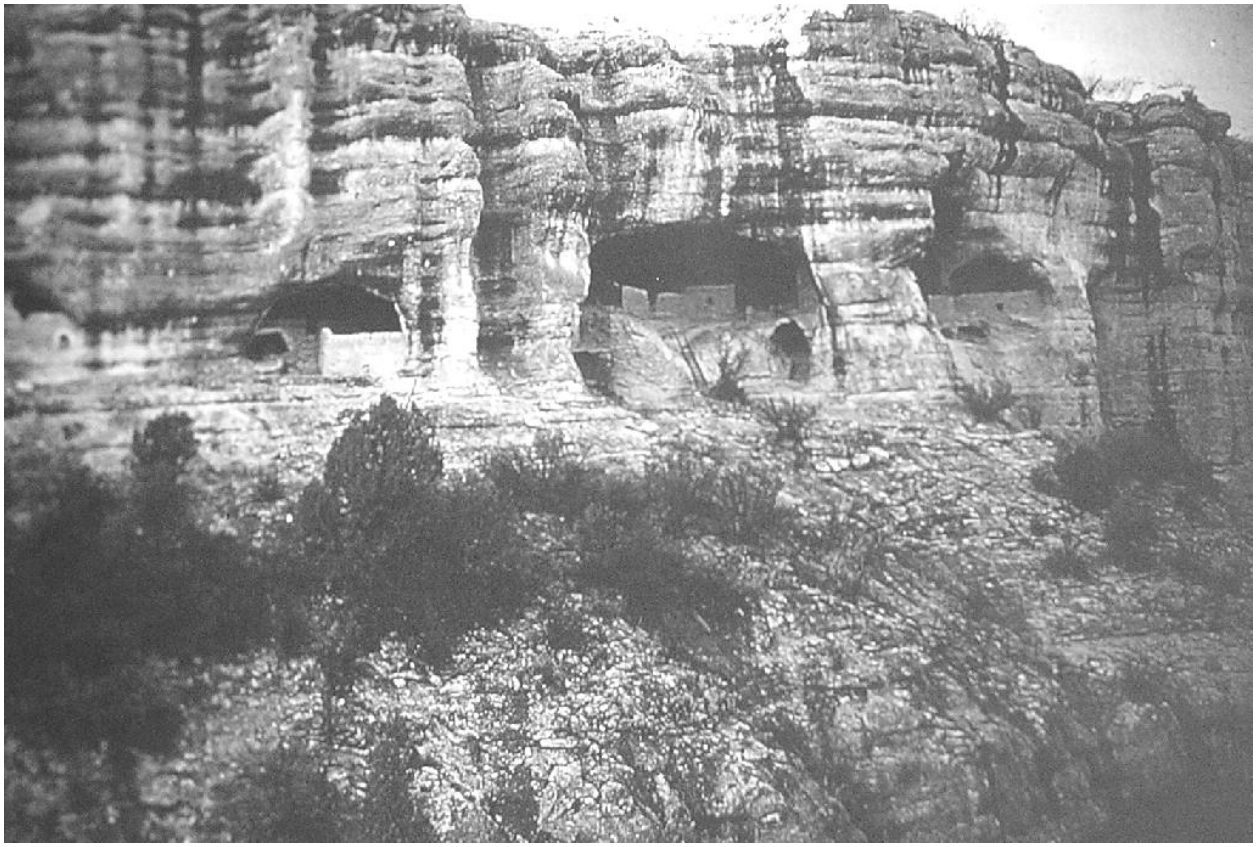
Five major culture groups emerged in the Southwest during the pithouse and later pueblo periods. The Hohokam established their cultural center in south central Arizona from A.D. 200 to 1200. The Hohokam made the first pottery in the Southwest, and their distinctive style influenced all the ceramics made by their neighbors for hundreds of years. In addition to extensive trade with groups in western and central México, the Hohokam also constructed adobe pueblos, massive canal systems that can still be seen today in parts

of the Phoenix area, and ball courts that are very reminiscent of those found in Mesoamerica.

The Patayan lived along the Colorado River from A.D. 700 to 1450, practiced farming along the river's flood plain, but never achieved the high level of water control that the Hohokam established. Their pottery was similar to pottery produced by the Hohokam, demonstrating the two cultures were in contact. They also lived in pithouse villages initially, and then gradually made the transition to pueblos.

The Anasazi inhabited the Four Corners region of the Southwest from roughly A.D. 400 to 1375, building elaborate pueblos in Chaco Canyon, at Aztec, Mesa Verde, Canyon de Chelly, and many other sites too

Great Kiva at Casa Rinconada, Chaco Canyon.



Gila Cliff Dwellings, New Mexico.

numerous to list here. The sophistication of these masonry structures, and the subterranean ceremonial rooms called *kivas* they were built around, suggest the Anasazi had very complex social organization and stratification. They also built roads across vast areas of the Four Corners region and there is evidence for trade with cultures living as far south as México.

The Mogollon occupied the southern half of New Mexico, southeastern Arizona, far west Texas and northern Chihuahua, México (A.D. 200 to 1400). In the Deming and Silver City area, they are called the Mimbres Branch of the Mogollon, named for the seasonal Mimbres River that runs north to south from the foothills of the Gila to the desert plain. The Mimbres are known for their unique and beautiful black-on-white pottery. Hundreds of Mimbres sites from pithouse villages to large pueblos with central plazas have been found in the Gila Wilderness, and there are

probably more still undiscovered in the mountains and forests. Further to the east of the Mimbres is the prehistoric range of the Jornada Branch of the Mogollon. Their pottery is nearly as ancient as the earliest Hohokam pottery. The Jornada Mogollon are less well known than their neighbors, the Anasazi, whose cut-stone pueblos can still be seen today, but they lived in the El Paso region for well over a thousand years. Their adobe pueblos melted into the desert, like those of the Hohokam and the Casas Grandes cultures. They farmed maize, beans, and squash, lived in pithouses and later adobe pueblos, leaving enigmatic images on the rocks in the area, particularly at Hueco Tanks and Three Rivers Petroglyph Site.

Paquimé, the Casas Grandes culture center in northern Chihuahua, México.

Just to the south and west of the Mogollon region was the Casas Grandes culture (A.D. 1150 to 1450), centered at Paquimé, in what is now Chihuahua, México. There is some controversy as to whether they were part of the Mogollon or were a separate culture. What *is* clear is that there was significant contact between the people of Paquimé and its

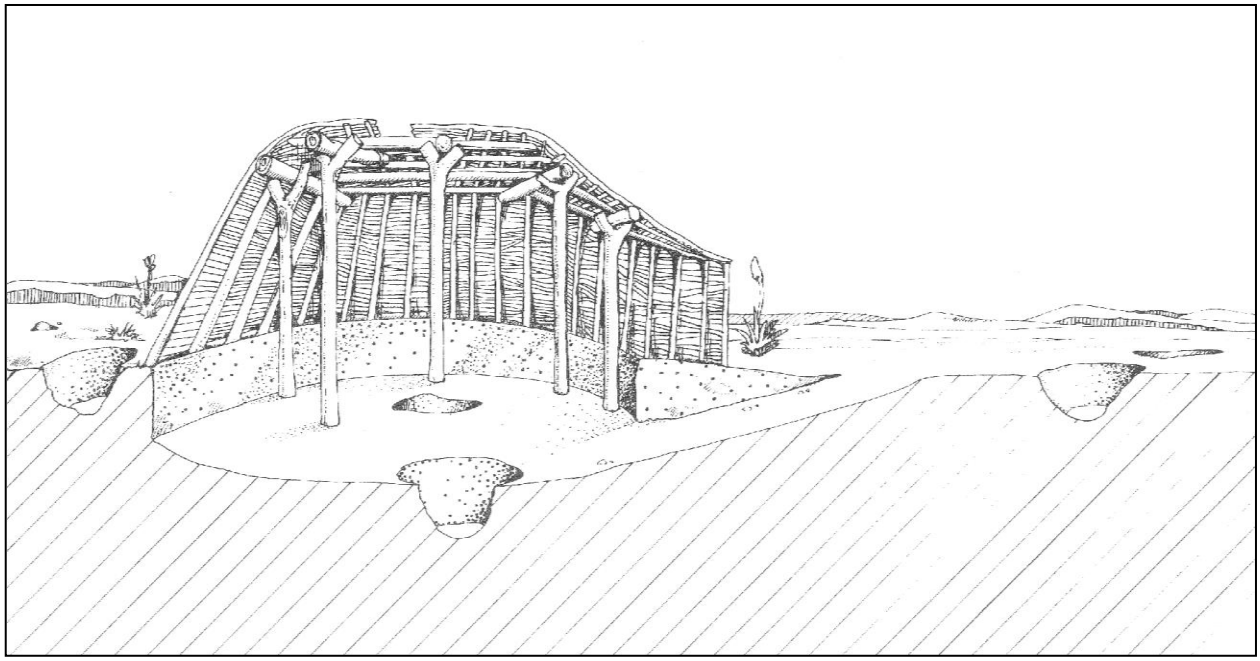
satellite communities and the people of the Mogollon region. Paquimé was a true city, with thousands of residents, multi-story adobe dwellings, drainage systems, and sophisticated industries. Once thought to be a major trade center, Paquimé is now believed to have been the end destination for goods from throughout the Southwest and México. Huge caches of shell beads, copper bells, pottery, and other items have been found there, including rows of cages for macaws. The sheer volume of these stores suggests they were being brought to Paquimé as religious offerings.

The Jornada Branch of the Mogollon

The Jornada Branch of the Mogollon is the eastern portion of the Mogollon cultural region, that encompassed the territory from Carrizozo, New Mexico in the north to just south of Villa Ahumada, Chihuahua, México in the south, and from east of Deming, New Mexico in the west to the Pecos River in the east. This territory is based on characteristics common to the ancient inhabitants of this region, such as similar architecture and pottery.

The Mesilla Phase A.D. 1 – 1100

The first phase of the Formative period in the Jornada Branch of the Mogollon is called the Mesilla phase. While the preceding Hueco phase is often considered the first component of the Jornada's Formative period, it was not until the Mesilla phase that the first pithouses were built in the region. Pithouses were, as the name implies, dug into the ground, so that part of the structure was below the surface and part was above. The reason for building a home partially underground was primarily for temperature control. Pithouses were cooler inside during the summer and warmer in the winter than surface structures. They were permanent structures, framed with wooden poles, sticks and grasses, and then covered with mud inside and out. In some parts of the Southwest where winters are harsher pithouses were dug as deep as a meter or more, but in the Jornada they were typically only a half a meter deep. Mesilla phase pithouses were circular or rectangular, and usually had descending entrance passages, but



An illustration of a pithouse in cross-section.

occasionally were entered through the roof. They were single-family structures, clustered in groups of fifteen to fifty dwellings. These clusters probably housed extended families or clans. Communal *hearths* and storage pits were located both in and between the pithouses, and well-defined trash accumulations were rare.

El Paso Brown was the first pottery type made in the Jornada, and is one of the oldest in the Southwest. It first appeared around A.D. 1, although recent research suggests it may have appeared as early as 200 B.C. This pottery type was not decorated, but the people of the southern Jornada made it in abundance. In the northern Jornada, people made a similar pottery called Jornada Brown, which is commonly found on Mesilla phase sites north of Orogrande. But these were not the only types of pottery used in the region. Alma Plain, San Francisco Red, and Mimbres Black-on-white from the Mimbres branch of the Mogollon to the west are also found on Mesilla phase sites.

By the Formative period, trade networks between the different groups in the Southwest and with cultures beyond the Southwest were well

established. Marine shell jewelry from the west coast of México is often found on Mesilla phase sites. While material goods are certainly visible evidence of these networks, it is clear from iconographic and ethnographic evidence that more was being exchanged than just seashells and pottery. The bow and arrow had begun to replace the atlatl and dart by the end of the Mesilla phase, and was probably introduced through contact with nomadic groups to the north and east of the Southwest.

The Doña Ana Phase A.D. 1100 – 1200

This phase is characterized by a transition from pithouse to above ground pueblo settlements and began about A.D. 1100. Pueblo is a Spanish word meaning "town" and is a good description of these new growing communities. Adobe was the predominant construction material, although there was some evidence of masonry. It is unclear why the people of the Jornada in particular and the Southwest in general made this transition to multi-room surface pueblos. What *is* clear is that populations were growing in the Southwest, probably as a result of higher crop yields, and a gradual shift occurred from the single-family pithouse dwellings to multi-room blocks where many families, extended families, lineages, or clans lived together. Pueblos started out modestly in the Jornada, and never achieved the populations or physical size of contemporary pueblos in other parts of the Southwest, such as the Mimbres pueblos at Old Town, Galaz, or NAN Ranch.

El Paso Brown pottery changed during the Doña Ana phase and was joined by El Paso Bichrome, then El Paso Polychrome slightly later. The bichrome was simply the original brownware with the addition of either red or black painted designs. El Paso Polychrome exhibited both red and black paint on the brown background. San Andres Red-on-terracotta began to be produced in the northern Jornada Mogollon in the Doña Ana phase. Chupadero Black-on-white, one of the most abundant types found in the Jornada, also made its first appearance during this phase. It was originally believed to have been a trade ware from the Gran Quivira pueblo region near Socorro, New Mexico, but recent research indicates it was also made locally in the northern Jornada. The most common trade

ware found on sites in this phase came from the Cibola region of New Mexico.

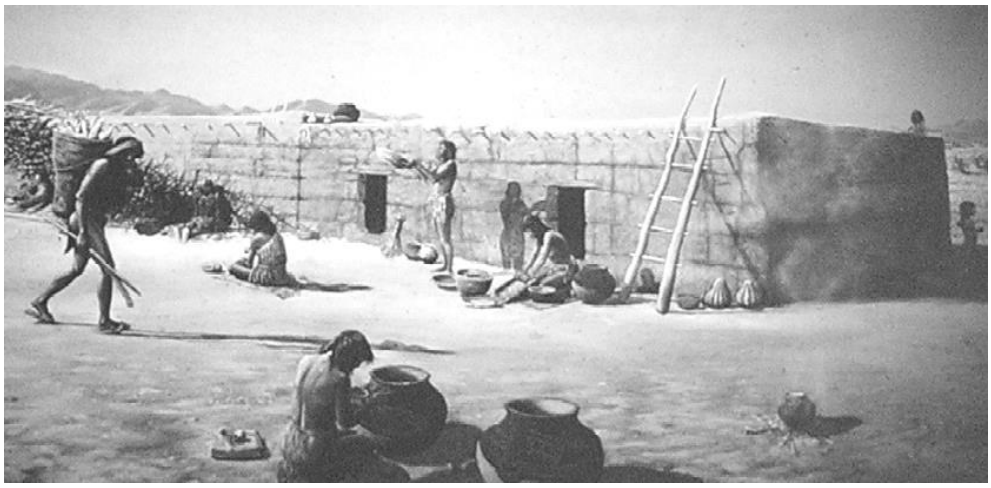
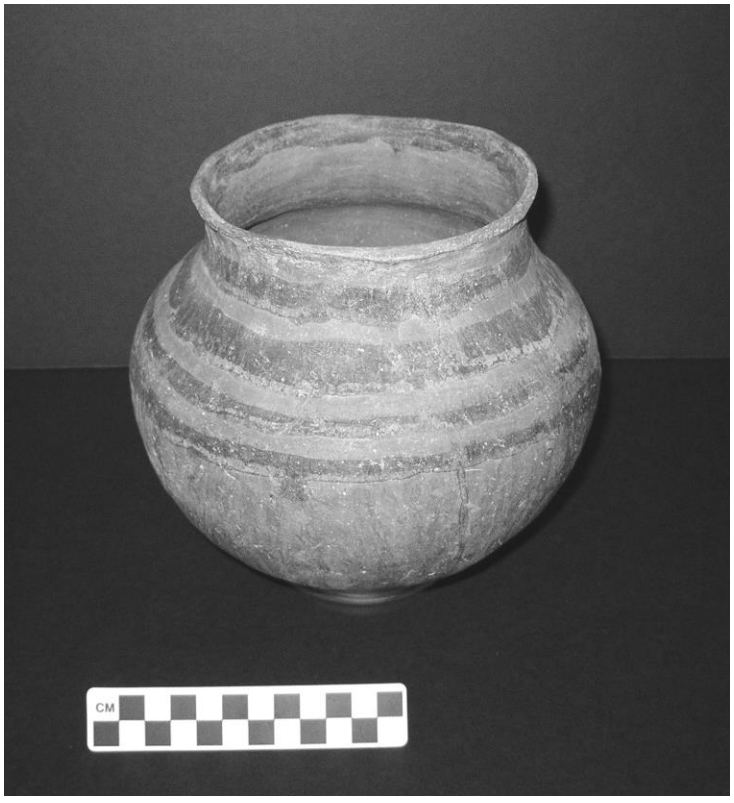


Illustration of Firecracker Pueblo in the Jornada branch of the Mogollon region.

The El Paso Phase A.D. 1200 – 1450

By A.D. 1200, the transition to pueblo living was nearly complete, although some El Paso phase settlements still contained pithouses. El Paso phase pueblos were much larger than their predecessors, both in size and in the number of rooms. Some had as many as 100 to 200 rooms. They were usually constructed in long roomblocks arranged in parallel rows, forming a U-shape, or sometimes enclosing a plaza. Some larger rooms in these pueblos exhibit characteristics common to the subterranean



El Paso Polychrome olla.

kivas in northern pueblos, including benches and caches of ceremonial objects, although they were still constructed at ground level. El Paso phase pueblos were built most often on alluvial fans or near rivers, although always on low rises above the flood plain.

Pottery types during the El Paso phase became more numerous, including El Paso Polychrome, Chupadero Black-on-white, Lincoln Black-on-red and Three Rivers Red-on-terracotta. Trade pottery types also became more numerous and from all parts of the Southwest, including a wide variety of Salado and Casas Grandes pottery types.

The introduction of major pueblo architecture and more numerous trade pottery types found in Jornada sites add to the growing evidence of an increasing population in the Jornada Branch of the Mogollon. With this population growth came an increase in social complexity and occupational specialization within these large communities. Horticultural abundance allowed for some members of the community to become specialists, such as religious leaders, basket makers, potters, or hunters, for significant periods of the year instead of spending the majority of their time and energy on subsistence.

Geographical distances did not seem to restrict contact between any people in the Southwest prehistorically, and certainly were not a barrier to contact between the people of the Jornada Mogollon and the pueblos to the north. The Jornada was part of the vast trade networks connecting the *tribes* of the Great Plains to the north and east, the people of the Pacific Coast, the tribes of the Texas Gulf Coast, and the highly sophisticated societies of Precolumbian México. Along these trade routes traveled buffalo meat and hides, turquoise, pottery, basketry, copper bells, seashells, and macaws.

The Jornada Branch of the Mogollon cultural region had perhaps more in common with the people of Paquimé than it did with the other Pueblo groups in northern New Mexico and northeastern Arizona. Casas Grandes ceramics are common on El Paso phase Jornada sites. And both the people of the Jornada Mogollon and the people of Casas Grandes (and the Hohokam, for that matter) built their pueblos primarily out of coursed

adobe, instead of the masonry typical of northern pueblos. While this difference is certainly due in part to what materials were available to pueblo builders, there is also a cultural component. Casas Grandes was also much closer geographically to the Jornada Mogollon than the closest of the northern pueblos at Gran Quivira and the Salinas pueblos, or those along the Mogollon Rim in eastern Arizona. The people of the Jornada also do not appear to have been as dependent on horticulture as their northern neighbors, and practiced widespread gathering of wild plant foods, including the harvesting of succulents such as agave and sotol in particular. Roasting pits for cooking these plants are found throughout the Jornada Mogollon. The Casas Grandes culture also harvested agave and other succulents. Enormous earthen ovens for roasting agave have been found at Paquimé.

Several different catalysts brought about the end of the El Paso phase. The first was a prolonged drought, which affected the entire Southwest. Felt first in the north, many Anasazi pueblos were abandoned and new ones were built in the northern Río Grande region closer to reliable water sources in the 1300s. By A.D. 1400, the pueblos in the Jornada Mogollon were also abandoned, the inhabitants possibly migrating north to form new pueblos just south of Socorro, New Mexico along the Río Grande. These became the people the first Spanish explorers called the Piro and Tompiro. Casas Grandes was also abandoned by A.D. 1450, but there is significant evidence that this abandonment had not been peaceful. This brings us to the second catalyst for change - the arrival of nomadic Athabaskan peoples from far to the north of the Southwest, who eventually became the groups we now know as the Apache and Navajo. The Athabaskans probably began arriving as early as A.D. 1100 or 1200, and there is speculation that the bow and arrow were adopted from early Athabaskan migrants to the region. But certainly by the 1300s, their presence had been felt throughout the Southwest and could account for the defensive nature of many later pueblos and the destruction of Paquimé in A.D. 1450.

The end of the El Paso phase was perhaps not as violent as the end of Paquimé, but is was no less dramatic. The pueblos were left to melt back into the desert sands. The fields of maize, beans, and squash were

abandoned. By the time the Spanish had arrived in the El Paso area, the only people they encountered were the hunting and gathering tribes of the Suma, Manso, and Mescalero Apache.

The Tiguas, who now live in Ysleta, are Pueblo people, but are relative newcomers to this area. The Tiguas are Pueblo Indians from the Isleta Pueblo just south of Albuquerque, who were brought south to the El Paso area with the fleeing Spanish during the Pueblo Revolt of 1680. With them came the last of the Piro and Tompiro from the Socorro area. They settled here and following the retaking of the pueblos in northern New Mexico by the Spanish, they chose to stay in the El Paso area instead of returning to Isleta. They may be descendants of the Mogollon, but by A.D. 1400, the Mogollon people were abandoning their pueblos.

Photograph of Isleta Pueblo Indians, circa 1900.

This short description of the prehistory of the Southwest and the El Paso area in particular is by no means complete, nor is it meant to be. A list of books to further explore Southwestern archaeology is included in the back of this guide.

Archaeological Ethics and Law

Who owns the past? This question is central to a major problem in the United States and the rest of the world. There is still an attitude in some quarters that if one finds it, one owns it. Not very long ago, families would pack up the station wagon and head to the backcountry for a day of picnicking and pot hunting. But a sinister trend has taken the place of the more benign recreational collecting. Looting and trafficking in cultural resources for profit has become both lucrative and widespread.

While at the British National Museum several years ago I saw the Elgin Marbles. These are the beautiful stone reliefs that adorned the Parthenon for a few thousand years until Lord Elgin, backed by the British Empire, decided they would be better off in England. The Greeks, however, have not seen it that way and have demanded the return of the marbles ever since. The marbles are, after all, part of their cultural heritage. In fact, they represent the cultural heritage of *all* people. No matter how much I appreciated seeing the marbles without traveling to Greece, it does not change the fact that they were stolen.

Who owns the past? The answer to this question is simple: the past belongs to us all. Every artifact or archaeological site is a part of our collective past, and we all have a right to that heritage and a responsibility to preserve it for future generations. To ensure the protection of this heritage, any construction or development project that receives federal funding must comply with federal laws, specifically the National Historic Preservation Act, the Archaeological Resources Protection Act, and usually the National Environmental Protection Act. Most states have similar laws to protect resources on state lands, and all of these laws have similar aims. The most important of these, in many respects, is the Native American Graves Protection and Repatriation Act, which I discuss in detail later.

Why are these laws necessary? These days, archaeologists try to distance themselves from archaeology's unsavory past. Only in the past few decades have archaeologists given any thought to ownership of archaeological sites and artifacts. A century ago archaeologists were little more than educated pothunters. Archaeological sites, including burials, were excavated in the name of scientific discovery, and artifacts were spirited away to distant museums and private collections. Archaeologists were often *themselves* collectors of artifacts. Museums often displayed human remains and the grave goods that had been buried with them. What do all these actions have in common? There was a clear disregard for the people whose ancestors were excavated, with undeniable racist undertones. It did not matter what Indians thought about the desecration of burial grounds, sacred sites, or the collection of culturally and ritually sacred objects. This represented a form of archaeological manifest destiny. Indians were regarded as little more than interesting, but ignorant, savages who would soon vanish into history.

Early archaeology throughout the world was akin to treasure hunting, conducted by wealthy amateurs such as Lord Elgin, to fill their Victorian cabinets and museums. It was the same the world over in Egypt, Palestine, India, Mexico, South America, and the United States. Sometimes these 19th century collectors acquired enough knowledge about the people they were digging up to write books about them. This did not change the fact that they were grave robbing and expropriating (taking) other people's cultural heritage.

Archaeology has changed tremendously since the early days, but the legacy of those days survives. Every time a person picks up an arrowhead and takes it home, a piece of our shared cultural heritage is lost. Just because the past belongs to everyone does not mean that an individual has the right to remove and posses it. And there is a deeper issue that no one wants to talk about: racism. Whether it would be acceptable for someone to dig up one of our ancestors, or put part of our cultural heritage on display in a museum, is unimportant. What *is* important is that it is unacceptable to American Indians. Pothunters do not dig up Euroamerican ancestors - they dig up Indians.

This brings us to the Native American Graves Protection and Repatriation Act, or NAGPRA. This act was signed into law in 1990. Let me give an example of why this kind of legislation was necessary. The Smithsonian Institution, which is exempt from NAGPRA and falls under the Museum Act of 1989, had more than 19,000 individual human remains in its collections in 1989, before it began its own repatriation process. Museums all over the United States had similar, if not quite as extensive, collections of human remains and associated artifacts. NAGPRA was designed to create a process for repatriating, or returning, human remains, associated and unassociated funerary objects, sacred objects, and objects of cultural patrimony from federally funded museums and educational institutions to the appropriate Indian tribes or Native Hawaiian groups. It gave these institutions a deadline for providing inventories of their collections for distribution to tribes with a possible cultural affiliation to these objects. It also put restrictions on future burial excavations on federal and tribal lands and enacted stiff penalties for trafficking in cultural and sacred objects.

NAGPRA has been controversial since its enactment, but given the past treatment of Indians, this act has served to right some wrongs. Human remains and associated burial goods are being returned to tribes for reburial. Repatriation of ceremonial objects has meant revitalization for tribal traditions and rituals. Some artifacts are now being displayed in tribal museums where the people whose ancestors made and used them are interpreting them. Increased cooperation between archaeologists and tribes has led to better understanding on both sides, including a trend in recent years toward Indians becoming archaeologists. Archaeologists working closely with tribes have gained a new appreciation and sensitivity to Indian views and the tribes have benefited from an increased knowledge about their own past.

Our American equivalent to Lord Elgin is the pothunter. Pot hunting is the theft of artifacts from archaeological sites on public lands. These looters are concerned only with finding artifacts of saleable value. In the Southwest, it is estimated that over 90% of all Mimbres sites and 60% of all Anasazi sites have been looted or vandalized. A Mimbres Classic Black-on-white bowl can bring thousands of dollars on the black market and end up in the hands of private collectors, the associated archaeological

information irretrievably lost. Pothunters often work at night, equipped with backhoes, police scanners, and lookouts. Sadly, what is lost is the information about the artifacts' context that helps archaeologists piece together the culture of the people who lived at the site. A single pothunter can destroy thousands of years of prehistoric information in only a few hours of digging.

Since the 1970s, there has been a concerted archaeological response to this crisis. The Mimbres Foundation was able to convince many landowners in the Mimbres cultural region of southwestern New Mexico to disallow pot hunting, and purchased a number of surviving sites to protect them. Joining forces with other archaeologists and benefactors, the Mimbres Foundation has now formed a national organization called the Archaeological Conservancy. Many more sites across the United States have now been purchased in this way, including the Keystone Archaeological Site, which is jointly owned by the City of El Paso and the Archaeological Conservancy. And on an international level, sites like Chaco Canyon and Taos Pueblo in New Mexico and Paquimé in Chihuahua, México have been given special protection under the United Nations Educational, Scientific and Cultural Organization (UNESCO) as World Heritage Sites.

With the advent of stiffer laws against looting and antiquities trafficking in recent years, pothunters are now facing more than the slap on the wrist of a decade ago. Fines of $100,000 for a first offense and jail time are stemming the tide of illegal digging in the Southwest. But it is the attitude of the public that is changing. Public awareness about the importance of archaeological site protection is what has made these new laws possible. As we become more responsible for our shared heritage, pothunters will find it increasingly difficult to find markets for antiquities.

Unfortunately, not every archaeological site can be protected. Sites can be threatened by a multitude of causes, both natural and man-made. For example, erosion from wind or rain, inundation from the creation of dams and reservoirs, or destruction from development, such as pipelines, roads or subdivisions, can threaten sites. To comply with state and federal laws, developers must have the area to be developed surveyed by contracted

professional archaeologists to determine if there are archaeological sites in the area before development may begin. If sites are found, they are mapped and even excavated to record as much information as possible before the site is destroyed by the development. This is often called salvage or contract archaeology. If it is determined the site is something more than a simple campsite with a few stone flakes and a hearth and is too important from a cultural resource standpoint to be destroyed, recommendations are then made to preserve it.

Sometimes development of the site cannot be stopped and the archaeologists then gather all the information, artifacts, and even burials from the site. Special permits must be obtained from the proper state and federal agencies to excavate burials, which are then stored until they can be reburied at a later date. Indian tribes that might be affiliated with the burials are contacted by the state in case the tribes wish to claim the remains. The goal is to give Indian tribes every opportunity to respond to the situation, make claims if they so choose, or make recommendations about the importance of the site and whether it should be preserved. After all, highways can always be rerouted around sites.

Archaeology and You

How can you help preserve the past? Here are some dos and don'ts:

- If you find a site, report it to the State Historical Preservation Office or the office of the State Archaeologist.
- Don't pick up artifacts or dig on sites and report people who do.
- Don't advertise your find to anyone.
- Don't buy or sell prehistoric artifacts. This encourages the black market for antiquities and site destruction.
- Join a local or state archaeological society to learn about local sites and volunteer on excavations.

Activity 5: Archaeology and You

Grade Level: 5 - up

Time: 1 to 2 hours

Goal:
The students will learn about some of the problems facing archaeology today and what they can do to help preserve archaeological resources.

Supplies:
None required.

Activity preparation:
Discuss with the students the information in the *Archaeological Ethics and Law* section or reproduce it for distribution prior to the discussion.

Activity: Set up a role-playing scenario:

1. An archaeological site has been found on land recently annexed by a city where the development of a new sports arena is planned. Some of the fundamental issues include: local merchants and the city will benefit from the additional tourism revenues; hundreds of jobs will be created to build and staff the arena; archaeologists want to save the site for science and future generations; and the Indian tribe wants to halt the project to preserve their cultural heritage.
2. Divide the students into groups, representing developers, archaeologists, construction workers, politicians, and local Indian tribal members. Have the students discuss the situation and options. How can these groups come to a compromise?
3. Ask questions of the students. How would the situation change if burials or sacred objects were found? Can the arena feasibly be moved to preserve the site, without costing the developers and the city millions of additional dollars? Do the benefits to the community, such as jobs and tourism, outweigh the cultural loss of the site?

Glossary

Absolute Dating A method that assigns dates in calendar years, such as Radiocarbon Dating and Tree-Ring Dating.

Archaeology The study of past cultures through the examination of the material remains they left behind.

Archaic Period Dating from 7000 BC to AD 100, the Archaic period is associated with hunting and gathering techniques and nomadic lifeways.

Artifact An object made, shaped or affected by human behavior.

Atlatl A Nahuatl (Aztec) word for dart throwing stick. The primary tool used for hunting in the Archaic period.

Context The relationship between material remains in time and space.

Dendrochronology Tree-ring dating, determined by counting defined annual growth rings from tree cross sections.

Domestication The act or process through which people adapt plants and animals to live in a human environment and be of use to humans.

Excavation The process of exposing archaeological deposits by digging.

Feature Non-portable artifacts that indicate human activity at a location, such as a hearth or architectural elements.

Foreshaft A piece connecting the shaft and head of a spear, arrow or dart, usually made of wood or bone.

Grid A linear matrix or framework superimposed on an area to create a map used to record the exact location of any object or feature found within the framework.

Ground Stone Artifacts made of stone that are shaped by grinding and often used for grinding, such as mortars and pestles or manos and metates.

Hearth The floor of the fireplace, often ringed by fire-cracked rock.

In Situ The natural undisturbed position of an object.

Kiva An underground or partially underground ceremonial and communal chamber found in both prehistoric and historic Pueblo villages.

Law of Association The principle that artifacts found in the same level are contemporary with each other.

Law of Superposition The principle that artifacts found in lower levels were deposited earlier and are older than those found in the levels above them.

Lithic Derived from the Greek word l*ithos*, meaning stone, it is used in archaeological contexts as an adjective to describe artifacts made of stone, such as lithic assemblages.

Mano A ground stone artifact held in one or two hands and used to grind organic material on a flattened surface such as a metate.

Metate A ground stone artifact with a surface upon which organic material such as corn was ground.

Midden Refuse or trash heap.

Mortar A vessel or depression in a rock surface in which materials are crushed or ground with a pestle.

Paleoindian The name given to the earliest human inhabitants of the Americas, arriving sometime around 15,000 BC to 7000 BC.

Pestle An implement used to pulverize or grind materials in a mortar.

Petroglyph A carved or pecked image of animals, humans, mythical beings, or geometric and curvilinear designs found on rock surfaces.

Pictograph Drawn or painted image of animals, humans, mythical beings, or geometric and curvilinear designs found on rock surfaces.

Pithouse A dwelling constructed partially above ground and partially below the surface, to help regulate the extreme heat of summer and the cold of winter. Built of a wooden frame, then thatched with smaller branches and grass and covered with mud.

Pleistocene Of, or relating to, the last million years of geological history, known as the age of glaciers, from which the earliest skeletal remains of Homo sapiens date.

Pottery Objects shaped of moist clay and heated to harden and strengthen them.

Prehistoric Of, or relating to, the time period that predates written records.

Projectile Point The sharp tip of a projectile, such as an arrowhead.

Provenience The source or origin of an artifact, specifically the horizontal and vertical context in which it was found in a site.

Pueblo A dwelling made of adobe or stone masonry, generally consisting of room blocks of single or multiple stories, where the entire community lived.

Relative Dating A method of determining a chronological sequence for artifacts without exact dates often through the use of artifact seriation, each region exhibiting different sequences of seriation which can be linked together and cross-dated, enabling dates from one site to be transferred to other sites.

Seriation A relative dating technique based on the chronological ordering of a group of artifacts or assemblages of artifacts based on their characteristics where similar artifacts are placed adjacent to each other to create a sequence or series.

Sherd A piece of broken pottery; a potsherd.

Site Any location where there is evidence of human activity.

Stratigraphy the study of strata or the levels of either geological or archaeological materials using the geological law of superposition.

Surface Collection The recovery of archaeological material from the surface of the ground.

Survey An examination of an area to record evidence of human activity.

Symbol A representation, such as a sign, for material or non-material objects or ideas.

Temper Non-plastic material, such as sand or crushed rock, added to clay to reduce stickiness, counteract shrinkage and allow the escape of steam during the drying and firing of a ceramic vessel.

Tradition An established and recognized cultural pattern or style.

Tribe A social group speaking a distinctive language or dialect and possessing a distinctive culture that distinguishes it from other social groups.

Unit A measured square within a site in which the placement of artifacts is recorded.

Books for Students

Duke, Kate
1997 *Archaeologists Dig for Clues.* Harpercollins Children's Books.

Goodman, Susan E. and Doolittle, Michael J.
1998 *Stones, Bones, and Petroglyghs: Digging into Southwest Archaeology.* Simon & Schuster Children's.

McIntosh, Jane R. and McIntosh, Jane
2000 *Eyewitness: Archeology.* DK Publishing, Inc.