Civilizations of the Americas

THE ANCIENT WORLD

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CIVILIZATIONS OF THE AMERICAS

Volume 3

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Preface

Studying the world's history is like being an explorer who travels across centuries to unfamiliar lands. The traveler encounters ancient cultures and civilizations and, above all, has countless opportunities to examine both what was thought to be familiar and what was completely unknown.

The history of the ancient world, much like that of the modern era, is a series of interactions played out by familiar and unfamiliar characters upon a stage of equally diverse geography. Knowing how these interactions occurred and evolved, and how, at times, they were obstructed, is crucial to both the study of the past and an understanding of the present, in terms of both progress and conflict. The five volumes of *The Ancient World: Civilizations of Africa, Europe, the Americas, the Near East and Southwest Asia,* and *Asia and the Pacific* help readers step back in time, making familiar what was unknown.

The way we interact with others today—learning a world language and exploring another culture, for example—is not very different from how people in the ancient world interacted with each other. Geographical characteristics, however, played a much more dramatic role in governing the interactions among ancient peoples than they do in interactions among modern ones.

Humans have been on the move from the beginning. Paths they have taken and other peoples they have encountered have always been functions of the geographical opportunities or hindrances they have faced. From Africa, the first place where humans lived, populations began to migrate north into Europe and throughout Asia as the glaciers of the last Ice Age receded. In the South Pacific, people seeking fertile hunting and fishing grounds sailed from one island to another centuries before open sea travel was thought possible in the West. As a result of the Ice Age, a land bridge, known as Beringia, connected Eastern Siberia, Asia, and North America, a connection that the Bering Sea now covers. Beginning around 13,000 B.C.E. or even earlier, humans called Paleo-Indians, in search of food, crossed from Asia into what is now Alaska and from there moved farther south.

While populations spread across the globe at an early time, their growth was limited by a reliance on hunting and foraging for subsistence. In order for large civilizations to develop, humans had to learn how to manipulate their environment; the cultivation of crops became a necessity for survival. The earliest evidence of crop cultivation appeared in Jericho (an oasis in the Jordan Valley) around 8,000 years ago. From there, agriculture spread in all directions, giving rise to the greatest of the early civilizations, those of Egypt and Mesopotamia. These kingdoms rose along what is known as the Fertile Crescent, a region of rivers, oases, and arable coastland that stretches in a curve north from the Persian Gulf, across the northern reaches of modern-day Iraq, and south along the Levantine coast into the Nile Delta region of northern Egypt.

Although different civilizations have been, and continue to be, separated by distance and by variation in climate and topography, not to mention differences in languages, traditions, and belief systems, some elements of one culture's intellectual history closely resemble those elements in other cultures. The creation and flood narratives of the Old Testament, for example, exist alongside similar tales in the ancient cultures of the Middle East, the Mediterranean region, and Africa. Ancient stories about the creation of the world, genealogy, agricultural practices, and morality, have been found to bear striking similarities all over the globe among groups of people who had little, if any, possibility of interacting.

With countless movements and human interactions obscured by time, distance, and varying perspectives, surveying the terrain of the ancient world may seem intimidating. As your guide, the volumes of this series provide a road map of the past. *The Ancient World* allows you to travel back in time to examine the origins of human history, how the environment shaped historical development, and how civilizations developed.

Articles are arranged alphabetically, and sidebar features expand the coverage: "Turning Points" discuss topics such as inventions that have propelled civilization forward; "Great Lives" reveal individuals whose extraordinary deeds shaped a people's history and culture; "Links in Time" connect the past to the present or one period to another; "Links to Place" draw some startling parallels in far-flung places; and "Ancient Weapons" reveal amazing early technology. May this journey offer you not only facts and data but also a deeper appreciation of the past and an understanding of its powerful connection to the present.

Sarolta A. Takács

The New World

The "New World" is a phrase commonly applied to the Americas because Europeans became aware of the continents' existence only at the close of the fifteenth century C.E., a relatively recent point in human history. On the one hand, it is a troubled cliché; on the other hand, it is fitting from a broad historical perspective. North and South America together constituted a new frontier when the first Americans arrived on these continents some 12,000 or 13,000 years ago, or earlier. Likewise, the first European explorers in the Americas also found a new world: continents endowed with a cross section of the globe's geological and climatic characteristics supporting a myriad of distinct and unfamiliar societies.

Indeed, geography played a key role in the development of ancient American cultures. The earliest Americans, as they searched for a livelihood, benefited from the continents' sheer land mass and abundant natural resources. These same resources made the Americas attractive to European colonial powers. However, the isolation that allowed the earliest American societies to develop independently also left people vulnerable to diseases to which they had little or no immunity. Smallpox, a disease that claimed countless lives among the indigenous population, would prove to be the deadliest weapon in the arsenal of European explorers and settlers.

THE LANDS AND THEIR PEOPLES

North America, which includes modern-day Central America, the West Indies, the Caribbean Islands, and Greenland, is the third-largest continent, covering an area of about 9.1 million square miles (23.6 million sq km). It is bordered to the north by the Arctic Ocean, to the east by the Atlantic Ocean, and to the west by the Pacific Ocean. This vast expanse of land features widely varying terrain, from steep and rugged mountains to great stretches of flat prairie, and from arid and treeless deserts to thick swamps and dense rain forests. Such differences in climate and geography have helped determine the extent, and shape the nature of, the continent's many indigenous cultures.

The vast majority of North America's more than 500 million current inhabitants are descended from European immigrants who arrived within the past 400 years. European diseases such as smallpox, and conflict between European settlers and native peoples, devastated the indigenous population. As a result, indigenous peoples—Native Americans or Amerindians, Inuit, and Aleuts—make up only a small percentage of the current population. There are, however, a sizeable number of individuals of mixed European and indigenous descent, particularly in Central America.

South America is the world's fourth-largest continent, encompassing about 6.9 million square miles (17.9 million sq km). To the north, the Isthmus of Panama marks the land boundary between South America and North America. The Caribbean Sea forms the remainder of South America's northern border. The Atlantic and Pacific oceans bracket the continent to the east and west, respectively.

South America is roughly divided into three regions by its two main geographical features—the Andes Mountains and the Amazon rain forest. The Andes run north to south along the entire west coast of South America, forming a formidable barrier between the west coast and the rest of the continent. To the east of the Andes, dominating northern South America, is the world's largest rain forest. The Amazon rain forest covers some 2 million square miles (5.2 million sq km), or about 30 percent of the continent's total land area. To the south of the Amazon is a low, flat plain that comprises most of the modern nation of Argentina.

The great majority of South Americans are of European or mixed European and indigenous descent, and most claim Spanish or Portuguese ancestry. As in North America, the arrival of Europeans resulted in the decimation of local populations. However, the daunting physical barriers presented by the Andes and the Amazon protected many remote indigenous groups by isolating them from outside contact. As a result of geography, the indigenous population of South America today is significantly larger than that of North America (some 18 million people compared to roughly 4 million).

PREHISTORY

The influence of the land on its people predates recorded history. As a result of the last Ice Age, a land bridge known as Beringia connected Eastern Siberia, Asia, and North America, a connection that the Bering Sea now covers. Beginning around 11,000 B.C.E., or perhaps even earlier, humans, called Paleo-Indians, in search of food, crossed from Asia into what is today Alaska and from there they moved further south through an exposed corridor within the ice sheet.

The early inhabitants found in North America a landscape still harshly cold and glaciated as the Ice Age waned. There were also some very imposing predators on the continent, enormous creatures that had yet to become extinct. These included the dire wolf, a huge ancestor of the modern wolf, which stood 5 feet (1.5 m) high, and the saber-toothed cat, which impaled its prey with two 7-inch (15-cm) teeth. As the Paleo-Indians traveled south, they stalked giant prey, such as the mammoth and mastodon, large hairy creatures related to the modern elephant.

Most modern knowledge of these earliest settlers of the Americas comes from archeological evidence of their hunting methods. The first tangible evidence of these newcomers are what seem to be spear points, called "Clovis points," named after the archeological site Clovis in New Mexico where they were first found. Similar finds have shown that humans had migrated throughout North, Central, and South America by around 10,000 B.C.E.

Dramatic climatic changes brought the Ice Age to an end, and Paleo-Indians, as a result, developed new means of subsistence. The large animals they once hunted died out, and smaller animals took their place. For example, the bison replaced the mammoth as the principal source of meat and hides for peoples living in North America. Archeological research reveals that the Folsom peoples of the Great Plains may have been specialists in hunting bison. Named for a site in New Mexico where their spearheads ("Folsom points") were first discovered, they appear to have been the first group to use hunting parties to surround their prey.

Eventually, the hunting and gathering lifestyle of the Paleo-Indians gave way to a more sedentary existence in areas where predictable sources of food could be cultivated. Maize or corn may have been domesticated as early as 10,000 B.C.E., and the potato, one of the first domesticated root crops, around 5,000 B.C.E. About 3,000 years ago, people living along the coast of what is now Peru dug irrigation channels to supply water to their fields. Systematic agriculture reached North America around 8,000 B.C.E. with the cultivation of beans, squash, and corn in what is today New Mexico. The earliest evidence of irrigation in North America, discovered in the same general area, dates to about 3,000 B.C.E. An examination of the spread of systematic farming and its impact on the evolution of ancient civilizations runs through many of the articles in this encyclopedia.

EARLY PEOPLES AND CIVILIZATIONS

The topography of the ancient Americas led to the development of region-specific societal structures. Nomadic cultures, such as the Clovis and Folsom peoples of North America, abounded in areas with wide plains and deserts. More sedentary societies, such as the great civilizations of the Maya and Aztec in Central America, flourished in fertile river valleys and coastal plains. Nomadic and sedentary societies met and influenced each other, resulting in certain parallels among native cultural practices and expression.

Woodland Groups

The heavily forested region of what is now the northeastern United States was home to many early North American cultures. These include the Adena of the Ohio Valley, who were the first Native Americans to build burial mounds and fortifications. Adena burial sites, some of which date to as early as 600 B.C.E., have yielded ornate funerary objects such as copper plates and ceramics as well as metal jewelry, shells, and pearls. The Hopewell people, who succeeded the Adena as the dominant society in the region, continued many Adena burial techniques. While the Adena had been nomadic hunters who settled in temporary camps, the Hopewell resided in more permanent villages and began to cultivate crops.

Mississippian Cultures

Around C.E. 500, Mississippian tribes, known as Mound Builders for the large earth mounds they built as tombs, supplanted the Hopewell. By this time, maize cultivation was the primary agricultural practice in the region. This nutritious and reliable crop allowed larger centers of population to develop. One of the cities of the Mound Building culture, Cahokia, in what is now Illinois, may have had as many as 20,000 inhabitants in the early twelfth century C.E. Cahokia also boasts the largest of the known temple mounds, which rises almost 100 feet (30 m) and extends over a length of almost 1,000 feet (305 m). The Temple Mound culture also elaborated on the funerary offerings of the Adena and Hopewell before them, and their graves contain sophisticated copper works such as ornate ceremonial axes.

Anasazi

In the southwestern area of North America, the Anasazi also developed large permanent settlements because of advancements in agriculture and grain storage. The Anasazi built apartment-like structures called pueblos out of adobe along the sides of cliffs around C.E. 900, and they farmed in the river valleys beneath their dwellings. The relative inaccessibility of their cliff-side homes protected them from possible attack by nomadic peoples.

Olmec

The Olmec created the most influential early civilization in central Mexico, flourishing from roughly 1500 until 400 B.C.E. Many aspects of Olmec culture were adapted by later Central American cultures such as the Maya and Aztec. These included the construction of stepped pyramids and the worship of deities such as the jaguar god. Later, the Aztec adopted the Olmec god Quetzalcoatl, a plumed serpent, as one of their principal deities.

The social structure of the Olmec seems to have been **stratified** into peasant and noble groups. In order to maintain an agriculturally based society, and to construct monumental structures such as temples and pyramids, this stratified social structure must have been administered with some efficiency.

Maya

The Maya were the most prominent Mesoamerican, or Central American, civilization. The earliest evidence of Mayan culture comes from the Yucatan Peninsula of southern Mexico and dates to around 2600 B.C.E. At the height of their power, in about C.E. 250, the Maya controlled an area that now encompasses southern Mexico, Guatemala, western Honduras, El Salvador, and northern Belize.

The Maya created a highly sophisticated and literate society marked by advancements such as a hieroglyphic writing system and a knowledge of astronomy extensive enough to allow compilation of an elaborate calendar. Like the Olmec, the Maya were pyramid builders. The Maya maintained communication within their realm via an extensive trade network, facilitated by roads built through the jungle.

Toltec

Much territory that had once been Mayan was overtaken by the Toltec culture from the tenth to twelfth centuries C.E. The Toltec formed a large empire ruled from the city of Tula in northern Mexico. Art and architecture discovered in Tula and other Toltec cities is reminiscent of earlier cultures such as that of the Olmec. Toltec art and public works were so admired by the later Aztec cultures that many Aztec claimed Toltec descent; in fact, the very word *toltec* became synonymous with "cultured" or "skilled."

THE LAST EMPIRES

The Aztec and Incan empires were the last great civilizations to arise in the Americas prior to the arrival of Europeans in the late fifteenth century C.E. Both empires developed complex agricultural and administrative structures, which allowed them to rule vast territories and amass great wealth and power. The Aztec and the Inca would be the unchallenged masters of their regions until European forces conquered them in the early 1500s.

Aztec

Aztec cultural roots can be traced to northern Mexico around C.E. 1100. By the fifteenth century C.E., the group had migrated south to central Mexico and founded an empire centered around the great city

of Tenochtitlán (the site of present-day Mexico City). Aztec culture was stratified, like that of the Olmec before them, and capable of producing grand public works like those of the Maya and Toltec. Tenochtitlán itself was a wonder of early urban development, built upon a series of artificial islands in Lake Texcoco. The Aztec dredged the surrounding swamplands and constructed floating gardens upon which they cultivated a variety of crops. The visual effect was so striking that the Spanish troops who conquered the Aztec referred to Tenochtitlán as "the Venice of the New World."

Inca

At about the same time that the Aztec dominated Central America, the Inca were establishing the largest empire in South America. Around C.E. 1100, the Inca began to expand from their homeland in the Andean region of modern-day Ecuador and Peru. The empire they founded eventually stretched from Ecuador to Chile and from the Andes to the western coast of South America. Like the Aztec, the Inca were a sophisticated people; for example, they employed innovative technologies to create terraces on the steep slopes of the Andes in order to exploit as much arable land as possible. The Inca, too, built large urban centers and connected them with a network of roads that stretched the length of the empire.

EXCHANGE AND ENCOUNTER

For more than 10,000 years, the descendants of the Paleo-Indians were the only inhabitants of the Americas; the continents were unknown to the rest of the world. The first Europeans to come upon this "New World" were Norsemen who had settled Greenland in C.E. 985. Around C.E. 1000, Leif Eriksson traveled from Greenland to what is today Newfoundland, Canada. He and some of his relatives made several unsuccessful attempts to create a permanent settlement in North America, but their discovery was soon forgotten. Europeans "rediscovered" the Americas in 1492, when Christopher Columbus encountered the Caribbean island of Hispaniola while searching for a westward route to India. Scholars estimate that perhaps as many as 40 million people lived in the Americas at the time of Columbus's arrival.

The European discovery of the Americas ended the continents' isolation from the wider world and touched off a steep decline in the indigenous population. European interest in the Americas focused on seizing natural resources—especially precious metals such as gold and silver—before other countries could do so. In the Caribbean and South and Central America, Spanish explorers and conquistadors laid waste to the existing societies. Within 20 years of Columbus's arrival, the Spanish had colonized most of the Caribbean and established a settlement on the mainland in Panama.

The pace of exploration accelerated following the fall of the Aztec Empire in 1521 to a small force of Spaniards led by Hernán Cortés, supported by indigenous enemies of the Aztec. The enormous amount of gold and silver seized by Cortés raised the promise of more great riches to come and led European monarchs to redouble their exploration efforts. Francisco Pizarro's conquest of the Incan Empire between 1532 and 1534 further stoked the fires of European exploration in the Americas.

By contrast, the European conquest of North America was a more gradual and less spectacular process. No gold or silver awaited the first explorers; the first colonies were unsuccessful, and in many cases European settlers depended for their survival upon help from the native population. Despite the lack of precious metals, valuable natural resources such as sugar, tobacco, indigo, furs, and timber attracted more settlers. By the mid-seventeenth century C.E., a host of European nations, including Spain, Portugal, England, France, and Holland, had established colonies in the Americas, often driving native peoples off the land. With the founding of permanent European colonies, the demise of the indigenous peoples was at hand. Within a few generations, disease and conflict would kill some 90 percent of the native population.

CONNECTIONS TO TODAY

The European discovery of the Americas served notice that the geographical isolation that had shaped the development of ancient indigenous American cultures was coming to an end. The invention of faster and more efficient means of transportation allowed ever greater numbers of immigrants to

flock to the Americas from increasingly more remote places. By the early twentieth century C.E., the ocean crossing that took Columbus months to achieve was reduced to only a few days. The advent of air travel would cut the time to mere hours. The Americas, which once represented a "New World" to so many, now exist in an increasingly connected world in which global transportation and communication provide access to even the remotest locations on the planet.

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Map of Ancient Americas

ANCIENT AMERICAS, CA. C.E. 500

If, as many historians and archeologists now suppose, humans first crossed into the Americas from Siberia across a land bridge about 13,000 B.C.E., it seems amazing that by 8000 B.C.E. they had traveled thousands of miles to settle the entire landmass of North and South America. The most sophisticated civilizations—those of the Maya, Aztec, and Inca—emerged in Mexico and Central and South America. Once Europeans began to colonize the Americas in the sixteenth century C.E., however, most of the indigenous people were wiped out within 300 years.

A

Adena

A group of prehistoric Native Americans who lived in what is now Ohio, Indiana, West Virginia, Kentucky, Pennsylvania, and New York from about 1000 B.C.E. to C.E. 100. Because members of the Adena culture left no written records and very little evidence of their day-to-day life, nearly everything we know about these people has been gleaned from thousands of earthen burial sites, or mounds, that they constructed throughout the eastern half of what is now the United States.

In C.E. 1901, **archeologist** William Mills unearthed the first **artifacts** from the Adena culture on the estate of Ohio governor Thomas Worthington. Mills discovered a siltstone pipe fashioned to resemble a human and named it after the estate, which was called Adena. Later, the name was assigned to the people who had created the pipe and built the mounds. Many such pipes have since been unearthed; they are considered to be particularly fine examples of prehistoric Native American art.

The Adena did not live near the burial mounds that they built, which were probably regarded as sacred, and only three Adena settlements have been found to date. It is possible that European settlers destroyed the remains of villages as they cleared and plowed the land. The mounds themselves, then, are all that is left of Adena culture.

The burial mounds of the Adena varied greatly in size. The largest cone-shaped mound of any mound building culture is the Grave Creek Mound, constructed by the Adena and located in Moundsville, West Virginia. Grave Creek Mound is 62 feet (19 m) high and 240 feet (73 m) in diameter, was built over a period of more than 100 years, and holds the remains of many people. The Adena built the Grave Creek mound by moving more than 60,000 tons of earth in small basketloads, an immense effort that must have involved nearly everyone in the community.

Archeologists believe that **political history** of the Adena involved evolution from an **egalitarian** society to a complex, **stratified** society over time. Early burial mounds do not betray marked differences in how people were buried, but over time there came to be significant differences between the graves and grave goods of ordinary people and those of the elite. It appears that the remains of common people were cremated and that chiefs, elders, and **shamans** were buried in log tombs that were covered with earth. Bodies were interred along with flints, beads, pipes, and other ornaments.

The Adena were primarily hunter-gatherers who moved from place to place in small family groups in pursuit of food. They did not live in permanent

settlements but evidently gathered together periodically to bury the dead and engage in a variety of religious rituals. These occasional meetings probably helped bind members of the culture together. The Adena did not practice intensive agriculture but may have grown a few plants in small gardens.

No one knows what happened to the Adena; either they died out or they were absorbed into other cultures. The Hopewell culture (100 B.C.E.–C.E. 500), which lived in the same general area as the Adena and built similar burial mounds, is often cited as a continuation of the Adena culture.

See also: Archeological Discoveries; Art and Architecture; Hunter-Gatherers; Mound Builders; Religion.

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Agriculture

The roots of farming and raising animals for food among ancient Native Americans can be traced to the second or third millennium B.C.E., with the domestication of wild grasses and cereals. Although many Native American culture groups never adopted a settled agricultural way of life, continuing to live by hunting and gathering until well after European colonization, many other cultures changed once people developed the ability to grow a surplus of food. These more advanced societies include the Hopewell and Mississippi cultures in North America, and Mayan, Incan, and Aztec civilizations in Central and South America.

NORTH AMERICA

For many years, historians believed that there were only three places in the world where plants were originally domesticated: the Near East, China, and **Mesoamerica**. From these three areas, it was believed, domesticated plants were carried around the world.

Recent research, however, suggests that there was a fourth major center of plant domestication: eastern North America. "In fact," according to anthropologist Ruth Selig in "A Quiet Revolution" (1998), "eastern North America provides the clearest record available of agricultural origins anywhere in the world." Plants such as chenopod, marsh elder, sunflower, erect knotweed, little barley, and maygrass were domesticated in North America by 2000 B.C.E., long before the appearance of more well-known crops such as corn, beans, and squash in Mesoamerica. The seeds of these first domesticated plants could be boiled and eaten as cereal, ground into flour, or eaten raw.

Like many other domesticated plants, these early varieties began as wild plants that grew along the floodplains of rivers. Over time, people began to harvest the seeds and replant them the following year. From about 250 B.C.E. to about C.E. 200, people of the Hopewell culture lived in small settlements in river valleys along the Mississippi River and planted these crops in small plots, using only stone and wooden tools. A field of only 200 square feet (19 sq. m) planted with marsh elder and chenopod could easily be harvested by a family of five in about a week and would have yielded enough to feed a family of 10 for six months.

Cultivation of Maize

Although maize arrived in North America from Mexico in about C.E. 200, North American farmers did not grow much of it until about C.E. 800. No one is sure why it took so long for the crop to become as popular in North America as it was in Central and South America, but there is some evidence that maize was originally reserved for religious and ceremonial use. Some cultures, for example, that did

TURNING POINT

The Domestication of Maize

Maize, or, as Americans typically call it, corn, was first domesticated in **Mesoamerica** thousands of years ago. It is an extremely valuable food crop because it is easy to plant, hardy, yields plenty of grain, and has a growing cycle that takes advantage of spring rains. Maize also provides excellent nutrition and, along with beans and squash, provides all the amino acids that humans need to sustain life. Moreover, corn can be dried and preserved, allowing a human population to survive during years with poor harvests.

While the domestication of many plant species was a simple matter of collecting and planting seeds, the domestication of maize was a long, difficult, and tricky process. Maize never existed in the wild, and it must be sown and cared for by people. The origin of maize is unknown, but most researchers believe that maize resulted from domestication of a Mexican plant, teosinte, or *Zia mays*. Teosinte yields kernels that can be popped, much like corn, and modern scientists have been able to demonstrate that it can be mutated into corn in only two steps. Some researchers believe that maize is a direct descendant of teosinte; others believe that it is a hybrid.

It remains a mystery why anyone ever thought of trying to cultivate teosinte, since its grains are small and individual, not multiple and attached to cobs as is the case with modern corn. The earliest cobs were only a few inches long and had only eight rows of kernels. It took several thousand years for the evolution of the modern grain, which occurred only because of systematic human intervention.

not eat corn instead buried it with individuals of high social status.

From C.E. 800 to C.E. 1100, a Native American culture known as the Mississippian arose and dominated most of North America east of the Mississippi River Valley. Mississippians quickly came to rely on maize as their primary food crop. As food surpluses grew, Mississippians built fortified towns and developed a complex social structure. This is evidenced by their burial mounds, which reveal sharp distinctions in social class. Most lower-status people were cremated, while higher-status people were buried along with luxury objects, such as jewelry. Farming took place outside the boundaries of the towns.

Land Ownership

Native Americans had two systems of land ownership. In one system, a village or cultural group owned the land while individual women controlled their own fields. As long as a woman continued to farm a field, it was hers for planting. But if she stopped using the land, someone else could take it over or it would be returned to the village for reallocation. This system of ownership occurred in **matrilineal** societies—that is, societies in which families were traced through their relationship to the mother, rather than to the father.

The second system of land ownership prevailed in the southwestern parts of what is now the United States. There, individuals could own land and pass it down from father to son or mother to daughter. Nevertheless, Native Americans did not conceive of ownership in the same way that Europeans did; they saw themselves less as owners than as guardians of the land, holding it in trust for the next generation.

Agricultural Methods

Typically, Native American farmers grew their crops in river valleys and flood plains, where the soil could be easily worked with stone and bone implements. They used fire to burn weeds and the remains of the prior year's crop, which added important minerals to the soil. Many culture groups developed unique methods of preserving seeds and plants from birds and insects. The Mohawk soaked seeds in water

mixed with hellebore, a toxic root. The Navajo sprinkled urine mixed with goat's milk on squash plants to prevent damage by chinch bugs.

Although most native North Americans planted their fields near sources of water, farmers in the arid southwest needed an artificial method of irrigating their fields. The Hohokam people built the most extensive network of canals in ancient North America along the Salt, Gila, and Verde Rivers in Arizona. The longest of the canals carried water more than 16 miles (26 km). In all they built more than 600 miles (965 km) of canals without the use of beasts of burden or metal implements.

In many tribes, farm labor was the province of women, although men did the heavy work of clearing the fields. Then women planted the seeds and harvested the crop, using simple tools of wood and stone, as well as baskets for storing and winnowing grain.

By C.E. 1000, most native groups across North America relied on a trio of domesticated plants that came to be known as the "three sisters": maize, beans, and squash. Native Americans developed an efficient method of growing their three primary crops. A typical field consisted of mounds of well-tilled earth—sometimes in rows, sometimes randomly placed. Corn was planted in the center of each mound, and beans were planted near the corn so that their climbing vines could be supported by the corn stalk. Farmers planted squash between the mounds. The three plants not only thrived together in the field, but also complemented one another nutritionally, providing a diet high in fiber and important nutrients.

MESOAMERICAN FARMING

The major civilizations of Mesoamerica, the Maya and the Aztec, each developed agricultural methods and crops that were suited to the geography of the regions in which they lived. The Maya farmed in tropical rain forests in what is now Belize, no easy task, and some Aztecs actually grew crops on floating islands in a lake in Central Mexico.

Mayan Methods

The Maya created one of the ancient world's greatest civilizations in the tropical rain forest of Central America, a part of the world that is not conducive to intensive agriculture. The geographic challenges they faced forced them to adopt a variety of techniques to grow enough crops to sustain a significant population.

To deal with the dense vegetation and poor soil of the rain forest, the Maya employed a farming method known as "slash and burn," or swidden, to enrich the soil prior to planting. Swidden begins by chopping down as many large trees as possible and allowing the felled trees to dry out. When the trees are sufficiently dry, the entire area is set alight. The resulting fire clears out underbrush, and the layer of ash it produces fertilizes the soil.

In areas where there was insufficient water, the Maya built irrigation canals. In swampy areas, the Maya dug up soil and shaped it into mounds on which they planted seeds. The excavated ditches gathered water that could be used for irrigation. After two to five growing seasons, fields were left fallow for as many as ten years. The Maya used these diverse methods of cultivation to grow maize, beans, chilies, squash, tomatoes, avocados, pumpkins, and cacao.

Aztec Methods

The Aztec, like the Maya, created a great ancient civilization in central Mexico. Their capital city of Tenochtitlán was built on an island in the middle of Lake Texcoco. To produce enough food for their growing population, the Aztec used a farming system known as *chinampas,* or "floating gardens." Aztec laborers dredged soil from the lake bottom and built a series of rectangular fields on which they grew food. This method overcame the major problems with growing food in the Valley of Mexico in south central Mexico: poor soil and variable rainfall. Surrounded by water and dredged from the rich soil at the bottom of the lake, the chinampas, although labor intensive, had high yields.

Like the Maya, the Aztec grew maize, beans, squash, and chilies and they, too, used the slash-and-burn method. They planted corn and beans in the same four- to- five-inch-deep hole, so the corn served as a support for the beans.

An Incan deity carved in the sixteenth century C.E. shows the importance of agriculture to ancient Incan society. The pottery figure wears a headdress that depicts the moon. In its arms and lap it holds corn and squash, two staple crops of the Inca. (The Bridgeman Art Library/ Getty Images)

Incan Methods

The Inca, a great civilization of South America, used very sophisticated farming techniques compared to other, contemporary cultures. Because rainfall was unpredictable in the vast lands of the Inca, their engineers built complex drainage and irrigation systems and terraced steep hillsides so crops could be grown. The Inca used a nitrate-rich fertilizer called guano, the droppings of seabirds and bats, to increase the yields of their crops.

The Inca grew a variety of plants that did well in diverse habitats and were, consequently, able to feed a population of 15 million people while amassing a three- to seven-year food surplus. They accomplished this without large beasts of burden to plow the fields. Several very common foods were first cultivated by the Inca, including potatoes, lima beans, and tomatoes. The Inca grew 20 varieties of corn and 240 varieties of potato. They even made a potato flour by freeze-drying potatoes. They also grew squash, beans, cassava, quinoa, peanuts, and peppers.

Following European contact, the crops of the Americas spread to rest of the world. Potatoes, unknown outside of the Americas before C.E. 1500, subsequently became a staple crop throughout Europe. Tobacco, indigo (for dyes), and sugarcane, all native to the Americas, became vital sources of export revenue for European colonists. Ironically, the same colonists would eventually annihilate many of the local cultures that first domesticated those crops.

See also: Anasazi; Aztec Civilization; Cahokia; Hohokam Culture; Hunter- Gatherers; Incan Civilization; Maize; Mayan Civilization; Mississippian Cultures; Technology and Inventions; Tools and Weapons.

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Anasazi

Native American people who lived in the Four Corners Area, where modern-day Colorado, Arizona, New Mexico, and Utah meet, from about 1200 B.C.E. to about C.E. 1300. The term *anasazi* is used by **archeologists** to designate a people with a distinctive culture, the probable ancestors of the Hopi and Zuni peoples of the Southwest.

Anasazi is a Navajo term that translates loosely as "enemy ancestors" or "people not like us." It seems likely that the Anasazi referred to themselves, as many tribes do, simply as "the people," but their language has been lost. Some scholars believe the Hopi word for ancestors, *Hisatsinom,* should be used to refer to the Anasazi. However, other descendants of the Anasazi, such as the Zuni, have different words for ancestors. Thus, most archeologists continue to use the term Anasazi.

HISTORY

The history of the Anasazi has been divided into several stages. The first, called Basketmaker I, refers to the earliest ancestors of the Anasazi, a nomadic desert people whose beginnings have been traced as far back as 6000 B.C.E. The second period, Basketmaker II, refers to the time from about 1200 B.C.E until about C.E. 500 C.E., when the Anasazi learned how to make pottery. Before that, they were a nomadic people who lived by hunting and gathering, and the lightweight baskets they made were ideal for storing and transporting food. Pitch-lined baskets could even hold water.

During the Basketmaker III Period, from C.E. 500 to 700, the Anasazi learned how to cultivate food crops, such as corn, beans, and squash. This allowed them to stay in one place for longer periods of time, which, in turn, led them to build more permanent homes and to begin to make pottery to hold surplus food and for cooking. Anasazi pottery was brightly colored, with red, orange, black, and white geometric designs.

Anasazi homes, called pithouses, were constructed by digging into the earth and hollowing out a square three to five feet (0.9 m to 1.5 m) deep. Over this, they constructed walls of dirt and a roof of logs that slanted upward, ending in a hole at the top. In the center of the structure was a hearth, and smoke escaped through the central hole in the roof. The Anasazi typically stored their food in nearby caves.

During the Pueblo I Period (C.E. 700 to 900), the Anasazi began to build above-ground multilevel homes, called pueblos by the Spanish, that were something like apartment buildings. The walls were made of stone and mortar, and the roofs were made of logs, which were then covered with mud. People moved from one level to another using ladders.

ANASAZI CULTURE, CA. 6000 B.C.E.–C.E. 1300

ca. 6000 B.C.E. Beginning of first stage of Anasazi culture, known as Basketmaker I, during which time the Anasaszi were a nomadic people

ca. 1200 B.C.E.–C.E. 500 Second stage of Anasazi culture, known as Basketmaker II, during which time the Anasazi learned to make the pottery for which they are known today

ca. C.E. 500–700 Basketmaker III stage, during which the Anasazi learn to cultivate food crops and begin to establish permanent settlements

ca. C.E. 700 Anasazi begin to build elaborate masonry houses

ca. C.E. 700–900 During this time, known as the Pueblo I Period, Anasazi begin to build multilevel houses

ca. C.E. 1150–1300 Pueblo II Period, during which time Anasazi begin to use the bow and arrow for hunting

ca. C.E. 1200 Anasazi begin to build safer settlements in more remote locations, indicating that they may have been involved in warfare

ca. C.E. 1300 Anasazi suddenly disappear; no one knows what happened to them

During the Pueblo II Period, between C.E. 1150 and 1300, the Anasazi began to use the bow and arrow instead of the spear and *atlatl* for hunting (an atlatl is a device that provides leverage and allows a spear to be thrown a greater distance). As a result, the Anasazi population increased significantly and began to disperse throughout the Southwest. At this time, the Anasazi began to build huge structures that sometimes housed hundreds of people.

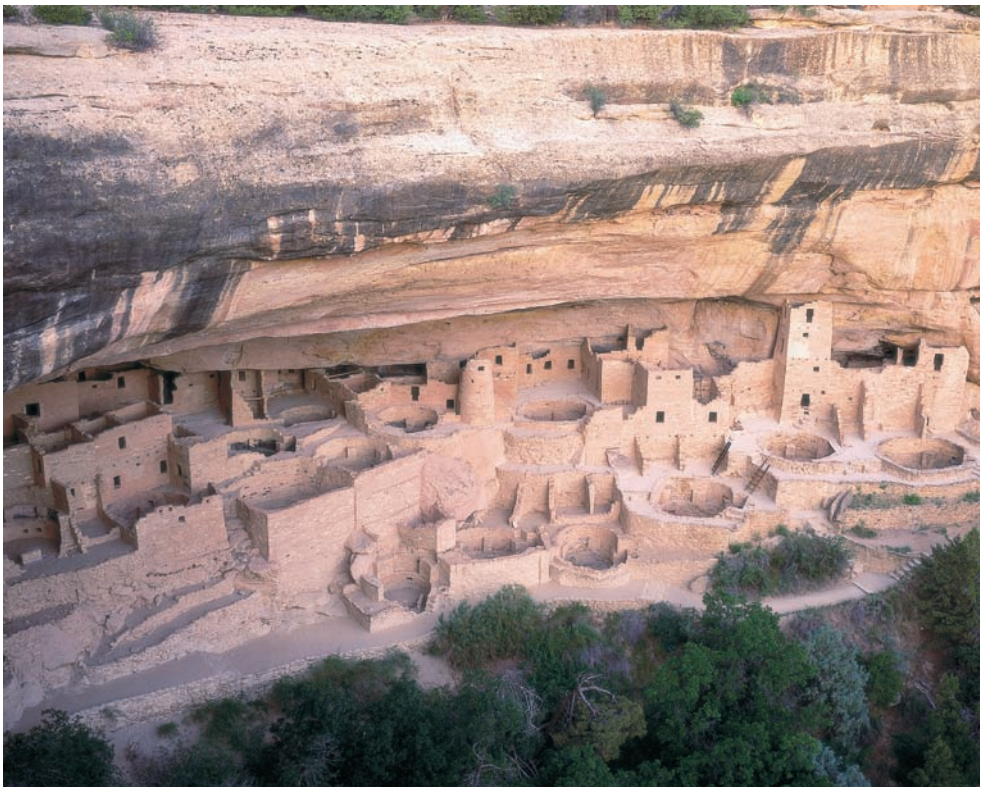
During the Pueblo III Period, from C.E. 1100 to 1300, the Anasazi began to build sprawling cities under the overhangs of immense cliffs. Thus, the Anasazi sometimes are referred to as cliff dwellers. One of the major centers of this period was at Chaco Canyon in New Mexico. Among the massive pueblos there is the five-story Pueblo Bonita, which could house more than 800 people. From their center in Chaco Canyon, the Anasazis built more than 300 miles (483 km) of roads connecting outlying villages with this cultural and religious center. The Great North Road stretches more than 12 miles (19 km), in a precise north-south direction. **Artifacts**, such as seashells, indicate that the Anasazi had a wide trading network.

In addition to Chaco Canyon, major Anasazi cities include Mesa Verde in southwestern Colorado and the nearby "Aztec" ruins, so named because the Spanish did not believe Native Americans capable of building such structures. Hovenweep National Monument on the Utah-Colorado border has six Anasazi sites, but Yellow Jacket in Colorado is the largest Anasazi town yet discovered. The pueblo there had 1,800 rooms housing more than 3,000 people. Many of these cliff settlements are accessible only by rope or rock climbing.

DEMISE

Beginning in about C.E. 1200, the Anasazi began to build their homes in locations chosen for safety, indicating that they may have been involved in warfare. Then, suddenly, in about C.E. 1300, the Anasazi seem to have disappeared. No one is sure what happened, but the great cities were abandoned.

Because the exodus from the cities was so sudden and complete, many scientists believe that environmental conditions such as droughts may have been a factor. Others believe that religion created the "pull" that drew the Anasazi to leave their cities and migrate across the Southwest, ultimately intermingling with the Hopi, Zuni, and other culture groups. According to one theory, changes in rainfall patterns led the Anasazi to question the effectiveness of their rain dances and, thus, the power of their gods and religion. It



This photo shows the ruins of Cliff Palace, located in Mesa Verde National Park in Colorado. Cliff Palace is the largest cliff dwelling in North America, built by the Anasazi between C.E. 1190 and 1260 and containing more than 150 rooms, including 23 kivas. (Demetrio Carrasco/Dorling Kindersley/Getty Images)

suggests that the Anasazi may have left their old settlements to find new gods that could help them ensure plentiful crops. As evidence of a change in religion, archeologists note that the Anasazi stopped building tower *kivas,* indicating that perhaps they no longer worshipped the deities they had previously worshipped.

See also: Agriculture; Archeological Discoveries; Hunter-Gatherers; Religion.

LINK TO PLACE

Pueblos and Kivas

Beginning about C.E. 700, the Anasazi people began to build elaborate masonry homes that the Spanish called *pueblos.* Pueblo is the Spanish world for "village," referring to a distinctive style of architecture that arose among Native American groups of the Southwest. The probable descendents of the Anasazi are still called Pueblo Indians.

The typical home in a pueblo was a flat-roofed building made of adobe. The homes comprised rectangular rooms that adjoined one another, with separate areas for storage and for ceremonies. The ceremonial areas, called *kivas,* were usually round and underground. Eventually, the Anasazi began to build up, developing apartment-like structures. Their towns appear to have been planned in advance and very carefully laid out. During this period, kivas were 40 to 70 feet in diameter (12.19 to 21.324 m) and some were built above ground. Some kivas were built in the shape of towers, and some were shaped like keyholes.

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Archeological Discoveries

In locations throughout North, Central, and South America, the discovery and study of ancient archeological **artifacts** have contributed to an understanding of how and where ancient Native Americans lived. **Archeologists** and historians have spent countless hours sifting through ruined cities and earthen mounds trying to piece together the story of the earliest Americans, few of whom left any written record. In many cases, only the stones and broken pieces of pottery are left to tell the tale.

MOUND BUILDERS

When settlers moved into the Ohio Valley in the eighteenth century C.E., they noticed massive mounds and other earthworks that were clearly made by human hands. Because many settlers had little respect for Native Americans, they did not believe that natives could have constructed the mounds. In fact, Native Americans themselves did not at the time know who built the mounds, because in most cases they were not direct descendents of

The Aztec stone calendar is one of the most famous symbols of Mexico. It was carved out of basalt in the fifteenth century C.E. and represents the principal deity of the ancient Aztec, the sun. (Macduff Everton/Iconica/Getty Images)

ARCHEOLOGICAL DISCOVERIES

C.E. 1790 Great Aztec Sun Stone is unearthed in Mexico City. This ancient calendar is today the most recognizable symbol of Mexico

C.E. 1848 Publication of first Smithsonian monograph on "Ohio Mounds and Moundbuilders"

C.E. 1881–1893 Anthropologist Cyrus Thomas conducts a thorough study of mounds in several states and determines that they were constructed by Native Americans

C.E. 1911 Archeologist Hiram Bingham discovers the ruins of Machu Picchu in Peru

C.E. 1926 Archeology students uncover a mammoth skull along with stone tools in Arizona, proving that humans and mammoths lived at the same time, about 13,000 years ago

C.E. 1930s Team from the Denver Museum of Natural History discovers a mammoth skeleton along with spear points, proving that humans had hunted these creatures

C.E. 1933 A team from the Philadelphia Academy of Natural Sciences discovers Clovis points in New Mexico, proving that humans inhabited the continent at least 12,000 years ago

C.E. 1976 Archeologist Tom Dillehay begins excavations at Monte Verde in Chile, a project that will lead to the theory that humans first came to the Americas much earlier than had been thought

C.E. 1996 Kennewick Man discovered along the banks of the Columbia River in Washington, and dated at 8400 B.C.E.; it is one of the oldest sets of remains discovered in the United States; Native American groups fight to have it reburied

C.E. 2002 Archeologist Saburo Sugiyama uncovers evidence of a Mayan presence in Teotihuacán

C.E. 2006 Peruvian archeologists discover burial site of a woman of the Moche culture containing war clubs and spear throwers, items never before discovered in the tomb of a Moche female

the builders. These factors led to the idea that there had been a mysterious race of "Mound Builders" who constructed the earthworks, then disappeared.

When the Smithsonian Institution was founded in C.E. 1846, one of its first projects was to investigate the mound complexes. Historians Ephraim Squier and Edwin Davis published the first Smithsonian **monograph**, or paper on a single subject, in C.E. 1848, which concluded that peoples from Mexico had constructed the mounds. However, between C.E. 1881 and 1893, anthropologist Cyrus Thomas conducted a new study of mounds and concluded that ancestors of modern Native American groups had indeed constructed the mounds.

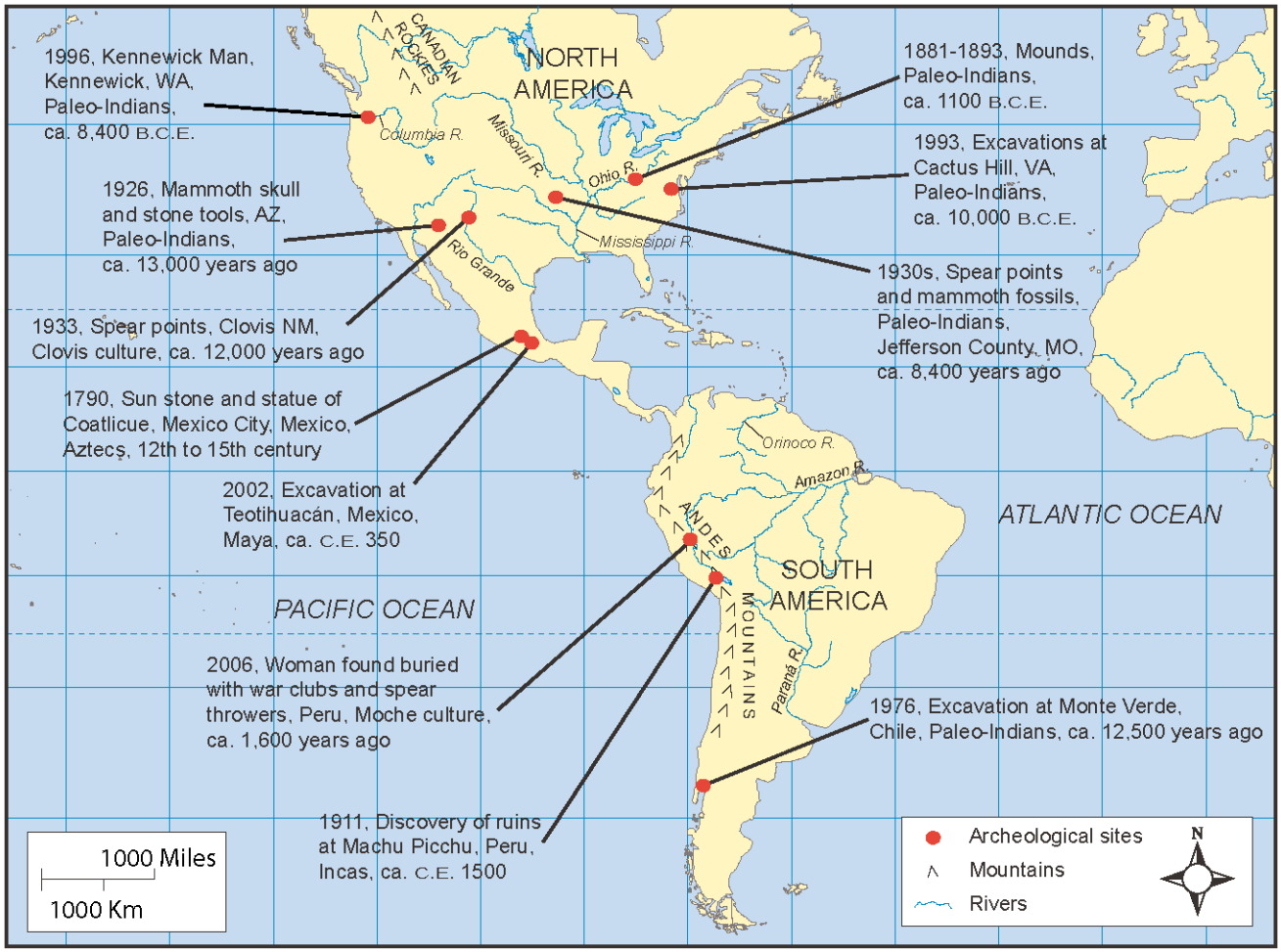
THE SOUTHWEST

In C.E. 1926, archeology students excavated a mammoth skull in Arizona. Below the skull, they found stones that clearly had been used by humans for grinding, indicating that the humans had been there at about the same time as the mammoth, at least 8,400 years ago. In the early 1930s, a team from the Denver Museum of Natural History found fluted spear points in the remains of a mammoth in what is now Jefferson County, Missouri. This was the first time anyone had discovered spear points with mammoth remains and thus this find was the first evidence that humans had hunted these creatures.

In C.E. 1933, in a dry lake bed near Clovis, New Mexico, archeologists discovered a distinctive spear point that came to be called a Clovis point, after the name of the town. When the point was dated, it proved to be nearly 12,000 years old, making it the oldest artifact ever uncovered in America. Since that time, Clovis points of a similar age have been discovered throughout North America.

MAJOR ARCHEOLOGICAL SITES OF THE ANCIENT AMERICAS

The first artifacts of Native American cultures were discovered on the East Coast because that is where the first Europeans settled. New discoveries were made to the West following the movement of the pioneers. Some of the most important finds—Clovis points, for example—occurred in the southwestern area of North America. Only in the nineteenth century did archeologists seriously explore the riches of Central and South America.



These discoveries led to several theories about how and when the first humans came to the Americas. The first widely accepted theory was that humans crossed over a land bridge called Beringia that once connected Siberia with Alaska about 12,000 years ago. They then migrated southward along a narrow space between glaciers, known as the "ice-free corridor," that stretched along the eastern edge of the Canadian Rockies.

Recent excavations on the East Coast—in places such as Allendale, Pennsylvania, and Cactus Hill, Virginia—have suggested that humans inhabited the Americas much earlier than once thought. These controversial finds have engendered what has been called the "Clovis first" debate, with some theorists holding to the idea that the continent was not populated until about 10,000 B.C.E. and others believing that there may have been people in the Americas as early as even 30,000 years ago.

Some supporters of an earlier date for settlement also believe that there may have been several waves

LINK IN TIME

Kennewick Man

One of the most controversial finds in the western part of the United States is that of what has been dubbed Kennewick Man. In C.E. 1996, a pair of college students found human remains on the banks of the Columbia River in Kennewick, Washington. When they first saw the skeleton, they thought they might have stumbled on evidence of a murder, but when the bones were examined by forensic pathologists, it became clear that they were more than 9,000 years old. This made Kennewick Man one of only about 50 skeletons that old that have been found in the Americas to date.

Although government researchers initially looked over the bones, protests from Native American groups prevented independent scientists from examining the remains for 10 years. Native Americans of the Umatilla tribe and four others claimed the bones, citing the Native American Graves Protection and Repatriation Act (NAGPRA), which is designed to return Native American **artifacts** and human remains to living descendents. They wanted the bones to be interred and not descecrated by scientific examination.

As a result of lawsuits that dragged on for 10 years, it was not until summer 2005 that scientists from the Smithsonian Institution, led by Douglas Owsley, had a chance to examine the bones to see what they would reveal about Kennewick Man and his environment. One of the most remarkable discoveries about Kennewick Man was that he appears not to be genetically related to the Siberian and Northeast Asian peoples believed to have crossed the land bridge at Beringia thousands of years ago. In fact, he may be Polynesian or Ainu (a group that now exists only in Japan), adding weight to the theory that several different groups populated the Americas at different times.

of migration from different parts of the world and by different routes. Archeologists are even studying **mitochondrial DNA** from Native American populations to determine if they can trace several sources of origin. Other anthropologists, such as Dennis Stanford of the Smithsonian, believe that the first Americans came across the Atlantic from Europe because there appear to be clear similarities between Clovis points and arrowheads found in France and Spain.

SOUTH AND CENTRAL AMERICA

Archeological finds in South America have also challenged the "Clovis first" hypothesis. In C.E. 1977, archeologist Tom Dillehay discovered evidence of human habitation in a cave in Monte Verde, Chile, that is 12,500 years old. If humans were living as far south as Chile that long ago, they must have arrived long before the opening of the ice-free corridor that supposedly allowed humans to travel southward and populate the rest of North and South America.

Another significant discovery in South America was that of Machu Picchu in Peru—the so-called "lost city of the Inca." The Inca ruled an empire in what is now South America that extended from Ecuador to Chile. The domination was ended in C.E. 1535 when soldiers from Spain, called conquistadors, attacked their cities and destroyed many elements of Incan culture. Of course, Machu Picchu was never really lost, in that natives in the area had always been aware of its existence. However, in C.E. 1911, Yale archeologist Hiram Bingham rediscovered Machu Picchu, beginning a new **era** of archeological exploration in South America.

Because Machu Picchu was so isolated, located in the Andes Mountains at 7,800 feet (2,377.5 m) of elevation, Spanish conquistadors never found it, and because the Inca left no written records, the history of this isolated city is still a mystery. Machu Picchu was a significant discovery for archeologists because it had been left virtually undisturbed for 400 years, unlike many other sites that were destroyed or looted by the Spanish.

TURNING POINT

Discovery of the Aztec Calendar

In C.E. 1790, Spanish Viceroy Juan Vicente De Güemas Pacheco de Padilla commanded that the Zócalo, or town square, in Mexico City be resurfaced. As workers dug up the old pavement, they uncovered a huge circular stone below the surface. When it was finally excavated, the stone proved to be 12 feet across (3.7 m) and three feet thick (0.9 m), and it weighed 24 tons. Ironically, the stone was preserved because of an effort on the part of Hernán Cortés, the conqueror of the Aztecs, in the sixteenth century C.E., to destroy native **artifacts**. Since the stone was too large to be broken up—the fate of many other Aztec objects—Cortés ordered it buried. It lay safely underground for more than 200 years, preserved from the ravages of time, until it was uncovered in 1790.

Thanks to the efforts of Antonio de Leon y Gama, a historian who had learned Nahuatl, the language of the Aztec, the stone was identified as the Great Aztec Sun Stone or calendar. By translating the calendar, Leon y Gama demonstrated that the Aztec had been falsely portrayed by their European conquerors as barbaric and primitive. He was able to translate some of the **hieroglyphs** on the calendar and demonstrate the sophisticated understanding of calendrical cycles its makers must have possessed. The Aztec knew, for example, the exact length of a solar year and had gained their knowledge without astronomical instruments such as the telescope.

The calendar comprises a series of concentric circles. In the center is an incised representation of the face of Tonatiuh, god of the sun. The god is shown wearing elaborate jewelry and with his tongue sticking out. The tongue is shaped like an obsidian knife, the sharp stone instrument used in human sacrifice, perhaps as an indication of the god's demand for still-beating human hearts.

Around the central circle are representations of the four epochs or suns—the four previous creations that the Aztec believed had come to disastrous ends before the beginning of the current **era**. The next ring is comprised of **glyphs** of the 20 named days of the month. The third ring includes depictions of the sun's rays and blood splashes, and at the bottom of the outer ring are two snakes facing one another. Eight equally spaced holes around the edge of the calendar once held sticks, which cast shadows as the sun's rays fell on them; thus, the stone functioned as a sundial.

Farther north, in Mexico and Central America, two archeological discoveries stand out. The first is the unearthing of the statue of Coatlicue ("serpent skirt") and the Great Aztec Sun Stone in Mexico City in C.E. 1790. Coatlicue, was the goddess of life and death in Aztec mythology. The statue depicted her wearing a skirt of writhing snakes and a necklace of hearts that had been ripped from sacrificial victims. These discoveries led to a renewed interest in the Aztec—a great civilization of Mexico that flourished from the twelfth to the fifteenth century C.E.—-as well as an enhanced understanding of their scientific and artistic achievements.

In C.E. 2002, Japanese archeologist Saburo Sugiyama found a burial at the Moon Pyramid in Teotihuacán, a city built by an unknown people, about 30 miles (48 km) northeast of Mexico City. The discovery seems to suggest direct links between the people who built this great city and the Maya, a great civilization of Mexico and Central America. The burial is at the top of the pyramid's fifth stage and may have occurred around C.E. 350, at the height of Teotihuacán's power.

Sugiyama had unearthed human remains before these, but all had been the remains of captives who were probably sacrificed. However, the

three men whose remains were found in the newly discovered site were not bound, and they were buried in a cross-legged, seated position. Such a position, Sugiyama says, is rarely seen in actual burials in Teotihuacán but has been depicted in paintings and can also be found at Mayan burial sites. Thus, Sugiyama feels that his discovery is evidence of contact between the two cultures.

Moreover, jade figurines at the burial site are of Mayan origin. Sugiyama says that these figurines seem to confirm that the Mayans were influenced by Teotihuacán. He adds that his finds are the best evidence yet of a connection between the two cultures.

In C.E. 2006, archeologists discovered one of the richest female burials ever among the ancient Moche people of Peru. The woman, who died some 1,600 years ago, was buried not only with traditional female implements such as weaving tools, but also with clubs and spear throwers, which are normally found exclusively in male burial sites. The curious find has puzzled scholars, who suggest that the woman may have been a ruler or a warrior princess.

Throughout North, Central, and South America, archeologists are gathering new and fascinating evidence that aids in the understanding of ancient cultures and that traces the path of human migration from the old to the new world.

See also: Aztec Civilization; Beringia; Cahokia; Clovis; Great Serpent Mound; Ice Age; Incan Civilization; Machu Picchu; Mayan Civilization; Mississippian Cultures; Mound Builders; Paleo-Indians; Teotihuacán.

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Art and Architecture

The idea of art for art's sake was not known among ancient Native Americans. Often the most beautiful objects, such as carved **effigy** pipes (pipes carved in the shape of people or animals), had religious or ceremonial significance. Decoration of everyday objects tended to follow traditional patterns; each culture had its own typical patterns and styles, and it was rare for artists to add individual touches to a ceramic jar or to a woven blanket.

NORTH AMERICA

Scholars group the natives of North America into five basic culture groups, based on shared values and similar practices and beliefs: Eastern Woodlands, Plains, Southwest, Northwest, and Arctic. The art and architecture of each group reflects its distinctive character, customs, and values.

Eastern Woodlands

Artists of the Adena culture (1100 B.C.E to C.E. 200) in what is now Ohio are famous for their pipes carved in the shapes of people, birds, and animals. Hopewell (200 B.C.E. to C.E. 500) artists also crafted elaborate platform pipes of pipestone or stealite. Figures of birds and animals with eyes of pearl were carved on a curved hollow platform through which the smoke was drawn; the bowl of the pipe was usually cut into the center of the figure. The effort put into creating these beautiful sculptures indicates the importance of ritual pipe smoking to these cultures.

Women in many Eastern Woodland cultures decorated clothing, shoes, knife sheaths, belts, and

This platform effigy pipe in the shape of a toad was carved by the Hopewell people between 200 B.C.E and C.E. 300 and probably belonged to a shaman who had a special connection to the spirit of the frog. (Werner Forman/Art Resource, NY)

various containers with porcupine quills. They dyed the quills, flattened them, and then attached them to fabric with sinew to form colorful geometric designs. Delaware, Ojibway, and Mohegan women were particularly skilled in quill embroidery. After the coming of the Europeans, glass beads replaced quills among many native crafters.

The Iroquois (Haudenosaunee) are famous for their wooden masks. Members of the False Face Society, whose members dance to ward off evil spirits, use these masks in religious rituals to cure the sick. Even the making of the masks formed part of the religion. A man would walk in the woods until the spirit of a particular tree spoke to him. He would respond, place tobacco at the foot of the tree, then remove a strip of bark from which to make the mask. Each mask was unique, though all of the faces have crooked noses. The mask, once shaped, was polished and decorated with hair and feathers. Modern collectors, including museums, display these masks, a practice that offends many Iroquois because they regard the masks as sacred.

Many Eastern Woodland tribes lived in longhouses (rectangular wooden buildings) or wigwams (skin-covered tents). The wigwam was built from saplings that were placed in a circle, then brought together at the top to form a cone. The wigwam was generally covered with woven mats of fibers or covered with birch bark. These architectural styles reflect the various lifeways of tribes; wigwams were temporary structures that could be easily dismantled. The coverings were packed away and transported to the next camp, where a new wigwam would be constructed. The longhouses were more permanent and housed extended families.

Great Plains

Native Americans of the Great Plains, including the Sioux, Blackfoot, Cheyenne, and Comanche—from the Mississippi to the Rocky Mountains—hunted buffalo, and much of their artwork reflected their special relationship with these animals. The tipis in which these tribes lived were constructed of wooden frames covered with buffalo hides, and the hides were often painted with scenes of heroism in battle or supernatural events. Robes and shields made of buffalo skins were also painted with the same sorts of images.

Southwest

The Anasazi (C.E. 300 to 1300) of the American Southwest made clay pottery, usually white or gray with black geometric decorations, but sometimes black on red. The decoration was painted on with brushes made from yucca. Most containers were made with round bottoms that could sit easily on the stones of a cooking fire. Although the pottery was utilitarian, its decoration may have had religious significance. Pueblo Indians, who are the probable descendents of the Anasazi, believe that Mother Earth, who resides inside the clay from which the pots are made, determines the design.

The distinctive architecture of the Southwest includes multi-story rock and mud brick apartment-like buildings called pueblos that could house hundreds of people. Within these houses were *kivas,* circular underground rooms used for ceremonies and meetings. The best known of the Anasazi great houses is Pueblo Bonito in Chaco Canyon. Pueblo Bonito had room to house more than 3,000 people in 800 rooms stacked five stories high, although **archeologists** do not believe that that many people ever actually lived there.

Northwest

Two art forms in particular are associated with the culture groups of the Northwest: totem poles and cedar masks. The design of the masks is generally similar to the design of the poles. Both are made from the cedar tree, which the culture groups of the Northwest regarded as sacred.

There are two basic styles, distinguished primarily by the colors of the paint used to decorate the poles and masks. Northern groups, such as the Haida, used only red, black, and turquoise, whereas groups to the south used many bright colors. Many consider the Haida the finest crafters of totem poles today. Their poles are elaborately carved, with every inch of space filled. The lines of the carving are sinuous and fluid, and the designs are extremely complex. Haida poles are often topped off with two or three "watchmen," figures who are said to watch over the village.

Many different creatures are represented on totem poles throughout the Pacific Northwest. Among the most famous is that of the thunderbird, a winged bird-like creature who is believed to be the lord of the sky realm. Ravens were popular figures in the myths and legends of the native peoples of the Northwest. Raven is a trickster, a liar, and sometimes a thief, but he is still a likeable creature and among the most popular figures on totem poles.

Haida make cedar masks that are used primarily by members of secret societies in dances and other rituals. They also make masks and puppets that represent the spirits of the woods, called *gagiid*. These figures have thin wrinkled faces and are painted bluish-green. The color is said to represent the face of a person who has almost drowned.

Arctic

Like all culture groups in North America, native peoples of the Arctic regions were inspired by the creatures that surrounded them and by the materials at hand in their environment. Polar bears, whales, fish, seals, walruses, and caribou are often depicted in the art of the Inuit and Yup'ik, and the materials they used included the walrus ivory. Because trees are scarce in the Arctic, masks that were used in various religious ceremonies were carved from driftwood.

MESOAMERICA AND SOUTH AMERICA

Ancient **Mesoamerican** and South American cultures include the Maya, the Aztec, and the Inca,

among others. Although each culture had distinctive traditions, they also shared many stylistic elements. For example, the pyramids of the Maya, Inca, and Aztec resemble one another much more than they do the pyramids of Egypt.

Mayan Art and Architecture

The Maya of the Yucatán Peninsula and parts of Central America are known for their elaborate calendar, their beautiful palaces and temple pyramids, multicolored pottery, and wall paintings.

During the Classic Period (C.E. 200 to 900), Mayan buildings were made of limestone, faced with lime stucco, and were decorated with elaborately carved **friezes** (decorative horizontal bands). Interiors of buildings were decorated with colorful murals, and Mayan artists even signed their work. The Maya used a structure called a corbel arch in many of their buildings. A corbel or false arch is made by layering rectangular blocks on top of one another but moving each layer inward until the blocks meet at the top. The resulting arch has a zigzag effect. Corbel arches are found in many cultures but the Maya used them to support roofs or upper stories.

The Maya are also renowned for their step pyramids. One of these is the famous pyramid at Chichén Itzá, constructed around C.E. 800 and located on the Yucatán Peninsula. The pyramid looks like a series of massive square blocks laid atop one another, each block smaller than the one below, resulting in the stepped effect. Ramps on all four sides with smaller steps were used to climb to a temple at the summit.

One of the most remarkable pieces of artwork of the Maya is the **hieroglyphic** stairway at Copán, located in western Honduras. Comprised of more than 1,250 **glyph** blocks that form a continuous text, the stairway and its statues tell the story of the city and the ancestors of the fifteenth ruler, Smoke Shell. The city of Copán flourished from C.E. 500 to 900.

Aztec Art and Architecture

The Aztec of Mexico were deeply influenced by the civilizations that preceded them; their art and architecture borrowed from earlier cultures. Their capital city of Tenochtitlán was one of the most spectacular in the Americas. It was built in the middle of Lake Texcoco, and the ancient Aztec dredged soil from the lake bottom to build floating fields called *chinampas* on which to grow food. The streets of Tenochtitlán were canals, and people often traveled from place to place by boat.

In addition to temples and pyramids, the Aztec built monumental stone sculptures of various deities. Perhaps the most famous surviving Aztec sculpture is the calendar, or sun stone, a 24-ton stone slab carved with astronomical signs and mythological figures. The calendar, once brightly painted, serves as a graphic representation of the Aztec universe. The outer rim of the calendar depicts two fire serpents who face each other at the bottom of the circle and whose tails intertwine at the top. Some historians believe that the symbol where the tails join marks the date on which the Aztec believed the world was created. In the center of the calendar is the sun god Tonatuih. His tongue, which is shaped to look like a sacrificial knife, protrudes from his mouth and in each hand he holds a sacrificial human heart. Around him are glyphs that represent the four catastrophes the Aztec believed had occurred before the present **era**.

One of the most remarkable arts of the Aztecs was feather working. Aztec **artisans** made elaborate headdresses of woven feathers plucked from brightly colored tropical birds. It is said that the headdress of the last king of the Aztec, Moctezuma II (r. C.E. 1502–1520), used feathers from more than 250 birds. Although these objects do not survive, paintings of kings and jaguars wearing feathered headdresses can be found on the walls of temples and palaces.

Incan Art and Architecture

The Inca ruled much of the western coast of South America from C.E. 1200 to 1535. Their art and architecture was much less elaborate than that of the Maya and the Aztec. The buildings of the Inca are elegant and simple and lack the elaborate decoration that was so popular among the Maya and the Aztec.

The buildings of the Inca were built of undecorated stone blocks with trapezoidal doors and windows. Stones were fitted precisely together; in fact, many were carved in place, laid atop one another then shaped to fit. Incan architecture often incorporated natural stone outcroppings into buildings and other structures. Thrones were often carved from rocks already in place. Terraces, fountains, and artificial waterfalls were characteristic of Incan cities and ceremonial centers.

Much Incan art was destroyed by Spanish soldiers led by Francisco Pizarro, who invaded and conquered the land of the Inca in C.E. 1532–1533. In particular, many gold **artifacts** were melted down and shaped into rectangular blocks for transport to Spain. One account mentions elaborate three-dimensional scenes crafted of gold, including a gold llama eating golden grass.

The Inca are also known for their beautiful woven cloth made of cotton and wool from alpacas and llamas. Some Incan cloth had thread counts of 600 to the inch, an accomplishment that was not seen again until the Industrial Revolution introduced machine-made cloth.

See also: Aztec Civilization; Incan Civilization; Mayan Civilization; Mississippian Cultures; Mound Builders; Religion; Teotihuacán.

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Aztec Civilization

Ancient **Mesoamerican** culture that dominated much of what is now Mexico from about C.E. 1400 until its conquest by Spanish conquistador Hernán Cortés in C.E. 1521.

The Aztec people created one of the most sophisticated civilizations in the Americas, famous for their knowledge of astronomy, their religious architecture, and their capital city of Tenochtitlán, which was built on an island. The Aztec were also a warlike people, fighting many battles for the sake of capturing victims for sacrifice to their gods.

EARLY HISTORY

Aztec civilization began in about C.E. 1000, when a group of Native American speakers of Nahuatl—a language group that includes Commanche, Pima, and Shoshone—began to migrate south from what is today northern Mexico. They called themselves *Mexica*. The term *aztec* comes from *Aztlan*, meaning "the place of whiteness," which is the name the Mexica gave to their legendary place of origin.

Beginning in about C.E. 1100, the Aztec led nomadic lives. However, their priests told them of a promise made by their god, Huitzilopochtli, that one day they would come to an island. There, they would see a rock with a cactus growing out of it. On the cactus would be a golden eagle holding a snake in its mouth. It would be in this place that they would settle and build a great city. Today, this image appears on the Mexican coat of arms.

This detail of the "tzompantli," or wall of skulls, which was once part of an altar in the ancient Templo Mayor (Main Temple) of Tenochtitlán shows only a dozen of the hundreds of carved skull replicas that form the wall. The skulls represent captives who were beheaded as part of religious rituals. (Nick Saunders/Barbara Heller Photo Library, London/Art Resource, NY)

LINK TO PLACE

Tenochtitlán

The capital city of the Aztec Empire, Tenochtitlán was built on five separate islands in the middle of Lake Texcoco. It was connected to the mainland by three causeways and served by many canals that were built beginning in about C.E. 1350. Since the city had no roads and and people traveled by canal, the conquering Spaniards called Tenochtitlán "the Venice of the New World." By about C.E. 1400, the city was home to about 200,000 people, making it larger than most European cities of the time.

The city was divided into four main zones, which were further divided into about 20 districts. At the center of the city was the main ceremonial center, which contained about 45 buildings, including the main temple, the Temple of Quetzalcoatl, a ball court, and a *tzompantli*—a rack or altar used for the display of human skulls. The emperor Moctezuma's palace had 100 rooms, each with its own bath.

After his conquest of the Aztecs in C.E. 1521, Hernán Cortés had the city of Tenochtitlán razed to the ground. Mexico City was built on its ruins.

TENOCHTITLÁN

In about C.E. 1250 the Aztecs came under the power of the king of Colhuacan (a town on the southeastern side of Lake Texcoco in the Valley of Mexico) who forced them to fight in his army. Eventually, the king exiled the Aztecs to an island in Lake Texcoco, where they began construction of the city of Tenochtitlán in about C.E. 1325. Tenochtitlán became the central city of a vast empire that stretched throughout central Mexico.

Wealth came to Tenochtitlán as a result of conquest and innovative agricultural techniques practiced by the Aztecs. They reclaimed the swampy land surrounding the islands by dredging earth from the lake bottom and constructing *chinampas,* or "floating gardens." Here they grew beans, corn, and squash, among other crops. They also terraced the hillsides to allow for farming and irrigated lands too dry to support crops. The culture prospered because there was plenty of food for all. Farming was, however, quite labor intensive in Tenochtitlán because the Aztec had neither plow animals nor the wheel to make the work easier. Although Tenochtitlán was destroyed by a flood in C.E. 1452, the city was entirely rebuilt.

AZTEC CIVILIZATION, C.E. 1000–1522

C.E. 1000 Aztecs leave their lands in northern Mexico to search for a new homeland

C.E. 1195 Aztecs arrive in the Valley of Mexico

C.E. 1250 Aztecs settle near Lake Texcoco

C.E. 1325 The great city of Tenochtitlán founded

C.E. 1350 The building of canals in Tenochtitlán begins

C.E. 1452 Tenochtitlán destroyed by flood

C.E. 1502 Moctezuma II takes the Aztec throne

C.E. 1521 Spanish invaders destroy Tenochtitlán

C.E. 1522 Rebuilding of Tenochtitlán begins

GREAT LIVES

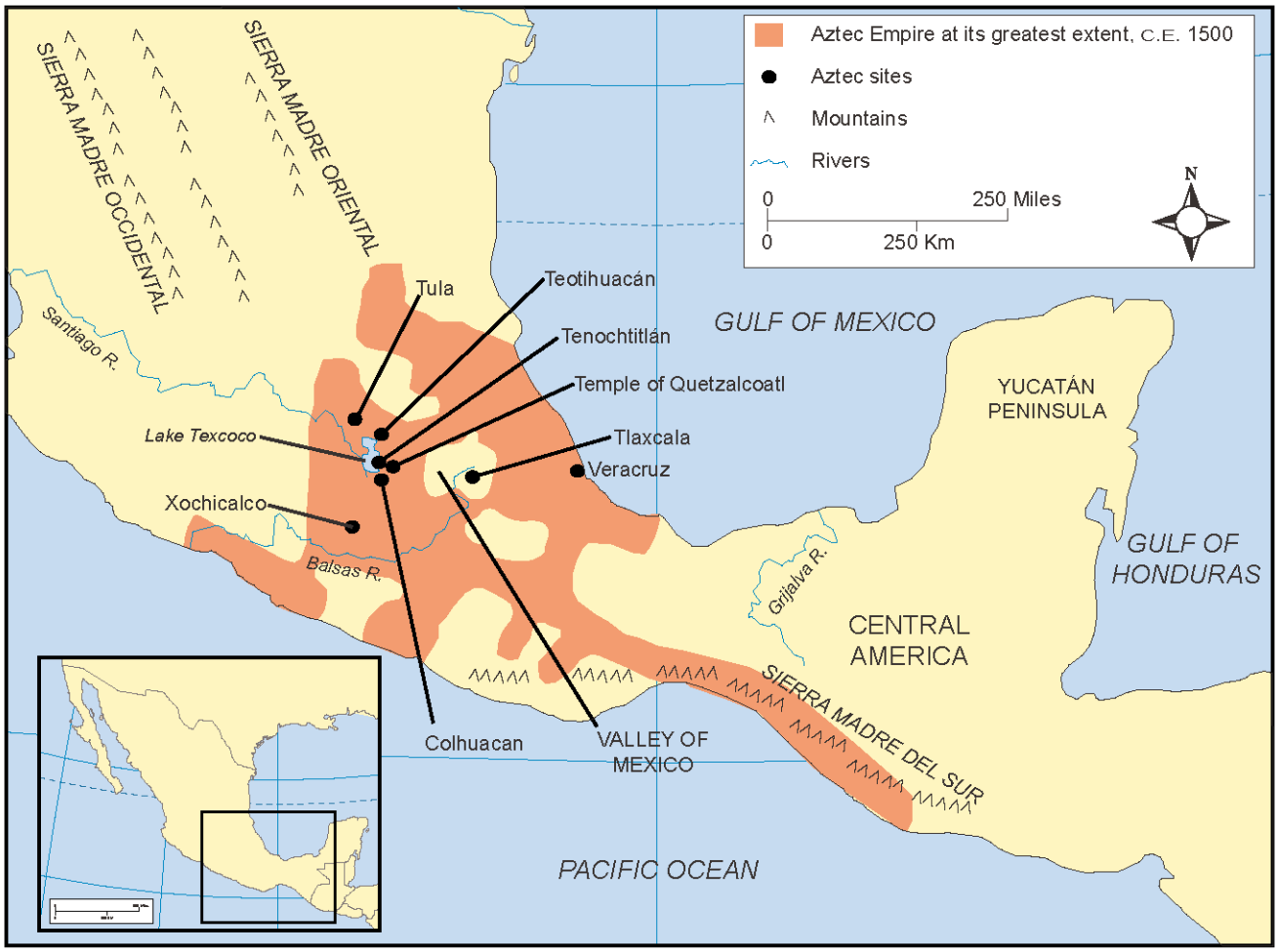
Moctezuma II

Moctezuma was the last Aztec emperor, an able administrator whose one grave error contributed to his civilization's demise. Moctezuma was both a fierce warrior and a judicious leader. It is said that he offered bribes to judges to determine if they were corrupt and went about town in disguise to see if his laws were obeyed. During his reign, aqueducts were constructed that brought fresh water to Tenochtitlán.

When Spanish troops led by Hernán Cortés landed on the Mexican coast in C.E. 1519, Moctezuma hesitated to oppose them, because an ancient Aztec legend predicted that the deity Quetzalcoatl would appear among the people as a fair-skinned visitor. Moctezuma was unsure whether Cortés was human, or the god whose visit was foretold by the legend. Moctezuma made the fatal error of allowing Cortés to march unimpeded to the capital city of Tenochtitlán and to visit the Aztec palace. Cortés entered the palace and took Moctezuma as a hostage, thus beginning a two-year war that would end in the destruction of the Aztec realm. Moctezuma died the following year after being struck by a rock while trying to calm a mob rioting against the Spanish.

AZTEC EMPIRE, CA. C.E. 1500

This map shows the extent of the Aztec Empire during its peak in Central Mexico and the heavily populated ancient cities of Tenochtitlán, Xochicalco, and Tula. The Spanish conquistador Hernán Cortés, who conquered the Aztecs in 1521, landed at Veracruz in 1519.



RELIGION

Aztec religion was based on a profound sense of the passage of time and a feeling of impending doom. The Aztec believed that the universe had been created five times and destroyed four times. They believed that only they, through ritual and sacrifice, could stave off the final destruction.

The Aztec had two calendars, ritual and solar, which synchronized every 52 years. At the end of each 52-year cycle, all the altar fires in the land were extinguished and the people mourned what they saw as the possible destruction of the universe. Priests would wait to see the constellation Pleiades appear over a particular crater in the Valley of Mexico. When it did, they believed, they were granted another 52-year cycle. At this time, the priests lit a fire in an animal carcass, from which all the altar fires in the land would be relit.

The Aztec believed that the gods would continue to protect and nourish them only if they nourished the gods through gifts of human blood. Priests routinely cut their fingers, tongues, genitals, and ears

in order to provide blood for their rituals. The Aztecs frequently engaged in human sacrifice as well. The primary purpose for warfare among the Aztec was to capture enemy warriors, who would then be sacrificed.

DEMISE

The Aztec empire came to an end in C.E. 1521, when Hernán Cortés and 500 Spanish soldiers gathered a force of local peoples who had been forced to pay **tribute** to the Aztec, and laid siege to Tenochtitlán. During the siege, which lasted two years, the city was devastated by smallpox. Soon, Cortés was able to capture the city easily, his firepower being far superior to the Aztec's bows and arrows. The Aztec chief Moctezuma II (r. C.E. 1502–1520) surrendered to Cortés, who later razed Tenochtitlán and enslaved the Aztec people.

See also: Agriculture; Art and Architecture; Mayan Civilization; Religion.

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Beringia

Name given to the landmass that once joined Asia and North America and served as the bridge across which animals and humans are believed to have crossed from one continent to the other. The appearance and disappearance of the land bridge known as Beringia is tied to the cyclical changes in the earth's climate over time. These changes include periodic ice ages during which the climate grew intensely cold and vast rivers of ice called glaciers covered entire continents. The last of these ice ages, when glaciers covered much of North America, ended about 10,000 years ago.

During ice ages, a large amount of the earth's water was locked in glaciers, which resulted in a dramatic drop in sea level. Recurring ice ages have lowered the level of the waters in the Bering Strait, which separates Asia from North America, many times. Because the strait is not very deep (ranging from 98 feet [30 m] to 164 feet [50 m]) when the waters recede, a landmass emerges. This landmass—and the area surrounding it from the Kolyma River and the Kamchatka Peninsula in present-day Siberia to the Mackenzie River in modern Canada's Northwest Territories—is known as Beringia.

Beginning about 55 million years ago, animals migrated across this land bridge, to be followed much later by humans. **Archeologists** have long believed that the original ancestors of Native Americans originated in Asia and migrated across Beringia about 11,000 years ago. However, a number of recent discoveries have caused experts to consider the possibility that humans were in North and South America much earlier than once believed. Scientists who study ancient climate conditions note that humans could have crossed into North America over the Beringia land bridge as early as 38,000 years ago. What is certain is that by 8000 B.C.E. humans had colonized all of North and South America.

Archeologists believe that humans probably crossed the land bridge in order to hunt large mammals such as bison and mammoths. They then may have traveled southward along an ice-free trail between glaciers called the Mackenzie Corridor, so named because it follows the path of that river, which flows north from Great Slave Lake in Canada's Northwest Territory to the Arctic Ocean. Alternatively, these early immigrants may have followed the western coastline from Alaska to the tip of South America. There is no evidence for either of these theories. If people did travel down the coastline, the land that was exposed at the time is now under water, making it impossible to uncover evidence of human habitation.

For many years, experts believed that Beringia was the sole point of entry for the first settlers in the Americas. However, the discovery of "Kennewick Man" in Washington state in C.E. 1996 has led some scholars to challenge that notion. Archeologists believe that the 9,300- year-old remains of Kennewick Man are those of a **caucasoid**, suggesting the possibility of European origins. Anthropologist Dennis Stanford of the Smithsonian Institution, for example, believes that Kennewick Man may have come from Europe across the Atlantic by boat.

Recent discoveries in Monte Verde in Chile suggest evidence of human habitation dating to more than 12,000 years ago. This has led some to wonder if Polynesians may have crossed the Pacific to settle in South America. Such developments suggest that there well may have been multiple migrations and points of entry by the first settlers into the Americas and that Beringia was not the only path to the new world.

See also: Archeological Discoveries; Ice Age.

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Bison

Largest land mammal in North America. For early Native Americans, the bison, or buffalo, was extraordinarily important, serving as a principal source of food, clothing, shelter, and tools.

Native Americans used every part of any bison they killed: They ate the meat; they used the hide to make shields, moccasins, teepees, clothing, and blankets. They used the heavy fur to stuff pillows and make rope, the brain to treat the hides, the rough side of the tongue as a comb, the bones for tools and weapons, and the lining of the stomach as a cooking vessel. It is hard to imagine any other single resource, animal or mineral, that was as valuable to Native Americans as was the bison.

Bison first came to the Americas from Asia, beginning millions of years ago, across the land bridge known as Beringia, which once connected the two continents and was located about where Alaska is now, the same route used by people about 11,000 years ago. The first bison to make the trek were larger than their modern counterparts, weighing more than 5,000 pounds (2,268 k), with horns that measured more than 6 feet (1.8 m) across. Today bison weigh about 2,000 pounds (907 k) and stand about 6.5 feet (2 m) at the shoulder. Because bison are so large and formidable, early Native Americans, who hunted them on foot and with stone arrowheads, had to rely on tricks and strategy to secure a kill. As bison are not afraid of wolves, Native Americans would approach a bison herd wearing wolf skins, until they were close enough for the kill. Alternatively, they would wear buffalo skins and trick the herd into stampeding over cliffs.

Because of their heavy reliance on the bison, Native Americans felt a special reverence for the creature. For example, the Lakota Sioux, who lived on the Great Plains, tell the story of White Buffalo Calf Woman, a supernatural creature who brought gifts to the people, including the *chununpa*, or sacred pipe. After she presented her gifts to the people and promised to return one day, she rolled over four times and turned into a white buffalo. To the Lakota and many other tribes of the Great Plains, the white buffalo came to symbolize peace and harmony among all peoples of the earth.

When Europeans arrived in North America, it is estimated that there were more than 60 million bison ranging across the United States, Canada, and into parts of Mexico. By the end of the nine-

teenth century C.E., there were fewer than 800, and bison were in grave danger of extinction. European hunters killed thousands upon thousands of bison, often shooting them from train windows, and left the carcasses to rot along the tracks. Many bison were killed just for their tongues, considered a delicacy. Not only did Europeans kill bison for sport but they also killed them to deprive Native Americans of a food source, forcing them to move away from lands that the Europeans wanted for themselves. In fact, "Buffalo" Bill Cody, who later created the famous "Wild West" show, was hired to slaughter buffalo for this reason and boasted that he killed more than 4,000 in a mere two years.

Fortunately, in 1905, the American Bison Society was formed to protect the buffalo, and since that time, conservation efforts have been very successful. Today, there are at least 200,000 bison living on ranches and in parks in the American West.

See also: Beringia; Hunter-Gatherers.

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Cahokia

Prehistoric Native American cultural center located in present-day Illinois, across the Mississippi River from modern-day St. Louis, Missouri. At the height of its power in C.E. 1050, Cahokia was the largest city north of Mexico and one of the largest metropolitan areas in the world. Between 15,000 and 20,000 people lived in Cahokia, which was the center of a vast network of villages and smaller complexes extending from modern-day Wisconsin through what is now the midwestern and southeastern United States. Merchants from Cahokia traded with peoples from the Atlantic and as far west as modern Oklahoma.

Cahokia was built by people of the Mississippian culture, which flourished from about C.E. 600 to 1400, during a period **archeologists** call the Woodland **Era**. Cahokia was an agricultural society with sharply delineated social classes. Common people lived outside the city, while the chief, who was considered to be the brother of the sun, and nobles lived within the city. Unfortunately, the people of Cahokia left no written records, and there are not even stories or legends about this great city. Only burial and temple mounds remain to tell the story of these prehistoric people.

During its heyday, Cahokia covered 4,000 acres (1,618 hectares) and was surrounded by a wooden stockade. The stockade, which was rebuilt at least three times, was made of 20,000 logs placed in a four- to five-foot-deep (1.2 to 1.5 m) trench and covered with mud. The stockade extended more than two miles (3.2 km), and was probably built to help defend the city from enemies.

The most impressive structure in Cahokia is known as Monk's Mound, which was named for Trappist monks who lived nearby in the early years of the nineteenth century C.E. Monk's Mound is one of 120 original mounds at Cahokia and by far the largest; in fact, it is the largest pre-Columbian earthwork north of Mexico.

Monk's Mound is a flat-topped pyramid built in three tiers over a period of approximately 250 years. The base of the mound covers 14 acres (5.7 hectares) and it rises 100 feet (30 m) into the air. The people of Cahokia had to move more than 22 million cubic feet (2 million cubic m) of dirt to build the mound. Atop the mound was a 5,000 square foot (465 sq m) dwelling, probably that of the chief.

LINK TO PLACE

Stonehenge and Woodhenge

Among the modern world's most famous prehistoric remains are the huge stone circles in England known as Stonehenge. Stonehenge was originally an earthwork, comprised of mounds and ditches, constructed some 5,000 years ago. (The word *henge* refers to a circular or oval area surrounded by a bank and ditch.) About 2,000 years ago, huge stones were added to the earthworks and arranged in concentric circles.

No one knows who built Stonehenge, but it clearly seems to have been constructed as a type of calendar used to predict the **solstices** (June 21 and December 21) and **equinoxes** (March 21 and September 21) which mark the changing seasons. On the summer solstice, June 21, the sun rises over what has been dubbed the Heelstone and shines directly into the center of the monument. Some archeologists speculate that the builders celebrated the solstices and equinoxes as religious festivals.

In the early 1960s, archeologist Warren Wittry of the University of Chicago uncovered a number of oval pits at the Cahokia mound in Illinois, an earthwork that appeared to form circles and arcs. Wittry hypothesized that the pits had once contained wooden posts that were arranged to align with the sun at certain times of the year. He named the structure Woodhenge because of its resemblance in form and function to Stonehenge. Although archeologists have identified posts at Woodhenge which mark the solstices and equinoxes, the function of other posts is unknown. Some scholars speculate that the posts align with stars or the moon; others suggest that the posts helped builders align the mounds.

Wittry found evidence of at least five additional "Woodhenges" at Cahokia, built from C.E. 900–1100, about 1,000 years after the stones were raised at Stonehenge. The structures varied greatly in size, containing anywhere from 24 to 60 posts. One circle, reconstructed in 1985, measured 400 feet (121.9 m) in diameter with posts some 20 feet (6 m) high.

Monk's Mound stands at the center of the city, surrounded by four large plazas oriented toward each of the cardinal directions and used for ceremonies attended by thousands of people. Pathways connected dwellings, burial mounds, public buildings, and temples.

Among the most interesting features at Cahokia are circles of huge red cedar posts that archeologists have dubbed "Woodhenges," after Stonehenge, the famous stone circle in England. There may have been as many as five of these at Cahokia, ranging in diameter from 240 to 480 feet (73 to 146 m). The circles were probably calendars in which the poles lined up with the sun on certain days of the year.

There are three types of mounds at Cahokia: platform mounds like Monk's Mound, which were used for the construction of buildings, and conical and ridgetop mounds, both of which were used for burials of nobility or as markers for important locations. Extensive excavation of one ridgetop mound, known as Mound 72, revealed that the mound was constructed in at least three stages over many years. The mound contains the remains of a man who was laid out in such a manner that he resembled a bird. In another layer of the mound, excavators found 53 young women between the ages of 15 and 30, and four men whose heads and hands had been removed. These individuals apparently were sacrificed as part of a religious ritual. Altogether, 272 bodies were unearthed in Mound 72, along with hundreds of stone arrow points.

Only a complex, **stratified** society could have managed the labor required to build and maintain

the huge complex, and only a culture with food surpluses could have created such a society. Cahokia is ideally located for agricultural production, in a valley just south of where the Missouri, the Mississippi, and Illinois Rivers come together. Like the Nile River, these three waterways flooded each year, leaving rich deposits of silt in which to plant crops. Thus, the people of Cahokia were able to grow a number of crops, including squash, pumpkins, sunflowers, and corn. They also gathered nuts and berries and hunted and fished. Most of the tools they used were fashioned out of stone, and they made pottery from the clay from a nearby stream.

The first French explorers who arrived in Cahokia found that the Native Americans who lived nearby did not have the sophistication to build such a city, and that they knew nothing about the people who had built this one. As a result, the settlers speculated that the remains were created by an earlier race of "Mound Builders" that had since disappeared. Modern archeologists have demonstrated convincingly that Cahokia and other mound complexes were indeed constructed by Native Americans, but what happened to the residents of Cahokia is a mystery. By C.E. 1400 Cahokia was deserted and the people gone.

Perhaps years of drought had forced the residents to leave, or perhaps warfare or disease decimated the population. Even those tribes who may be descended from the builders of Cahokia—the Osage, Omaha, Ponca, and Quapaw—have no legends or songs about these mysterious people.

See also: Agriculture; Archeological Discoveries; Mississippian Cultures; Mound Builders; Society.

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Clovis

Term used to refer to prehistoric people who arrived in what is now the southwestern United States in about 10,000 B.C.E. Named by **archeologists** in C.E. 1932 for a site in Clovis, New Mexico, these people were assumed for many years to have been the ancestors of all native peoples in North and South America.

ARCHEOLOGICAL DISCOVERY

In the late nineteenth and early twentieth centuries, most American archeologists believed that Native Americans were relatively recent colonists in the New World. This belief made it easier, some say, for European colonists to claim the land as their own and dispossess the "natives." However, discoveries in the early years of the twentieth century C.E. challenged that assumption, suggesting that people were living in North America in 10,000 B.C.E. More recent discoveries have continued to push back the date when, it is believed, that the first humans crossed from the "old" world to the "new." Some archeologists, such as Albert Goodyear of the University of South Carolina, now believe humans were in North America 50,000 years ago.

In C.E. 1927, in Folsom, New Mexico, a species of bison that had been extinct since the last Ice Age (70,000–8500 B.C.E.) was uncovered, with stone spear points embedded in the animal's ribs. This find confirmed that people had lived in America earlier than once believed. Then, in C.E. 1932, in Clovis, New Mexico, Edgar Howard of the University of Pennsylvania found spear points that were of an earlier date than those unearthed at Folsom. With the points, he also discovered the carcass of a

CLOVIS PEOPLE, CA. 10,000 B.C.E.–8500 B.C.E.

40,000 B.C.E. Possible date of earliest settlement by humans in the Americas

23,000 B.C.E. Earliest date of an ice-free passage between glaciers through which people may have traveled to populate the Americas

10,000 B.C.E. Approximate date of arrival of Clovis people in the southwestern part of what is now the United States

8500 B.C.E. Clovis people vanish from the archeological record

C.E. 1927 Ice Age bison with spear points nearby discovered, demonstrating that humans and bison lived at the same time

C.E. 1932 Discovery of Clovis points, indicating that people lived in North America much earlier than once supposed

C.E. 2003 Studies demonstrate that the mass extinction of animal species was probably due to climate change, not hunting

mammoth, indicating that people had been in the Americas more than 10,000 years ago. He called the people who created these distinctive bifaced spear points "Clovis." Since the discovery in Clovis, many other such sites have been found and dated. In about 8500 B.C.E., Clovis people vanish from the archeological record.

EARLY THEORIES

Archeologists believe that the Clovis people came from Siberia to the Americas across a landmass, known as Beringia, that connected Asia and North America during the most recent Ice Age. There were two brief periods—before 23,000 B.C.E. and after 11,000 B.C.E.—during which the glaciers that covered much of what is now Canada moved apart to expose an ice-free corridor more than 1,000 miles (1,609 km) long and from 15 to 60 miles (24 to 97 m) wide. Following that corridor and continuing southward from Canada, the Clovis people would have crossed through parts of what is now New Mexico, where the first **artifacts** were found.

Not much is known about the Clovis people, except that they were nomadic and excellent big-game hunters who used distinctive stone-tipped spears to kill animals that are now extinct. In fact, in C.E. 1967, biologist Paul Martin of the University of Arizona hypothesized that the mass extinction of 33 species including ground sloths, tapirs, mammoths, mastodons, and saber-tooth cats was caused by the Clovis people and their descendents. He believed that these hunters were especially effective because their prey had not developed a fear of humans and were thus easy to kill in large numbers. More recent studies have discounted this theory, however, and scientists now believe that the extinction was brought about by climate change, not overhunting.

NEW THEORIES

Since the 1980s, many alternative theories have been proposed about the identity of the first peoples who came to America, and when and how they arrived. These theories have arisen as a result of a number of excavations at places such as Topper in South Carolina, Meadowcroft Rockshelter in Pennsylvania, Cactus Hill in Virginia, and Monte Verde in Chile.

In all of these places, archeologists believe they have found evidence of human settlement as many as 25,000 to 50,000 years ago, though the evidence is still widely disputed. This suggests that Clovis people may not have been the earliest settlers in the Americas. Some scholars now believe that there were several migrations to America from various parts of the globe—Europeans crossing the Atlantic, Polynesians crossing the Pacific, and Ainu and Mongols crossing Beringia may all have settled in the Americas at different times.

See also: Beringia; Hunter-Gatherers; Ice Age; Mammoths; Paleo-Indians; Tools and Weapons.

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Culture and Traditions

Because most Native American groups did not have writing, **archeologists** and historians have to piece together many elements of these ancient cultures from material remains. Anthropological studies of surviving Native American societies in the late nineteenth and early twentieth centuries have also provided insights into ancient cultural traditions, such as customs and beliefs, ceremonies, values, and behavioral patterns.

Before the arrival of Europeans, hundreds of different tribes with widely varying lifestyles lived in the Americas. Still, it is possible to generalize about certain common elements of culture that were shared by many groups.

FAMILY AND KINSHIP

In many Native American groups, the nuclear family (mother, father, and children) was less important than the clan or kinship group (the extended family). How that extended family was defined differed from tribe to tribe.

North American Groups

Some kinship systems, such as that of the Omaha, a tribe whose homeland was in what is now northeastern Nebraska, traced descent through the father, while others, including the Iroquois (Haudenosaunee), a tribe of northeastern America, traced descent through the mother. In some tribes, a man who married joined the clan of his wife; in others, the woman joined her husband's clan.

Within a clan system, each individual is supported by a complex net of relationships with the clans of both parents. Generally clans are exogamic, meaning that a person must marry someone who does not belong to either the father's or the mother's clan. This was true, for example, of the Chickasaw, who lived in what is now Alabama.

In many native groups, each clan had specific rites and duties. For example, in some groups, chiefs could be chosen only from specific clans. Among the Mohawk, it was the women of these clans who selected the chief. Among the Iroquois and Muskhogean tribes, if a clan suffered a loss of a member, the clans whose sons had married into the grieving clan would prepare the death feast and take care of all the details of the funeral. If a clan member was killed in a battle, it was the duty of other members to avenge the death and, in some cases, to find someone to assume the dead warrior's role in the clan. An outsider who replaced a dead warrior would be adopted into the clan, marry the widow, and in every respect live the life of the deceased. In fact, Native American groups frequently adopted captives into clans in order to replace lost members. The Iroquois went so far as to adopt entire tribes to make up for the losses they incurred in their frequent battles.

Mexican, Central American, and South American Groups

One major distinction that can be made among Native American groups is that between North American groups and those to the south. While native North Americans generally did not evolve complex social hierarchies and urban centers, such cultures did evolve in Central and South America.

MAJOR CULTURAL AREAS OF THE ANCIENT AMERICAS, CA. 2000 B.C.E.–C.E. 1500

Illustrated here are the sites of the major cultural groups of the Americas. The East Coast was home to the Eastern Woodland tradition. To the west lived the Plains Indians; farther west were the California Indians and the southwestern culture groups. To the north lived the Northwest Coastal Indians and the Inuit. To the south, in what is now Mexico and Central America, were various Mesoamerican groups. Of the South American tribes, that of the Inca was the largest, with perhaps as many as 10 million people occupying what is now Peru.

Nevertheless, the lives of the ordinary people were similar to those of their northern cousins.

The Aztec were organized into extended families comprised of several brothers and their families. Families worked together to farm the land, but these extended families did not own the land that they farmed. Land was owned by *calpulli,* groups of families who shared a common ancestor. The calpulli owned the land, established schools for boys, and collected taxes to pay to the central government.

In the cities, calpulli were larger and tended to be made up of people who shared an occupation. The urban calpulli lived in particular sections of the city and tended to keep to themselves. The leaders of each calpulli formed a city council, which, in turn, selected the *tlatoani,* or leader, of the city. Although the Aztec system of government began as a kind of democracy, the position of tlatoani eventually became hereditary. At the time Europeans came to Central America in the sixteenth century C.E., there were 20 major calpulli, plus 40 associated calpulli in Tenochtitlán.

In Incan society, people were grouped by kinship ties into *ayllus,* which owned land in common and parceled it out to families to farm. The concept of reciprocity was very important to the Inca. Families had the right to ask other families for help in cultivating the land, in return for which the head of the household would give food and *chicha* (an alcoholic beverage). Ayllus were also expected to help one another.

The Maya lived in extended family groups. A household might consist of several related adults, their parents and children. Large families were very useful in farming the land. Family groups tended to build their houses around courtyards where many group activities occurred.

MARRIAGE AND THE ROLE OF WOMEN

There is great diversity in the marriage customs of various culture groups in the Americas, although one common characteristic is that marriage was primarily regarded as an economic, rather than a romantic, institution. In general, the clan system was used as a way to prevent marriages between closely related individuals. However, many groups, including the Maya, permitted first cousins to marry one another. In general, parents or other relatives tended to select their children's mates. Most American culture groups practiced **monogamy**, but **polygamy** was common among chiefs and nobles. Mayan, Incan, and Aztec kings and some members of the nobility were allowed to have multiple wives.

LINK TO PLACE

Chaco Canyon

Chaco Canyon is located in the northwest corner of New Mexico. It is about 10 miles (16.1 km) long and relatively shallow. The canyon itself is at an elevation of about 6,200 feet (1890 m), which is considered the high desert. Evidence of human presence in the canyon goes back nearly 5,000 years. But a major change took place in about C.E. 850. That is when people began to build permanent settlements in the canyon. The buildings they built were four or five stories tall, and many contained 700 or 800 rooms, including *kivas,* circular underground rooms used for ceremonies. Each great house was built in such a way that it was easily seen by another, which allowed people to communicate quickly and effectively. These great houses were linked to neighboring communities by a system of roads. This great city was evidence of an organized and sophisticated culture. The builders were clearly skilled astronomers, since many of the structures in the canyon are aligned with celestial phenomena. The Sun Dagger, for example, is a **petroglyph** that marks solar cycles.

The city flourished for about 300 years but was suddenly abandoned. No one knows exactly why, but some believe a drought may have contributed to the abandonment.

An ancient stone archway on Taquile Island in Peru's Lake Titicaca, the highest navigable lake in the world. An Incan creation myth tells how their civilization began in and around the lake, which is still considered sacred to the Incan people. (Kevin Schafer/Stone/Getty Images)

Women generally were well regarded and well treated among native North Americans. Especially in **matrilineal** groups, such as among the Iroquois, women held high social status and were responsible for choosing or deposing chiefs. In fact, early women's rights organizations in the United States were influenced by Native American concepts of equality. Lucretia Coffin Mott, a nineteenth-century C.E. Quaker advocate for women's rights, was deeply influenced by her knowledge of the lives of women of the Seneca tribe, as was Matilda Joslyn Gage, one of the three founders of the National Woman Suffrage Association.

Nevertheless, it can hardly be said that men and women were equal in these ancient cultures; the roles of men and women differed substantially. In North America, women tended to the home and did most of the agricultural work, while men hunted, engaged in warfare, and did the heavy agricultural work such as clearing fields. Women also made pottery, tanned hides, and gathered nuts and berries. In Central American and South American cultures, where farming tended to be more difficult work because of the terrain, men did the intensive farming while women tended smaller vegetable gardens. Weaving in all the cultures of the Americas was considered primarily women's work. In Central and South America, a substantial portion of a woman's day was spent grinding corn into flour—a task that had been done by machine in the Old World for many centuries, thanks to the invention of the wheel and the use of beasts of burden, neither of which was much used in the New World.

Women also played religious roles in these societies. Women could be **shamans** or priestesses, which were considered very high-status roles. The

Inca worshipped the sun as the central deity, but they also worshipped the moon, which represented the female principle—which in turn controlled both agricultural and human fertility. They had temples that were devoted to goddesses and staffed by priestesses, called *mamaconas*. The Aztec, too, had priestesses.

BELIEFS, CEREMONIES, AND TABOOS

Religion was an important part of Native American life and influenced nearly everything people did, including burial customs. Native North American traditions, such as the vision quest, in which young men went into the wilderness to fast and pray in search of important truths about themselves, were based on religious beliefs. The same is true of the sweat lodge ceremony, in which men gathered in a small structure with hot rocks in the center over which water was poured. This ritual was thought to purify the body and soul.

Many ceremonies and rituals of Central and South America were elaborate gatherings that included thousands of people, all come to the city for the purpose of appeasing or thanking the gods. **Mesoamerican** religions all taught that the gods must be nourished with sacrifices of human blood, and bloodletting played a central role in many religious ceremonies. Priests and kings, in particular, were expected to pierce their tongues, ears, and genitals, catch the blood on paper, then burn the paper. Human sacrifice was also practiced, most particularly among the Aztec, who brought captives to the tops of pyramids, cut out their living hearts, and rolled the bodies down the steps. Even the famous ball games of Mesoamerica were inspired by religious beliefs. The players reenacted the eternal battle between the forces of light and the forces of dark—and losers were often sacrificed.

Nearly all rituals associated with death were also based on specific religious beliefs about the afterlife, and particularly on the idea that people could take property with them into the next world. In the sharply **stratified** societies of Central and South America, kings were buried with expensive objects and even, in some cases, wives and slaves, much like the Egyptian pharaohs. Ancient societies in North America were not as stratified as those to the south, but richer individuals were buried with more and more elaborate objects than ordinary people. Chiefs might be buried with fine pottery, shell jewelry, and beautifully carved pipes, while ordinary people would be buried with cruder examples of these objects. But all of these cultures believed firmly that a person must be buried with things he or she would need in the next life.

Taboos, or forbidden behaviors, were also inspired by religious beliefs. Native North Americans believed that all things were animated by a spirit, and that belief led them to certain taboos. In many groups, clans had particular animals that were sacred to them—called totems—and it was forbidden to hunt these animals; a clan associated with deer, for example, could not hunt deer. In essence, these groups felt themselves to be descended from certain animals and killing the totem animal would be like killing a relative. In the Pacific Northwest, the parents of twins kept them away from water, because they believed such children would become salmon if brought too close. In some cultures, it was taboo to speak the name of a person who had died.

Certain places were considered sacred and had many taboos associated with them, especially taboos requiring fasting and sexual abstinence before one approached these locations. In Incan mythology, for example, the children of the sun are believed to have emerged from Lake Titicaca in what is now Peru, and the place is still considered holy by native peoples. The Maya considered caves sacred and often built their cities and temples near the entrances to caves. It is thought that nobles and priests conducted secret ceremonies in certain caves.

Native American cultures still provide fertile ground for archeologists and anthropologists to study many different customs and traditions. Today, many people are rediscovering and experiencing elements of these ancient cultures. The vision quest

and the sweatlodge are just two examples of ancient traditions that are alive today, not only among Native Americans but among Americans of all heritages.

See also: Aztec Civilization; Incan Civilization; Mayan Civilization; Religion; Slavery; Society.

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Great Serpent Mound

A prehistoric **effigy** mound, in the shape of a serpent, located in Adams County in modern-day southern Ohio. Many prehistoric Mound Building cultures built effigy mounds, earthen sculptures in the shape of sacred animals, for use as tombs or for ceremonies. The largest and most impressive of these is the Great Serpent Mound, which measures 1,300 feet long (396 m), four to six feet high (1.2 to 1.8 m), and ranges from three to 25 feet in width (.9 to 7.6m). It is shaped like a snake, curving along the landscape. Directly in front of the head is an oval enclosure that is about 60 by 120 feet (18 by 36 m). The significance of the oval is uncertain.

LINK IN TIME

Poverty Point Earthworks (Louisiana)

Poverty Point, located in northeastern Louisiana, is the site of the oldest prehistoric American earthworks, built between 1800 and 1400 B.C.E. An explorer named Jacob Walters discovered Native American **artifacts** there in C.E. 1840, but the importance of the site was not recognized until an aerial photograph taken in the C.E. 1930s was rediscovered in the 1950s. The photograph revealed the remarkable size and structure of the earthworks, making it clear that Poverty Point had been constructed by a sophisticated ancient American culture.

The earthworks seen from above look like a huge letter "C," made of six concentric earthen embankments, separated by ditches from which the dirt was taken. In the center of the semicircle is a large plaza. On the outside of the semicircle are five other mounds, two of which are **effigy** mounds in the shape of birds.

If the mounds at Poverty Point were laid end to end, they would be almost eight miles (13 km) long. Once six feet (1.8 m) high, they have eroded over the centuries to only one or two feet (0.3 to 0.6 m) high. The mounds were probably used for burial, and there may be as many as a thousand individuals interred there.

For many years, **archeologists** believed that members of the Adena Culture (a prehistoric group that lived in present-day Ohio, Indiana, West Virginia, Kentucky, Pennsylvania, and New York from about 1000 B.C.E. to C.E. 100) built the Great Serpent Mound. In 1996, however, **radio-carbon dating** of wood charcoal from two parts of the mound indicated that the serpent is of a later date, about C.E. 1070. This would suggest that the Serpent Mound was built by the Fort Ancient culture, a Mississippian group that lived in the Ohio Valley from about C.E. 900 to 1600.

The precise purpose for which the mound was constructed is unclear. When the first European settlers in the area came upon the mound, there was a stone altar in the head that had been used to burn sacrificial offerings. As archeologists have excavated the mound over the years, they have also found ceremonial knives. Because headless skeletons have been unearthed in nearby graves, some archeologists speculate that human sacrifice may have been conducted there. Other scholars suggest that the mound may also have been used for astronomical observation.

See also: Adena; Archeological Discoveries; Mississippian Cultures; Mound Builders; Religion.

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Hohokam

A Native American group that lived in the southwestern deserts of North America from about C.E. 200 to C.E. 1450 and successfully farmed the desert using sophisticated irrigation techniques. It is believed that the Hohokam, whose name in the Pima language means "the people who vanished," migrated from Mexico. They brought with them some of the technology of **Mesoamerican** cultures, including knowledge of agriculture and pottery-making methods.

FOUR PERIODS OF HISTORY

Archeologists have divided the history of the Hohokam into four periods: Pioneer, Colonial, Sedentary, and Classic. In the first period, Pioneer (300 B.C.E to C.E. 550), Hohokam farmers lived along the Gila River in southern Arizona. They grew corn and beans. In about C.E. 550 they began to irrigate their fields by digging canals from the nearby river. They also dug wells for drinking water. Their homes were made of branches covered with mud; the foundations were dug one or two feet (0.3 or 0.6 m) into the earth.

During this period, the Hohokam began to plant new crops that, archeologists believe, they acquired through trading with peoples to the south in what is now Mexico. These included cotton, several different kinds of beans and squashes, and pigweed, also known as amaranth, the seeds of which were ground into flour and eaten like popcorn.

During the Colonial Period (C.E. 550 to 900), the Hohokam villages grew larger, and there is evidence of social distinctions in the grave goods associated with some of the remains. The Hohokam did not like living in close quarters, preferring instead what has been called the *ranchera* style, with widely separated homes within a village. In Snaketown, south of Phoenix, Arizona, for example, about 1,000 people lived spread out across 400 acres (161 hectares).

Perhaps influenced by their Mesoamerican neighbors to the south, the Hohokam built large ball courts that were used for games and other religious ceremonies. Archeologists have uncovered 139 such courts, which are about the size of modern tennis courts.

HOHOKAM CULTURE, 300 B.C.E.–C.E. 1450

300 B.C.E.–C.E. 550 Pioneer Period of Hohokam culture; settlements small and scattered; plainware is replaced by buff-colored pottery

C.E. 550–900 Colonial Period of Hohokam culture; a time of cultural stabilization and expanding influence; pottery becomes more elaborate

ca. C.E. 550 Hohokam begin building their system of irrigation canals

C.E. 900–1200 Sedentary Period; Hohokam culture reaches its peak; characteristic pottery is red on buff; hundreds of miles of canals are completed

C.E. 1200–1450 Classic Period; Hohokam build larger communities

ca. C.E. 1350 Population begins to decline

During the Sedentary Period (C.E. 900 to 1200), population growth led to an increase in the number and size of the canals. Altogether, the Hohokam may have irrigated as many as 100,000 acres (40,500 hectares) with hundreds of miles of canals. Scientists have estimated that the Hohokam moved 11,000,000 cubic yards (764,554 cubic m) of soil during the Classic Period alone. Remarkably, the Hohokam built these canals without the aid of metal tools or beasts of burden, in hard soil consisting of decomposed rock held together by the tenacious roots of desert plants.

Digging the canals required not only physical strength and manual labor but also knowledge of hydraulics (the science of using liquids to do mechanical work) and engineering. Those who planned and built the canals must have possessed the ability to perform complex mathematical calculations in order to determine the volume of water needed to irrigate fields miles from the main canal, and the grade needed to keep water flowing at a carefully controlled rate.

In addition to technical and engineering knowledge, the Hohokam had a sophisticated political organization in order to plan, construct, maintain, and repair their complicated network of canals. In times of drought, for example, leaders likely had to make and implement difficult decisions about which fields got water and which did not. They also would have needed to manage the constant work of keeping the canals free of silt.

The Sedentary Period also was marked by a blossoming of Hohokam **artisans**, including fine potters, weavers, and jewelers. The Hohokam made pottery with elaborate decoration in red, black, and white on buff (brownish yellow) and cotton cloth for clothing and other uses, such as bags and bedding.

The Hohokam were the first to use acid etching to make beautiful designs on shells, a technique that was not discovered in Europe for another several centuries. They painted designs on seashells with pitch, then dropped the shells into an acid made from fermented cactus juice. The acid dissolved the unprotected surface, leaving the pitch-covered portion in **relief**. Artists then removed the pitch and painted the raised portions of the shells.

The Hohokam often painted a design on pottery of a figure carrying a staff, called the "burden basket carrier." This figure is probably that of a trader, indicating how important trade was to this culture and suggesting extensive trading networks. For example, the shells decorated by acid etching were obtained through trade with peoples as far away as California. The Hohokam also brought copper bells, plaques of iron pyrite, and exotic birds from Mexico.

The final period of Hohokam culture is referred to as the Classic Period (C.E. 1200 to 1450). During this time, increased population, and perhaps the threat of warfare, led to the formation of larger communities. Homes in these communities were constructed closely together around central plazas, and adobe walls surrounded each community. Some communities had large "Great Houses" that were made of stone or adobe and were up to four stories

high. These houses were probably intended for the elite members of the group.

DEMISE

By C.E. 1350, the Hohokam population began to decline, and people moved away from the large settlements. No one is sure why, but most scientists speculate that environmental factors played a part. Droughts and floods are not uncommon in desert regions, and overfarming can degrade the environment to the extent that the land no longer yields what it once did.

There is evidence, though, that the Hohokam were careful to preserve their environment, and their irrigation and farming techniques had very positive effects on the land. They cultivated many native desert plants, took great care of trees, and added to the fertility of the fields through the silt deposited by irrigation. Nevertheless, families moved away from the large settlements and wandered the desert in small bands, uniting again as the Pima culture some time in the eighteenth century C.E.

See also: Agriculture; Aztec Civilization; Hunter-Gatherers; Mayan Civilization; Technology and Inventions.

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Hopewell Culture

See Mound Builders.

Hunter-Gatherers

The earliest people to populate the Americas, who lived by means of hunting prey animals and gathering food that grew naturally. A preagricultural people, the earliest Native Americans did not plant crops and were nomadic, wandering from place to place in search of food.

Many Native American peoples practiced hunting and gathering until the time of European settlement, although some groups in Mexico had begun planting crops as early as 3000 B.C.E. By about 2000 B.C.E., culture groups in the American Southwest had also begun to farm and live in permanent settlements, as did people along the upper Missouri River. Many Native American groups, however, continued to live by hunting and gathering, even in places where they were aware of farming.

Farming is very labor intensive. The hunter-gatherer lifestyle, by contrast, allows people many free hours daily to enjoy games, conversation, and other leisure activities. Thus, successful hunter-gatherer societies tend not to take up farming. Even when Native American cultures adopted farming, the hunt was still an important event, and the meat that hunters killed was an important source of protein and animal skins.

Among Native Americans, gathering was usually done by women. Although Native American women collected nuts, seeds, and berries, they also "gathered" small animals and insects as food. In some cases, gathering was a complicated process, involving the entire group. Gathering pine nuts, a staple food among Native Americans of the Great Basin, a cool desert in what is now Nevada, Utah, and Arizona, required considerable work and the participation of many people, including men. Men harvested pine cones from trees, and women and children

carried the cones back to camp in baskets. Women roasted the cones until the nuts could be easily removed, then roasted the nuts again to remove the shells. Then they either stored the nuts whole or ground them into flour.

Native American hunters used three basic weapons. The first was a simple thrusting spear, a long shaft with a stone projectile point on the end. Such weapons were used only at close range. Hunters often held the spear and thrust it into the animal or threw it a short distance. The *atlatl,* a device that allowed the hunter to throw the projectile much farther and faster, made him a more effective hunter. However, the bow and arrow was by far the most effective weapon of the hunt due to its superior range and accuracy.

Material possessions hindered the mobility of hunting and gathering groups, so people in such societies did not accumulate more than could be easily transported. Because social stratification is based on the accumulation of wealth, hunter-gatherer societies tended not to be **hierarchical**. In addition, because the groups were small (numbering from 30 to 60), they did not require complex social structures.

In recent years, several previously unknown hunter-gatherer groups have been discovered in the Americas, including the Nukak of central Colombia. First contacted by outsiders in 1988, the Nukak have begun to leave their native rainforest habitat. In 2006, some 80 Nukak arrived in the city of San José del Guaviare, possibly as refugees from civil violence in Colombia.

See also: Agriculture; Archeological Discoveries; Mound Builders; Society.

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Ice Age

Period of intense glaciation marked by extremely cold climate. The most recent Ice Age in the Americas began about 70,000 years ago and ended about 10,500 years ago.

Most scientists believe that ice ages result from a combination of several factors, including the composition of the earth's atmosphere, changes in the earth's orbit around the sun, variations in solar activity, the orbital dynamics of the earth-moon system, the impact of meteorites, and volcanic eruptions. The first of these factors is considered the most important. An abundance of land within the Arctic and Antarctic circles also appears to be a prerequisite for an ice age. Snow and ice accumulating on such landmasses reflects the sun's heat back into space, thereby cooling the earth. Although the earth's orbit does not seem to be a major cause of ice ages, it does seem to affect the pattern of freezing and thawing that take place during an ice age.

Earth has experienced several ice ages throughout its history, but the term is usually applied to the most recent glaciation, when large animals such as woolly mammoths and mastodons roamed the continents. It was during this ice age that the first people came to the Americas. Scholars speculate that Asian peoples migrated to North America across a landmass, known as Beringia, that once joined the two continents. Beringia emerged from what is now the Bering Sea as ocean levels dropped during the Ice Age. It disappeared again as the weather warmed, the waters rose, and the ice began to recede.

A series of mass extinctions, involving 33 to 35 species of animals, occurred at about the time the Ice

Age ended. The species that disappeared from North America during this time included woolly mammoths, mastodons, glyptodonts (huge armadillo-like creatures), mylodons (immense ground sloths), saber-toothed cats, and birds with 25-foot (7.6-m) wingspans. Most scientists believe that the wetter climate following the Ice Age helped produce great forests that replaced much of the grazing land that supported large fauna. Because these creatures were too big to forage in the dense forests, they eventually died out.

What we know today as a "normal" climate reflects an infinitesimally short period in the history of the planet. The earth is now in what is called an "interglacial period" during which glaciers have retreated far to the north, but such periods have occurred thousands of times in the history of the planet, as have periods of intense glaciation. No one knows how long this period of moderate temperatures will last.

See also: Beringia; Mammoths.

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Incan Civilization

Culture group that rose to power in the fifteenth century C.E. in what is now Peru. At its height, the people of the Inca empire performed remarkable feats of engineering and controlled more than 350,000 square miles (900,000 sq km), from modern Ecuador to modern Chile.

Little is known about the early years of the Inca people. Beginning in about C.E. 1100, however, they began to attack neighboring groups from their capital city of Cuzco. During the reign of their *Sapa Inca,* or king, Pachacuti, beginning in about 1438, the Inca came to dominate a kingdom that was about the size of the 13 American colonies and included almost the whole of the Andes Mountains. After Pachacuti's death, his sons continued in their father's footsteps, conquering lands as far north as Ecuador, as far south as Chile, and as far east as Argentina and Bolivia.

POLITICAL AND SOCIAL ORGANIZATION

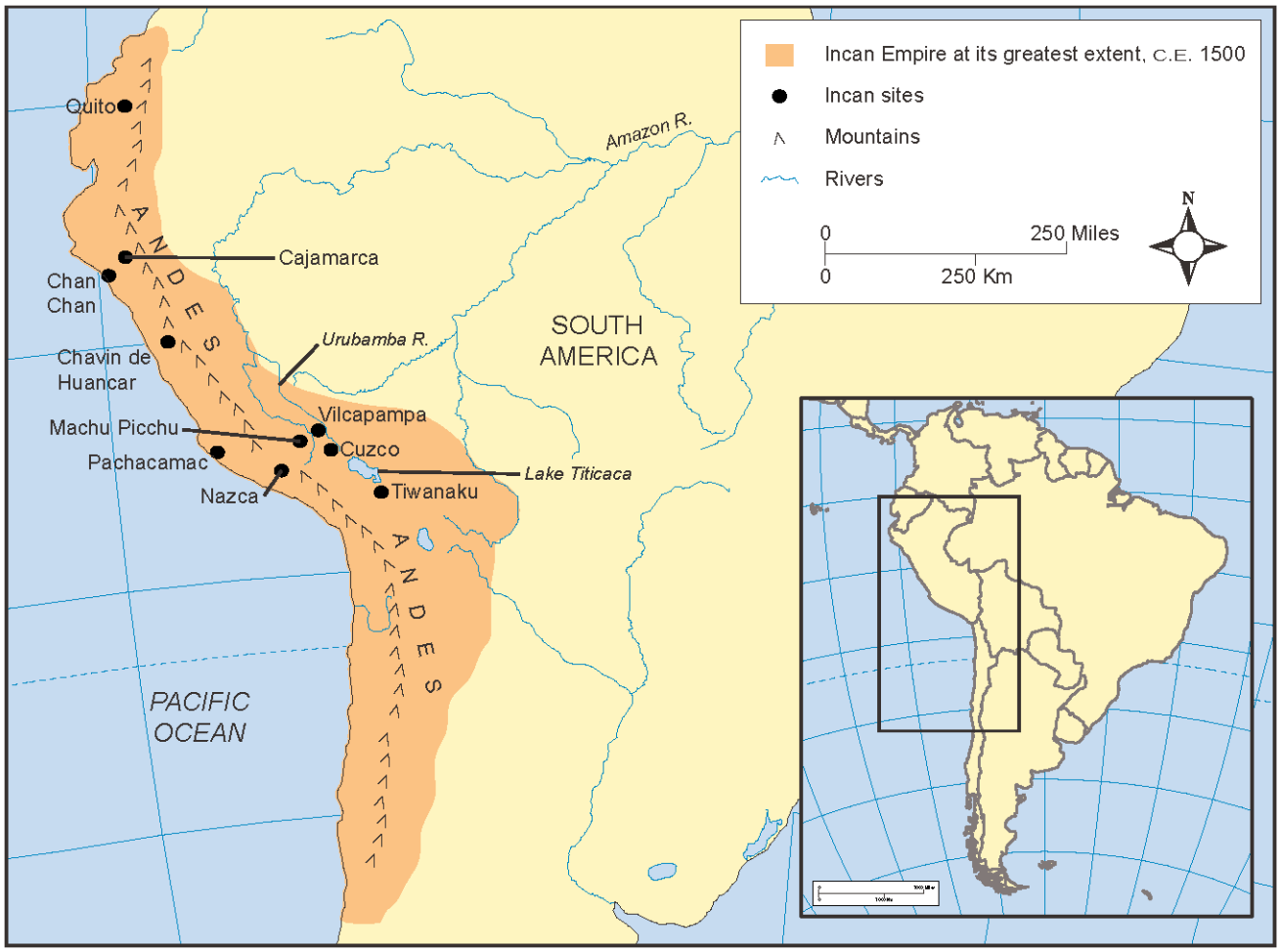
The Inca were capable administrators who devised a complex political system in order to rule their vast holdings. The Sapa Inca was the political and religious head of the tribe, and he was believed to be the son of the Inca's major deity, the sun god Inti. Although he had many mistresses, the Sapa Inca married his sister in order to produce an heir to the throne who was descended from the sun god on both sides.

Incan society was strictly **hierarchical**. Occupying ranks on the social ladder below the **aristocratic** class were priests, army commanders, and craftspeople. The vast majority of the people farmed the land in order to provide enough food to feed the population. As the empire grew, there were opportunities for conquered peoples to rise to administrative positions, but only pure-blooded Inca could hold the most important governmental positions. The children of conquered rulers were brought to Cuzco in order to be raised in the Incan religion and culture, which increased social stability in this diverse empire. Still, there were rebel groups who continually resisted Incan dominance.

The Inca called their empire *Tawantinsuyu,* or "Land of the Four Quarters." Indeed, the empire was divided into four administrative sections, each ruled by a relative of the Sapa Inca. Each quarter

INCAN EMPIRE, CA. C.E. 1500

Archeological discoveries have revealed that the Inca Empire was vast. At its peak, in about C.E. 1500, it stretched 2,500 miles (4,025 km) through South America, from the southern border of present-day Colombia south into Chile and east from the Pacific Coast into the Amazonian rain forest.



was subdivided into progressively smaller units. Under each of the four provincial governors, called *apos,* were ten district governors, who oversaw groups of about 10,000 peasants. Below these were village leaders who ruled groups of about 1,000 people, foremen who supervised 100 people and, at the lowest level, an official who was responsible for 10 individuals.

AGRICULTURE

The Inca were skilled farmers who managed to grow large food surpluses on mountainous land that was difficult to irrigate and plow. The Inca did not have the wheel or draft animals, so the land was tilled using stone tools, metal hoes, and digging sticks. On this land, Incan farmers grew 240 varieties of potato, as well as corn, beans, peppers, peanuts, cotton, squash, and cassava.

In practice, all Incan farmers were tenants on the land. The Sapa Inca owned all the land, and each peasant was obligated to give a portion of his crop to the emperor. In addition, the government imposed a labor tax on the people called a *mit'a*. This tax required most people to work part of the

INCAN CIVILIZATION, CA. C.E. 1100–1572

ca. C.E. 1100 Inca begin to attack neighboring groups in order to expand their territory

C.E. 1438 Incan emperor Pachacuti ascends to the throne, ruling a kingdom as large as the original thirteen American colonies

C.E. 1471 Pachacuti dies but his sons continue to acquire territory

C.E. 1523 Spanish conquistador, Francisco Pizarro, arrives in Peru

C.E. 1525 Incan Emperor Huyana Capec and his heir both die

C.E. 1525–1532 Civil war disrupts Incan empire, pitting brothers against each other for throne

C.E. 1532 Atahualpa emerges as victor in civil war and executes his brother

C.E. 1532 Francisco Pizarro captures and executes Altahualpa; except for a rebel group, Incan empire falls to the Spanish

C.E. 1572 Spanish forces capture Vilcabamba, the last holdout of the Incan empire

year for the government in the building of cities and roads or in mining gold and silver.

PUBLIC PROJECTS

It was for public projects such as roads, in fact, that the Inca are most admired. Over mountainous terrain, without the use of the wheel, the Inca built a vast system of stone roads. It is estimated that the Inca had more than 10,000 miles (16,000 km) of roads crisscrossing their vast territory. Communication in the empire was dependent on these roads and a group of trained runners who carried messages from one part of the empire to another, often running 140 miles (225 km) in a single day. Along the roads, the Inca built rest houses called *tambos* where travelers could spend the night. In addition to roads, the Inca built remarkable rope suspension bridges over deep chasms in the mountains. These bridges were so sturdy that one survived for 500 years.

Inca palaces, temples, and fortresses are also remarkable for their precision and beauty. Typically, Inca builders used huge limestone or granite blocks that they had to transport many miles, often up steep mountains, without the use of draft animals or wheels. The stones were laid on top of one another and then sculpted to fit. So talented were the Inca architects that even a leaf of paper will not fit between the stones. The Inca also built many cascading fountains and artificial waterfalls. The city of Machu Picchu has a system of 16 fountains that still function today.

CONQUEST

In 1523, the Spanish explorer Francisco Pizarro led an expedition to the coast of Peru. There, he learned that the Inca had tremendous stores of gold and silver. Pizarro returned to Spain and asked for permission to conquer the native peoples. He was granted that permission, returned to the west coast of South America in 1532, and began battling coastal tribes. He eventually worked his way to the Inca capital of Cuzco with only 200 men and 40 horses.

Pizarro encountered a fractured empire just emerging from civil war over the succession to the Inca throne. He captured and executed the new Sapa Inca, Atalhualpa, and installed a puppet emperor, Manco Capac. When the Spanish began to fight among themselves over the immense riches of the Inca, Manco led an unsuccessful revolt. He and his followers retreated to the mountains north of Cuzco. Spain finally conquered this final Inca stronghold in 1572.

The Inca people, however, have survived to this day. Particularly in rural areas, many people still speak Quechua, the language of the Inca, and they still eat many of the same foods, play the same music, and share the same religious beliefs as their ancestors.

Shown here is an Incan quipu from the fifteenth century C.E. This device was made of colored string and knots and allowed certain highly trained interpreters to keep track of resources such as llamas and agricultural products. (Werner Forman/Art Resource, NY)

LINK IN TIME

The Quipu, An Incan Computer

The Inca never developed a written language or a system of mathematics, yet they were able to rule a vast and complex empire. One tool that helped them keep track of the many details involved in ruling the empire was the *quipu*. The quipu was a system of knotted cords used by the Inca as a kind of data bank that could be read only by specially trained Incan accountants called *quipucamayocs,* or "quipu authorities." A long string, often made of llama wool, represented the concept or idea of which the Incas wanted to keep track. Suspended from the long string, were a series of shorter strings, of different colors, knotted in various places. A single quipu could have as many as a thousand strings suspended from it. The number and color of the strings, the knots, and the spaces between strings all had meaning to the quipucamayocs. The quipus were used to keep track of populations, crops, and items kept in storehouses.

Although some anthropologists believe that the quipus were actually a system of writing in which the knots represented words and ideas, most feel it was a device that allowed the interpreter to remember a complicated message. It may even be that only the person who made the quipu could read it.

See also: Agriculture; Art and Architecture; Language and Writing; Machu Picchu.

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Inuit

See Thule Tradition.

L

Language and Writing

Scholars estimate that, before the arrival of Christopher Columbus in the fifteenth century C.E. , Native Americans spoke between 1,800 and 2,000 different languages, including 300 in North America, 300 in Mexico and Central America, and 1,400 in South America and the West Indies. Many of these languages have died out and are no longer spoken by anyone; others are spoken by fewer than 1,000 individuals.

Today, only Navajo and Cherokee in North America are spoken by significant numbers of people. In Central America, the Nahuatl and the Mayan languages are still spoken by many, and in South America, the Quechuan language family and Tupí Guaraní have many speakers. Only the people of **Mesoamerica** had true writing systems.

CHARACTERISTICS OF SPOKEN NATIVE AMERICAN LANGUAGES

Native American languages are not only numerous, they also are very different from one another and provide fertile ground for linguistic study. The language spoken by the Inuit of Greenland, for example, has only 17 phonemes, or individual sounds; by contrast, Navajo has 47. (English has 40.) Some Native American languages have nasalized vowel sounds similar to French; some use rising and falling tones to distinguish meaning, as does the Chinese.

In English, speakers string several individual words together to form sentences. In many Native American languages, speakers combine a number of elements—or **morphemes**—many of which have no meaning in themselves—into a single "word" with a complex meaning. Such languages are known as **polysynthetic**. In Yu'pik Inuit, for example a speaker might say, "*tuntussuqatarniksaitengqiggtuq*," which means something like "He had not yet said again that he was going to hunt reindeer." Edward Sapir, one of the most famous linguists to study Native American languages, often cited this utterance from the Paiute language: "*wiitokuchumpunkurüganiyugwivantümü*," which means "they who are going to sit and cut up with a knife a black female (or male) buffalo."

Some Native American languages use a grammatical device known as "switch reference." In English, the sentence, "She walked a long way and she rested" is somewhat ambiguous, since it is not clear if the person who walked is the same person who rested. In the Hopi language, however, the verb form changes if the person changes, so the same sentence in Hopi would not be ambiguous.

Several Native American languages assign gender to nouns, as in French, Spanish, and German. Others, such as those in the Algonquian group,

EVOLUTION OF AMERICAN LANGUAGE AND WRITING

ca. 1200 B.C.E. The Olmec civilization of Mexico develops the beginnings of a written language

ca. 700 B.C.E. Probable date for the beginning of writing among the Maya of Central America

400 B.C.E. Earliest known carved stone calendar made by the Maya

250 B.C.E. Earliest known writing in Mayan script

C.E. 1200–1250 The earliest known Mayan book, now known as the Dresden Codex, is written

ca. C.E. 1500 Mayan books now known as the Paris, Grolier, and Madrid Codices are written

ca. C.E. 1530 Spanish conquerors burn Mayan books

C.E. 1554–1560 The *Popol Vuh,* the sacred book of the Maya, is recorded in Roman characters

C.E. 1950 Russian ethnologist Yuri Knorsov first proposes that Mayan script is partially phonetic—that some of the glyphs represented sounds

C.E. 1962 Mayan hieroglyphs are cataloged

C.E. 1965 The Grolier Codex is discovered by José Saenz in Mexico

classify nouns as animate or inanimate. Some languages have separate forms for singular and plural nouns; others use the same form for both. (English does both; most words have singular and plural forms, but words like "sheep" are used for both singular and plural, using only context to make the distinction.)

Other Native American languages have an "animacy hierarchy," in which all nouns are ranked from humans through animals and objects, with abstractions—such as friendship or loyalty—at the bottom of the hierarchy. In practice, this means that if a human being is the object of a sentence and an animal the subject (as in "The horse kicked the boy"), the word for "boy" must precede that for "horse" in the sentence structure. Navajo is one Native American language with an animacy hierarchy.

So different and fascinating are Native American languages that the linguists Edward Sapir and his student Benjamin Lee Whorf developed a hypothesis about the interplay between language and the perception of reality as a result of studying the Hopi language. In *Language, Thought, and Reality* (1956), Whorf asserted that the language a person speaks affects thought and perception—independent of other elements of the culture in which one is raised. He notes, for example, that "Hopi, with its preferences for verbs, as contrasted to our own liking for nouns, perpetually turns our propositions about things into propositions about events."

Hopi does not have the subject-object distinctions that characterize English. Where an English speaker might say, "There is a house over there," or "That is my house," a Hopi speaker would say, "It houses." Such a difference in language, says Whorf, will inevitably color thought, such that a Hopi speaker may see the world as a place entirely different from that perceived by an English speaker. In fact, Whorf says, Hopi may be a better language than English in which to discuss modern physics and such concepts as Einstein's theory of relativity.

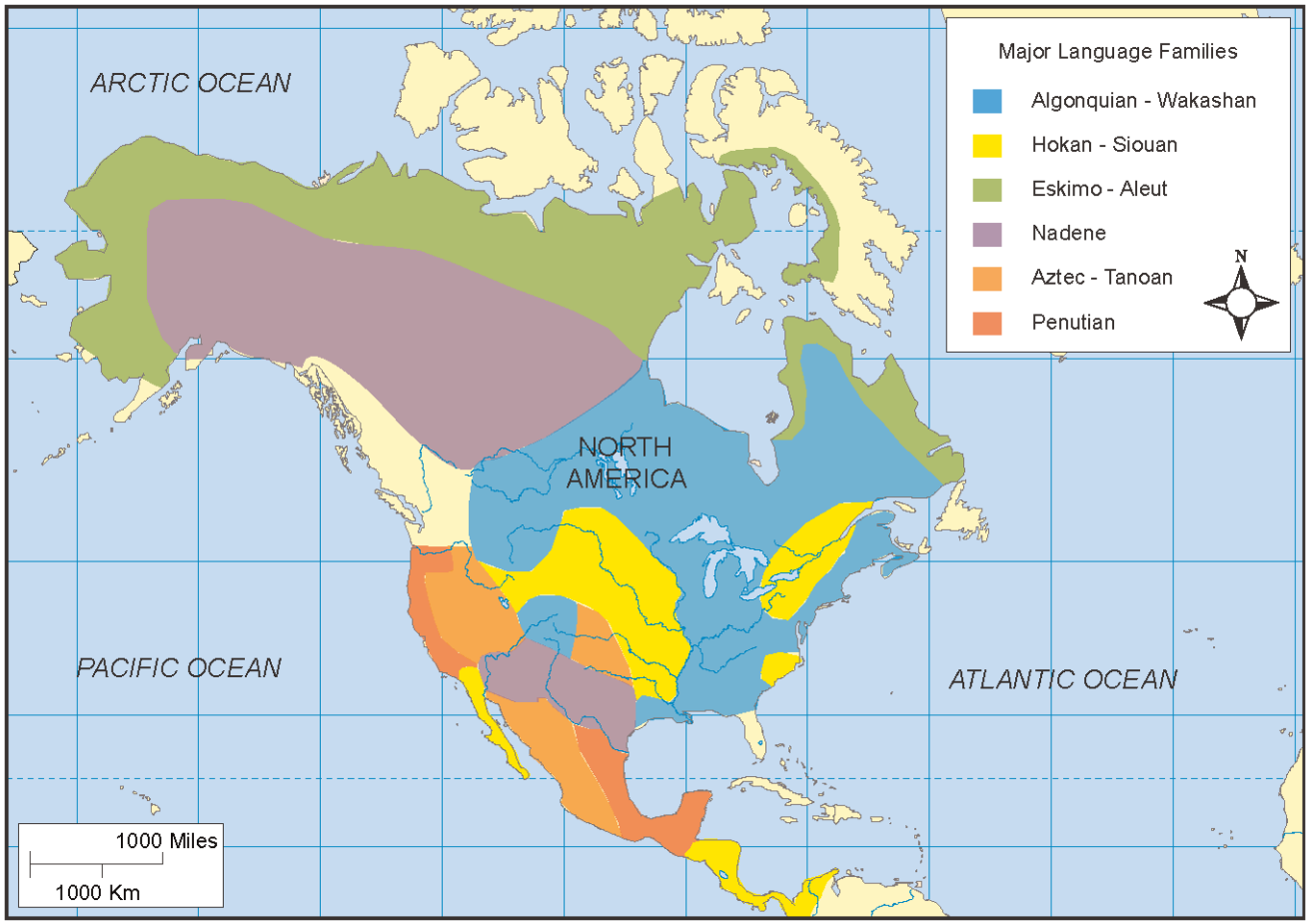
ORIGINS OF NATIVE AMERICAN LANGUAGES

Although historians still assume that Native Americans came to the Americas thousands of years ago, no Native American language is clearly derived from an Old World language. According to scholars at the Smithsonian Institution Anthropology Outreach Office, no one has yet been able to find any words in any Asian languages that are similar to Native American words. Thus, for now, the origin of Native American languages remains unknown.

Although many Native American languages have become extinct, they have left their legacy in

MAJOR LINGUISTIC GROUPS OF THE ANCIENT AMERICAS

This map shows the six major language families of North America, where 300 different languages were spoken prior to European contact in the fifteenth century C.E. Another 1,740 languages, from 34 different language families, were once spoken in Central and South America.



many place names and words used every day. These include such names as Alaska, Alabama, Arizona, Connecticut, and Canada, and such everyday words as raccoon, coyote, squash, tomato, potato, tapioca, chocolate, tobacco, succotash, barbecue, hurricane, hammock, canoe, moccasin, totem, pow-wow, and many others.

NORTH AND CENTRAL AMERICAN LANGUAGE GROUPS

There are many different methods of classifying Native American languages, but one that is still widely accepted is that proposed by Sapir in 1929. Sapir divided Native American languages north of Mexico into six major families: Eskimo-Aleut, Algonquian-Wakashan, Nadene, Penutian, Hokan-Siouan, and Aztec-Tanoan.

The Eskimo-Aleut language family was spoken in Greenland, Canada, Alaska, parts of the United States, and Siberia. The Aleut language is spoken today by fewer than 400 people. The Eskimo languages are divided into two subgroups: Yupik and Inupiaq-Inuktitut. Yupik today has about 13,000 speakers, while Inupiaq-Inuktitut has about 100,000 speakers.

The Algonquian-Wakashan language family was at one time spoken throughout North America.

Algonquian tongues encompassed more than 50 separate languages including Algonquian, Arapaho, Cheyenne, Delaware, Kickapoo, Micmac, Penobscot, and Shawnee. Also in the family were Coeur d'Alene, Okanogan, Pend d'Oreille, Puyallup, Tillamok, Nootka, and Kitamat. Most Algonquian-Wakashan languages were polysynthetic. Today these languages are spoken by fewer than 150,000 individuals throughout the United States and Canada.

The Nadene and Penutian language family incluldes Athabascan, Haida, and Tlingit, which were spoken in the Pacific Northwest. It also includes several languages spoken in California as well as Mexico and Central America.

The Hokan-Siouan family includes languages that were spoken throughout North America: Seminole, Chickasaw, Creek, Iroquois, Yuma, Seneca, Osage, and Crow. Some of these languages can even be found in Mexico and Central America. Many of these languages are **aggluntinative**, which means that word elements are often mixed to form an additional word; German and Dutch have many words that are formed this way. The word *Kontaktlinsenverträglichkeitstest* in German, for example, means "contact-lens compatibility test."

Aztec-Tanoan languages are spoken from the northwestern United States to Mexico and Central America. Many of these languages are polysynthetic. This group includes Nuahatl, the language spoken by the Aztec, an ancient civilization of what is now Mexico. Mayan is part of the Penutian language family and is still spoken today by more than four million speakers.

SOUTH AMERICAN AND WEST INDIAN LANGUAGE GROUPS

Linguists have spent many years studying North American language groups. Much less time and effort has been spent studying other language groups of the Americas, so much less is known about these languages. Part of the reason for this is the sheer number of languages that existed outside of what is now the United States. For example, at the time of European contact in the sixteenth century C.E., more than 1,000 different languages in 34 language families were spoken in South America alone. By comparison, today there are only 21 language families in all of Africa, Europe, and Asia combined.

MESOAMERICAN WRITING SYSTEMS

Of all of the languages spoken in the Americas before the arrival of Columbus in C.E. 1492, only those in Mesoamerica had true writing systems. Many Mesoamerican writing systems resemble one another and share certain characteristics, such as the use of signs called **glyphs**. The glyphs were intricate and highly pictorial, easily recognized representations of the object or animal they are intended to represent. For example, the sign for "jaguar" looks like a stylized jaguar. There are also, however, many glyphs that are comprised of geometric shapes such as triangles, circles, and spirals.

In the Mayan language, glyphs were originally used more like pictures than word-symbols. A group of glyphs would signify a complex idea, but it did not matter in what order they were "read." Later, the glyphs were grouped into glyph boxes and then into a two-column layout, which was read from left to right. When text was grouped into three columns, the first column would be read from top to bottom and the next two from left to right.

Like the Egyptian system, Mayan writing evolved from glyphs that were intended to represent simple objects into glyphs that were added to other glyphs to modify their meaning into glyphs that represented individual sounds. To date, about 800 different glyphs have been identified. Many of the glyphs have more than one meaning.

It is thought that the Olmec people developed the beginnings of a written language in about 1200 B.C.E. and that the Maya began using written language in about 700 B.C.E. The earliest carved stone calendar of the Maya dates from about 400 B.C.E, and the earliest known writing in Maya script dates from 250 B.C.E.

Most Mayan writing depicted histories of a people or places, genealogies, or conquests. They were carved into stone or wood, onto buildings and free-

This image shows a small part of "Newspaper Rock," located near Canyonlands National Park in Utah. The rock includes an early form of writing from the Fremont, Anasazi, Navajo, and Anglo cultures. (Daniel Gotshall/Taxi/Getty Images)

standing stones called *stelae,* and onto altars. Mayan scribes also painted glyphs on ceramics and walls, and wrote books that were made of a single long sheet of paper folded accordion style.

There are in existence today only four books written by the Maya, named after the cities where they are now kept, or in one case, after a club that once owned the manuscript; they are the Dresden **Codex**, the Paris Codex, the Madrid Codex, and the Grolier Codex. It is believed that the Dresden Codex was written between C.E. 1200 and 1250 and that the other three were written in about C.E. 1500. There are so few examples of Mayan books in existence because Spanish conquerors burned all the Mayan books they could find beginning in about C.E. 1530. The Dresden, Paris, and Madrid codices were known to scholars from the nineteenth century C.E., but the Grolier Codex was not discovered until C.E. 1965. One other Mayan book remains, the sacred text of the *Popol Vuh,* but the surviving copy is not written in **hieroglyphs**; it is a transcription into Roman characters done in about C.E. 1554.

Historians and linguists still have much to do when it comes to the study of Mesoamerican languages and writing. It was not until C.E. 1950, for example, that scholars realized the script was partially phonetic—that is, that some of the glyphs represented sounds—and not until C.E. 1962 that all the hieroglyphs were catalogued. Only recently have archeologists begun to believe that a series of drawings uncovered in Tenochtitlán may actually be a writing system, which would make it the first in the Americas.

LINK TO PLACE

Rock Drawings and Petroglyphs in the Southwestern United States

Perhaps the earliest forms of writing in the New World were drawings, called pictographs, and rock carvings, called **petroglyphs**, that were executed by early hunter-gatherers in what is now the southwestern United States. The drawings and carvings were created over a period of many thousands of years, from about 5000 B.C.E. to about C.E. 1700. Some of the rock carvings are easy to decipher. A petroglyph in southeastern Colorado, for example, depicts a herd of deer or antelope and a group of stick figures, which is no doubt a depiction of hunting. Others are more difficult to interpret.

Other petroglyphs have been interpreted as attempts on the part of **shamans** to reproduce the experience of trances. Rock art found near the Pecos River in west Texas, for example, shows human-like figures with arms that appear to be stalks of corn; this may be an attempt to show the transformation of a shaman into the sacred corn plant. Other figures are geometric, including zigzag lines, chain-like figures, spirals, circles, and doughnut-shaped objects.

Many of these mysterious ancient pictures are in danger today. They are exposed to natural forces and continue to erode. But humans have also inflicted damage. Simply touching the drawings can cause them to deteriorate. Some people have inflicted and continue to inflict intentional damage, shooting at the drawings or painting graffiti at the sites.

See also: Archeological Discoveries; Aztec Civilization; Mayan Civilization.

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L'Anse aux Meadows

Site, located in present-day Newfoundland, Canada, of the only authenticated ancient Viking settlement in North America. Two Norse tales, *The Saga of the Greenlanders* and *The Saga of Erik the Red*, tell how Viking sailors led by Norwegian explorer Leif Eriksson discovered a new land to the west of Greenland, a place Eriksson called Vinland, where he arrived in ca. C.E. 1000. Modern scholars have recognized that Vinland was actually in modern-day North America.

For years, historians and **archeologists** searched unsuccessfully for evidence to support the tales told in the Norse sagas. Finally, in C.E. 1960, while searching for evidence of a Viking presence in Canada, Norwegian historian Helge Ingstad came across some fascinating information. George Decker, a local fisherman, told Ingstad about rectangular mounds he had seen in a field near L'Anse aux Meadows, a cove at the tip of the Great Northern Peninsula in northern Newfoundland. Ingstad briefly explored the site

and concluded that the mounds were the remains of Viking-style log houses. Columbus, it appeared, was not the first European to travel to the New World.

In C.E. 1961, Ingstad returned to L'Anse aux Meadows with his wife, archeologist Anne Stine. Over the next two years, excavations uncovered the foundations of eight structures, including a smithy for processing iron and a bathhouse similar to those found in Greenland. Fireplaces with ember pits, a style common in Greenland, were also found, as well as a bronze pin, of the kind Vikings commonly used to fasten their cloaks, and an Icelandic stone lamp.

Among the most important finds at L'Anse aux Meadows was a tiny stone wheel, called a spindle whorl, used for spinning wool. This find, along with a bone needle and a pair of scissors, seemed to confirm the claim of the sagas that women were present at the site.

Archeologists have also discovered bogs nearby that were the source of iron that the Vikings smelted into nails. In the bogs, they also uncovered old broken nails and planks of the sort Vikings used to build their ships. Certainly, one function of the settlement at L'Anse aux Meadows was to repair and refit ships that made the voyage from Greenland.

Although a total of more than 800 **artifacts** have been found at the site, one thing that was *not* found in L'Anse aux Meadows was the grape. This fact is significant because Leif Eriksson named his settlement Vinland, after the abundant grapes growing wild in the region. According to the sagas, he returned to Greenland with his ship laden with timber and grapes. However, grapes have never grown in Newfoundland, which suggests that L'Anse aux Meadows is not the settlement described in the sagas. Grapes do grow farther south in what is now New England, leading historians to speculate that the actual settlement was in New England and that L'Anse aux Meadows was merely a staging site from which explorers and settlers ventured south and west. Unfortunately, no evidence exists of a Viking settlement anywhere other than L'Anse aux Meadows.

Some scholars have speculated that the "vin" in Vinland could also mean "grass" or "farm," and suggest that the word connotes an area of grassy pasture. These conjectures have been dismissed by most experts, using complicated linguistic arguments, and the scholarly consensus seems to be that the exact location of Vinland is still a mystery.

See also: Archeological Discoveries; Vinland.

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M

Machu Picchu

Ancient stone city (ca. C.E. 1460–1532) built by the Incas in the Andes Mountains, near their capital city of Cuczco. Scholars speculate that Machu Picchu was built by the emperor Pachacuti Inca Yupanqui (C.E. 1438–1471) as a rural religious retreat for himself and other nobles and priests. Because the Inca had no written language, however, no one really knows for certain who built the city or for what purpose.

Machu Picchu, often referred to as "lost city of the Incas," was rediscovered in C.E. 1911 by Yale **archeologist** Hiram Bingham, who was searching for the Incan city of Vilcapampa. Machu Picchu, located at the top of a mountain ridge 7,800 feet (2,400 m) above sea level, is invisible from below and difficult to reach. When Bingham arrived, Machu Picchu was overgrown with vegetation.

This panoramic view shows the beautiful ancient Incan city Machu Picchu, located high in the Peruvian Andes. Lost to history for centuries because of its isolated location, the city was rediscovered by Hiram Bingham in C.E. 1911. (Ed Simpson/Stone/Getty Images)

LINK IN TIME

Machu Picchu Today

Machu Picchu, hidden 2,000 feet above the Urubamba River in the Peruvian Andes, escaped destruction by Spanish conquerors and was remarkably well preserved when it was rediscovered by Hiram Bingham in 1911. Unfortunately, modern tourism poses a greater threat to the site than did the conquistadors. The soil on which the city was built is shallow, and when it is compressed by the tramping of millions of tourists' feet, the buildings begin to shift. Tourists also leave trash along the Inca trails, trample indigenous plants, and place in further jeopardy already endangered animal species such as the spectacled bear.

In addition, the area surrounding the ancient city has become overrun with tourist attractions—hotels, shops, and parking lots—which mar the natural beauty and mystery of the cloud-covered mountain top. A plan to build cable cars up the mountain was stopped by preservationists, who argued that a ride such as one might find in a modern amusement park did not belong in an ancient and sacred site.

The government of Peru has been slow to act to preserve Machu Picchu because tourism generates so much income. A recent master plan recommended that no more than 2,500 tourists be allowed to visit the site each day, but the plan has met considerable opposition from commercial interests.

Several groups are now working to preserve Machu Picchu. *Progama Machu Picchu* is a conservation organization that is working to strengthen the administration of the Machu Picchu sanctuary and to protect the local flora, fauna, and environment. *Yachay Wasi* (which means "House of Learning" in Quechua) represents the native groups who live in the area surrounding Machu Picchu. They work to ensure that Machu Picchu, which they recognize as a sacred place, is protected as such. With the help of these and other groups, Machu Picchu may survive another 500 years, its beauty intact.

Beneath the vegetation lay a city made of hewn stone that was once home to about 1,000 people. It survived nearly intact because the Spanish troops who conquered the Incan Empire never knew of its existence.

Machu Picchu covers about five square miles (13 sq. km) and is divided into three distinct sections—one for agriculture, one for homes, and one for religious ceremonies. The builders of the city used the existing stone outcroppings as part of many of the structures, which seem to grow naturally out of the landscape. The rocks from which the structures were built were quarried nearby, and no two are the same size; the largest weigh as much as 50 tons. They are fitted together without mortar so tightly that a knife blade cannot be slipped between them.

The agricultural section of Machu Picchu consists of terraces and irrigation canals. These fields grew enough food to support the population. There are nearly 200 houses in the residential section, most of which were built of stone, and they once had thatched roofs. In the religious area, there are several temples, the most beautiful and distinctive of which is the "Temple of the Sun," a circular tower of the finest stonework. Since the Inca did not typically build anything in the shape of a circle, this building is quite unusual. Another structure has been nicknamed the "Temple of the Three Windows," after the three trapezoid-shaped windows that adorn one wall. The Inca did not usually incorporate windows into their buildings, and no one knows why they were added to this one.

Until recently, Machu Picchu was the most visited tourist site in Peru, but some worry that tourists may cause damage to the site. In C.E. 2000, the Pe-

ruvian government began limiting the number of visitors to Machu Picchu. The following year, geologists warned that the rear slope of the fortress was slowly sliding downward, putting the site in danger of landslide.

See also: Archeological Discoveries; Incan Civilization; Religion.

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Maize

The Native American word for corn, from the Taino word "mahis." Native Americans taught the Pilgrims, who arrived in the Americas in 1621, to grow maize, which allowed these newcomers to survive in the new land.

The word "corn" is Germanic and was used to refer to any edible grass seed, such as millet, sorghum, barley, rye, or oats. Europeans typically used the term "corn" to describe whatever grain was the most prevalent wherever they lived. In England, for example, "corn" referred to wheat. In the Taino language, "maize" meant "source of life," and Columbus and other Spanish explorers who first encountered this American plant used the Taino word to refer to it. Other Native American groups had different words for what we now call corn. The Aztec called it "centli," the Maya, "ixim," and the Zapotec, "rxoa." Many of these words have the same sense as the Taino word, suggesting that maize is the source of life.

Maize originated as a wild grass (Teosinte) in Mexico. Wild maize was quite different from modern corn, in that each kernel was tiny and encased in a husk, much like wheat or oats. To develop the "ear" of corn as we know it, Native Americans must have spent centuries collecting, selecting, and planting seed, beginning about 7,000 years ago. Primitive ears of corn were only a few inches long and had a mere eight rows of kernels. Over thousands of years of cultivation, the size of the cobs and kernels grew. By 1400 B.C.E., maize was cultivated throughout what is now Mexico, then made its way north and was disseminated throughout what is now the United States.

Native Americans in the northern parts of the Americas were cultivating maize by C.E. 900, but they had to make many adaptations to the plant in order to accommodate the shorter growing season. For example, like other grasses, maize grows in segments, with ears forming at the juncture of each segment. By planting the seeds from the lowest segments of plants, Native Americans were able to develop variants that produced more ears of corn at the lower parts of the plant, thus shortening the growing season.

Ancient maize was not at all like the sweet corn that we eat directly off the cob today; it was a hard grain, similar to modern hard field corn. Native Americans ground maize into flour, which they then made into corn cakes, called "apopone" or "ponop," and a porridge called "samp" by the Algonquians. They also used the husks to make dolls, mats, cloaks, and moccasins and the cobs to make pipes. And they brewed a form of beer from corn.

Native American farmers developed ingenious agricultural methods that increased yield and made farming easier. For example, they planted maize, beans, and squash together (a combination often referred to as the "three sisters"), using the corn stalks to support the beans, and the space needed between the corn rows for squash, which also kept down weeds. They planted the corn seeds along with fish, which served as fertilizer and increased yield.

This sculpture of the Aztec Corn God Centeotl underscores the importance of maize to the Aztec. Farmers often made blood sacrifices to Centeotl as they planted their crops in order to ensure a good harvest. (The Bridgeman Art Library/ Getty Images)

Today, of all grains grown in the world, corn is by far the most productive, feeding far more people per acre than any other similar plant.

See also: Agriculture.

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Mammoths

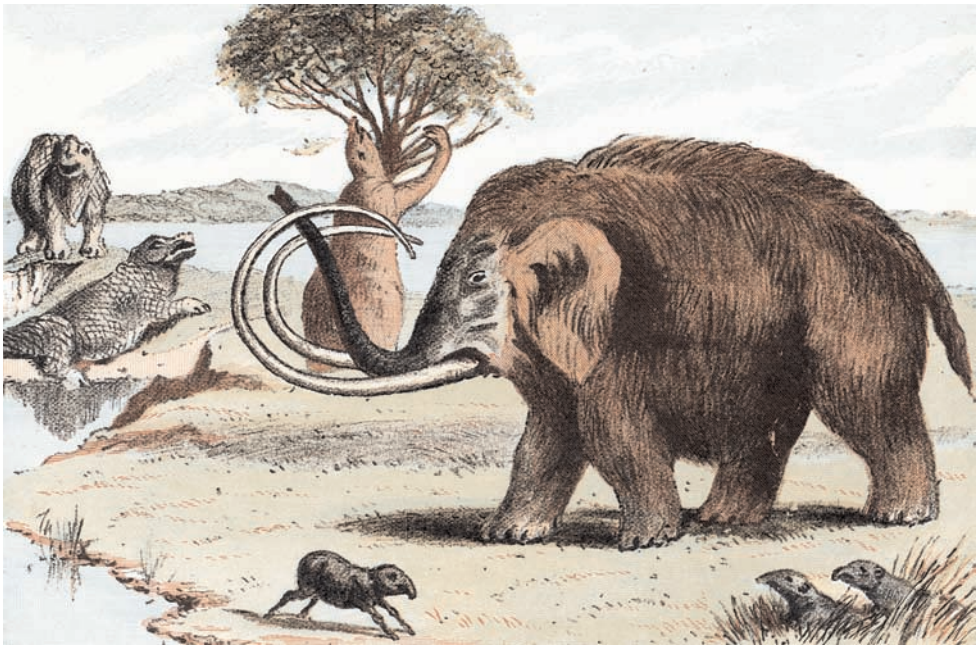
A now-extinct species of elephant that once roamed North America and was hunted by early Native Americans. The mammoth provided ancient peoples not only with food but also with hides—from which they made clothing and shelter—and bones, which they used to make weapons and other tools.

About 1.8 million years ago, in search of new feeding grounds, the southern mammoth made its way to what is now Alaska from Asia by walking across the Bering Strait during periods when ocean levels were low enough to allow the passage. Then, about 1.2 million years ago, the Steppe mammoth arrived from Siberia, followed by the woolly mammoth that evolved in Eurasia and came to North America about 165,000 years ago. The Columbian and Imperial mammoths, which, along with the woolly mammoth, were the most common species in North America, descended from the original steppe mammoth.

The woolly mammoth was about 9 feet (2.74 m) tall, with long fur and curved tusks. The Columbian mammoth was 16 feet (4.87 m) tall, one of the largest elephants that ever lived. It was probably not fur covered, in this respect resembling the modern elephant. The Imperial mammoth was about 14 feet (4.26 m) tall and was fur covered.

The woolly mammoth is the best known of all the prehistoric **megafauna**, or extremely large animals, perhaps because several perfectly preserved specimens have been found frozen in the ice of Siberia and Alaska. Thousands of fossils, especially fossilized teeth and tusks, have also been found throughout North and Central America. Scientists dubbed these mammoths "woolly" because of their distinctive coats of long dark coils of hair.

The woolly mammoth was well adapted to live in very cold climates. Underneath its furry coat, the hairs of which were sometimes 2 to 3 feet long (0.6 to 0.9m), was a three-inch (7.7-cm) layer of fat. Its distinctive curved tusks were used to dig through snow to find the 400 to 700 pounds (130



A nineteenth-century C.E. drawing of the now-extinct woolly mammoth that once roamed the plains of North America and was hunted by the earliest Paleo-Indians. (Oxford Science Archive/HIP/Art Resource, NY)

to 320 kg) of grass and other plant material that it ate every day.

The variety of fauna in the Americas was comparable to that of Africa today, with many different species of large mammals. The woolly mammoth, at 9 to 11 feet (2.7 to 3.5 m) tall, was not the largest of the mammoth species, some of which were 16 feet (4.9 m) tall. Its ears and tail were much smaller than today's elephants, to prevent heat loss.

At the end of the last Ice Age, about 11,000 years ago, many species, including mammoths, saber-toothed cats, tapirs, the giant beaver, and mastodons, went extinct. Scholars provide varying **historical interpretations** of this evidence. Some experts believe that many of these creatures were particularly susceptible to being killed by hunters because they had no natural fear of humans, having lived hundreds of thousands of years without threat from predators. By the time they learned to fear humans, they had been hunted to extinction. Other experts speculate that the mammoths died from diseases brought by humans.

Recent discoveries, however, point toward changes in the climate as the cause of the mass extinction of these creatures. Mammoths were uniquely suited to live on a steppe environment such as existed in North America until the end of the last Ice Age, a dry, treeless plain covered with short grasses and shrubs. As the climate warmed, the air became drier. Plant life changed and eventually the mammoths died out.

See also: Archeological Discoveries; Beringia; Clovis; Hunter-Gatherers; Ice Age.

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Mayan Civilization

A loose confederation of city-states that flourished in present-day Guatemala, Belize, Honduras, El Salvador, and southern Mexico from approximately 2600 B.C.E. to C.E. 900. The Mayan was the only **Mesoamerican** civilization to have developed a sophisticated writing system.

The history of Mayan civilization is generally divided into three periods: Preclassic (2000 B.C.E.–C.E. 250), Classic (C.E. 250–900), and Postclassic (C.E. 900–1500). This practice of viewing cultures or civilizations in terms of broad **eras** of its history is called **periodization**. Most of the art, architecture, and accomplishment associated with Mayan civilization occurred during the Classic Period.

RAIN FOREST CULTURE

Mayan civilization, unlike other major ancient civilizations, was not an urban one. That is, although the Maya constructed large and beautiful cities, such as Tikal in about C.E. 600, **archeologists** believe that these were ceremonial centers, not places where large groups of people lived and worked. It appears that most Mayans lived on small farms and came to the city only for religious celebrations and ceremonies.

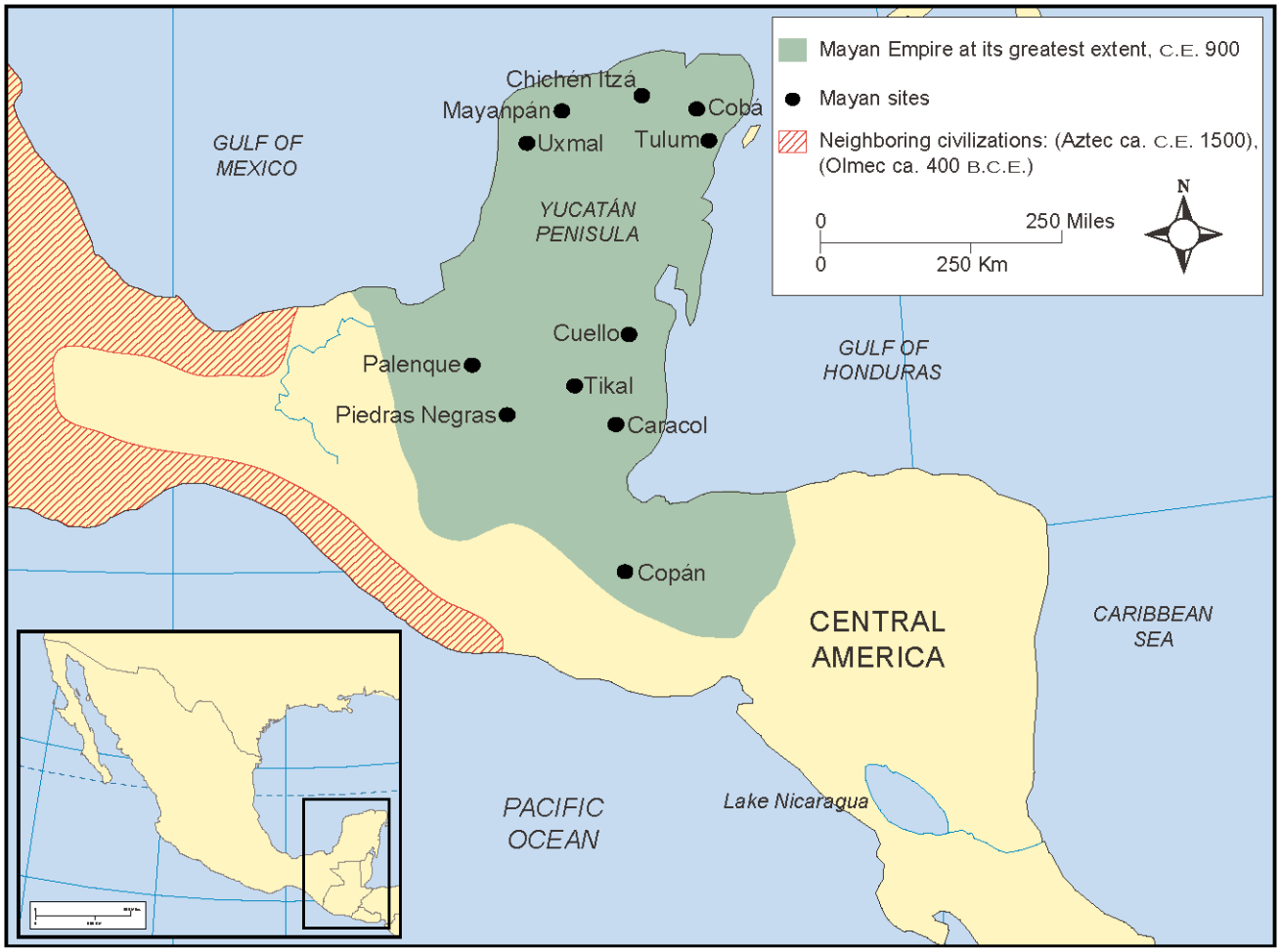
Mayan civilization, in fact, is the only civilization known to have emerged in the hot humid conditions of the rain forest. Most ancient cities grew as a result of intensive agriculture, which produced surplus food with a minimum of labor. However, the soil in tropical rain forests is poor and easily depleted, requiring great effort to grow enough food to support a large population.

RELIGION

Religion was the unifying fact of Mayan civilization. Mayan cities with their immense pyramids, temples, palaces, and ball courts, were built in order to worship and placate Mayan gods. The Maya believed

MAYAN EMPIRE, CA. C.E. 900

The Maya ruled what is now southern Mexico, Guatemala, Belize, Honduras, and El Salvador. This map shows some of the major cities of the empire, which were ceremonial centers rather than places where people lived and worked. Possibly because of some religious crisis, although scholars do not know for sure, the Maya began to abandon most of these great centers around C.E. 900.



that human blood had to be offered to nourish the gods, and kings and priests would often cut their genitals with jade knives or pull thorn-covered ropes through their tongues to draw blood for the gods. The Maya also practiced human sacrifice. A king could not inherit the title from his father until he had captured an enemy in battle. Priests sacrificed these captives on altars high atop pyramids by cutting into the chest and removing the beating heart.

Mayan ball games, too, were seen as having religious significance as contests between the forces of good and evil. The losers were often executed by having their hearts torn out. Some losers were even tied and rolled down the steps of a pyramid.

MAYAN WRITING

Possibly influenced by the Olmec, the Maya developed the only native system of writing in the Western Hemisphere. Their system, somewhat similar to the Egyptian, is comprised of **hieroglyphs**, or picture writing. The Maya used more than 800 **glyphs**. Like Egyptian hieroglyphs, some Mayan symbols stood

The Temple of the Warriors and the Thousand Columns in Chichén Itzá in Mexico is so named because of the carvings of warriors on the front and the supporting pillars of the structure. The artwork shows the influence of ancient Toltec culture on the Maya. (SEF/Art Resource, NY)

GREAT LIVES

Pakal the Great

During an excavation in the Mayan Temple of Inscriptions in Palenque, Mexico, Alberto Ruz of Mexico's National Institute of Archaeology and History noticed a stone slab that had holes drilled into it. He also noticed that the chamber's walls seemed to continue beyond the floor. He realized that there must be another room below the one in which he was standing. The ancient Mayan builders had sealed off the room below and inserted the final slab by drilling holes in it and lowering it into place with ropes.

When, in C.E. 1952, Ruz excavated the lower chamber, he discovered a huge underground chamber containing what he assumed to be the tomb of a great ruler. However, archeologists were puzzled by the inscription they found suggesting that this was the tomb of Pakal the Great, who had lived to be 80 years old. The skeleton in the sarcophagus seemed to be that of a man of about 40.

The confusion arose because the skeleton's teeth were not as worn as those of an elderly man. This is probably because, as a member of the nobility, Pakal would have eaten a softer diet than many of his subjects. Other anthropologists have suggested that people who lived long lives tended to have younger bones than their contemporaries in the first place, which might explain the discrepancy between Pakal's advanced age and his youthful teeth and bones.

MAYAN CIVILIZATION, 2600 B.C.E.–C.E. 1531

ca. 2600 B.C.E. Date of earliest evidence of Mayan culture

2000 B.C.E.–C.E. 250 Preclassic Period of Mayan civilization

C.E. 250–900 Classic Period of Mayan civiliczation

ca. C.E. 600 Mayan city of Tikal is largest city in Mesoamerica

C.E. 899 Tikal abandoned

C.E. 900 Other Mayan cities, except those in the Yucatán Peninsula, abandoned

C.E. 900–1500 Postclassic Period of Mayan civilization

C.E. 1000 Toltec influence evident in Mayan city of Chichén Itzá

C.E. 1221 Peasants revolt in Chichén Itzá

C.E. 1224 Chichén Itzá abandoned

TURNING POINT

Mayan Astronomy

The Maya were skilled astronomers who used their abilities in this area for both practical and religious purposes. For example, during the Classic Period, the Maya developed three calendars: a 260-day sacred calendar, a 365-day solar calendar, and a third calendar that measured a 20-year cycle. The Maya developed a complex system of coordinating their calendars, and their priests used this system to determine when to plant corn, when to hold particular ceremonies, when to crown kings, and when to go to war.

Mayan astronomers accurately predicted solar eclipses and the future positions of celestial objects using only a forked twig and the unaided eye. In addition, many Mayan buildings are perfectly aligned with the cardinal compass directions, and many seem designed to allow priests to identify **solstices** and **equinoxes**.

for sounds and, thus, had some of the characteristics of a true alphabet. Mayan writing is difficult to decipher, since there is no way to tell if a particular glyph stands for an object or a sound. To date, scholars have deciphered about 85 percent of Mayan glyphs.

DEMISE

Beginning in about C.E. 899, the Maya abandoned Tikal and many other cities, except for those in the Yucatán Peninsula. No one knows precisely why, although many scholars attribute it to a religious crisis of some sort. This speculation arose because the Maya did not completely disappear; rather, they simply abandoned their ceremonial cities.

The religious crisis may have been precipitated by crop failures. If the populace saw a **cause-and-effect relationship** between natural disasters and the actions of priests and kings, they may have quickly lost faith in these leaders. Food may have been scarce because of overfarming, or climate conditions may have changed. There is evidence of a prolonged drought in Mexico and Central America at the time, which may have led to famine.

In the Yucatán Peninsula, Mayan cities such as Chichén Itzá were not abandoned; in about C.E. 1000, Toltec influence can be clearly seen in the architecture and art of Chichén Itzá. Whether the transition was peaceful or the result of conquest is unclear, but in any case, a combined culture arose with Chichén Itzá as the central city until 1221, when a peasant revolt caused the center of power to shift elsewhere. The city was abandoned in C.E. 1224. The Spanish conquered the city in the sixteenth century C.E.

See also: Agriculture; Art and Architecture; Language and Writing; Religion; Technology and Inventions; Toltec Culture.

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Mississippian Cultures

Term used to describe the Native American Mound Building cultures that occupied the midwestern, eastern, and southeastern United States from about C.E. 900 until the arrival of Europeans in the sixteenth century C.E.

Mississippian culture is characterized primarily by what **archeologists** call "intensive maize agriculture," that is, farming, particularly of corn, on a large scale. The name Mississippian stems from early belief that the culture arose in the flood plains of the Mississippi River Valley. However, recent excavations suggest that its origins lie farther east and south, in modern-day Florida, Alabama, and Georgia.

In addition to maize, the people of the Mississippian cultures were successful at growing beans, squash, and other food crops. **Historical research** indicates that the diet of the Mississippian people also included nuts (hickory nuts and acorns) and meat (deer, turkey, raccoon, and bear), as well as fish, birds, and turtles. The abundant food production allowed the Mississippian people to construct permanent settlements and establish a complex social organization.

MOUND BUILDING

Most major Mississippian settlements contained platform mounds, large rectangular earthworks topped with wooden temples or palaces. For this reason, Mississippians are also referred to as "Mound Builders." Among the most famous of these mounds is one now known as "Monk's Mound" in Cahokia, Illinois. These earthworks were remarkable feats of construction, especially considering the fact that the people who built them had neither beasts of burden nor wheeled vehicles. Individuals moved mountains of earth in baskets that held about 60 pounds (27 kg) of soil each.

Archeologists believe that the mounds were constructed over a period of about 200 years. If a chief died, his palace might be burned, covered with earth, and a new palace erected on top of the original one. Over the years, the mounds grew to tremendous proportions. For example, Cahokia, near modern-day St. Louis, Missouri, was the largest of the urban centers constructed by the Mississippians; at its height it was home to more than 20,000 individuals. The base of the temple mound at Cahokia measures 740,000 square feet (68,000 sq. m), making it the largest earthwork in North America. Cahokia, in fact, covers an area one quarter greater than does the Great Pyramid at Giza.

SOCIETY

Clearly, such massive construction projects required a centralized government capable of commanding the work of hundreds of people. That Mississippian society was complex and **hierarchical** is also clear from burial sites such as those found at Cahokia in Illinois. Lower-status people are interred with only a few cooking utensils, whereas the

THE MOUNDS OF MISSISSIPPIAN CULTURE

The Mound Building cultures, also known as Mississippian, occupied large portions of the midwestern, eastern, and southeastern United States. These cultures relied heavily on maize agriculture and built large settlements that are distinguished by huge earthwork mounds. Among the most famous of the ancient Mississippian mounds are those found in Cahokia (Illinois), Etowah (Georgia), Moundville (Alabama), and Spiro (Oklahoma).

graves of the ruling elite contain many rare and valuable objects. Accounts of early settlers indicate that Mississippian chiefs were called "Great Suns" and were often elaborately dressed in cloaks of feather and fur. Succession was **matrilineal**, meaning that a chief would be succeeded by his sister's son.

Little is known about the religion of the Mississippians because they left no written records. However, burial customs in which people were interred with objects to assist them in the next life suggest that these people, like so many others throughout the world, paid special reverence to ancestors. Paintings and sculptures depicting reproduction suggest that fertility was especially valued. Many paintings also indicate that the Mississippians also revered bravery in battle.

Artifacts uncovered at Cahokia, at Etowah Mounds in Georgia, Moundville in Alabama, Spiro Mounds in eastern Oklahoma, and other Mississippian sites also reveal that this culture had an extensive trading network. Most of the major settlements

were in river valleys, and traders plied the waterways in dugout canoes, carrying shells, copper, pearls, silver, chert (a kind of rock used for making arrowheads), and other goods from one urban area to another.

ART AND TECHNOLOGY

Mississippian culture is also distinguished by fine pottery and stoneware. Mississippian pottery, which was probably made exclusively by women, is distinguished from earlier ware by the use of ground shells as a tempering agent to make the pottery less breakable. Because the pottery was stronger as a result of adding ground shells to the clay, potters could craft more elaborate shapes. Ceramic jars and bowls in the shape of people and animals, called **effigies**, are characteristic of Mississippian culture. Mississippian sculptors also made beautiful stone pipes in the shape of birds, animals, and people.

Mississippians hold a special place in the **history of science and technology** in ancient America. They were the first Native Americans to use the bow and arrow. The Mississippians were so effective with that weapon that they were able to drive away Hernando de Soto and his Spanish forces during their exploration of the region during the mid-sixteenth century C.E. In fact, Mississippian warriors shot arrows with such force and precision that they pierced the Spaniards' metal armor.

DEMISE

Evidence suggests that the large Mississippian settlements were in crisis beginning in about C.E. 1300, before the arrival of Europeans. No one knows precisely what happened, but archeologists have speculated that Mississippian agricultural techniques may not have been efficient enough to support growing populations, or that the soil around the large settlements might have been deprived of nutrients by overfarming. The construction of palisades or tall wooden fences around some settlements suggests that war might also have been a factor in the decline of Mississippian culture.

With the coming of Europeans, disease reduced Native American populations, and the reintroduction of the horse to the North American continent by Spanish explorers encouraged some groups to return to a hunting and gathering way of life. Eventually, even the descendants of the Mississippians—such as the Cherokee and Choctaw, the Miami, and the Seminole—no longer remembered that their ancestors had constructed the great earthworks and regarded them with as much amazement as European settlers did. It was many years before archeologists realized that the mounds were, in fact, built by Native Americans and not a mysterious vanished race of "Mound Builders."

See also: Cahokia; Mound Builders; Great Serpent Mound; Mound Builders.

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Mound Builders

A term first coined in the eighteenth century C.E. to denote the ancient Native American people who created massive earthen mounds and other earthworks in the eastern and central present-day United States. As these cultures left no written records, the mounds are the only surviving evidence of these ancient peoples.

When Europeans first came to North America, they encountered massive earthwork mounds. As the country was settled and people moved westward, they found more and more of these earthen structures. The European colonists had no **historical understanding** or appreciation of native cultures, so they assumed that these mounds could not be the work of Native Americans. As a result, they called those who crafted the structures, simply, "Mound Builders." In fact, it was not until C.E. 1894 that Cyrus Thompson of the Smithsonian Institution determined that Native Americans had constructed the mounds.

The mounds were built over several periods in Native American history and by four different cultures, or loosely connected groups who came together for trade and religious purposes. These cultures included the Poverty Point Culture (fl. 1700–700 B.C.E.), the Adena Culture (fl. 1100 B.C.E.–C.E. 200), the Hopewell Culture (fl. 200 B.C.E.–C.E. 400), and the Mississippian Culture (fl. C.E. 800–1550). Although these cultures lived in different times and places, and had different domestic economies, they all built mounds.

Some of the mounds were burial sites; others were platforms for the construction of residences and temples; and still others were **effigy** mounds, designed to resemble an animal or person. From what these peoples left behind, in and around the mounds, archeologists have drawn conclusions about their ancient cultures.

POVERTY POINT EARTHWORKS

One of the earliest large-scale mound complexes in North America is located in Poverty Point, Louisiana. The people of the Poverty Point Culture who built the mounds were primarily hunter-gatherers, people who move from place to place following herds and harvesting wild plants. Usually such peoples do not build permanent settlements. Archeologists speculate that the Poverty Point people tended to return to the same hunting sites each year and constructed the mounds at one of their

The Rock Eagle effigy mound in Eatonton, Georgia, was constructed by people of the ancient Mississippian Mound Building culture about 2,000 years ago. The oldest mound ever discovered, it is made of rock in the shape of an eagle and is 120 feet (36.6 m) from head to toe and 102 feet (31 m) from wingtip to wingtip. (Tami Chappell/America 24–7/Getty Images)

GREAT LIVES

Frederick Ward Putnam

Frederick Ward Putnam is often cited as the father of American archeology for his work in excavating and documenting sites in Ohio such as the Great Serpent Mound and Fort Ancient. Putnam was born in Salem, Massachusetts, in C.E. 1839, and studied anthropology under the scholar Louis Agassiz. In 1875, Putnam was appointed curator of the Peabody Museum of Harvard University and later professor of archeology and ethnology there. Putnam also helped to found the Field Museum of Natural History in Chicago.

From about 1880 to 1895, Putnam excavated and wrote on many Mound Building sites in the Midwest and was able to acquire access to the Great Serpent Mound for the Peabody. He developed methods of excavating mounds that help to preserve the sites while allowing archeologists to delve into their treasures. So important were these contributions that one contemporary anthropologist, Frank Hamilton Cushing, lauded that Putnam was "certainly the foremost among American archaeologists."

favorite locations. The mounds were begun about 1200 B.C.E., just at the time when the Poverty Point people were beginning to cultivate and store plants, though they were still hunter-gatherers. No one is sure how many people lived at Poverty Point, but some estimate as many as several thousands. There is evidence that the people of Poverty Point traded over long distances and that they had a fairly sophisticated stone-working industry.

The Poverty Point earthworks consist of six concentric semicircular earthen ridges. To the west of the ridges is a large mound, which is 60 feet (18 m) high and 566 feet (175 m) long. From the top of this mound, one can see the spring and fall **equinoxes** across the center of the circular ridges.

MOUND BUILDING CULTURES

The Adena culture that lived in the Ohio River Valley from 1100 B.C.E. to C.E. 400 built elaborate burial mounds in what are now Ohio, Kentucky, West Virginia, Indiana, Pennsylvania, and New York. Like the Poverty Point Culture, the Adena were primarily hunter gatherers who returned to the same hunting grounds year after year.

Among their most remarkable structures is Grave Creek Mound, located at Moundsville, West Virginia, which, at 62 feet high (19 m) and 240 feet (73 m) in diameter, is the largest conical burial mound in the United States. Grave Creek Mound was constructed between 400 B.C.E. and C.E. 200. Excavations of the mound indicate that it was used as burial site.

Following the decline of the Adena Culture, the Hopewell tradition emerged, which was in many ways a continuation of the earlier culture. In general, the Hopewell burial grounds were larger, there were more mounds, and the grave goods were indicative of a more complex culture. The Hopewell culture also built effigy mounds, earthen constructions in the shapes of animals such as birds and bears. At the Effigy Mounds Park in Iowa, there are 31 such mounds in a variety of different shapes.

The people of the Mississippian Culture are also called temple Mound Builders. While they built conical burial mounds like the Hopewell and Adena, they are best known for enormous platform mounds, which often served as the base for elite housing, temples, and other public buildings. Cahokia, near St. Louis, Missouri, is a Mississippian site that may have been the home to more than 20,000 people at one point in its history.

No one really knows what happened to the Mound Building cultures. They may have declined as a result of overpopulation, disease, or warfare, or they may have been decimated by drought or famine. It is possible that the Hopewell were the ancestors of the Algonquians, a Native American

group of the Northeast, and the Mississippian cultures were the ancestors of the Creek, a Native American confederacy that lived in what is now Georgia, and the Choctaw, a Native American group of the Southeast.

See also: Adena; Agriculture; Archeological Discoveries; Cahokia; Culture Groups; Great Serpent Mound; Hunter-Gatherers; Mississippian Cultures.

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Myths and Legends

Native American myths and legends typically seek to explain the origins of the universe and the mysteries of life. These tales are usually divided into four major categories: creation stories, hero stories, trickster stories, and stories about the end of the world.

CREATION STORIES

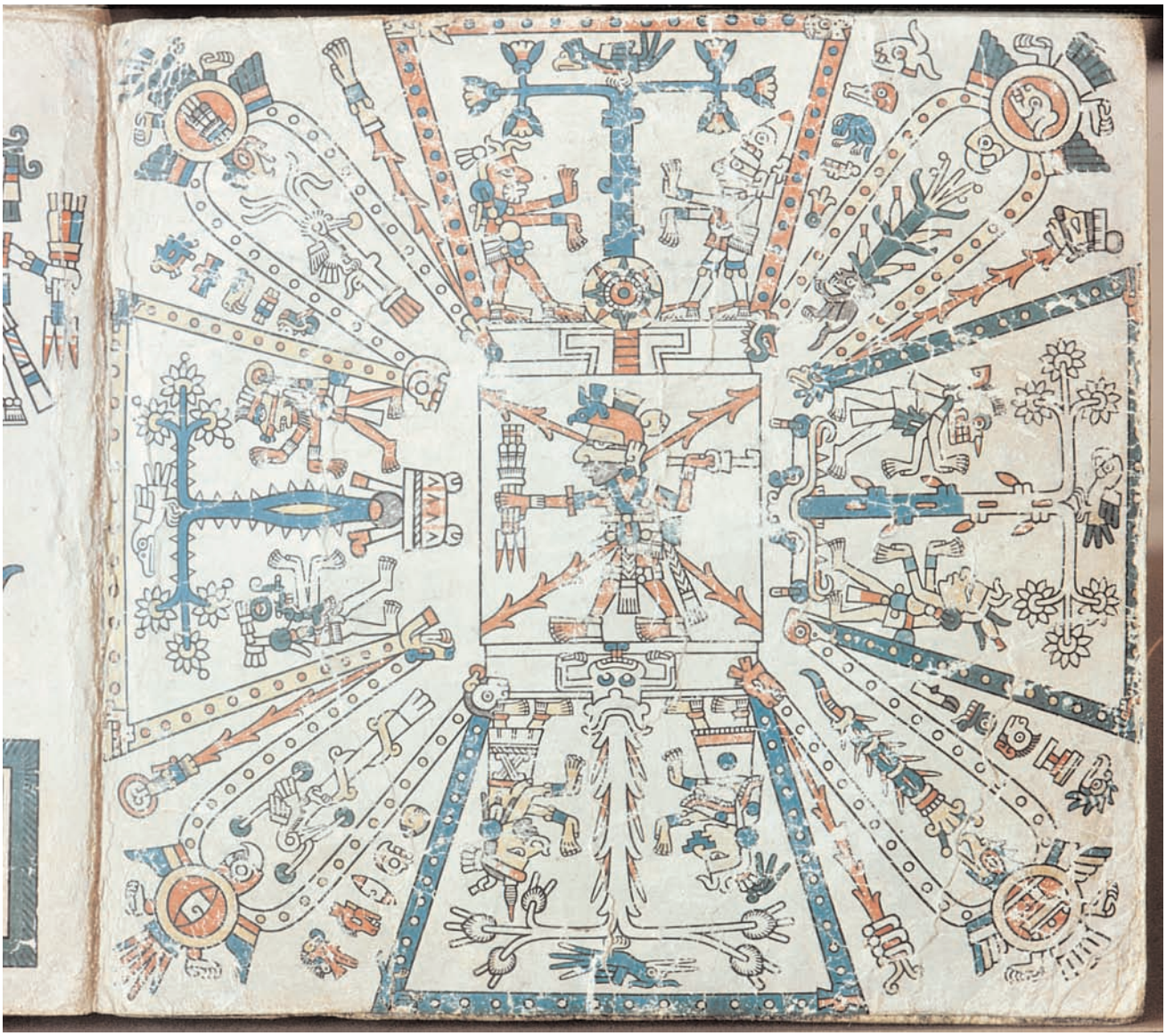
Many Native American creation myths reveal common themes, such as that of the universe emerging from a watery beginning. One Yuma (a native group of the southwestern part of North America) myth begins, "There was only water—there was no sky, there was no land, only nothingness." A Cherokee (a native group originally from the southeastern part of North America) myth begins, "Well, in the beginning also, water covered everything. Though living creatures existed, their home was up there, above the rainbow, and it was crowded." In many stories, a creature dives or is sent down to gather mud from which to shape the earth.

Other creation legends involve twins, one of whom is good, one evil. These stories embody a perception of the duality of the universe, the eternal battle between opposites. In a Yuma myth, for example, the twins Kokomaht and Bakotahl vie to create the earth and humans. In the battle between them, Bakotahl creates an evil whirlwind. Kokomaht stops it, but a small part escapes him. "In it were contained all the sicknesses that plague people to this day."

Unlike the creation myths of most Native American culture groups, the creation story of the Maya is written down in a book known as the *Popol Vuh*. It is a complex story that tells not only of the creation of the earth, but also of the first humans and the natural order of things. At first there is nothingness. Then the Heart-of-the-Earth-and-Sky calls forth the earth. It emerges but there is no sunrise. Then Heart-of-the-Earth-and-Sky begins to experiment with creating humans. He tries to make them of clay, but these creatures disappoint him, so he lets them be washed away by the rain. He makes a new crop out of wood, but destroys them because they are foolish; a few escape his wrath and become monkeys.

Next Heart-of-the-Earth-and-Sky calls on other gods to help him and makes four men from corn. These men are pleasing in many ways, but Heart-of-the-Earth-and-Sky worries that they are too smart and may upset the balance of nature, so he causes them to sleep and forget some of their knowledge. He creates four women, and together the eight humans watch the first sunrise. Humans, the story suggests, are an essential part of creation, but they must know their limitations.

Interestingly, many Native American myths include stories of the destruction of the earth, sometimes by flood. An Apache (a native group of southwestern North America) myth, for example, which is quite similar to the Mayan creation story, portrays the clay and wooden humans being destroyed by flood, so the gods could start over.



This depiction of the creation of the universe is from the *Codex Ferjervary-Mayer,* an ancient Mixtec book. The Mixtec were an ancient American people who were conquered by the Aztec. At the center of the image is the fire god, who is being fed on sacrificial blood. (Werner Forman/Art Resource, NY)

HERO STORIES

Many Native American hero stories tell of those who sacrifice themselves for the good of the group. One of the most poignant of these tales is the Penobscot (a native group of northeastern North America) story of the Corn Mother. Corn Mother is the daughter of Kloskurbeh, "the All-Maker." She marries and brings forth the human race. When the people become hungry, she tells her son to kill her and her sons to drag her body across the land and to burn her bones. From her flesh comes corn to feed the people and from her bones comes tobacco. The Corn Mother's husband reminds the people to "take good care of [her] flesh, because it is her goodness become substance. Take good care of her breath, because it is her love turned into smoke. Remember her and think of her whenever you eat, whenever you smoke this sacred plant, because she has given her life that you might live. Yet she is not dead, she lives: in undying love she renews herself again and again."

In other hero tales, the protagonist must battle against monsters and demons. Such battles, of course, can be found in the myths and legends of many countries.

Glooscap, a deity and hero of the Passamaquoddy, Micmac, and Miliseet, for example, has to help humans battle the water monster, who is greedy and steals all the water for himself. The monster is a formidable adversary, but he is no match for Glooscap, who has superhuman strength and can adjust his height so that he is always bigger than his opponent. Glooscap squeezes the monster, from whom water pours to refill the streams and lakes. So tightly does he squeeze the water monster that the monster shrinks and becomes what is known today as a bullfrog.

Many heroes have mysterious or extraordinary beginnings. Rabbit Boy of the White River Sioux (a native group of southwestern North America) begins as a blood clot that a rabbit kicks around and imbues with the power of motion. Another hero of a Brule Sioux myth, Iyan Hokshi, or Stone Boy, is born to a young maiden as a result of her eating a rock. Like many Native American heroes, Stone Boy is extraordinarily strong and smart at a very young age. "Day after day he grew, ten times faster than ordinary infants, and with a more perfect body."

The Hero Twins of Mayan mythology follow much the same pattern of mysterious birth and precocious strength that many North American hero stories do. In one tale, Hun Hunahpu, a Mayan fertility god, is killed and his skull hung from a tree. A young virgin stops nearby and the skull speaks with her and spits into her hand. As a result, she gives birth to the hero twins, Hun-Apu and Xbalanque. Hun-Apu and Xbalanque are famous for their skills as ball players; in fact, they even play ball with the Lords of Death and defeat them by substituting a squash for the ball. It is in honor of these twins that the Maya and other **Mesoamerican** cultures played their ball games.

TRICKSTER STORIES

While stories of heroes often reveal what a culture reveres, trickster stories—which are popular in nearly every culture—reveal what makes a culture laugh. Very often, what makes people laugh is comeuppance—situations in which small yet sly creatures defeat those who are rich or powerful or simply full of themselves.

Tricksters embody not only playfulness but also the creative impulse, spontaneity, and the joy of living. They break the rules, defy taboos, and make trouble whenever and wherever they can. In many Native American myths, Coyote is both trickster and creator. The Raven, the Blue Jay, Iktome, the spider, and other animals also play the role of the trickster in some Native American cultures.

LINK TO PLACE

Trickster Stories in the Americas and Africa

As in North America, tricksters—-gods or spirits, often in animal form, that symbolize the human tendency toward mischief and jokes-—are very popular in Africa. Tricksters are sometimes portrayed as small animals who, through cunning, outwit much larger and stronger creatures. For example, in a Mayan tale, Rabbit tells Coyote that the moon's reflection in a pond is a huge wheel of cheese. He convinces Coyote to try to drink all the water in order to get to the cheese. Coyote drinks until his stomach hurts before he realizes he has been fooled.

Among the most famous of African tricksters is Anansi the spider, whose stories are told by the Ashante of West Africa. In one story, Anansi causes a fight between two humans by wearing a hat that is red on one side and white on the other. The friends argue about the hat's color until Anansi shows up to explain the trick. In both of these stories, the "underdog," the smaller, weaker creature, outwits the larger and presumably smarter creature.

In a story from the Kalapuya (a native group of northwestern North America), frogs have captured all the water on earth and force people to pay to drink. Coyote pays for a drink; however, he takes a very long drink, and while his head is underwater, he digs through a dam allowing the water to flow into the valley and create rivers and waterfalls. Other trickster stories are similar to this, in that the trick leads to a benefit for humans. In a story told by the Shasta people (a native group of what is now northern California), Ground Squirrel tricks Obsidian Man and steals sharp stone arrowheads from him to give to the people, who up to that point had to hunt with bark arrowheads.

STORIES OF THE END

Native Americans tell many different stories about death and the end of the world. For example, there is a prophesy among the Hopi that when the Blue Star Kachinas, a specific group of spirits, dance in the plazas, the end of the world is approaching.

In a Blackfoot (a native group of what is now Montana) story, the creator makes a woman from mud. When she comes into being, she asks if she will live forever or go back to being mud. The old man replies that he will throw a buffalo chip into the water; if it floats, he says, people will die but come back to life four days later. The woman, newly created and knowing nothing about the nature of the world, chooses to throw in a stone, saying that if it sinks, humans will die. Unfortunately, she is so naïve that she does not understand that a small stone weighs more than a buffalo chip. Thus, death comes into the world.

The Mayan system of belief held that by the time of their civilization, the world had already been created and destroyed four times. The last time the world was destroyed, it "rained so hard, the sun fell down." Based on their religious beliefs and astronomical observations, they believed that the world would end a fifth time; in fact, they had already calculated a date: the winter **solstice**, December 21, 2012. Many other Mesoamerican cultures shared this belief that the world would end on a specific date, including the Aztec.

The retold myths that belong to the Native Americans of North, Central, and South America reveal the ideas and beliefs of ancient American cultures. Although common themes emerge, the stories also bring to life the many distinct value systems of ancient Native American nations.

See also: Aztec Civilization; Culture and Traditions; Mayan Civilization; Religion.

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Nazca

A series of unexplained prehistoric drawings carved into the earth on the arid Nazca plain, near the Pacific Ocean in southern Peru. The figures, which extend more than 200 square miles (518 sq km), include hundreds of long straight lines, geometric figures, and 70 representations of people and animals.

Archeologists estimate that the lines were etched into the desert floor some time between 200 B.C.E. and C.E. 600. Drawings incised in rock are called **petroglyphs**; the Nazca Lines, because they are on the ground, are called geoglyphs.

The composition of the soil on the Nazca plain made possible the creation and preservation of the lines. The soil is not sandy; instead, it is hard-packed red earth covered with red gravel. The ancient Nazca made their drawings by removing the stones and scraping away the top layer of soil to expose the lighter soil underneath. In some cases, they piled the red stones beside the light-colored lines and made them part of the design. The longest of the straight lines is nine miles (14.5 km) long and the largest of the individual figures is nearly 900 feet (274 m) long. The lines have been preserved for hundreds of years because of the extremely dry conditions of the area, where rainfall averages only 20 minutes a year. A lack of wind on the Nazca plain also helps to preserve the lines.

The figures depicted at Nazca include lizards, spiders, monkeys, llamas, dogs, and 18 different kinds of birds. The lines that comprise the drawings are about 11 inches (28 cm) deep and from 1 to 10 feet (.3 to 3 m) wide. The Nazca lines are especially mysterious because, when seen from the ground, they look random. Only when flying above the desert floor can one distinguish the various shapes. In fact, archeologists were not aware of the lines until C.E. 1927, when a pilot noticed what appeared to be runways. The fact that the lines make sense only when seen from above led many people to speculate that prehistoric people with crude tools could not possibly have created the designs.

Still, most scientists and historians today are convinced that the lines were created by the Nazca people who lived nearby and made pottery with designs similar to those on the drawings. The question that remains to be answered is why they went to so much trouble to draw pictures on the ground. One theory, advanced by German mathematician Maria Reiche, is that the lines align with the stars in some way, serving as a kind of calendar. Another theory, advanced by anthropologist David Johnson, is that the lines are maps of underground waterways. In C.E. 1977, author Jim Woodman speculated that the lines demonstrate that ancient cultures had the technology to fly. Woodman and hot-air balloonist Julian Nott tested this idea

by constructing a hot-air balloon from materials that would have been available 1,500 years ago. The Condor I, made of fibers and reeds, actually flew for a short period of time before crash landing. However, there is no concrete proof to support Woodman's theory.

Although scholars may never know their precise meanings, most believe that the drawings have some religious significance. Canadian astronomer Robin Edgar has suggested that the drawings may be responses to an unusual series of solar eclipses that occurred during the time when the lines were drawn. He notes that when the sun is totally eclipsed, it appears to be a giant eye looking down from the sky—the "Eye of God." This may explain why the drawings were made so as to be visible from above. Another theory suggests that the lines were "walking temples." Art historian Alan Sawyer notes that "Most [of the] figures are composed of a single line that never crosses itself, perhaps the path of a ritual maze." During religious ceremonies, then, people may have walked through the drawings, much as one might walk through a labyrinth or maze and, in so doing, absorbed the spirit of the creature represented by the drawing.

Another mystery associated with the lines centers around the fact that many of them are miles long and perfectly straight. It seems impossible that ancient peoples with crude tools could have constructed something so precise. In C.E. 1983, University of Kentucky professor Joe Nickell and his father copied one of the Nazca drawings, a giant condor, in a farm field in Kentucky, using only stakes and rope—technology that would certainly have been available to the Nazca. According to Dr. Persis B. Clarkson, an archeologist and geoglyph expert at the University of Winnipeg, constructing the lines did not require "difficult technology." All the creators needed, he said, was "the will."

There are other notable geoglyphs in Egypt, Malta, the United States, Bolivia, and Chili, but none has as many drawings or covers as great an area as do the Nacza lines. These ancient desert drawings are beautiful, but their significance for ancient peoples may remain a mystery.

See also: Great Serpent Mound; Language and Writing; Religion; Technology and Inventions.

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Norton Tradition

Name given by **archeologists** to cultures of the western Arctic, which invented kayaks, float harpoons, and other tools that helped in the exploitation of marine resources. The Norton tradition (1000 B.C.E.–C.E. 800) is an outgrowth of the Artic Small Tools tradition (ASTt), which prevailed from about 2750 B.C.E. to about C.E. 800 from southwestern Alaska to Greenland. These cultures are known for their small and delicate projectile points and blades, which tended to be no more than 2 inches (5 cm) long. These tools are also referred to as **microlithic**, which means "small stone."

The people of the ASTt were the first to spread across the North American Arctic, as far as Greenland. They subsisted by hunting caribou and fish such as salmon, which come into rivers from the sea in order to spawn. They used a bow and arrow and a toggling harpoon—that is, a harpoon in which the blade was left in the prey while the shaft was withdrawn.

The people of the Norton tradition differed from other groups of the small tools tradition in that they were able to develop effective and efficient techniques for hunting sea mammals, such as seals and whales, as well as land mammals. They invented boats made of skin, called *kayaks* and *umiaks*. A umiak is similar to a kayak but it has no decking, is wider and deeper, and is capable of carrying heavy loads. Umiaks were used for hunting—-particularly of bowhead whales—as well as for moving people and possessions from one hunting camp to another.

Norton groups also invented the float harpoon, which allowed hunters to let go of the line attached to a harpoon once the head was embedded in the prey. The line was attached to a float made of inflated sealskin, which the wounded animal would drag until it was exhausted. At that point, the hunter could move in for the kill.

Perhaps because of their more efficient methods of hunting, people of the Norton tradition were able to live in more or less permanent settlements near the sea, leaving only in the summer to live in temporary fishing or hunting camps. The homes of the Norton tradition were partly underground, with the entrance tunnels dug lower than the house to trap the cold. The homes were heated by large lamps that burned whale blubber.

The Norton tradition can be divided into three stages, or **eras**, each marked by distinctive pottery and artwork. The first stage, Choris (1000 to 500 B.C.E.), is known for its fiber-tempered pottery—that is, pottery made of clay mixed with organic fibers—which had linear designs. The second stage, Norton (500 B.C.E. to C.E. 800), is known for check-stamped pottery (in which a checkerboard design is stamped on the surface of the pottery with ivory paddles), stone lamps, and slate harpoon and arrowheads. The third stage, Ipiutak, which overlapped the Norton stage by several hundred years, is known for its ornate and beautiful harpoon heads and ivory carvings of animals and humans. Around C.E. 800, the Norton tradition was superseded by the Thule tradition, which invented much of the technology still used today by the Inuit peoples of the Arctic.

See also: Thule Tradition.

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Olmec Civilization

The first complex culture to exist in **Mesoamerica**, whose people inhabited land bordering the Gulf of Mexico from about 1200 to 400 B.C.E. Most scholars believe the Olmec to be of Siberian origin, as are other Native American peoples.

The Olmec were probably among the Paleo-Indians who crossed into North America from Siberia along a land bridge known as Beringia about 11,000 years ago. They moved southward, eventually settling along the Gulf of Mexico. Because many sculptures created by the Olmec have distinctive features, including thick lips and wide flat noses, some historians have asserted that the

LINK IN TIME

Earliest Known Writing Discovered

In September 2006, archeologists announced the existence of a stone slab, discovered in Veracruz, Mexico, which bears a written inscription in the language of the Olmec, the ancestors of the Maya and Aztecs. The stone, which is 3,000 years old, weighs about 26 pounds (11.8 k) and has 29 distinct glyphs, some of which are repeated, for a total of 62 characters. The discovery is especially significant because the earliest example of writing in the Western hemisphere previously known—the Tuxtla Script—dates from about C.E. 100, making it less than 2,000 years old.

Although earlier fragments of what appeared to be Olmec writing have been found prior to this discovery, scholars were unable to determine whether the symbols were merely pictures or an actual written language. It now appears clear that the Olmec had a written language, a fact that does not surprise most archeologists because the Olmec had an elaborate calendar, understood the concept of zero, and made paper. All of these achievements suggest an advanced civilization that would likely possess the ability to write as well.

The stone was discovered in 1999 by a road crew working about a mile from San Lorenzo, an Olmec site. María del Carmen Rodríguez of the National Institute of Anthropology and History of Mexico and her husband Ponciano Ortíz of Veracruz University analyzed and reported on the stone and its inscription. Unfortunately, the glyphs incised on the stone cannot be translated because there are no other significant inscriptions in Olmec with which to compare the writing. Until more examples of Olmec writing are discovered, the stone's message will remain a mystery.

Olmec descended from African explorers who crossed the Pacific Ocean and settled in Mexico. Others have claimed that the slanted eyes on some Olmec sculptures indicate that the Olmec originated in China.

IDENTIFICATION

Until the twentieth century C.E., most **archeologists** did not identify the Olmec as a separate and distinct culture, and they frequently misidentified Olmec **artifacts** as Mayan. For example in C.E. 1862, when a group of workers drilling for oil in the Mexican state of Tabasco uncovered a gigantic stone head, archeologists who evaluated it assumed it was Mayan, even though the style was quite different from most Mayan works of art.

In 1929, Marshall H. Saville, the first curator of Mexican and Central American Archaeology at the American Museum of Natural History, classified the heads as belonging to a different culture, which he called Olmec, meaning "rubber people." Ten years later, a carving with a date incised on the back was discovered near the site where the colossal head was found. The date, which was 300 years earlier than any known Mayan monument, made it clear that Olmec civilization was the older of the two. Later excavations at San Lorenzo, La Venta, Veracruz, and Laguna de los Cerros in Mexico confirmed that the Olmec people built the first complex society in the Americas and influenced the development of Mayan and subsequent cultures.

SOCIETY AND CULTURE

The Olmec were responsible for many innovations. For example, they developed a calendar that had 360 days. They also built flat-topped stone pyramids with steep staircases and channels below ground to bring water into their cities, and they invented the first system of **hieroglyphic** writing

This colossal stone head is one of more than 170 such structures carved by the ancient Olmec people out of volcanic rock. The distinctive headgear is thought to be the leather helmet worn by Olmec ball players. Although they share many features in common, each head clearly depicts a specific individual. (The Bridgeman Art Library/ Getty Images)

in the Americas. Archeologists were surprised to find that the plateau on which San Lorenzo was built, which is more than 160 feet high (48 m), was artificial. Clearly, then, the Olmec had a complex political and social structure that enabled them to engage in massive construction projects. The Olmec were agriculturalists, growing corn, beans, and squash.

Olmec society was **stratified**, with peasants who worked the land and an elite class of priests and nobles who lived in the cities and controlled religion and trade. Olmec notions of beauty seem odd to modern eyes. The Olmec knocked out their front teeth and deliberately deformed the heads of noble babies by elongating and flattening them.

Olmec theology deeply influenced religious beliefs of later Mesoamerican peoples. Their principal deity, represented as a jaguar, was adopted by later cultures and transformed into their god of rain. The plumed serpent, Quetzalcoatl, worshipped by the Aztec, was also an Olmec deity. The Olmec sacrificed humans, including infants, a practice that later Meosoamerican cultures continued.

OLMEC ART

The Olmec are perhaps most well known for their artistic accomplishments. Most distinctive are the colossal heads, 17 of which have been unearthed, that were carved out of basalt. These are the oldest known monuments in the Americas. The raw material for these sculptures had to be transported more than 60 miles (96 km) from their source to the cities in which they were carved.

The heads range in height from 4 to 11 feet (1.2 to 3.4 m) and weigh from 11 to 24 tons. Although they are somewhat stylized, the heads are individualized enough that archeologists believe them to be portraits of particular people, perhaps rulers of the Olmec. Some believe them to be portraits of great athletes, since they are all wearing helmets such as

might have been used to protect the heads of ballplayers from the hard rubber balls the Olmec used in their games.

Another unusual and common theme in Olmec art is what has been called the "were-jaguar." These are figures that appear to be part human, part jaguar. The jaguar itself appeared to be a symbol of royalty, and its association with a human figure may have been an attempt to infuse the human with the power of the great jungle cat. Some examples of were-jaguar sculptures seem to depict **shamans** in the process of transforming into jaguars, in an ecstasy of religious fervor. Others show strange-looking infants held in the arms of adult males. These babies have feline faces contorted in agony, and their legs seem to hang uselessly.

DEMISE

By the fourth century B.C.E., Olmec civilization had collapsed. No one knows what happened to bring about the end of the Olmec. Some scientists speculate that changes in the environment may have led to food shortages, but there is no definitive evidence to support this theory. Other researchers have suggested that the Olmec were destroyed by invaders, but there is no real evidence to support this theory either.

See also: Agriculture; Archeological Discoveries; Art and Architecture; Aztec Civilization; Mayan Civilization; Paleo-Indians; Religion; Technology and Inventions.

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Paleo-Indians

Term used by **archeologists** to identify the earliest peoples who migrated to North America. Paleo-Indians are considered the ancestors of all native peoples in modern-day North, South, and Central America.

The term *paleo* is from the Greek, meaning "ancient," or "old." When applied to Native Americans, it refers to the earliest nomadic, hunter-gatherer groups who roamed the continent. What archeologists know about Paleo-Indians is based on rather sparse finds of material culture, objects such as spear points and bone tools.

In C.E. 1927, the first clear evidence of Paleo-Indian culture was found near Folsom, New Mexico. There, a bison with a spear tip embedded between its ribs was unearthed. Then, in 1932, near Clovis, New Mexico, the remains of a woolly mammoth was found near a cache of stone tools. This indicated that humans were hunting bison in America nearly 12,000 years ago, much earlier than scientists once thought.

The owners of those tools are now referred to as "Clovis people," after the town where the remains were found. The people of the Clovis culture are thought to be the earliest humans in the Americas. Scientists have long believed that they migrated from Siberia about 11,000 years ago, over a land bridge that emerged when sea levels dropped during the last Ice Age.

Recent **historical inquiry**, however, may push the date of human habitation in the Americas back by several thousand years, forcing scholars to revise their theories about the original settlement of the Americas. Some archeologists believe that they have found crude stone tools in Monte Verde, Chile, and Cactus Hill, Virginia, that, according to **radiocarbon dating**, are some 17,000 years old. Others have speculated that Pacific Islanders may have come to the Americas by boat earlier than 12,000 years ago, while some suggest that Africans colonized parts of South America.

Among the **artifacts** found at Clovis and Folsom are flint projectile points. Clovis points, as the older artifacts have been called, are distinctive leaf-shaped points about four to five inches long (10 to 12 cm), with a concave base and deep grooves (called flutes). The flutes, carved up the center of each point, probably enabled Clovis hunters to attach the points to the shaft of a short spear. Folsom points were crafted later than the Clovis points and are smaller. In addition to spear points, Paleo-Indians fashioned other stone tools, including scrapers, grinders, hammers, and knives. They also probably made tools from wood, plant fibers, and animal bones, tusks, and horns, but such artifacts have not survived.

Little is known about the **cultural history** or **social history** of Paleo-Indians because there

MIGRATIONS OF THE PALEO-INDIANS

Scientists long believed that the first people to migrate to the Americas arrived 11,000 years ago, crossing Beringia, a land bridge over the Bering Strait from Siberia into what is now Alaska. From there they migrated into Central and South America and eastward to the Atlantic Ocean. However, archeologists have found stone tools near Folsom and Clovis, New Mexico, which indicate that humans may have migrated 12,000 years ago. At Monte Verde, Chile, and Cactus Hill, Virginia, others have found crude stone tools that suggest an even earlier date of arrival, perhaps as much as 17,000 years ago.

are no artifacts other than a few stone tools to study. Archeologists believe that they were nomadic hunter-gatherers who traveled in small bands of related individuals, hunting large and small game and gathering fruits, nuts, berries, and seeds. They probably moved from one place to another with the change in seasons, returning to the same places year after year, as long as food was plentiful. They tended to live near water sources, not only so they had drinking water but also because prey animals could be found easily nearby.

Paleo-Indians probably lived in tents, which could be easily packed and transported. They did not own many possessions because they moved from place to place and carried only what they needed for daily life. In general, archeologists speculate that such societies tended to be **egalitarian**. The leaders who emerged tended not to be chosen on the basis of class or wealth, but rather because they possessed particular skills that helped the group survive.

The natural world in which the Paleo-Indians lived was very different from the world today. The climate was drier and colder than it is now, and the animal and plant life was quite different. Paleo-Indians hunted a variety of **megafauna**—very large species of animals that are now extinct—including mammoths, mastodons, 2,000-pound (909-kg) giant armadillos, 300-pound (1,362-kg) beavers, bison, saber-toothed tigers, and 1,500-pound (6,180-kg) short-faced bears.

In C.E. 1967, Paul Martin, a **geochronologist** (someone who studies the measurement of geological time), asserted that Paleo-Indians were responsible for the extinction of these and many other species of animals, including camels and horses, which actually originated in the Americas. Because they were not afraid of humans, Martin claimed, these animals made easy prey and were, literally, hunted out of existence.

Many scholars disagree with Martin, noting that it is far more likely that climate change caused the mass extinction. Shepard Krech III, of Brown University, for example, points out that it would have been virtually impossible for Paleo-Indians to kill more than "90 million 1,000-pound animals" with stone-tipped spears even if they hunted day and night.

Archeologists use the term *archaic* to describe the many and varied Native American groups that succeeded the Paleo-Indians, who were characterized by the fact that they did not make pottery or practice agriculture. These later groups adapted to different climates and environmental conditions, from the frozen arctic to the searing desert, and from the mountains to the coasts. In what is now the eastern United States, archaic peoples were succeeded by the Woodland cultures, Mound Builders who made pottery and planted crops. In the West, however, many groups never made the transition to a more settled way of life until the Europeans arrived in the fifteenth century C.E. and never relied on agriculture in any significant way.

See also: Agriculture; Archeological Discoveries; Beringia; Hunter-Gatherers.

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Potlatch

Ceremonial feast given by natives of the present-day northwestern United States and British Columbia, in which the host presented many valuable gifts to guests. The word *potlatch* comes from the Chinook language and means "gift." Among tribes of the Northwest, including the Haidas, Kwakiutls, Makahs, Nootkas, Tlingits, Nez Perce, and Tsimshian, the potlatch was

an important ritual that helped individuals proclaim and sustain their status in their kin groups and tribes. Potlatches form an important and unique part of the **economic history** of the inhabitants of the Northwest. Although the origins of the ceremony are prehistoric, Native American groups of the Northwest still host potlatches today.

The potlatch probably began as gift exchange preceding marriage but eventually expanded to help people celebrate other life events, including birthdays, deaths, and changes in social position. Ultimately, a potlatch could be celebrated at any time for any reason.

Although potlatches differed somewhat from tribe to tribe, the central ceremonies were similar. Potlatches were typically several-day-long celebrations lasting several days that involved masked dancing, singing, gaming, feasting, and other rituals in a strictly prescribed order. The most important aspect of the potlatch, however, was the distribution of gifts by the host. The more the host gave away, the higher his social status. People would often spend years amassing wealth simply in order to give it away. Typical gifts included blankets, furs, canoes, weapons, and slaves. While most potlatches were small celebrations within a tribe or kinship group, some were intertribal, hosted by chiefs. These were especially lavish, as each chief tried to outdo the others.

Potlatches were reciprocal, in that guests were expected to "repay" their hosts by holding their own celebrations and giving away even more lavish gifts. Thus, in a very important sense, a potlatch is not simply a party; it is an economic system, a way of distributing and redistributing wealth. In some groups, such as the Kwakiutl, potlatches became highly competitive and in some cases gifts were destroyed once they were received. Destroying a gift considered valuable served as a way for the recipient to demonstrate economic superiority over the host.

In the nineteenth century C.E., both the United States and Canada outlawed potlatches because they regarded the custom as wasteful and unproductive. So important was the practice to tribes, however, that most continued to hold potlatches in secret and pressured government officials to repeal the laws. The United States did so in 1934 and Canada followed suit in 1951. Potlatches are still held today by many northwestern tribes.

See also: Culture and Traditions; Society.

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Poverty Point

See Mound Builders.

Pueblo

See Anasazi.

Religion

Although religious belief and practice varied greatly among Native American peoples, many characteristics were shared by nearly every group. Examining early beliefs, which strongly influenced later generations and modern life, reveals a great deal about what ancient people valued.

CHARACTERISTICS

One common element of many Native American religions was a focus on the cycles of nature. Groups that devised calendars, such as the Aztec and the Maya of Central America, did so primarily as a religious exercise, so they would know when to hold religious festivals and when to offer sacrifices. Other tribes made offerings to the deities of weather or the four cardinal directions in order to harness the goodness of natural forces and ward off droughts and other such disasters. Throughout the year, people might celebrate certain natural events such as the harvest, or the return of the salmon to the river, or the coming of the sap in maple trees.

In addition, most Native American religions were **animistic**; that is, people generally believed that everything, including objects, is animated by a soul or a spirit. They also believed that those sprits could be either positively influenced or offended by human behavior. Thus, among the Ojibwa, a hunter who had killed a bear might place an offering of tobacco in the bear's nostrils to placate the animal's spirit, or throw tobacco into a river to ensure safe passage.

Many Native American religions were also **pantheistic**; that is, they believed in a pervasive spiritual presence. For example, among the Lakota (a branch of the Sioux who lived on the Great Plains), Wakan Tanka (or Great Spirit) was in all things but not confined to any particular place or object. Manitou of the Algonkquians, a tribe of the Southeast, was regarded in much the same manner.

Native Americans generally did not worship or pray to the creator. They were **polytheistic**, praying to a number of deities, often representations of natural forces such as the rain or the wind. The Objibwa's primary deity was known as Kitche Manitou, but they also believed in guardian spirits who appeared to them in visions and dreams. The Hopi, too, believed in a supreme being, called Masau, but their rituals were constructed around kachinas, clay figures that represented the sprits of ancestors and environmental forces.

Some Native American groups also believed in evil spirits, such as ghosts. The Navajo and the Apache both feared ghosts and did what they could to avoid them. They were careful to bury their dead quickly so the living would not encounter the spirits of the dead. Sometimes the homes of the dead were burned or abandoned for the same reason.

RELIGIOUS EXPRESSION IN THE ANCIENT AMERICAS

3114 B.C.E. Date Mayans assigned to the beginning of the current cycle of creation

C.E. 700 The first *kivas,* round ceremonial rooms, are built by the Anasazi

ca. C.E. 1000 Temple mounds built at Cahokia

C.E. 800–1200 Toltecs originate *tlatchli,* a ball game that served as a reenactment of a sacred myth

C.E. 1325 Aztecs discover an eagle with a snake in its mouth perched on a cactus, as had been prophesied by their priests

C.E. 1487 Aztecs sacrifice 20,000 prisoners at the dedication of the Great Temple in Tenochtitlán

C.E. 2012 Date Mayans assigned to the end of the current cycle of creation

Sweat Baths and Lodges

North American and **Mesoamerican** groups both incorporated steam baths into their religious rituals. In North America, the structures for steam bathing came to be known as sweatlodges.

Generally reserved for men, sweatlodges were small buildings, constructed in a variety of different styles, with a hole dug into the floor. Heated stones were placed in the hole, and water was poured over the stones. The resulting steam was believed to purify both body and soul. After the coming of the Europeans, initiatory practices such as sweatlodges were discouraged, but today many Native Americans have revived the practice and many non-natives participate.

Kivas

The Anasazi people of the American Southwest built special underground rooms in their cities that were clearly intended for worship. The Anasazi began the practice of building these circular underground temples, called *kivas,* in about C.E. 750. The largest of the kivas is the Great Kiva in Chaco Canyon, New Mexico; it measures 65 feet (20 m) in diameter. Worshippers (limited to men only) usually entered a kiva by climbing down a ladder that was placed through a hole in the roof, but some kivas were accessible by underground passages. At the center of the kiva was a *sipapu,* a hole in the earth that symbolized humankind's connection with the earth itself. A stone bench lined the walls, which were themselves decorated with **petroglyphs.**

MESOAMERICAN RELIGION

The religions of Mesoamerica shared many characteristics with other Native American religions, but there were many differences, as well. The Maya, the Aztec, and other Mesoamerican groups believed that the universe existed in a delicate balance between two opposing forces—light and dark, good and evil—-and that it was, to some extent, up to humans to maintain the balance between these opposing forces. Members of these cultures played ball games that were not merely sporting events but were also rituals that symbolized the constant battle of the opposing forces of good and evil. The serious nature of the games is best illustrated by the fact that the losers were often sacrificed to the gods. It is thought that the Toletec originated the sacred ball game in about 800–1200 B.C.E

Many aspects of Aztec religion were borrowed from conquered peoples. The Aztec worshipped three major gods: Huitzilopochtli ("hummingbird wizard"), who was the sun god and also the god of war; Tezcatlipoca ("smoking mirror"), the supreme deity; and Quetzalcoatl ("plumed serpent"), the god of the priesthood, learning, and civilization. Beneath these were four other gods, envisioned as creators, who were remote and not much involved

LINK TO PLACE

Shamans in the Americas and Africa

Ancient healers were known as **shamans**. The word *shaman* comes from a Siberian language and means "he who knows." The term "medicine man" is sometimes used to refer to Native American shamans, but it is a term that most Native Americans today dislike. Many even dislike the term "shaman" because they believe it refers to the particular ethnic practice of Siberia and not to their own native healers. Shamans were doctors, religious leaders, spiritual visionaries, and sages.

Ancient Native American healers—like their modern counterparts—practiced their rituals within a cultural context that regards disease as having a spiritual cause. Thus, healing involved not only curing the specific illness but also curing the whole person, what people today sometimes refer to as "holistic medicine."

Each Native American culture had distinct practices, but there were many common elements. Rituals generally began with a purification or cleansing of the body. Native American sweat lodges were used for this purpose. The patient might also be given an herbal tea to induce vomiting, as a way to cleanse the body. The healer might involve the patient's family and friends or the entire tribe in chanting, dancing, and singing in order to draw out the spirit who was causing the illness.

Shamans still practice in parts of Africa today as they have for centuries, and they use many of the same methods that Native American healers do. For example, during a modern healing ritual conducted by a shaman in Tanzania, the healer first talks to the patient to determine what sort of spirit is causing the problem. She then brings together family and friends and uses songs and chanting to enter a trance-like state. The healer explains to the afflicted woman that she is ill because she has not "closed" the spirit of her father, who killed himself. As soon as she makes a sacrifice to close his spirit, she is told, her health will improve.

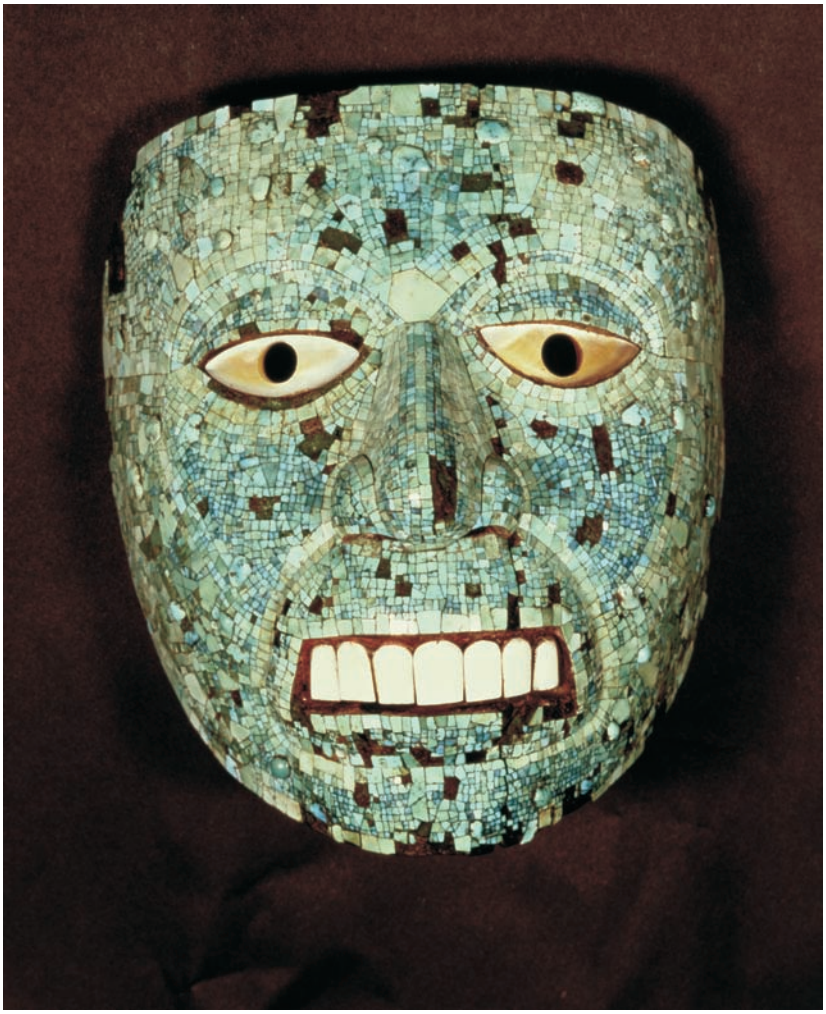
in human affairs, and a number of other gods, including Tlaloc, the god of rain, Chalchihuitlicue, the god of growth, and Xipe, the god of spring.

Like many traditional religions, all aspects of Aztec life were ruled by religious belief. In fact, the Aztec came to settle in the Valley of Mexico because their priests had prophesied that they would settle in a place where they found an eagle perched on a cactus holding a snake in its mouth. The Aztec founded their great city of Tenochtitlán in C.E. 1325 because, as legend has it, they came upon that very scene on an island in Lake Texcoco. Their belief in the god Quetzalcoatl may also have contributed to the downfall of their civilization. When Spanish invaders entered Aztec territory in C.E. 1519, their emperor, Moctezuma II, did not resist them because he believed that the leader of the Spanish forces might be the god whose return had been prophesied.

Human Sacrifice

Human sacrifice was another distinguishing aspect of Mesoamerican religions. Although many groups engaged in the practice, the Aztec conducted human sacrifice on an unprecedented scale. For example, **archeologists** have estimated that more than 20,000 captives were sacrificed at the dedication of the great pyramid temple in Tenochtitlán in C.E. 1487.

Human sacrifice among the Aztec and Maya was based on the belief that the gods provided for humans only if humans nourished the gods. The primary nourishment craved by the gods was human blood. In its mildest form, this requirement for blood sacrifice called for priests and nobles to draw a small amount of their own blood and allow it to drip onto fabric or paper that was then burned in sacrifice. They used obsidian



Made of wood decorated with a mosaic of turquoise and shell, this ancient mask is thought to depict the great Mesoamerican deity Quetzalcoatl, the plumed serpent. The mask was probably worn by priests during religious ceremonies honoring this Aztec god. (The Bridgeman Art Library/Getty Images)

knives to draw blood from genitals, ears, and extremities, and thorn-covered strings to pierce their tongues.

Aztec priests, however, began to teach that the gods were best pleased by the sacrifice of a living human heart. This belief led to wars designed not to capture territory, but to capture enemy warriors, who could be sacrificed to the gods to ensure divine benevolence. Archeologists know how these ceremonies were carried out from depictions on the walls of Aztec temples. Four priests held down the victim on an altar atop a pyramid. Another priest cut into the chest below the ribs and pulled out the still-beating heart. The priest burned the heart and the corpse was thrown down the steps of the pyramid.

Temporal Focus

Another common characteristic of Mesoamerican religion is its focus on time—and particularly on the end of time. Both the Aztec and the Maya believed that the universe had been destroyed and recreated four times, and that a fifth destruction was inevitable. The Mayan calendar system, in fact, predicted a date for this destruction: our year 2012. Mayan priests estimated that the current cycle began in 3114 B.C.E.

The Aztec had both a ritual and a solar calendar, which synchronized every 52 years. This led them to conceptualize life in 52-year cycles. At the end of each cycle, the Aztec believed, the gods might decide to destroy all of creation. In order to forestall this destiny, the Aztec held their most important religious ceremony, the New Fire Ceremony, every 52 years.

For five days, the Aztec went into mourning and extinguished the ritual fires burning on altars all over the land. On the last day, priests went to the Hill of the Star, where they waited for the constellation of the Pleiades to appear. When it did, the priests lit a fire from which the altar fires were relit. The people then celebrated the beginning of the new cycle.

LIFE AS WORSHIP

One important way in which Native American religion differs from modern Western religion is the extent to which it permeated every aspect of daily life. Even everyday activities had spiritual significance.

The Osage of western Missouri, for example, believed in the simultaneous unity and the duality of existence. They referred to their supreme deity as the Wakonda above and the Wakonda below, and represented the concept of this duality by referring to the relationship between the sky and the earth. Though different, and in many ways opposite, the earth and sky at the same time form a unity; together they form the whole of the universe as people understood it. The Osage expressed this same concept in how they laid out their towns. Divided by an east-west road, each town had two grand divisions, again symbolized by the earth and sky.

Marriage was also regarded as a way of uniting two opposite principles, and not only the obvious duality of male and female. Because social custom mandated that people marry someone from the opposite side of the town, marriage also symbolized the union of the earth and the sky. Residents of one part of the town went so far as to sleep on the right side of the body and put the right shoe on first, while residents of the other part did the opposite. Thus, even in sleep, the Osage practiced their religion.

The arrival of Europeans had a profound impact on the practice of Native American religions, although the extent of that impact varied from one place to another. The differing fates of native religious practices in North and South America reveal **patterns of continuity and change**. The Aztec, for instance, were destroyed completely as a result of European contact, and their religions vanished with them. By contrast, many native North American peoples still practice traditional religions in much the same way as did their ancient ancestors.

See also: Aztec Civilization; Mayan Civilization; Myths and Legends.

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S

Slavery

Slavery was practiced in the Americas long before European colonists arrived in the fifteenth century C.E., but it was different from the racially based enslavement of Africans that was practiced by Europeans at that time. In order to justify enslaving Africans, Europeans held that Africans were less than human—inferior to whites. Native Americans, on the other hand, apparently did not regard their slaves as inherently inferior. The children of Native American slaves typically did not inherit their parents' status and, in some cases, slaves could earn their freedom and eventually live as respected members of the tribe.

Most of those people who were held as slaves by Native American groups were captives who had been taken in battle. Although some captives were held as slaves, many others were adopted into the victorious tribe as replacements for those who had been lost in the war. For example, some captives were expected to marry the widows of dead warriors. An adopted war captive, in general, was treated much like the person he or she replaced, as long as the person was not lazy or cowardly.

In some groups, criminals were enslaved as punishment for their transgressions. Among the Aztec, some people even sold themselves or family members into slavery in order to pay debts.

In the Pacific Northwest, the practice of slavery among Native Americans more closely resembled the form of slavery practiced by Europeans. Coastal tribes, such as the Tipai Ipai, that fished rather than hunted for food, tended to live in settlements where the accumulation of property earned a person social status. (This was generally not the case among the more nomadic groups, who did not accumulate property, because it was too much trouble to transport. In these groups other factors, such as bravery in battle, conferred status.) Thus, in the Northwest, slaves were indicators of wealth and were bought and sold as property.

Among the Tlingit of Alaska at the time of European contact in the sixteenth century C.E., the price of an adult slave might be as high as 500 of today's dollars in blankets. Although Tlingit slaves were generally well fed, they were excluded from all religious ceremonies and not allowed to marry a free man or woman. The Tlingit sacrificed slaves and buried their bodies beneath the corner posts of the homes of chiefs.

After contact with Europeans, many Native American groups who had not previously sold slaves began to do so. Some tribes turned on neighboring tribes and sold captives into slavery.

The Choctaw, for example, lost more than 2,000 men to the slave trade.

See also: Society.

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Society

Ancient Native American societies included both hunting-and-gathering groups and settled agricultural populations. These different groups developed distinct institutions, social relationships, and traditions, all of which distinguish one group of people from another.

SOCIAL ORGANIZATION

Hunter-gatherer groups tended to be small, usually 25 to 30 individuals, and **egalitarian**. Leadership was informal and based on a person's ability to help the group find food. As early peoples learned to farm, leaders emerged to control the distribution of food and land. In places where a surplus of food was produced, not everyone had to work in agriculture, and people began to specialize in other occupations. Only in these sorts of complex societies did social **stratification** emerge, with leaders sometimes claiming divine authority.

In North America, only the so-called Mound Building cultures evolved a relatively complex, socially **stratified** society, but they left no written record. **Archeologists** know about social stratification in ancient American societies such as those of the Mound Builders because the graves of some individuals were quite elaborate, and the goods buried in some of the graves were much more luxurious than those in others.

Most Native North Americans lived in tribes or chiefdoms. In a tribe, a group of people with kinship ties are led by a charismatic individual with special abilities. The leadership position is usually not hereditary. Tribal societies tend to be egalitarian and the community is more important than the individual.

Although chiefdoms are similar to tribes in many ways, chiefs tend to be more powerful than tribal leaders, and chiefdoms are more stratified than tribes. Also, there are city centers that help to administer the complex society. Although chiefdoms can be highly complex, they lack bureaucracies to do the things that states do—that is, collect taxes, distribute food, raise armies, and develop a system of justice. The Mound Builders' societies were chiefdoms, but the Aztec, Maya, and Inca societies of Mexico, Central, and South America were states, with centralized governments and large bureaucracies and hereditary kingships.

NATIVE AMERICAN FORMS OF GOVERNMENT

Nearly all native North American groups, whether tribes or chiefdoms, developed social and political structures based on kinship ties. In most tribes, the office of chief was a political position but not a military one. The chief was often an older man, chosen for his wisdom, while military leaders were often younger men. Chiefs usually were advised by tribal councils, so their authority was far from absolute, although it is not accurate to say that these forms of government were democratic.

Confederation

A more complex kind of organization often found among natives of North America was the confederation, a political union of two or more tribes. Some confederations were temporary, organized for purposes of defense in an emergency. Some, like the famous Iroquois League—which united the Iroquois, Seneca, Mohawk, Oneida, Cayuga, and Onandoga tribes beginning in about C.E. 1570—were longer-lived and more complex organizations.

TURNING POINT

Smallpox

Before Europeans arrived, historians estimate that the population of North America was 12 million. By the nineteenth century C.E., there were fewer than a half million Native Americans in North America. Most had succumbed to smallpox. The disease was able to sweep through the population so swiftly and effectively because the people had no immunity.

Smallpox also helped bring about the demise of the Inca Empire. Smallpox arrived in the Inca Empire even before the Spanish invaders did. The disease traveled into South America from the Carribbean Islands, which had already been settled by the Spanish. The outbreak spread rapidly along the empire's system of roads. Within a very short period of time, smallpox had taken the life of Huayna Capac, the *Sapa Inca,* and that of his successor. Two of the Sapa Inca's sons fought a bloody war for power, with Atahualpa emerging victorious. He returned to his capital city just as Francisco Pizarro and his men arrived. Pizarro tricked Atahualpa and captured him, but the war had already been lost. Within only a few years, smallpox killed from 60 to 90 percent of the Inca.

In the Iroquois League, several tribes gave up some of their powers and rights as independent entities to the confederation. Representatives of the tribes gathered into a supreme council, which had judicial, legislative, and executive functions. The confederacy even had a constitution, which was originally oral but later written down. Many historians believe that the Iroquois federal system of government influenced the United States' system, and that the Iroquois constitution influenced many elements of the U.S. constitution. Other, looser, Native American confederations included the Seven Council Fires of the Dakota (which was established around C.E. 1700 and included the Mdewakanton, Wahpeton, Wahpekute, Sisseton, Yankton, Yanktonai, and Teton) and the Powhatan Confederacy (which was established in the sixteenth century C.E. and included the Powhatans proper, the Arrohateck, the Appamattuck, the Pamunkey, the Mattaponi, and the Chiskiack).

State Systems

In Central and South America, the Inca, the Maya, and the Aztec developed much more sophisticated political systems than those in North America. Each can be considered a state in the modern sense of the term, an autonomous political unit under a single government.

The Inca had perhaps the most complicated system of government of all three of these civilizations, probably because their empire was so large, extending as it did from Ecuador to Chile. The *Sapa Inca* ("unique Inca"), was considered to be the son of the Sun God, and he ruled supreme in his kingdom. His position was hereditary, and only members of the original Inca tribe could aspire to be Sapa Inca.

The Inca governed through a federalist system that consisted of a central authority and four provinces. Each province was ruled by a governor, who was a relative of the Sapa Inca. Assisting each governor were about 90 local leaders known as the *tukuyrikuq,* each of whom managed a city and the areas surrounding it. Below the tukuyrikuq were four additional levels of administration. The *hunu kuraqa* were responsible for approximately 10,000 people each, the *waranqa kuraqa* for about 1,000, the *pachaka kuraqa* for 100, and the *chunka kamayuq* for 10.

Because there were not enough descendants of the original Inca tribe to staff these positions, the Inca government established an extensive civil service that trained and employed the children of conquered tribes. Boys and girls were given an intelligence test that determined if they were clever enough to become administrators. If they were, they were taken from their families and brought to the Inca capitol of Cuzco to be trained.

During the Classic Period of Mayan civilization (250 B.C.E.–C.E. 900) the leader of each city was given the title *ahau,* which means "lord" or "noble." The head of state was known as the *k'ul ahau,* which means "supreme ruler." This position was hereditary, but Maya leaders needed charisma to hold power—which was not the case with Aztec, where the position itself guaranteed power. To become the supreme ruler of the Maya, one must have taken a captive in battle. The captive was then sacrificed at the king's accession to power. Each Mayan city had an administrator, similar to a modern-day mayor.

Local rulers among the Aztec were called *tlatoani,* or "speakers." All of the heads of households were expected to defer to and pay taxes to the local talatoani. Though elected, the tlatoani was usually chosen from a particular lineage or kinship group.

Over time, as Tenochtitlán became the dominant city in the Aztec civilization, the tlatoani of that city became the supreme ruler—the *Hueyi Tlatoani,* or "Great Speaker." He was chosen by a council of nobles from members of the royal family. Although the emperor had tremendous power, he was nevertheless obliged to consult the council when he made important decisions. Military units were stationed throughout the empire, and military leaders, often members of the nobility, functioned as governors.

SOCIAL CLASSES

The tribes and chiefdoms of North America were essentially egalitarian societies. Some people rose to leadership positions, but those positions were rarely hereditary, and, in theory, anyone could become a chief. Also, because these groups typically did not have a great deal of wealth, the economic distinctions between the chief and the rest of the tribe were not great.

Of course, there were exceptions. The Mound Building cultures (ca. C.E. 800–1600) of the midwestern and southeastern parts of what is now the Unites States appeared to have had clear upper and lower classes, and the wealthy were buried with luxurious grave goods. In the Pacific Northwest, Native American groups allowed for and admired the acquisition of wealth, but the custom of the potlatch ensured that whatever wealth was acquired was given away.

Things were quite different in the more stratified societies of Central and South America. Mayan society was divided into nobles, priests, commoners, and slaves. Aztec society was divided into three broad classes as well. At the top of the social pyramid were the *pipiltin,* the nobility. Below them were the *macehual,* or commoners. At the bottom of the social structure were the *mayeques,* or serfs. Commoners could gain status and prestige, generally by military prowess. A commoner who captured four enemies in combat was promoted to the rank of *tecuhtli,* given land and serfs, and his children could be educated with the children of the nobility. While the nobility had privileges not accorded to other classes, they were also held to a higher standard of behavior. Being drunk in public was frowned upon among the lower classes, but it was an executable offense for members of the upper class.

The class of commoners was also subdivided, a person's status being determined by occupation. Merchants, jewelers, goldsmiths, and feather workers were considered high status.

Among the Inca, only members of the original tribe could aspire to the nobility. While workers, such as goldsmiths and weavers, were much admired, they could never aspire to become a member of the nobility. The only route to status and prestige was through the civil service.

LAWS

In most tribal societies, such as those in ancient North America, laws are generally not written down, and chiefs or elders were generally charged with meting out justice. But in the more stratified societies of Central and South America, the law was also a more complicated affair. There were standard—and sometimes severe—punishments for certain crimes.

Among the Maya, a thief was sentenced to be the servant of his victim and murder was punishable by death. For some minor crimes, the criminal's hair might be cut to shame him or her. The Aztec had a sophisticated legal system that included lower

courts and courts of appeal. All but the lowest level of the judicial system was appointed by the emperor, and judges served for life unless they were convicted of a crime. Some cases would be heard by the emperor himself. Much Aztec law was written down, but there was also a large body of common law.

Because punishment was harsh and swift, there was little crime among the Inca. For some crimes, such as cursing the gods, the punishment was being tossed off a cliff. The punishment for theft was the amputation of a hand or foot. Those criminals who survived their punishments were forced to spend each day proclaiming their crimes and begging for their food.

The Americas in ancient times were home to a number of quite different political and social systems—from complex states to small family groups. While North American groups tended to have simpler social and political structures, Mesoamerican groups evolved more complex social and political systems.

See also: Aztec Civilization; Incan Civilization; Mayan Civilization.

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T

Taino

Native American inhabitants of a number of Caribbean Islands, including Cuba, Haiti and the Dominican Republic, Puerto Rico, Jamaica, and the Bahamas. The Taino were the first Native Americans encountered by Christopher Columbus when he arrived in the Americas in 1492.

About 2,000 years ago, the Taino migrated from the area now known as Venezuela to nearby islands in the Caribbean, where they led pleasant, relatively untroubled lives. They were able to grow abundant crops using a system that involved little work. They planted their crops in *conucos,* large mounds packed with leaves to reduce erosion. They also sowed many different kinds of seeds, a practice that ensured that no matter what the weather conditions were, something would grow.

The Taino cultivated cassava, maize, squash, beans, peppers, sweet potatoes, yams, and peanuts. They also raised cotton, which they used to make fishing nets, and tobacco, which they smoked during religious ceremonies. They hunted small mammals and birds, and fished. Their simple way of life left them with large amounts of leisure time, which they used to play games, make pottery and other art works, and practice elaborate religious rituals.

Taino society was **hierarchical**, with three distinct social classes: the *naborias,* or working class; the *nitainos,* or subchiefs and noblemen, including priests and medicine men; and the *caciques,* or chiefs. The importance of each cacique was determined neither by lineage nor by prowess in battle, but rather by the size of the clan. The naborias lived in round buildings called *bohio,* which could hold from 10 to 15 families. The chief and his family lived in a large rectangular building. The Taino practiced **polygamy**: each man had two or three wives; caciques had as many as 30.

No one is sure how many Taino lived in the Caribbean Islands before the arrival of the Europeans. Estimates have ranged from as high as four million to as low as 100,000. Most scholars seem to accept 400,000 as a reasonable number.

The Taino were an extraordinarily peaceful and trusting people. This made them nearly defenseless in their dealings with Columbus and the Spanish settlers who followed. Columbus himself noted that the Taino would trade objects of very high value (as far as Europeans were concerned) for mere trinkets, and he thought they were naïve because they had no concept of owning land.

GREAT LIVES

Bartolomeo de las Casas (1484–1566)

Bartolomeo de las Casas settled in Cuba in 1502, just ten years after Columbus had arrived in the Caribbean. He had been a soldier, and as a reward for his military service he was given an estate in Cuba, which included hundreds of native slaves.

When las Casas was ordained as a Catholic priest in 1514, however, he gave up his ownership of slaves and devoted the rest of his life to seeking social justice for the Taino and other native groups. In 1515, las Casas brought his case to King Ferdinand of Spain, who referred him to Bishop Juan Rodriguez de Fonseca, president of the Council of the Indies. When las Casas told de Fonseca that Spanish settlers had killed 7000 native children in three months, he replied only, "And how does that affect me?"

Las Casas, appointed by Ferdinand as "Protector of the Indians," returned to the islands, where he tried in vain to protect the natives. Believing that the Taino were too frail for the work they were forced to do, las Casas suggested that slaves imported from Africa would be heartier and less subject to injury. Unfortunately, his advice was accepted, and in 1517 the first African slaves were transported to the Caribbean. Later in his life, las Casas wrote that he deeply regretted having made this proposal.

Las Casas is probably best remembered for his book *Brief Report on the Destruction of the Indians (or Tears of the Indians,* 1552) in which he outlines in graphic and horrible terms the treatment of the native peoples by the Spanish. He recounts an instance in which a group of Spaniards attacked a Taino settlement: "They grabbed suckling infants by the feet and, ripping them from their mothers' breasts, dashed them headlong against the rocks. . . . They spared no one, erecting especially wide gibbets on which they could string their victims up with their feet just off the ground and then burn them alive thirteen at a time, in honor of our Savior and the twelve Apostles, or tie dry straw to their bodies and set fire to it."

Las Casas died in Madrid, Spain, in 1566. Today, he is recognized as a national hero in Cuba and Nicaragua.

The Taino were utterly devastated by the coming of the Europeans. They were forced to give up large portions of their crops as **tribute** to the Spanish overlords, and were enslaved and forced to work in silver mines. Taino leaders were hung if they attempted to resist the domination of the foreigners. However, disease was the worst killer—thousands died of smallpox and other viruses for which they had no resistance.

Whether the Taino actually became extinct or whether some few members of the tribe remained to carry on the heritage of these peaceful people is a matter of debate. Most scholars believe the Taino were completely wiped out.

See also: Agriculture; Religion; Society.

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Technology and Inventions

The social and material innovations developed by ancient Native Americans were often overlooked, discounted, or attributed to foreign cultures by European settlers. Calendars, medicines, toboggans, canoes, and weapons were among the astounding inventions of early Native Americans, innovations that had a direct impact on Native American survival as well as on all of modern civilization.

NATIVE AMERICAN INNOVATIONS

When European explorers came to the so-called "New World," they regarded themselves as much superior to the "primitive" and "barbaric" peoples whom they encountered. Often, Europeans were incapable of interpreting the native technology they saw. When they did recognize remarkable accomplishments, such as the magnificent earthwork mounds at Cahokia in Illinois, they assumed that another culture, which they also assumed to have been white, had built them. Among the mounds that were misinterpreted were those built by the Hopewell people, beginning in about 200 B.C.E.

Of course, the truth is that the native peoples of North and South America were far from primitive. In many ways they were more advanced than their European counterparts. Aztec and Mayan cities of Mexico and Central America rivaled Rome in their use of aqueducts and underground systems to carry water. The Hohokam people of the United States southwest also constructed extensive irrigation canals beginning in about 1000 B.C.E. The construction of thousands of miles of roads by the Inca in what is now South America, beginning in about C.E. 1400, was done under circumstances much more difficult than those faced by the Romans—and without the use of the wheel.

Depicted here are two ancient Aztec *atlatls*, or spear throwers. These particular atlatls are decorated with images of gods and warriors and show the groove into which a spear would be fitted. The atlatl allowed warriors to throw their spears much farther than they could have otherwise. (Werner Forman/Art Resource, NY)

ANCIENT WEAPONS

The Atlatl

The *atlatl* is a device used by a warrior or hunter to increase distance, accuracy, and power in hurling a spear. *Atlatl* is an Aztec word that means "water thrower," which indicates that its original use was to spear fish. Although the Aztec did not invent this tool, modern Americans use their word for it because the tool so frightened the Spanish conquerors who first encountered the Aztec in the sixteenth century C.E.

An atlatl consists of a stick with a groove cut down its entire length, ending in a cup-like slot. The user fits a spear in the groove, and rests its end in the cup, then holds onto the atlatl at the end farthest from the cup. Using an overhand movement, much like striking a tennis ball, the user propels the device forward, releasing the spear. The extra leverage provided by the atlatl increases the speed and accuracy of the spear.

Atlatls were from one to three feet long (30 to 90 cm), depending on how they were to be used, and were frequently decorated with carvings. The longer the atlatl, the greater the force with which it could propel a spear. A spear thrown with the aid of an atlatl had so much power that it was able to pierce metal armor. The atlatl eventually evolved into the bow and arrow.

The bridges built by Roman engineers were remarkable, but so was the bridge built by the Inca to cross the Apurímac River in southern Peru. This suspension bridge built of plant fibers was 150 feet long (945 m) and lasted for more than 500 years. The pyramids of Egypt are remarkable edifices, but no more so than the Maya and Aztec pyramids, which were built under much more difficult circumstances—atop mountains, and not on the flat desert sands.

Like the ancient Egyptians, the Maya invented a written language that used **hieroglyphs**. Their hieroglyphs sometimes represented complete words but sometimes represented sounds, which is a step in the direction of creating a phonetic alphabet. Like the Egyptians, the Maya carved hieroglyphs on stone monuments, called *stelae,* to commemorate the deeds of their heroes and gods. They also invented paper made from fig bark.

MAYAN AND AZTEC CALENDARS

Among the most remarkable accomplishments of ancient Americans was the Mayan calendar. The Maya, who were particularly adept at **chronological thinking**, actually had three different systems of measuring time, all of which appeared on their circular stone calendars. The three systems were called the Long Count, the Tzolkin (or divine calendar), and the Haab (the civil calendar).

The Haab, like the modern secular calendar, is based on a 365-day year. Unlike the modern calendar, however, the Maya divided the year into 18 months of 20 days each, with a five-day period at the end, a time that was considered unlucky. The Maya had very accurate knowledge of solar movement and understood that the year was actually slightly longer than 365 days, though they did not attempt to account for it in their calendar, as we do when we add an extra day every fourth year—which is how we get leap year.

MEDICAL INNOVATIONS

Native Americans were also innovators in the medical field. There is evidence that the Inca perfected a kind of brain surgery known as trepanation. Trepanation involves removing a circular piece of bone from the skull of a patient, often because of a skull fracture or painful swelling of the brain from other causes.

There is considerable evidence of trepanation going back literally thousands of years, when it

must have been performed with stone tools. However, the Inca seem to have been masters of the procedure. A sample of 214 trepanned skulls from Peru shows that 55 percent of those who had the surgery healed completely. Historians have noted that when the procedure was performed in Germany in the nineteenth century C.E., only a quarter of the patients survived.

Beginning nearly 3,000 years ago the Maya made false teeth out of seashells. A 600-year-old jaw uncovered by **archeologists** demonstrates that the procedure was so successful that the patient's bone grew back to hold the dentures.

An understanding of herbal teas used as contraceptives by Native American women helped in the development of modern oral contraceptives. Both the Shoshone and the Matto Grosso of Paraguay made teas from herbs that modern science has shown reduce fertility.

Native Americans who first cultivated tobacco used it both in religious rituals and for medical purposes. The Maya used tobacco to cure asthma, congestion, headaches, poor digestion, toothache, and a number of other ailments.

TRANSPORTATION

Native Americans were the first to create the kind of sled known as the toboggan. The word is from the Algonquian language and refers to a sled without runners, crafted from parallel pieces of wood fastened together with cross pieces called battens and bent so that the front of the sled curves up. The toboggan was originally made in order to carry animals killed in the hunt through the snow. The Inuit made toboggans from whalebone; other tribes used hickory, ash, or maple.

Both the *kayak* and the birch bark canoe are Native American inventions. A kayak is a canoelike boat usually built for one person. It is made from wood lashed together with sinew and covered with seal hides, leaving a small opening in which the kayaker sits. The design gives the craft unusual stability and the ability to ride high on the water, keeping the kayaker dry, which is especially important in frigid Arctic waters.

Birch bark canoes were prevalent in New England, but were also made anywhere in the country that birch trees grew large enough to fashion a canoe. The size of the tree was important, because most canoes were covered with a single piece of bark. Canoes were made in all sizes, some just large enough to hold one person, others large enough to hold 50.

Men built the frames for these canoes out of wood that was bent to shape by steaming. Then women covered the frame with birch bark, which they peeled from trees, sewed together, and attached to the frame with spruce root fibers. Pine pitch was used to seal the seams. In areas where birch bark was rare, canoes were covered with animal hides.

Canoes were the ideal vehicle for transportation in areas with many streams and lakes. They were lightweight and could easily be portaged, or carried from one stream to another, when necessary. Despite its relatively light weight, a canoe paddled by a single individual was sturdy enough to carry as much as a ton of cargo. However, canoes were easily damaged in rapids and often had to be repaired on the run, so native sailors carried materials with them to fix any tears caused by sharp rocks and debris.

Canoes were also used in **Mesoamerica**. The great Aztec city of Tenochtitlán was built on a lake and instead of streets, its builders constructed canals, beginning in about C.E. 1350, which were navigated by canoe.

SPORTS

Ball games, such as football and soccer, are based on ball games played by Native Americans who lived in Central America. These peoples invented the ball court and made the first balls out of rubber. The earliest ball courts were made of packed earth, with earthen retaining walls, but by the time of the Aztec, ball courts had become much more elaborate. At Chichén Itzá, on the Yucatán Peninsula of Mexico, the ball court was 283 feet long (86 m), 100 feet wide (30 m), and surrounded by walls 27 feet high (8 m). There were temples at both ends of the court and stone seating along the sides.

The game that the Aztec called *ullamalitzli* was played with a six–inch (15-cm) solid rubber ball. One object of the game was to drive the ball into the opponent's end of the field; another was to propel the ball through a stone or wooden hoop, without the use of one's hands. This game differed from modern ball games, however, in that it was considered part of a sacred ritual and the losing team risked execution.

Native Americans in North America invented the game of lacrosse, which is still played today and has become increasingly popular. Players used a netted racket to throw a ball through the opponent's goal. Again, use of the hands was prohibited.

The ancient Native Americans invented many other things still in use today, including chewing gum, snowshoes (which were invented about the time the first Native Americans arrived in the America, in about 12,000 B.C.E.), moccasins, tipis, hot chocolate, totem poles, and beef jerky, just to mention a few.

See also: Aztec Civilization; Great Serpent Mound; Incan Civilization; Language and Writing; Mayan Civilization; Mound Builders; Tools and Weapons; Totems.

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Teotihuacán (ca. 300 B.C.E.–C.E. 700) (tay-oh-tee-wakan)

Located about 30 miles (48.3 km) northeast of modern-day Mexico City, the largest ancient city in the Americas. Little is known about the people who built this great city, not even what they called it in their own language. The name *Teotihuacán* was given to the ruins of the city by the **Mesoamerican** tribe known as the Aztecs, who were awed by the scale of the city and revered it as a holy place. It means "city of the gods" or "the place where men become gods."

At its peak, Teotihuacán covered an area of more than eight square miles (21 sq. km). It is laid out along a north-south avenue, called by the later Spanish conquerors *Calle de los Muertos* (Street of the Dead, because they wrongly assumed that the temples along the road were tombs.). At the height of its influence, Teotihuacán may have been home to 125,000 people and more than 2,000 structures, including more temples than any other ancient city in the Americas.

In the northern part of the city, on the east side of the Street of the Dead, is the Pyramid of the Sun. This structure is the largest stone pyramid in the Americas, and the third largest in the world, rising to a height of 213 feet (64 m) and measuring 738 feet (224 m) on a side. Originally constructed as four platforms—each smaller than the one below, creating a stepped effect—the pyramid was built over four lava-tube caves, which were thought to have spiritual significance for the people of

The Pyramid of the Sun, built in Teotihuacán in about 150 B.C.E., is the third-largest pyramid in the world. It was once topped by a temple and covered with brightly painted plaster. The Aztec named the pyramid when they visited Teotihuacán hundreds of years after it was abandoned. (Art Resource, NY)

Teotihuacán. Atop the pyramid was a temple of which nothing remains today.

Other major structures in Teotihuacán include the Pyramid of the Moon, the Temple of Quetzalcoatl (Feathered Serpent), and the Ciudadela, or citadel. The Ciudadela is a large sunken plaza that was at one time surrounded by buildings and platforms. The Spanish gave the plaza its name, mistakenly assuming that it was the ruins of a fortress.

Because of the absence of military themes in painting and sculpture, it had long been assumed that the people of Teotihuacán were peace-loving and **egalitarian**. A series of archeological discoveries in recent years suggests strongly, however, that the culture was much less peaceful than was once thought.

In the C.E. 1980s, the remains of 137 people, hands bound behind their backs, were discovered beneath the Temple of the Feathered Serpent. The bodies may have belonged to warriors captured in battle. Over the years, **archeologists** have found other tombs in the Pyramid of the Sun, some of which seem to suggest that the culture valued militarism, especially in the choice of animals buried with the dead. Animals that symbolize warriorlike qualities, such as jaguars, wolves, coyotes, and puma, which symbolize warriorlike qualities, have often been found buried with sacrificial victims. A C.E. 2004 discovery of 12 bodies, 10 of which had been decapitated, may also be evidence of a warlike culture.

Some time in the eighth century C.E., Teotihuacán was abandoned. No one is sure what happened, though it appears that the city was deliberately burned around C.E. 650. Whether warfare was involved or whether the natural resources were depleted, forcing people to move in order to survive, no one knows.

See also: Archeological Discoveries; Aztec Civilization.

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Thule Tradition (thoo-lee)

The name given by **archeologists** to ancient people who lived in the Arctic from 700 B.C.E. to C.E. 1600 and are the ancestors of today's Inuit peoples. The name is derived from the Greek phrase, "Ultima Thule," which refers to the northernmost habitable region of the world.

The Thule tradition evolved out of the earlier Norton tradition (2750 B.C.E. to C.E 800) and refined many of its innovations, such as skin boats, elaborate harpoons, and skin floats. However, the people of the Thule tradition carried maritime hunting even further than their predecessors, hunting bowhead whales on the open seas in large skin boats such as *umiaks* and *kayaks*. They also developed the throwing board, which was used to propel a harpoon farther than it could be thrown without the leverage provided by the board. Like the Norton tradition, the Thule tradition is also known for its toggling harpoon heads, which would release the tip of the harpoon from the shaft once it was embedded in the prey.

Because they were such efficient hunters, people of the Thule tradition were able to acquire large amounts of surplus food and erect relatively large permanent communities. Like the houses of the Norton tradition, Thule houses were built partly underground. The houses were roofed with baleen (the fringed part of whales' jaws), hides from various sea mammals, and sod. The inhabitants slept on raised platforms at the rear of the house.

People of the Thule tradition also developed an innovative method of hunting sea birds. Thule hunters lowered nets (probably developed originally to catch fish) from the tops of cliffs using sealskin ropes. Often, one hunter would descend the cliff while two or three others steadied the ropes. By this method they not only captured birds but also gathered eggs and plant life that grew on the cliffs.

So inventive were the Thule people that, by C.E. 1000, they had developed all of the major items still used by Inuit peoples to survive in an arctic climate, including a form of snow goggles. Around this same time, Thule peoples began to move east across northern Canada toward Greenland. They also expanded into the interior of the Canadian mainland and as far south as Kodiak Island in the Gulf of Alaska. Their culture was disrupted by the arrival of Europeans in the Arctic in the sixteenth century C.E. As in the case of other Native American groups, Europeans took over their land and relocated them to less desirable territory.

See also: Norton Tradition.

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Tiwanaku (200 B.C.E.–C.E. 1000)

Tiwanaku, an archeological site 13,000 feet (3,962 m) above sea level in the Andes Mountains in what is now Bolivia, was once the administrative capital of an ancient civilization that may have been the precursor to that of the Inca. Founded in about 200 B.C.E., the small agricultural center of Tiwanaku grew to become a major urban center by C.E. 600. By then it was home to approximately 40,000 people and covered an area of 2.3 square miles (5.6 sq km).

The success of this civilization was due primarily to the development of inventive agricultural methods that allowed the people of this city to grow an abundance of food in an inhospitable mountainous environment. One technique, called raised-bed irrigation, involved digging an extensive network of canals, using the soil from the excavation to create raised beds for planting. The canals provided water for the crops. They also absorbed heat from the sun during the day, which kept the crops warm during the bitter cold nights in the mountains.

The remains of Tiwanaku include impressive structures such as the great Gateway of the Sun, carved from a single piece of stone, which bears carved symbols indicating that it functioned as a calendar. The site also features massive stone blocks, carved to resemble persons holding cups in one hand and scepters in the other. Archeologists believe the sculptures may represent rulers or priests. Tiwanaku is also home to terraced pyramids, the largest of which, the Akapana, has a 656-square-foot (61-sq-m) base and rises to a height of 55.8 feet (17 m).

The Tiwanaku culture disappeared about C.E. 1000. As with many ancient cultures in the Americas, no one really knows what happened. There is evidence that a period of drought may have caused widespread famine that devastated Tiwanaku.

See also: Archeological Discoveries; Incan Civilization.

Tobacco

A broad-leaved plant, first domesticated by the Maya, an ancient **Mesoamerican** group, more than 2,000 years ago. Tobacco leaves were dried, cured, and then smoked as part of religious rituals. The importance—both in rituals and in daily life—of tobacco to the Maya is underscored by the many representations of the plant in Mayan art.

European settlers learned about tobacco use from the **indigenous** people of the Americas and soon began exporting vast quantities to Europe, where the habits of smoking, chewing, and taking snuff, or powdered tobacco, became wildly popular. Christopher Columbus, in fact, received tobacco leaves as a gift from the Taino—the Native Americans who greeted him when he first landed in the Americas—but Columbus did not know what they were and threw them away. It was not until C.E. 1560 that tobacco was introduced in Europe.

GROWING AND PROCESSING TOBACCO

Native American farmers began cultivating tobacco by gathering seeds from wild tobacco plants

LINK IN TIME

Legacy of Ancient Ritual

Since C.E. 1964, when Luther L. Terry, then the surgeon general of the United States, first sounded the warning about the dangers of smoking, many people quit the habit, and proportionately fewer young people have started smoking. However, even today, smoking accounts for more than 400,000 deaths each year in the United States. As a group, given their long history of tobacco use, Native Americans are at great risk for death from smoking-related diseases because more Native Americans smoke than does any other population in the country. According to the 2004 National Health Survey of Adults, 33.8 percent of Native Americans smoke, compared to 22.2 percent of white Americans, 20.2 percent of African Americans, 15 percent of Hispanics, and 11.3 percent of Asian Americans. Even more worrisome is the fact that more than half of all high school students in schools funded by the National Bureau of Indian Affairs (BIA) smoke, compared with 22 percent of students in other high schools. In addition to a history of smoking, another reason for tobacco use by young people may be that laws governing the sale of tobacco to minors do not apply on Native American lands, allowing children easy access to tobacco products.

Every year representatives of the National Native Conference on Tobacco Use meet to develop strategies to curb tobacco use among Native Americans. One idea that has emerged from these meetings is the importance of emphasizing the difference between the traditional ceremonial use of tobacco and modern recreational use. Ancient Native Americans used tobacco only occasionally; they did not smoke 20, 30, or more cigarettes a day, as many smokers do. Moreover, traditional tobacco itself is much less dangerous than commercial tobacco, which has more than 4,000 additives, some of which are carcinogenic, or cancer causing.

Native American antismoking advocates are also working to try to stop commercial cigarette companies from using traditional Native American symbolism to sell cigarettes and from sponsoring rodeos, sports tournaments, powwows, and other events that attract young people who live on today's reservations.

and scattering them on ground that had been cleared of brush. Farmers harvested the leaves and stems at intervals, bringing them back from the fields to the village to be dried. Different tribes used different drying methods. Some dried tobacco in sweatlodges, steam-filled rooms that Native Americans used in purification ceremonies. Others allowed the leaves to be covered with the morning dew, then brought them inside the home to dry, repeating this process over a period of weeks. Farmers usually dried the stems and leaves separately.

Rubbing the dried leaves (or stems) together by hand produced a coarse powder that was stored in tightly woven baskets. Native Americans considered tobacco made from leaves to be the highest quality, while tobacco made from stems was regarded as inferior. Lower-grade tobacco typically was given as a gift to the spirits or to guests who were considered socially inferior.

TOBACCO USE

Most ancient Native American cultures considered tobacco a sacred herb, burning it as an offering to the gods, much as members of some religions burn incense. They also smoked tobacco in pipes, chewed it, steeped it in water, and drank it, as well as using it medicinally. Tobacco was a valuable commodity often traded or given as a gift.

In some tribes, only **shamans**, or priests, smoked tobacco and then only as part of a religious

ritual. Taken in quantities much greater than smokers today inhale, the nicotine in tobacco is a powerful hallucinogen. Shamans smoked large amounts of tobacco as a way of journeying to the world of spirits. In other tribes, smoking was more widespread but still reserved for special occasions such as religious or communal rituals. In general, only men smoked.

Native Americans also used tobacco for a variety of medical applications. Chewing tobacco was a traditional toothache cure, for example, and healers sometimes applied chewed tobacco to wounds and snakebites as a curative. Some Native Americans mixed tobacco with other herbs and placed the mixture in "medicine" bags worn around the neck to ward off evil or bring good luck. Interestingly, the reason Europeans began to use tobacco was because of their belief in its medicinal properties; tobacco was thought to be a cure for everything from eczema to cancer.

PIPES

Because tobacco was so important in Native American society, the pipes in which it was burned were also treasured. There is a Sioux legend that tells how the White Buffalo woman brought the first pipe to the people. As she hands it to the chief, she says, "Behold this and always love it. It is very sacred and you must treat it as such. With this you will send your voices to Wakan Tanka, your father and grandfather."

The typical pipe was composed of a hollow stem, usually made of wood or bone, and a bowl made of catlinite (also called pipestone) or soapstone. To hollow out a piece of wood, Native Americans used a variety of methods. They chose branches with a lot of pith, or soft interior, and used a bone or horn to remove the soft material. Native Americans of the Northwest sometimes hollowed out a branch by soaking it in salmon oil, then placing the grub of a beetle inside and sealing off the ends. As it matured, the beetle devoured the pith, leaving a hollow tube. The two pieces of the pipe could be fitted together for smoking, then disassembled to fit in a small pouch that could be easily carried.

There were many different styles of pipes, from the beautiful stone platform **effigy** pipes of the Hopewell culture of the North American Midwest (people who thrived from about 100 B.C.E. to C.E. 200) carved into elaborate representations of people and animals, to the tomahawk pipe, with a hatchet on one end and a pipe on the other. Tomahawk pipes were not used in battle but were generally reserved for ceremonial use, often as "peace pipes."

The first European settlers in America learned about tobacco from Native Americans, and the plant gained widespread popularity worldwide within less than century.

Today, tobacco is viewed by most Americans as noxious and deadly, a point of view that is at odds with tobacco's status as a sacred herb among most Native American cultures, many of which still use it in religious ceremonies.

See also: Agriculture; Mayan Civilization; Religion; Taino.

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Toltec Culture

Culture that dominated large portions of central Mexico from about the tenth to the mid-twelfth century C.E. and deeply influenced the great Maya and Aztec cultures.

The great city of Teotihuacán in central Mexico was sacked in about C.E. 650. For 200 years afterward, the region went through a period in which there was no centralized government or predominant culture. Then, around C.E. 950, a culture based in Tula in northern Mexico began to spread through Mexico and Central America. Some scholars believe that this group, referred to as Toltec, may have been refugees from Teotihuacán who preserved and disseminated its culture. Unfortunately, much of what is known today about the Toltecs comes solely from Aztec legend.

At its most populous, Tula may have been home to as many as 40,000 people, living in a 3-square-mile area (1.2 hectares). The residents farmed outside the city walls in fields irrigated by a system of dams and canals. The central part of the city contained a large plaza bordered by pyramid temples and ball courts. The earliest known *tzompantli,* a wall built from the skulls of sacrificial victims, is found in Tula.

The Toltec brought the many small states in Central America under their control to form a loosely knit empire that they ruled from Tula between C.E. 1000 and 1200. Influenced by the architecture of Teotihuacán and by the earlier **Mesoamerican** culture of the Olmecs, the Toltec were great artists and architects. They smelted metals and built beautiful temples with intricate carvings.

The Mayan city of Chichén Itzá (conquered by the Toltec in the eleventh century C.E.) demonstrates a combined Toltec-Mayan influence in both art and architecture. The Temple of Warriors in Chichén Itzá, for example, is a larger version of a structure at Tula. The pyramid of El Castillo, also at Chichén Itzá, is not only an impressive structure in itself but also demonstrates the Toltec knowledge of astronomy. The sun rises over one corner of the pyramid at the summer **solstice** and sets over another at the winter solstice. During the spring and fall **equinoxes**, the sun creates a pattern of triangles that resembles a snake slithering down the pyramid.

Although the Toltec did not introduce the cult of Quetzalcoatl, the plumed serpent god of Mesoamerica, he was a crucial part of their mythology, and their stories influenced both the Aztec and the Maya. The central figure of the Toltec myth is Topiltzin, also referred to as Quetzalcoatl, son of Mixcoatl and a Toltec princess, Chimalman.

In Toltec mythology, a father and son—probably mythologized versions of real people—create the Toltec empire by conquering neighboring cities. When Topiltzin conquers the Maya, he becomes Kulkulcan (the Mayan word for "feathered serpent"). His son, Huemac, is destroyed by the evil Tezcatlipoca but, before dying, Huemac razes the Toltec capital at Tula to prevent the evil forces from dominating it. He then sets himself on fire and rises to become the Morning Star—the planet Venus. He, like his father, is referred to as Quetzalcoatl.

Aztec mythology predicted that Quetzalcoatl would one day return to rule over his people. Unfortunately, when the Spanish conquistador Hernán Cortés arrived in Mexico in C.E. 1519, the Aztec thought he might be Quetzalcoatl. This mistake gave Cortés at least a temporary advantage over the Aztec.

The Toltecs were probably the inventors of high-stakes ball games, which were also adopted by later Mesoamerican cultures. The games, played on large stone courts with hard rubber balls, evidently had religious significance, perhaps symbolizing the victory of the god-heroes over death. The losers lost not only the game but also their lives. While the Toltec were not the first to sacrifice humans to the

This ancient Toltec calendar is made up of four glyphs arranged in a square. The calendar was crafted from stone between C.E. 856 and 1250. (The Bridgeman Art Library/Getty Images)

gods, they sacrificed many more people than earlier groups and may have influenced the large-scale carnage practiced by the later Aztecs.

The Toltecs were Nahuatl-speaking people as were the Aztecs. The literal meaning of their name is "reed people," but "Toltec" came to connote a cultured person or craftsperson because of their mastery of stone and metal arts. They are famous for gigantic Atlantes statues, carved from huge stone columns, which are believed to depict Toltec warriors.

Sculptures depicting Chac-Mool, the Toltec rain god, are found at many Toltec sites. The god is often portrayed as a reclining man with his knees bent and his head and shoulders raised off the ground, holding a bowl over his abdomen. These figures served as altars, and the bowls often held human hearts that were sacrificed to the gods.

No one knows precisely what happened to the Toltec. In about C.E. 1200, the city of Tula was destroyed, probably by a group of warlike nomads known as Chichimecs. The later Aztecs admired Toltec culture and claimed to be descendants of the Toltec warriors. The Aztec concept of a warrior elite also likely was borrowed from the earlier culture. The Aztec even plundered Tula for material to build their cities, unfortunately destroying much valuable archeological evidence as a result.

See also: Aztec Civilization; Mayan Civilization; Olmec Civilization; Teotihuacán.

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Tools and Weapons

The natives of North America made few tools or weapons of metal, except for copper, which was used most often by Native Americans of the Great Lakes region and by the Inca. Instead, most objects crafted by ancient Native American peoples were fashioned out of stone, wood, and animal parts such as skin, bone, antlers, and sinew.

Colin F. Taylor, in his book *Native American Weapons* (2001), identifies five major categories of weapons: those used for striking, cutting, piercing, defensive purposes, and those whose purpose was symbolic. Weapons that strike, cut, and pierce were also used as tools to butcher animals, grind flour, and till land.

STRIKING TOOLS

Among the striking tools and weapons were clubs of various shapes, sizes, and materials. Many different culture groups made what archeologists refer to as monolithic clubs, that is, clubs entirely crafted from stone—usually flint or jasper. Some of these stone clubs were very beautifully crafted, leading to speculation that they were intended primarily for ceremonial use. Large numbers of these stone clubs have been unearthed in the southeastern United States and on the northwest coast.

Found throughout the Americas are clubs with stone heads and wooden handles. The stone heads were made of flint or chert (a gray or brown sedimentary rock) and were generally round or oblong. There were two primary methods of attaching the stone heads to wooden shafts. Sometimes the top parts of the shafts were shaved thin and wrapped around the stones, into which grooves had been carved. The shafts were then fastened to the head with rawhide strips. Alternatively, the shafts could be inserted into holes cut into the stone and fastened with rawhide.

Many clubs were made entirely of wood. Some were rough-hewn balls attached to sticks; others were beautifully carved, with the club heads set at various angles to the shaft. Clubs reserved for

ANCIENT WEAPONS

Clovis Points

Clovis points are the earliest arrow or spearheads discovered in North America, made from 9,000 to 15,000 years ago and named after the New Mexican city where they were found. These distinctive projectile heads were made by the first people known to live in North America, also referred to as Clovis.

The earliest examples of Clovis points were discovered in the southeastern portions of the United States, but specimens have been found throughout the continent. Clovis points are usually about three inches long (7.6 cm), but range in length from one (2.5 cm) to six inches (15.2 cm). They are auriculated, which means that they have earlike projections from the base, and fluted, which refers to a method of removing flakes of stone from the projectile in long narrow channels. Clovis points are the only projectiles found in America with fluting. The widest part of the blade is about a third of the way up. Clovis points were made primarily of chert, flint, chalcedony, and jasper.

The Clovis point was hafted, or attached to a short wooden spear. At the point where the hafting occurred, the point was ground down so that the tip of the shaft fit into the indentation. The haft was then secured to the projectile with hide or sinew.

ANCIENT WEAPONS

The Self-Bow

No one knows when the bow and arrow was first used, but many archeologists believe that it was a relatively late invention, first used in the Americas in about 1000 C.E. There were two kinds of bow prior to the seventeenth century C.E. One was the self-bow, made of a single piece of highly elastic wood, often hickory. (In this context, "self" refers to the fact that the bow is made of a single piece of wood.) East of the Mississippi River, this was the only kind of bow that was made. These bows might be as long as six feet (1.8 m). The reinforced bow was smaller, about 45 inches long (114 cm), and covered with a sheet of sinew (animal tendons); the sinew rather than the wood ensured the elasticity of the bow.

Despite the simplicity of its construction, the self-bow was a deadly weapon in the hands of an experienced archer. Europeans discovered that arrows fired by a self-bow could penetrate even steel plate armor. Although Native Americans eventually adopted firearms as their weapons of choice, the bow and arrow remained in widespread use until the late nineteenth century C.E.

ceremonial use might be carved and decorated to look like animals or beaked birds. Some clubs were shaped like gun stocks, flattened, slightly angled, and wider at one end than the other. Others resembled mallets. Some clubs had knife blades inset on one or both sides of the club head.

Probably the best-known Native American striking weapon is the tomahawk. The word *tomahawk* comes from the Algonquian *tamahak* ("cutting instrument") and is used to describe a hatchet-like tool. Original tomahawks were made of stone and wood, but after European contact, the heads were made of metal. Tomahawks were used for cutting and chopping, in warfare, and for rituals and ceremonies, as a symbol of leadership.

Many Native American groups smoked tobacco and crafted a variety of pipes to do so. Some tomahawks, in fact, were made into pipes, with a blade at one end and a bowl at the other. These pipe-tomahawks often served as gifts to seal alliances. Other styles of pipes, including **effigy** pipes carved into animal shapes, were made from stone, ceramics, and wood or antlers. Peace pipes of the Sioux and other Plains tribes were made from a hollowed-out wooden stem attached to a clay bowl. Peace pipes are ceremonial pipes that were often smoked by former enemies who had settled their disagreements.

CUTTING TOOLS

Cutting tools and weapons made by ancient Native Americans included scrapers, saws, and knives that were used for tasks including butchering meat, preparing hides, felling trees, and carving wood. Cutting weapons were fashioned using a method

These spears were made by people of the Anasazi culture, which flourished from C.E. 700 to 1200 in the American Southwest and then disappeared. The spearheads were knapped from stone, then attached to the wooden hafts with sinew or strips of rawhide. (Werner Forman/Art Resource, NY)

known as flaking or flint knapping, in which a stone tool was used to flake off pieces of flint, chert, or obsidian in order to make razor-sharp edges on one or both sides of an oblong piece of stone. After the arrival of Europeans, Native Americans made knives and scrapers from various metals. They also made sheathes for knives of elaborately beaded animal hides.

Piercing tools included lances, long wooden shafts with stone tips, and arrows, smaller wooden shafts tipped with arrowheads—perhaps the most prevalent **artifact** in America, still found today in many parts of the country. Lances and arrows were used for both hunting and warfare. During combat, Native Americans, tended not to throw the lance, but to stab an opponent with it.

Native Americans also invented various tools to help them throw projectiles farther, including blow tubes, slings, and the *atlatl,* a long piece of wood that was grooved to hold a spear called a dart. The atlatl helped to propel the spear farther than it could have gone without assistance.

DEFENSIVE WEAPONS

Defensive weapons included shields and various forms of body armor. Eskimos made body armor from bone and ivory; other groups, from the Navajo to the Mohawk, used the hides of various animals to protect warriors in battle. Shields were both rectangular and round and crafted of hides, basketry, wood, or bark. Tribes such as the Coeur d'Alène, in the area of present-day Idaho, made five-foot-long shields from elk hides, which they decorated with elaborately painted designs.

See also: Archeological Discoveries; Aztec Civilization; Technology and Inventions.

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Totems

Totems are animals, plants, or other objects—or representations of animals, plants, or objects—that serve, among traditional people, as the symbol of a family or clan and may be revered as an ancestor to the clan. Ancient Native American tribes of the Northeast built huge poles, often made of single trees, elaborately carved with totems, or representations of animals sacred to them. These totem poles served as visible representations of their family histories.

Tribal groups, especially those that practice **animistic** religions, have totems, animals whose spirits are believed to be connected with an individual or clan. Many Native American initiation ceremonies, called "vision quests," involve a young person seeking to discover his or her own totem. A young man, for example, may dream over and over of a bear, encounter a bear in the woods, and, thus, proclaim the bear as his totem. Native Americans do not believe that they choose their totems; rather, they believe the totems choose them.

The word *totem* comes from the Algonkquian word *ototeman,* which indicates a blood relationship between brothers and sisters who have the same mother. Peter Jones, a Methodist missionary and Ojibwa chief, who published the first accurate report about totems in the mid-nineteenth century C.E., wrote that the Great Spirit gave totems to each clan to remind the members that they are related to one another and may not intermarry. The idea of a totem as the guardian spirit of an individual in animal form is a mistaken interpretation

This detail from a Haida totem pole highlights many of the characteristics of Haida style—intricate carving, elaborate design, and flowing lines. Haida poles were typically painted red, black, and turquoise, as in this example. (Stuart Dee/Photographer's Choice/Getty Images)

introduced by Europeans in the late eighteenth century C.E.

Unquestionably, the most famous totems are the totem poles carved by Native Americans of the Pacific Northwest. These poles are found wherever the giant red cedar trees grow, from southeast Alaska, through British Columbia, south to the Olympic Peninsula of Washington state. The most skilled and famous of the totem pole makers are the Haida people.

Although the tradition of totem pole carving is ancient, there are no ancient examples in existence because most poles last fewer than 100 years. Moreover, Native Americans generally do not make any attempt to preserve or repair the poles but allow them to be subject to the forces of nature. As all other living things die, so do totem poles. The red cedar from which the poles were carved was a particularly good wood for longevity because it has a natural water and disease resistance. Left untreated, it eventually rots.

Early European settlers believed that Native Americans "worshipped" the poles, which led Christian missionaries to preach against them and to destroy many. However, totem poles were never worshipped. Actually, they had many uses and meanings. Totem poles have been described as being like family crests, three-dimensional family albums, and "billboards" for families, which allow them to show off their wealth.

The animal and human figures carved into the poles were the totems of a family and its individual members. Creatures often found on totem poles include Raven, Bear, Eagle, Killer Whale, Beaver, and Thunderbird, and their designs are somewhat standardized from area to area. The Bear always sticks out his tongue, for example, and the Beaver has very large teeth and carries a stick.

The carving of totem poles is still practiced today by artisans in the Northeast. The work of many of these traditional artists can be viewed on the Internet.

See also: Art and Architecture; Myths and Legends; Potlatch.

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Vinland

The name given by Viking explorers to a land mass west of Greenland that, according to Norse sagas, marked the earliest European settlement of North America. Although modern excavations have located evidence of early Viking habitation in eastern Canada, the precise location of the place known as Vinland remains uncertain.

Scholars believe that the first Norseman to see the North American coast was the merchant Bjarni Herjólfsson who was blown off course on a trip from Greenland to Iceland in C.E. 985 or 986.

GREAT LIVES

Leif Eriksson

Although it was believed for many years that Christopher Columbus was the first European to discover the Americas, it now seems clear that the Viking Leif Eriksson, son of Erik the Red, arrived in Newfoundland 500 years before Columbus arrived in the Bahamas.

Eriksson was born in Iceland in about C.E. 960. When he was 12 years old, his father was banished as punishment for murder. Having heard rumors of lands to the West, Erik set sail with his entire family and a group of colonists. Within a few days, the ship arrived on the shores of a large island, which Erik named Greenland. It was here that Eriksson grew up.

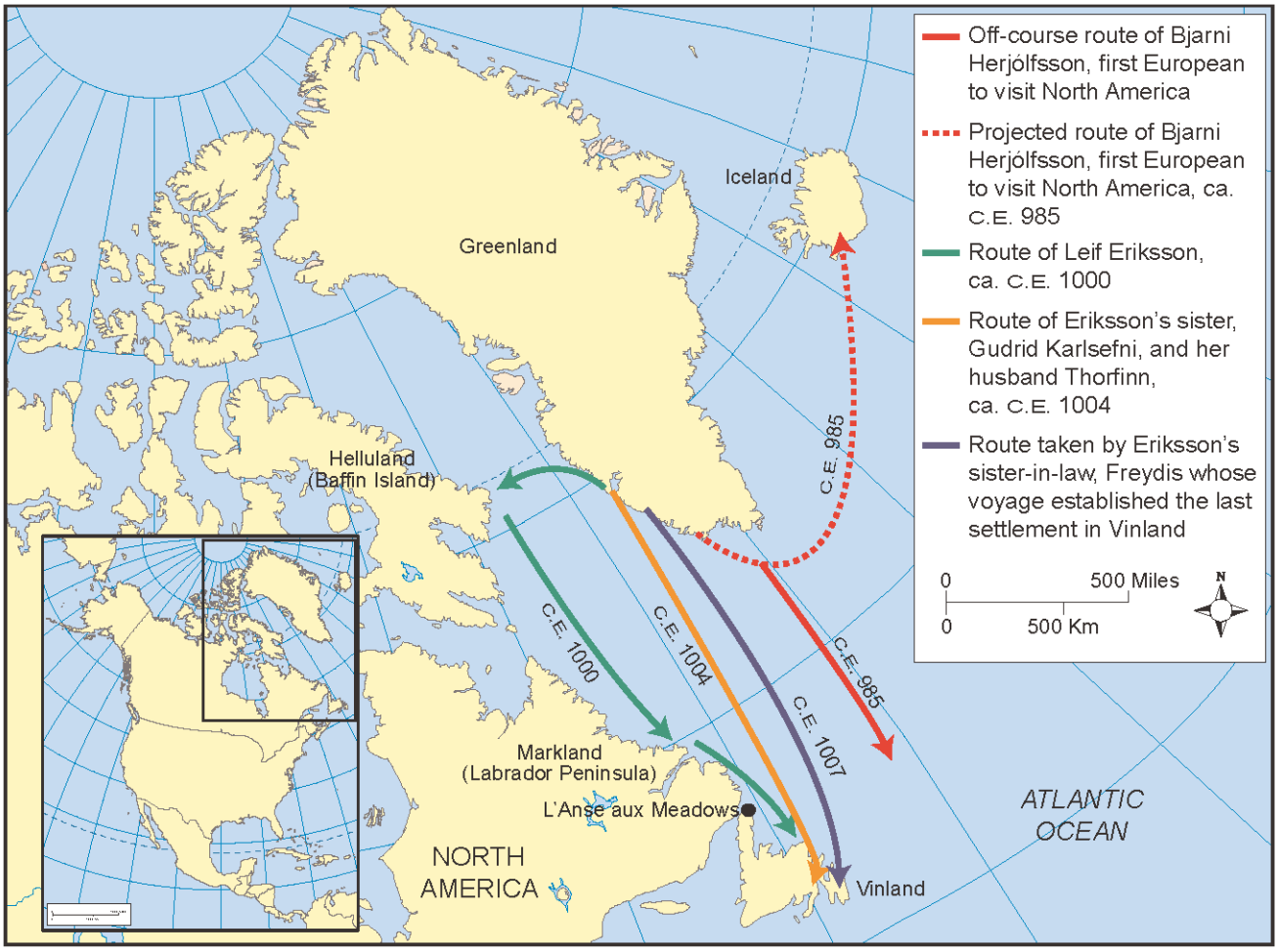
At the age of 24, Eriksson sailed to Norway as the captain of a crew of 14 men. While in Norway, he met with King Olav I, who liked the young man and invited him to stay at his court. During the year he spent in Norway, Eriksson converted to Christianity. When he returned to Greenland, he brought a priest with him to help spread Christianity there.

Restless, Eriksson decided to set sail again in about C.E. 1000, having heard stories of lands yet farther west from a merchant, Bjarni Herjólfsson. Eriksson and his crew of 35 sailed north up the coast of Greenland and then 600 miles west to the new land. Erikisson called this new place Vinland and returned to Greenland laden with timber and grapes.

This was to be Eriksson's last voyage. After his father's death in about C.E. 1001, Eriksson had to take over his father's duties as head of the Greenland colonies. Eriksson died in about C.E. 1025.

VINLAND, CA. 1000 B.C.E.

Although no one really knows the exact locations of the places described by Viking explorer Leif Eriksson and later related in the Norse Sagas, many archeologists believe that Eriksson landed first on Baffin Island and that Vinland was Newfoundland. Evidence of Norse settlement has been found in L'Anse aux Meadows in that province, making it the first European settlement of North America. This map also shows the various routes taken by the Viking explorers of the New World.



Herjólfsson, who never landed, told his story to Leif Eriksson, who set out to explore the new land in about C.E. 1000. Eriksson named three sites in North America: *Helluland* ("flatstone land"), most likely Baffin Island, the largest island in the Canadian Arctic; *Markland* ("woodland"), believed to be the Labrador Peninsula; and *Vinland* ("wine land"), generally believed to be Newfoundland. Eriksson returned to Greenland from his first trip to Vinland carrying grapes and logs, a scarce commodity in treeless Greenland.

Over the next 10 years, Viking sailors from Greenland made at least three more voyages to North America. Eriksson's brother Thorvald and his cohorts lived in Vinland for about two years and were the first Europeans to encounter Native Americans, whom the Vikings called Skraelings. In fact, Thorvald was killed during an encounter with natives. Eriksson's sister-in-law Gudrid and her husband Thorfinn Karlsefni also settled in Vinland, but were also driven away by hostile encounters with the natives. The final attempt at Viking settlement of

Vinland ended in the murder of all of the colonists at the hands of Eriksson's sister-in-law, Freydis, and her husband, Thorvard.

In the early C.E. 1960s, explorer Helge Ingstad and his wife Anne Stine, an **archeologist**, excavated a Viking site in Newfoundland called "L'Anse aux Meadows (Méduses)," which means "Jellyfish Cove" in French. Although it is clear that there was a Norse settlement at L'Anse aux Meadows, it is not at all clear that this is the land Eriksson called Vinland. Some historians argue that Eriksson was explicit in his description of a land where grapes were plentiful, and they note that grapes never grew in Newfoundland. Thus, the exact location of Vinland is still unknown. Many believe that Vinland was located in present-day Massachusetts, perhaps near Cape Cod.

There is one **artifact** of Norse settlement in North America that has created great controversy: A map of Vinland, supposedly drawn in the fifteenth century C.E. and first published by Yale University in 1965. Dating of the map is crucial because, if it is as old as some believe, it may even have been known to Columbus *before* his voyage to the New World. The current verdict of most scientists who have studied the map is that it is a forgery, but others contend that further study is still warranted.

See also: L'Anse aux Meadows.

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Weapons

See Tools and Weapons.

Woolly Mammoth

See Mammoths.

Writing

See Language and Writing.

Glossary

The following words and terms, including those in "The Historian's Tools," also appear in context in boldface type throughout this volume.

The Historian's Tools

These terms and concepts are commonly used or referred to by historians and other researchers and writers to analyze the past.

cause-and-effect relationships A paradigm for understanding historical events where one result or condition is the direct consequence of a preceding event or condition

chronological thinking Developing a clear sense of historical time—past, present, and future

cultural history See history, cultural

economic history See history, economic

era A period of time usually marked by a characteristic circumstance or event

historical inquiry A methodical approach to historical understanding that involves asking a question, gathering information, exploring hypotheses, and establishing conclusions

historical interpretations/analysis An approach to studying history that involves applying a set of questions to a set of data in order to understand how things change over time

historical research An investigation into an era or event using primary sources (records made during the period in question) and secondary sources (information gathered after the period in question)

historical understanding Knowledge of a moment, person, event, or pattern in history that links that information to a larger context

history of science and technology Study of the evolution of scientific discoveries and technological advancements

history, cultural An analysis of history in terms of a people's culture, or way of life, including investigating patterns of human work and thought

history, economic An analysis of history in terms of the production, distribution, and consumption of goods

history, political An analysis of history in terms of the methods used to govern a group of people

history, social An analysis of history in terms of the personal relationships between people and groups

patterns of continuity and change A paradigm for understanding historical events in terms of institutions, culture, or other social behavior that either remain consistent or show marked differences over time

periodization Dividing history into distinct eras

political history See history, political

radio-carbon dating A test for determining the approximate age of an object or artifact by measuring the number of carbon 14 atoms in that object

social history See history, social

Key Terms Found in A to Z Entries

agglutinative Referring to a language in which linguistic elements are combined to form words

animistic General belief that everything, including inanimate objects, possesses a soul or a spirit

archeologist A scientist who studies prehistoric people and their culture

aristocratic Belonging or referring to a hereditary ruling class, whose wealth is generally based on land and whose power is passed from one generation to another

artifact In archeology, any material object made by humans, especially a tool, weapon, or ornament

artisan A skilled craftsperson who practices a trade, making objects by hand or with hand tools

caucasoid A term used to describe the race of humans from Europe, North Africa, and the Middle East

codex (pl. codices) An ancient manuscript

culture groups A term used to describe native North American groups that did not live in a defined territory but shared certain values, practices, and beliefs as opposed to groups that lived in defined territories and possessed sophisticated social organizations, such as the Aztec of Mesoamerica

effigy A small sculpture of a person or animal

egalitarian Characterized by social equality

equinox Literally "equal night"; an astronomical term referring to the two days each year in which daylight and darkness are approximately equal; usually March 21 (spring equinox) and September 21 (autumnal equinox)

frieze A long band of painted or sculpted decoration on a wall usually above eye level or near the top of the structure

geochronologist Someone who studies how to measure geological time, a scale used by geologists and other scientists to measure the relationships among events that have occurred in the history of the earth

glyph A pictorial symbol that represents a specific word or a sound in a written language, often incised or engraved into a surface

hierarchical Describing an organization, especially of persons, that ranks people by authority or importance; societies that are hierarchical have distinct social classes, some of which are considered superior to others

hieroglyph Picture or symbol representing a word, syllable, or sound; refers primarily to Egyptian writing but is also used to refer to the Mayan and Aztec writing systems

matrilineal A social system in which descent is traced through the mother's line

megafauna Very large species of animals that are now extinct, for example, mammoths, mastodons, 2,000-pound giant armadillos, 300-pound beavers, bison, saber-toothed tigers, and 1,500-pound short-faced bears

Mesoamerica A region extending from central Mexico to Costa Rica that was home to several great pre-Coluombian civilizations

microlithic "Small stone"; refers to small tools made by early humans

mitochondrial DNA A form of DNA found outside the nucleus of the cell; mitochondrial DNA does not

change much from parent to offspring and can be used by scientists to trace relationships back hundreds of generations

monogamy The practice of taking a single spouse

monograph A scholarly paper, usually on a single subject

morpheme The smallest unit of language that carries meaning

pantheistic The belief that "God is all, and all is God"; that the universe is identical with God

petroglyph An image carved or painted on rock

polygamy The practice of taking more than one spouse

polysynthetic A term used to describe a language in which elements are strung together to form single words that function as sentences do in English; such languages have very long words

polytheistic Praying to a number of deities, often representations of natural forces, such as the rain or the wind

relief When referring to a sculpture on a flat background in which the figures project partially from the background

shaman Sometimes referred to as a "medicine man"; someone who acts as a link between the material and spiritual world

solstice An astronomical term referring to days when the earth is at the nearest and farthest distance from the sun; the summer solstice is usually June 21 and the winter solstice is December 21

stratified Characterized by division into different orders or levels

tribute A payment from one nation or group to another, usually to acknowledge submission

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