

## ASSIGNMENT 3

### Digging Up and Analyzing the Past

**A**ssignment 3 is the last devoted to the method and theory of archaeology. We discuss the basic principles of archaeological excavations, of uncovering and recording archaeological data in the ground. Back in the laboratory, we learn how to analyze artifacts, then discuss some of the fundamental theories of world prehistory. By the end of this assignment, we are confident that you will have sufficient archaeological grounding to embark on a journey through the intricacies of human prehistory.



#### WHAT LIES AHEAD

##### Assignment Objectives

After completing Assignment 3 you will be able to:

1. Describe and evaluate the uses and limitations of two main forms of archaeological excavation, and be able to evaluate them against the problems of excavating three types of archaeological sites.
2. Describe three methods of artifact analysis, their uses and limitations.
3. Describe and evaluate four ways in which archaeologists study ancient human remains and diet, and discuss their uses and limitations.
4. Discuss the uses and limitations of culture history and describe major mechanisms of culture change.
5. Discuss the major theories of world prehistory described in this assignment.



#### Work Required

Assignment 3 requires you to:

- Write a *one-page* synthesis essay on the fundamental methods used to analyze food remains in the archaeological record, as defined at the end of the “Artifact Analysis” section of the Assignment.
- Respond in the Study Guide to the (short) questions, where indicated.

**WARNING: you should be starting on the First Essay/Statement for the course, due at the end of Assignment 4.**



## LECTURE 1: ARCHAEOLOGICAL EXCAVATION

This week lecture explores archaeological excavation, for this is the most fundamental of all archaeological methods. The lecture discusses:

- The basic principles of archaeological excavation, the uses and limitations of different approaches.
- The excavation of various sites, large and small, excavation strategies, and the problems which the excavators confronted.

You should have a notebook handy during the lecture.



*The Videoclip on the Web introduces the subject matter of Assignment 3. You might care to view this now ... Then read on here ...*



## LECTURE 2: ARTIFACTS ANALYSIS

At intervals in this course, you encounter artifacts of various forms and differing complexity. How does an archaeologist analyze and classify artifacts? This lecture examines some of the basic problems of classification and typology, as well as touching on the issue of ethnographic analogy. We also discuss some of the complexities of ancient technology, with special reference to stone tools in early hominid sites.



## ARCHAEOLOGICAL EXCAVATION

For all its seeming romance, archaeological excavation is a highly precise science. It is said that a successful excavation should be such a complete record that the excavator can reconstruct the site down to the inch using the excavation notebooks. Of course, this is an exaggeration, but archaeologists never forget that all excavation is destruction of the finite records of the past.

Our readings on excavation are in two parts:



***Archaeology: A Brief Introduction.*** Read Chapter 8 in its entirety.

This reading describes the basics of excavation and some of the many sites archaeologists investigate.

Amplify this reading with Sir Mortimer Wheeler's classic essay on a Roman attack of A.D. 43, which shows how archaeological evidence can be used to paint a portrait of the past.



***Anthology Section: "The Siege of Maiden Castle."***



## ANALYSIS OF ARTIFACTS AND FOOD REMAINS

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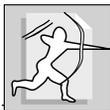
Given that this course is mainly concerned with major developments in human prehistory, there is little point in delving deeply into artifact analysis and the study of food remains, except for a general understanding on your part of the basic terms, methods, and principles involved.

The basics are summarized conveniently for you in:



***Archaeology: A Brief Introduction.*** Read Chapters 9 and 10 in their entirety.

When you have finished, read on:



## INTERPRETING THE PAST: CULTURE HISTORY AND MECHANISMS OF CULTURE CHANGE

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We end our discussion of method and theory with a survey of the ways in which archaeologists interpret human prehistory. This requires more reading, so settle in for a fairly long reading session on interpreting culture history.

First, the mechanisms of culture change . . .



***Archaeology: A Brief Introduction.*** Read Chapter 13, pp. 242–246.

The mechanisms of culture change are vitally important and you need to understand them. Please write *one-sentence* definitions of each in the spaces provided below. Don't just copy from the readings. Make sure you truly understand what you are writing down.



CULTURE HISTORY:

INVENTION:

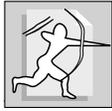
DIFFUSION:

MIGRATION:

## Cultural Process

Now, attempts to explain the past, the processes by which ancient cultures changed:

*Archaeology: A Brief Introduction.* Read pp. 68–75.



## AN OUTLINE OF WORLD PREHISTORY

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Starting with Assignment 4, we begin our journey through human prehistory, from our origins over 2.5 million years ago. To prepare you for this journey, we have prepared a summary of the major developments of prehistory, which you should now read, as your final reading for Assignment 3. This provides you with a background overview of what lies ahead. Please read:



**Anthology Section:** “*World Prehistory: A Summary.*”

Once you have finished this reading, you have completed Assignment 3.

### WARNING!



A gentle reminder that you should be working on your first Essay/Statement, due at the end of next week (Assignment 4). The topic was handed out by your TA and is also on the Web Page.

E N D O F A S S I G N M E N T 3

## ASSIGNMENT 3: ANTHOLOGY

### 1. THE SIEGE OF MAIDEN CASTLE, ENGLAND. BY MORTIMER WHEELER.

Sir Mortimer Wheeler was one of the great excavators of the twentieth century. Colorful, military-like in his organization and attitude to excavation, he refined Pitt-Rivers' methods to a high pitch in the 1920s and 1930s. He excavated mostly Roman sites, with the dig at the great Iron Age hillfort at Maiden Castle in southern England being the climax of his British work. Maiden Castle was attacked and invested by a Roman legion in A.D. 43. Here is Wheeler's brilliant reconstruction of this long-forgotten event.

#### *THE EARLY ROMAN PERIOD (C. A.D. 43-70)*

And so we reach the Roman invasion of A. D. 43. That part of the army of conquest wherewith we are concerned in Dorset had as its nucleus the Second Augustan Legion, whose commander, at any rate in the earlier campaigns, was the future Emperor Vespasian. Precisely how soon the invaders reached Maiden Castle can only be guessed, but by A. D. 47 the Roman arms had reached the Severn, and Dorset must already have been overrun. Suetonius affirms that Vespasian reduced "two very formidable tribes and over twenty towns (oppida), together with the Isle of Wight," and it cannot be doubted that, whether or no the Durotriges (as is likely enough) were one of the tribes in question, the conquest of the Wessex hill-fort system is implied in the general statement. Nor is it improbable that, with the hints provided by the mention of the Isle of Wight and by the archaeological evidence for the subsequent presence of the Second Legion near Seaton in eastern Devon, a main line of advance lay through Dorset roughly along the route subsequently followed by the Roman road to Exeter. From that road today the traveller regards the terraced ramparts of the western entrance of Maiden Castle; and it requires no great effort of the imagination to conjure up the ghost of Vespasian himself, here confronted with the greatest of his "twenty towns." Indeed, something less than imagination is now required to reconstruct the main sequence of events at the storming of Maiden Castle, for the excavation of the eastern entrance has yielded tangible evidence of it. With only a little amplification it may be reconstructed as follows.

Approaching from the direction of the Isle of Wight, Vespasian's legion may be supposed to have crossed the River Frome at the only easy crossing hereabouts—where Roman and modern Dorchester were subsequently to come into being. Before the advancing troops, some 2 miles away, the sevenfold ramparts of the western gates of Dunium towered above the cornfields which probably swept, like their modern successors, up to the fringe of the defenses. Whether any sort of assault was attempted upon these gates we do not at present know; their excessive strength makes it more likely that, leaving a guard upon them, Vespasian moved his main attack to the somewhat less formidable eastern end. What happened there is plain

to read. First, the regiment of artillery, which normally accompanied a legion on campaign, was ordered into action, and put down a barrage of iron-shod ballista-arrows over the eastern part of the site. Following this barrage, the infantry advanced up the slope, cutting its way from rampart to rampart, tower to tower. In the innermost bay of the entrance, close outside the actual gates, a number of huts had recently been built; these were now set alight, and under the rising clouds of smoke the gates were stormed and the position carried. But resistance had been obstinate and the fury of the attackers was roused. For a space, confusion and massacre dominated the scene. Men and women, young and old, were savagely cut down, before the legionaries were called to heel and the work of systematic destruction began. That work included the uprooting of some at least of the timbers which revetted the fighting-platform on the summit of the main rampart; but above all it consisted of the demolition of the gates and the overthrow of the high stone walls which flanked the two portals. The walls were now reduced to the lowly and ruinous state in which they were discovered by the excavator nearly nineteen centuries later.

That night, when the fires of the legion shone out (we may imagine) in orderly lines across the valley, the survivors crept forth from their broken stronghold and, in the darkness, buried their dead as nearly as might be outside their tumbled gates, in that place where the ashes of their burned huts lay warm and thick upon the ground. The task was carried out anxiously and hastily and without order, but, even so, from few graves were omitted those tributes of food and drink which were the proper and traditional perquisites of the dead. At daylight on the morrow, the legion moved westward to fresh conquest, doubtless taking with it the usual levy of hostages from the vanquished.

Thereafter, salving what they could of their crops and herds, the disarmed townsfolk made shift to put their house in order. Forbidden to refortify their gates, they built new roadways across the sprawling ruins, between gateless ramparts that were already fast assuming the blunted profiles that are theirs today. And so, for some two decades, a demilitarized Maiden Castle retained its inhabitants, or at least a nucleus of them. Just so long did it take the Roman authorities to adjust the old order to the new, to prepare new towns for old. And then finally, on some day towards the close of the sixties of the century, the town was ceremonially abandoned, its remaining walls were formally "slighted," and Maiden Castle lapsed into the landscape among the farm-lands of Roman Dorchester.

So much for the story; now for its basis. First, scattered over the eastern end of Maiden Castle, mostly in and about the eastern entrance and always at the same Romano-Belgic level, were found upwards of a dozen iron arrowheads of two types: a type with a pyramidal point, and the simple flat-bladed type with turn-over socket. Arrowheads occurred at no other Iron Age level, but both types are common on Roman military sites where ballistae but not hand-bows are to be inferred. There, then, in the relatively small area uncovered, are the vestiges of the bombardment.

Secondly, the half-moon bay which represents the Iron Age B adaptation of the Iron Age A barbican, close outside the portals of the eastern entrance, was covered with a thick layer of ash associated with the postholes of three or more circular or roundish huts. In and immediately below this ash were quantities of late Belgic or “Belgicizing” pottery. In the surface of the ash was similar pottery with scraps of pre-Flavian Samian. There are the burned Belgic huts, covered by the trodden vestiges of the continued post-conquest occupation for which more tangible evidence will be offered shortly.

Thirdly, into this ash a series of graves had been roughly cut, with no regularity either of outline or of orientation, and into them had been thrown, in all manner of attitudes — crouched, extended, on the back, on the side, on the face, even sitting up — thirty-eight skeletons of men and women, young and old; sometimes two persons were huddled together in the same grave. In ten cases extensive cuts were present on the skull, some on the top, some on the front, some on the back. In another case, one of the arrowheads already described was found actually embedded in the vertebra, having entered the body from the front below the heart. The victim had been finished off with a cut on the head. Yet another skull had been pierced by an implement of square section, probably a ballista bolt. The last two and some of the sword-cuts were doubtless battle wounds; but one skull, which had received no less than nine savage cuts, suggests the fury of massacre rather than the tumult of battle — a man does not stay to kill his enemy eight or nine times in the melee; and the neck of another skeleton had been dislocated, probably by hanging. Nevertheless, the dead had been buried by their friends, for most of them were accompanied by bowls or, in one case, a mug for the traditional food and drink. More notable, in two cases the dead held joints of lamb in their hands — joints chosen carefully as young and succulent. Many of the dead still wore their gear: armlets of iron or shale, an iron finger-ring, and in three cases bronze toe-rings, representing a custom not previously, it seems, observed in prehistoric Britain but reminiscent of the Moslem habit of wearing toe-rings as ornaments or as preventives or cures of disease. One man lay in a double grave with an iron battle-axe, a knife and, strangely, a bronze ear-pick across his chest. The whole war cemetery as it lay exposed before us was eloquent of mingled piety and distraction; of weariness, of dread, of darkness, but yet not of complete forgetfulness.

The date of the cemetery was indicated by a variety of evidence. Most obvious is the Roman arrowhead embedded in the vertebra, but other associated relics point to the same conclusion. The seventeen pots put into the graves at the time of burial are all of that Wessex “Romano-Belgic overlap” class which has long been recognized at Jordan Hill, Weymouth, and elsewhere. The gear with one of the skeletons included, as has been remarked above, a Roman ear-scoop, the use of which may or may not have been understood more clearly by its Belgic possessor than by the modern antiquary; at least it implies Roman contacts which, in Wessex, appear not

long to have anticipated the Roman Conquest. One grave, moreover, contained a late British coin, and though it was impossible to say safely whether the coin was inserted at the interment or was incorporated in the loose ash into which the grave was cut, at least it was dropped within a very short time of the event. And finally, the materials included in the strata which "bracket" the cemetery are themselves, as noted above, sufficient to indicate a date at the end of the pre-Conquest period.

There, then, is the climax of the more human side of the story of conquest. But on the structural side the evidence for that event and for its sequel is no less vivid. On the topmost Belgic road-metal, in both portals of the eastern entrance but particularly in the southern, excavation revealed the tumbled stones from the massive walls that had formerly flanked the entrances. Here and there the fallen stones lay overlapping, like a collapsed pack of cards, in the sequence in which they had formerly stood as a vertical wall. With them was no cascade of rampart-earth such as might have implied a fall through subsidence, even could one presuppose the coincidence of the simultaneous fall of every part of the structure; the walls had been deliberately pulled down and no attempt had been made to replace them. But that was not all. Over the debris in each portal a new road had been built, metalled like the Belgic roads now buried beneath them. The new roads partially covered the surviving bases of the flanking walls, showing that the condition of these today is identical with their condition at the time of the road-building and confirming the permanence of the structural ruin. No provision of any kind was made in the new scheme for a gate; not a single post-hole was associated with the new road, and indeed the mutilated rampart-ends would have provided a poor setting for a fixed barrier. The implications of all this are evident. The entrance had been systematically "slighted" and its military value reduced permanently to a minimum; but traffic through it did not cease, no interval occurred in the continuity of the occupation.

The picture is now complete in outline. Disarmed at the Roman Conquest, Maiden Castle remained in use for about a quarter of a century after the invasion, a pre-Roman city still in all essentials, partaking only a little of the cultural equipment of its conquerors. The picture is a reasonable and convincing one. The first generation of Roman rule was preoccupied with the subjugation of the difficult hill-countries of the north and west, with the development of mining areas, the planning of arterial roads, the founding or development of those few towns which had an immediate military or commercial function. Dorset offered, it is true, iron ore on a modest scale; but between Sussex and the Mendips there was little mineral wealth to attract the Roman prospector in the first flush of conquest. Wessex could wait. There was no urgent need to upset the traditional economic basis of the urbanized peasantry which crowded the downlands. To do so would have been to court added political difficulties at a time when difficulties were already manifold. It was better that, under surveillance, the Wessex farmers should for a time (and doubtless in return for the periodical payment of just or unjust dues) be allowed to maintain

themselves in the fashion which they knew. The removal or, alternatively, the ennoblement of their rulers would rob them of independent leadership. A few police-patrols would do the rest.

(Extract from Mortimer Wheeler, *Maiden Castle*, Society of Antiquaries of London, 1943. Reprinted with permission of the Society of Antiquaries of London).

## 2. WHAT HAPPENED IN PREHISTORY

### *HUMAN ORIGINS AND EARLY PREHISTORY*

In 1871, Charles Darwin, the Victorian biologist who is the father of modern evolutionary theory, hypothesized that humanity originated in Africa. He based his argument on the great diversity of ape forms south of the Sahara Desert and on the close anatomical relationships between humans and such living primates as the chimpanzee. A century and a quarter later, we know that Darwin was correct and that humanity did indeed evolve in tropical Africa.

Staggering advances in multidisciplinary research have changed our perceptions of human origins dramatically since 1959, when Louis and Mary Leakey announced the discovery of a robustly built hominid at Olduvai Gorge in Tanzania, East Africa. At the time, the entire span of the human past was thought to encompass a mere quarter of a million years. Soon the hominid-bearing levels at Olduvai were potassium-dated to over 1.75 million years ago. Today, we know the first toolmaking humans appeared in East Africa at least 2.5 million years ago, while earlier hominid ancestors flourished on the savanna woodlands of the region as early as 4 million years before present.

The critical behavioral changes that separated humans from nonhuman primates developed over several million years, among them a shift to bipedal (two-footed) posture, significant increases in brain size and communication skills, and the appearance of hands capable of making and manipulating simple tools. These changes took place during a period of gradual global cooling, which culminated in the dramatic climatic shifts of the Ice Age. By 3 million years ago, a wide variety of hominids inhabited tropical Africa, among them the direct ancestors of the first human beings. The very first humanly manufactured artifacts came into use about 2.5 million years ago; they were little more than sharp-edged flakes knocked from lava cobbles and used for butchering animals and other tasks. We know little of the behavior of these earliest humans, although laboratory studies of broken animal bones strongly suggest that they scavenged much of their meat from predator kills. At the same time, they relied heavily on wild plant foods, as have most hunter-gatherers ever since.

The earliest hominids flourished and evolved in sub-Saharan Africa. At the time, the rest of the world was still uninhabited. Around 2 million years ago, more-

advanced humans with larger brains and more humanlike limbs evolved out of earlier hominid populations. About this time, too, humans tamed fire, which became a potent tool for adapting to much cooler environments. This was the moment at which humanity foraged its way across the Sahara Desert and into Asia and then Europe, adapting to a wide variety of tropical and temperate environments. This radiation of archaic humans, grouped, generically, under the label *Homo erectus*, may have taken place about 1.9 million years ago, or somewhat later, as part of a general movement of many mammal forms out of Africa into other parts of the world.

Three-quarters of a million years ago, the human population of the Old World was probably no more than a few tens of thousands of people, living in small family bands in temperate and tropical environments. By this time, the world had entered a seesaw-like pattern of alternating glacial and interglacial periods, oscillating between cooler and warmer conditions in such a way that global climate has been in a state of transition for 75 percent of the past 730,000 years. Our archaic ancestors adapted successfully to these dramatic long- and shorter-term shifts with brilliant opportunism. By 400,000 years ago, European hunters at Schoningen, Germany, were using long wooden spears to pursue even large and formidable game, while a simple and highly effective stone technology based on choppers and axes evolved slowly into much more sophisticated and specialized tool kits.

### ***THE ORIGINS AND SPREAD OF MODERN HUMANS***

Between 750,000 and 200,000 years ago, human biological and cultural evolution continued at a slow pace, as *Homo erectus* evolved gradually into more modern forms, toward ourselves, *Homo sapiens sapiens*. Most famous among these early *Homo sapiens forms* are the Neanderthals of Europe and central and southwestern Asia, who appeared over 200,000 years ago and adapted successfully to the extreme temperatures of the late Ice Age.

A vast anatomical and cultural chasm separates *Homo sapiens sapiens* from its more archaic *Homo sapiens* predecessors. We are the “wise people,” capable of fluent speech and intelligent reasoning, brilliant innovators with the ability to adapt successfully to every extreme environment on earth. Great controversy surrounds our origins, with scientists divided into two broad camps. One school of thought believes that modern humans evolved separately in different parts of the world more-or-less simultaneously. However, most experts, including molecular biologists, think that our direct ancestors evolved out of more archaic human populations in tropical Africa between 150,000 and 200,000 years ago. They base their argument on a scatter of human fossil finds south of the Sahara Desert and on mitochondrial DNA, inherited through the female line, which places our ultimate roots in Africa.

Fully modern humans appeared in Africa well before 100,000 years ago, then foraged their way across the Sahara Desert during a period of increased rainfall that turned much of the desert into semiarid grasslands. By about 90,000 years ago, anatomically modern people were living in southwestern Asia alongside more archaic Neanderthal populations. Soon afterward, the moderns may also have moved into southern, then southeastern Asia: We do not know. But some 40,000 years passed before modern humans spread northward and westward into the colder environments of late Ice Age Europe and Eurasia. But this time, our ancestors had developed much more sophisticated tool kits based on blade technology, which, like the modern-day Swiss Army knife, formed a basis for many more specialized artifacts such as knives, spear points, and chisel-like tools that could be used to cut and shape bone and antler.

Between 40,000 and 15,000 years ago, modern humans settled in every corner of the world. As the Cro-Magnons, they replaced European and Eurasian Neanderthal populations, developing an elaborate tool kit that enabled them to adapt to a highly changeable, often intensely cold environment. These are the people who produced the magnificent cave paintings and engravings of western Europe. By 40,000 years ago, perhaps earlier, small hunter-gatherer populations had crossed open water to New Guinea and Australia. Ten thousand years later, they had settled on the Solomon Islands and other relatively close southwestern Pacific Islands. The settlement of the offshore Pacific Islands did not take place until the development of root agriculture and outrigger canoes took settlers to the offshore islands of Melanesia and Polynesia nearly 30,000 years later.

### ***FIRST SETTLEMENT OF THE AMERICAS***

By 20,000 years ago, human beings had penetrated far into northern latitudes, onto the frigid steppe-tundra of central Asia, to Siberia's Lake Baikal, and perhaps into extreme northeastern Siberia. But the Americas were still virgin continents, joined to Siberia by a low-lying land bridge during the late Ice Age, when sea levels were about 300 feet (91 m) lower than today.

The first settlement of the Americas remains one of the great mysteries of archaeology. Everyone agrees that the ultimate ancestry of the Native Americans lies in northeast Asia, and perhaps China, but there is little agreement as to when or how the first settlers arrived in the New World. There are a few unsubstantiated claims for settlement before 20,000 years ago, perhaps even as early as 40,000 years before present. Unfortunately, none of the sites purported to document such early settlement stand up to close scientific scrutiny. Nor is there evidence for human occupation of the inhospitable reaches of northeastern Siberia before some 15,000 to 18,000 years ago. Most archaeologists believe that the first Americans arrived, either crossing the land bridge or perhaps by canoe along the frigid coastline during the very late Ice Age or immediately thereafter, perhaps as early as 15,000 years ago.

The earliest well-documented human settlement in Alaska dates to just before 9000 B.C., but there are also sites of that age, and even slightly earlier, much further south. No one knows, too, how the first human settlers moved from Alaska into the heart of the Americas. Perhaps they traveled southward along the coastline along now-submerged shores or overland, as the great ice sheets that once mantled northern North America retreated at the end of the Ice Age. We do know, however, that hunter-gatherer populations were scattered throughout the Americas by 10,500 B.C., well adapted to every kind of environment from open plains to tropical rainforest. From these early populations developed the great diversity of later Native American societies that were the direct ancestors of the much more elaborate indigenous societies of later times.

### ***THE ORIGINS OF FOOD PRODUCTION***

Since 15,000 years ago, the endless cycle of global climate change moved into another warming mode. The great ice sheets that had covered northern Europe and North America receded rapidly. World sea levels rose closer to modern levels. Global warming brought major shifts in rainfall patterns and vegetation. Birch and oak forests replaced open plains in Europe. The Sahara again supported dry grassland. Birch forests populated much of Canada. Hundreds of animal species large and small became extinct in the face of global warming, among them the long-haired arctic elephant (the mammoth) and the mastodon. Human societies everywhere adapted to radically different environments, many of them turning to intensive exploitation of small game, fish and sea mammals, and plant foods of every kind. Many groups settled at the boundaries of several ecological zones, or by estuaries, lakes, or sea coasts, where they could exploit diverse food resources and stay in one place for much of the year. In these resource-rich areas, local populations rose considerably and the landscape filled up, to the point when each group had its own territory, and there was sometimes competition for valuable food supplies. By about 10,000 years ago, demographers believe, the Old World was close to the limits of its ability to support growing human forager populations, even in favorable environments.

Post-Ice Age global warming did not proceed steadily, but in stops and starts. The mechanisms that drive long- or short-term climatic change are still a mystery, but they are closely connected to changes in the complex interactions between the atmosphere and the ocean, including the circulation of warm water from the tropics to northern latitudes and the downwelling of salt to the ocean floor in the North Atlantic. Whatever the causes of the change, the past 15,000 years have been marked by some dramatic millennium- and centuries-long climatic shifts, among them the famous "Little Ice Age" which caused regular famines in Europe between A.D. 1300 and 1850. But the most dramatic of these shifts occurred between 11,000 and 10,000 B.C., when the world suddenly returned to near-glacial conditions during the so-called Younger Dryas event (named after a polar shrub).

### ***Early Food Production in the Old World***

The Younger Dryas saw advancing glaciers in northern Europe and North America, while bringing severe drought to southwestern Asia. This drought had catastrophic effects on the sedentary forager populations clustered in the valleys, and elsewhere between Turkey and southern Iraq. Within a few generations, many of these societies turned to the cultivation of wild cereal grasses as a way of supplementing wild plant foods. Only a few generations passed before wild wheat and barley became domesticated crops and agriculture replaced plant foraging as a staple of human existence. At about the same time, some groups also domesticated wild goats and sheep, also pigs, and later cattle. By 8000 B.C., farming societies were widespread throughout southwestern Asia. Agriculture also began in Egypt's Nile Valley at about the same time, but the exact date is still unknown.

The new economies were brilliantly successful and spread rapidly through the eastern Mediterranean world and around the shores of the Euxine Lake (now the Black Sea), which was then a freshwater lake separated from the Mediterranean Sea by a huge natural earthen bank which crossed what is now the Bosphorus between Turkey and Bulgaria. Farmers lived in Greece and southeastern Europe by 6000 B.C. Some five centuries later, the rising Mediterranean burst through the Bosphorus and flooded the Euxine Lake in a natural disaster that unfolded over a few weeks, causing the new Black Sea to become brackish and rise hundreds of feet and displacing the many agricultural societies on its shores. The flooding of the Black Sea must have caused massive disruption and population movements away from the inundated areas, accelerating the spread of farming peoples northwestward into temperate Europe, where agriculture was well established by 5000 to 4500 B.C.

Food production did not develop in one region alone. Rice cultivation developed in southern China, along the Yangtze River, by at least 6500 B.C. and probably earlier, and cereal agriculture in the north by 6000 B.C. As in southwestern Asia, the new economies were a logical response to growing population densities and unpredictable climatic shifts.

In southwestern Asia, south Asia, and China, food production provided the economic foundation for the world's earliest preindustrial civilizations.

### ***Early Farmers in the Americas***

When Europeans arrived in the Americas in the fifteenth century A.D., they marveled at the expertise of Native Americans with cereal and root crops. The native Andeans domesticated hundreds of potato forms, while maize was the staff of life for millions of farmers between tropical South America and Canada's St. Lawrence Valley in northeastern North America.

Despite intensive research, we still know little of the origins of food production in the Americas. Thanks to AMS radiocarbon dating and generations of botanical

research, we know that maize was domesticated from a wild grass named teosinte somewhere in south-central Mexico, at least as early as 3000 B.C., and probably earlier. Maize, as well as other crops such as beans, spread rapidly in various strains—into lowland and highland South America by at least 1000 B.C., and into the southwestern United States by 1500 B.C. The first domestication of the potato took place in the highland Andes at least as early as 2500 B.C., along with other staples, such as quinoa.

Maize agriculture spread widely among North American forager societies that were preadapted to food production by millennia of intensive hunting and gathering, often in densely populated environments such as the river valleys and lakes of the Midwest and southeast. Some of these people were already cultivating native plants such as goosefoot and squashes many centuries before maize and bean agriculture became established among them.

As in the Old World, the new economies spread rapidly from their points of origin. By the time Europeans arrived in the fifteenth century A.D., native Americans were exploiting hundreds of domesticated plants in every environment where agriculture was feasible. In many areas, such as the highland Andes, growing populations tested the limits of maize and other crops by planting them at ever higher altitudes and by breeding cold- and drought-resistant strains. It is no coincidence that many Native American crops are now staples of the modern global economy. At the same time, the native Americans domesticated few animals other than the alpaca, dog, llama, and turkey, for they lacked the potentially domesticable animals that abounded in the Old World.

Only 2,000 years or so after the domestication of plants, Native American societies in Mesoamerica and the Andean region developed much more complex societies, and soon thereafter, the first indigenous New World civilizations.

### ***THE FIRST CIVILIZATIONS IN THE OLD WORLD***

Five thousand years after farming began in southwestern Asia, the first literate, urban civilizations developed almost simultaneously in southern Mesopotamia and along the Nile River. Their roots lay among increasingly complex farming societies which had become increasingly interdependent and centralized. Numerous innovations accompanied the emergence of the first civilizations—intensified agriculture, often relying on irrigation, metallurgy, the sailing ship, and writing among them.

The origins of state-organized societies is one of the most hotly debated issues in archaeology, for we still lack a definitive explanation of how civilization began. The most plausible scenario combines fast-rising population densities and increased competition for economic and political power with environmental changes which included a stabilization of global sea levels at modern levels. The complex economic, political, and social changes to civilization have been likened to a game of ancient

Monopoly that pitted chief against chief in fast-moving diplomatic and economic games where the strongest and most decisive leaders survived. You can see the process along the Nile River, where increasingly large and more powerful riverside states competed with one another over many centuries. Eventually, powerful rulers in Upper (southern) Egypt conquered the states of the fertile delta region in the north and created a unified kingdom in about 3100 B.C. under a pharaoh (king) named Menes. Over the next few centuries, his successors created a powerful religious ideology and royal culture that turned the pharaoh into a divine ruler with supreme powers on earth. Egypt's conservative, yet surprisingly flexible, civilization endured for nearly 3,000 years as a preindustrial society that created the pyramids and nurtured some of the greatest rulers in history.

The route to civilization in Mesopotamia involved similar complex processes of environmental, political, and social change in a lowland environment where powerful cities became a patchwork of small city-states which competed one with another over water rights, trade routes, and land. The Sumerian civilization, a patchwork of competing city-states such as Eridu, Ur, and Uruk, was only rarely unified into a large entity until the third millennium B.C., when the rulers of Ur patched together a civilization that unified, at least nominally, a mosaic of smaller states from the Mediterranean coast to the Persian Gulf. Successive civilizations rose from the disintegration of Sumerian society after 2500 B.C., when Akkadians based in Babylon to the north created a new empire in southern Mesopotamia, followed in turn by the Assyrians of the first millennium B.C.

By this time, the civilizations of the eastern Mediterranean world were linked by increasingly close economic ties, to the point that some scholars have written of this as the first "world economic system," perhaps a somewhat grandiose term for a vast region between India and mainland Greece linked by land and oceangoing trade routes which handled goods and commodities of every kind. By 2600 B.C. Sumerian monarchs boasted of ships from distant Meluhha that docked at their ports. Meluhha was probably the Indus Valley in what is now northwestern Pakistan where the indigenous Harappan civilization developed before 2000 B.C. This was a loosely connected riverine civilization with numerous large towns and several large cities, among them Harappa and Mohenjodaro. Harappa traded regularly with Mesopotamia on such a scale that it had its own script and systems of weights and measures; it disintegrated about 1700 B.C. A few centuries later, the center of gravity of early Indian civilization moved eastward into the Ganges River valley, where the great Mauryan civilization flourished in the first millennium B.C.

The Greek mainland and Aegean islands nurtured their own distinctive civilizations, which developed from many centuries of long-distance trade in olive oil, wine, timber, and other commodities. Crete's Minoan civilization prospered off of far-flung trade routes that linked the Aegean with the eastern Mediterranean and the Nile Valley. Egyptian inscriptions and paintings show Minoan traders at the pharaoh's

court as early as 1600 B.C., while the famous *Uluburun* shipwreck off the southern Turkish coast in 1310 B.C. chronicles the astounding wealth of foreign trade at the time. After 1450 B.C., the Mycenaeans ruled both the Greek mainland and Crete, strengthening their ties with the powerful Hittite civilization in what is now Turkey, the Assyrians in Mesopotamia, and the Egyptians. This prosperous, highly competitive world collapsed in political turmoil about 1200 B.C. for reasons that are still little understood. The first millennium B.C. saw the rise and fall of the Persian empire and of Alexander the Great's vast domains, the glories of classical Greece, and then, finally, the rise of the Roman Empire, which dominated the western world from before the time of Christ until the Dark Ages.

As Egyptian and Mesopotamian civilizations appeared in the west, more complex societies developed in northern and southern China. By 2500 B.C., these "Lungshan" cultures enjoyed highly centralized, elaborate social organization and were developing into highly competitive and much larger political units. By about 2000 B.C., Chinese history enters an era of legend with a basis in fact, with the competing Xia, Shang, and Zhou dynasties of the Huang Ho (Yellow) River. Between 1766 and 1100 B.C., the Shang civilization dominated the north, to be succeeded by the Zhou dynasty, which in turn gave way to a historical jigsaw puzzle of warring states which were finally unified by the ruthless and despotic Emperor Shihuangdi in 221 B.C. The emperor is famous for his lavish and still unexcavated royal tomb, guarded by a regiment of spectacular terra-cotta soldiers.

By the time of Christ, Greek sea captains had discovered the secrets of the monsoon winds of the Indian Ocean, which allowed a sailing vessel to sail to India and back with favorable winds within 12 months. Within a few centuries, the Roman world was linked to India and, indirectly, with the Han empire in distant China. The Mediterranean and Asian worlds became interconnected with economic and diplomatic ties that endured until Portuguese explorer Vasco da Gama sailed around Africa's Cape of Good Hope and direct to India along the monsoon route in A.D. 1497. His voyage took place as the European Age of Discovery brought Columbus to the Indies and other explorers to the Pacific and southeast Asia.

### ***EARLY AMERICAN CIVILIZATIONS***

The indigenous civilizations of the Americas developed a brilliant complexity, with many resemblances in general characteristics and organization to preindustrial states in the Old World.

#### ***Mesoamerican Civilization***

When Spanish conquistador Hernán Cortés and his motley band of followers gazed down on the glittering Aztec capital, Tenochtitlán, in the heart of the Valley of Mexico, in 1519, they were astounded by the gleaming temples and palaces that could be seen from miles away. They marveled at the vast market, larger than that in

Constantinople, attended by as many as 20,000 people a day. More than 250,000 Aztecs lived in or around Tenochtitlán, which was, at the time, one of the largest cities in the world. Within two years, the Aztec capital was a pile of smoking ruins after months of bitter fighting. Soon, the dazzling Aztec civilization was just a memory.

The Aztec empire developed out of more than 2,500 years of Mesoamerican civilization. The architecture of the Aztec capital, cosmology, religious beliefs, and their institutions of kingship had deep roots in earlier, much-revered, civilizations.

Mesoamerican civilization developed from ancient village roots, but the religious beliefs and institutions of the Olmec people of the Veracruz lowlands were of paramount importance after 1500 B.C. The Olmec developed their religious ideology and distinctive art style from farmers' beliefs, which involved both shamanism and a profound belief in the power of the elusive, fierce jaguar. By 1200 B.C., their religious beliefs and the art style that accompanied them were widespread throughout lowland and highland Mesoamerica. Massive, brooding figures of Olmec rulers give an impression of immense shamanistic power, of individuals who traveled freely between the material and spiritual worlds, which is always a feature of Mesoamerican civilization. The Olmec had still little-known equivalents in other parts of the lowlands and highlands, but their influence on later Mesoamerican civilizations was enormous.

As the Olmec flourished, Maya civilization developed out of village cultures in the Yucatán lowlands. Some small ceremonial centers were flourishing by 1500 B.C. A thousand years later, the first large Preclassic Maya cities rose in the southern Yucatán, among them Nakbé and El Mirador, places where kingship became a formal institution and Maya lords became powerful rulers who presided over ever-changing city-states. By A.D. 100, the Classic Maya civilization was well under way, as a jigsaw puzzle of city-states large and small competed ferociously with one another for political power, trade monopolies, and prestige. The Maya developed their own indigenous script, whose decipherment is one of the great scientific triumphs of the twentieth century. This decipherment has allowed us to reconstruct not only the complex Maya calendar, but many details of their political history and cosmology.

Classic Maya civilization flourished in the southern lowlands until the ninth century. The four largest city-states—Calakmul, Copán, Palenque, and Tikal—were all ruled by long-lived dynasties of authoritative lords. Meanwhile, the great city of Teotihuacán rose to prominence in the highlands. This was a city of more than 120,000 people and a trading and religious center of enormous power. From 200 B.C. to A.D. 750, Teotihuacán was the dominant presence on the highlands, ruled by increasingly militaristic rulers who traded with the city of Monte Albán in the Valley of Oaxaca and with the Maya, who were strongly influenced by the city's militaristic beliefs. In about A.D. 750, Teotihuacán abruptly collapsed, leaving a political vacuum in the highlands. In the eighth century, Maya civilization collapsed in the southern

highlands, probably as a result of stress brought about by drought, environmental degradation, and internal social disorder. The dense urban populations scattered, but Maya civilization endured and flourished in the northern Yucatán until the arrival of the Spanish in 1517.

In the highlands, several centuries passed before the Toltec civilization emerged as a new, dominant force in the Valley of Mexico, only to implode in A.D. 1200, probably as a result of fierce external and internal rivalries. The Aztecs arrived in the valley soon afterward as obscure nomads entering a political environment of vicious competition between well-established city-states. With brilliant diplomatic and military skill, the Aztecs became mercenaries, then conquerors. By 1425, they were masters of the Valley of Mexico and in the midst of expanding their empire, which extended from the Gulf of Mexico to the Pacific Ocean and from Guatemala to northern Mexico when the Spaniards gazed on Tenochtitlán in 1519. The Aztecs held their domains together by force and harsh tribute assessments. Inevitably, many vassal cities joined the newcomers as a way of overthrowing the hated Aztec masters, only to suffer a different form of bondage after the Spanish Conquest.

### ***Andean Civilization***

Andean civilization also developed from ancient village roots. It was to encompass the vast Inca empire, overthrown by Spaniard Francisco Pizarro in the early 1530s. At the time, as many as 6 million people lived under Inca rule, part of Tawantinsuyu, “the Land of the Four Quarters,” which extended from Chile and Bolivia in the south to Ecuador in the north and encompassed the Andes highlands, some Amazonian rainforest, and the arid Pacific coast.

The origins of Andean civilization may be associated with the intensive exploitation of anchovies and other coastal fish, which flourished in the cold Humboldt Current, which flows close to the arid Pacific shoreline. This bounty, when combined with intensive agriculture in irrigated coastal river valleys, provided ample food surpluses for complex societies centered on increasingly elaborate ceremonial centers. By 900 B.C., a distinctive Andean religious ideology had appeared at Chavín de Huantar in the foothills and spread widely through the entire region along trade routes that linked highlands and lowlands.

The first millennium A.D. saw the development of two poles of Andean civilization. The first was centered on Peru’s north coast, river valley societies that traded cotton, textiles, and marine products such as fishmeal with the highlands. The Moche state, which flourished for much of the early and mid-first millennium A.D., enjoyed great wealth, as its leaders organized elaborate intervalley canals and irrigation systems. North coast civilization was volatile and vulnerable to drought and catastrophic El Niño floods. By 1100, the Chimu state dominated the region, only to be overthrown by Inca conquerors in the fourteenth century.

The southern pole of Andean civilization was centered around the shores of Lake Titicaca and dominated by Pukara, and especially the city of Tiwanaku, which reached the height of its powers in the first millennium A.D. before collapsing in about A.D. 1000. The highland plains around Lake Titicaca were conquered early by the Inca, who began aggressive campaigns of conquest to expand their domains after 1438. The Inca empire was at its maximum extent when Spanish conquistadors brought smallpox and destruction to the Andean world in the 1530s.

The conquest of the Aztec and Inca empires was part of the final chapter of prehistory, which saw Western civilization expand to every corner of the world and the creation of the first truly global economy. But the great diversity of humankind in the modern world serves to remind us of our common roots in the remote past, a past reconstructed in large part by archaeology, the only scientific discipline that studies and explains human cultural evolution over long periods of time.

