

# Chapter 7: Archaeological Discoveries: The Stone Ages and Ancient Civilizations

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## Learning Objectives

- Describe the characteristics of the Upper Paleolithic, Mesolithic, and Neolithic
- Explore the causes of the increase in social complexity in the Mesolithic
- Examine how and why plant and animal domestication was invented and its consequences
- Describe the characteristics of the “Neolithic Revolution”
- Examine the characteristics of Ancient Civilizations and explore the evidence of the oldest of these civilizations, the Ancient Sumerians

## The Stone Ages in the Old World

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Archaeologists often tell time by examining changes in the technologies made and used by people in the past. For most of human history, tools were made out of stone, so archaeologists have divided time before written records, often referred to as “prehistory”, in the **Old World** (Europe, Asia, Africa, and the Middle East) up into units based on the type of stone tools being made, known as the Stone Ages: The Paleolithic, the Mesolithic, and the Neolithic. The same patterns seen in the Stone Ages in the Old World are also seen in the **New World** (North and South America), but these periods are given different names and are generally more recent in the New World due to the increased amount of land in the New World and its later overall occupation.

The oldest Stone Age, the Paleolithic, dates from approximately 2.5 million years ago until approximately 15,000 years ago. This is a huge time range, so the Old Stone Age has been divided up into even small units. The first, the Lower Paleolithic, covers the period when *Homo habilis* and *Homo erectus* were the dominant hominins, from approximately 2.5 million years ago until approximately 300,000 years ago, and the main tools being made were Oldowan and Acheulean tools (see Chapter 5). From 300,000 to approximately 40,000 years ago (when Neanderthals were the dominant hominin) the Middle Paleolithic and the main tools were prepared core technologies, known as Mousterian tools. Finally, the end of the Paleolithic, the **Upper Paleolithic**, is the period of the Old Stone Age when *Homo sapiens* were the dominant hominin. The Upper Paleolithic dates from approximately 40,000 years ago until approximately 15,000 years ago.

## The Upper Paleolithic

Like the hominins who came before them, the people of the Upper Paleolithic were hunter-gatherers. Unlike the groups that came before them, the hunter-gatherers of the Upper Paleolithic demonstrated a level of technological and cultural sophistication that made them different from their predecessors. This is the main reason scholars think that *Homo sapiens* were able to out-compete the other remaining hominin species that they encountered. As hunter-gatherers, the people of the Upper Paleolithic relied exclusively on wild plants and animals for their survival. Their diets were more varied than the groups that came before them and included more marine resources than previous hominins. Not only did they hunt and trap wild animals and gather eggs, berries, nuts, roots, and other plant food, but they also fished and gathered shellfish. The stone tools made during the Upper Paleolithic vary a lot more than those found in the previous periods of the Old Stone Age, with a lot more variety in those tools both in terms of the kinds of tools made and the raw materials used. The wider range of rock materials used to make these tools indicates that the people of the Upper Paleolithic were traveling or trading over great distances to acquire these raw materials. In general, the tools they made are considered to be **blade technology**, meaning that the flakes removed from the core are twice as long as they are wide. These blades could be made into knives, awls, or scrapers and were also used to make a wide range of tools out of bone, antler, and ivory. These include the first known needles, indicating that *Homo sapiens* were the first to make close-fitting clothing or clothes with arm holes and leg holes. We also see tools that are being made for very specific tasks, like harpoons. We believe that Neanderthals likely hunted birds and fish, especially towards the end of their existence, but *Homo sapiens* were the first to make tools specifically for hunting these creatures rather than simply using tools in a “one-size-fits-all” manner. These tools indicate an increased level of specialization among our species and speak to the emerging complexity of our species. The hunter-gatherers of the Upper Paleolithic also invented a new hunting technology – the spear-thrower or **atlatl** (Figure 1). This technology allowed hunters of the Upper Paleolithic to throw spears faster, harder, and more accurately than using just their hands. In addition to using spears, Upper Paleolithic hunters also used nets, snares, and traps to hunt Ice Age wild animals.



Figure 1: Reconstruction of a Paleolithic hunter with a spear-thrower and spear, Natural History Museum, Vienna, Austria. Source: Wikimedia Commons.

In addition to more specialized tools, the hunter-gatherers of the Upper Paleolithic also had more complex living spaces. People of the Upper Paleolithic lived in caves and rock shelters during the winter months and in substantial open-air campsites with tents during the spring and summer. The campsites from the Upper Paleolithic are generally larger and more complex than those found in previous periods. In particular, Upper Paleolithic campsites featured specialized activities areas, with different tasks being done in different places across the campsite. It means that instead of one person sitting down in one place and doing all their activities – making tools, cooking food, making clothes, etc. – those activities were taking place in different parts of the camps and were therefore likely being done by different people or if not by different people, being done with conscious separation. Either way, it speaks to the increased complexity of and specialization within these groups. Larger campsites also indicate the increased population sizes of hunter-gatherer groups in the Upper Paleolithic, another indication of their success.

We also see a dramatic increase in symbolic behaviors among the hunter-gatherers of the Upper Paleolithic. Archaeologists recover increased evidence of burials with grave goods, sometimes even objects that have never been used, indicating that they were made specifically to be buried with someone when they died. There is also increased evidence of objects of personal adornment, such as jewelry from these sites. There is, however, no evidence of social hierarchies within these groups and archaeologists believe that these objects are indications of increasing ideas of personhood and identity. Finally, there is an explosion of artwork from Upper Paleolithic sites. Neanderthals also produced jewelry and artwork. But the amount of those things found at sites associated with Neanderthals pales in comparison to the amount found on Upper Paleolithic sites.

The artwork recovered from archaeological sites dating to the Old Stone Age is likely only a small fraction of the total artwork produced during these time periods. It is very likely that humans, and human ancestors, were producing art from wood, bark, animal hides, clay, plant fibers, and other organic materials. Unfortunately, these materials do not survive well in the archaeological record, and we have recovered very little evidence of what these products would have been like. Of the artwork we have recovered from the Old Stone Age, specifically from the Upper Paleolithic, there are two main kinds: **Portable Art** and **Cave Art**. Of the two, portable art is much more common, but far less famous. As successful hunter-gatherers, the people of the Upper Paleolithic had a lot of free time to spend on tasks not related to procuring food. It appears that they spent at least some of that time carving their tools made of stone, bone, antler, and ivory with beautiful decorations. Atlatls commonly feature decorative animals, usually animals eaten, carved into their bone, antler, or ivory handles (Figure 2). Other tools made of bone and ivory are similarly decorated, which is why the most common form of artwork recovered from Upper Paleolithic archaeological sites is portable, decorated utilitarian items, functional things that feature decorations that are not necessary to make that tool work. In addition to decorating tools, Upper Paleolithic hunter-gatherers also made portable figurines that appear to be abstract representations of women, known as Venus Figurines (for more information on these, see Resource Links).

Figure 2: Atlatl "creeping hyena", found in La Madeleine rock shelter in Tursac, Dordogne, Aquitaine, France. 10.7 cm. at the National Prehistory Museum in Les Eyzies-de-Tayac. Source: Wikimedia Commons.



While portable art is the most common kind of art from the Upper Paleolithic, the most famous works of art from this period are from the Painted Caves of Europe. These caves are clustered in Southwestern France and Northern Spain and feature engravings and carvings on the walls of caves from these regions. The paintings span the entirety of the Upper Paleolithic (with some of the caves being recently dated to periods before *Homo sapiens* were occupying Europe, indicating that these caves were likely painted by Neanderthals) but the majority of the caves date to the latter part of the Upper Paleolithic. The paintings in the caves vary considerably in terms of technique and in terms of size. The smallest paintings are only a few inches tall but the largest are over 16 feet long. Some of the paintings are placed in parts of the caves that are easy to access and view, while others are painted in deep recesses of the caves and hidden from view. Most of the identifiable images in the cave paintings are of animals (Figure 3). These animals are often beautifully drawn, sometimes using multiple colors and accurate representations of perspective and are often anatomically correct. But most of the images on the cave walls are actually abstract markings – lines, swirls, hand stencils, dots, and other objects scholars have classified as “signs” (Figure 4). There are very few images of objects or of humans in the cave paintings.



Figure 3: Cave painting of a dun horse (equine) at Lascaux Caves, France.

Source: Wikimedia Commons

<http://www.lascaux.culture.fr/?lng=de#/fr/00.xml>

Figure 4: Images of hands on the walls of the Cueva el Castillo in Cantabria, Spain. Source: Wikimedia Commons.



There are many different hypotheses that have been suggested to explain why people of the Upper Paleolithic made paintings in caves. One possibility is that these paintings could have been simple decorations of living spaces, like the way that we hang paintings in our homes. This hypothesis seems unlikely because there is no evidence that the caves where the paintings are were ever lived in by people of the Upper Paleolithic, although they did live in other caves. Another possibility is that the paintings were examples of trophyism or hunting magic, where people were painting images of the animals they hunted or wanted to hunt. These hypotheses seem to make sense because most of the recognizable images from the caves are of animals and most of those animals are ones that people of the Upper Paleolithic were eating. There are even some images of people hunting animals painted on the cave walls. However, there are also images of animals that weren't hunted but were rather the ones doing the hunting, like cave bears, painted on the walls. Additionally, this theory doesn't explain the abstract images in the caves. So, trophyism and hunting magic don't explain most of the art in the caves. Instead, most archaeologists believe that the images painted on the walls of the caves were made as part of rituals involving shamans in trance-like states. So far, over 200 painted caves have been discovered throughout Europe, as well as some examples of open-air artwork that was carved, rather than painted, into rock. And both types of sites show evidence of repeated visits to the site, with images often overlapping previous images carved or painting there. There were likely many more ritual spaces used by the Upper Paleolithic peoples that did not preserve today. But the existence of these places shows us that rituals and shamans held an important place in the world of the Upper Paleolithic and speaks to the success of these hunter-gatherers. By the end of the Upper Paleolithic, the Old World was full of groups of successful hunter-gatherers. And when human groups are successful, their populations increase.

## *The Mesolithic*

The **Mesolithic**, or Middle Stone Age, is a difficult period to describe because in some places it almost didn't exist, and the transition from hunting and gathering to farming happened relatively quickly, while in other places, it existed for thousands of years. We generally define it as happening between 15,000 and



10,000 years ago, but the truth is that the characteristics we associated with the Mesolithic show up in different places at different times. We use the dates of 15,000 to 10,000 years ago because of the climatic shift that happened during that period, which likely triggered the start of the Mesolithic in many places. During the Upper Paleolithic, hunter-gatherers were still living in the last Ice Age, known as the **Pleistocene**. Most of the northern hemisphere was covered by large ice sheets and glaciers, and large, cold-adapted mammals roamed the lands. These large mammals, or **megafauna**, such as mammoths and mastodons, were a major part of the diets of both Neanderthals and the hunter-gatherers of the Upper Paleolithic. However, starting about 15,000 years ago, the global climate began to change as the Ice Age came to an end, ushering in the post-glacial period known as the **Holocene**. The climate began to warm up and the great ice sheets began to melt, causing the sea levels to rise and forests to replace the barren tundra that covered most of the northern hemisphere. All these changes affected the lives of hunter-gatherers, especially in areas like western and central Europe and northern North America. The new temperate forests that covered most of the northern hemisphere were not environments that were conducive to supporting the animals that had previously inhabited the tundra, especially large, slow-moving herd animals. Some species, such as caribou, reindeer, and musk ox, migrated northward, following the retreating ice sheets. Other species, such as mammoths and mastodons, couldn't relocate or reproduce fast enough and were driven extinct. This meant that the hunters of the Mesolithic couldn't rely on the same animals as the hunters in the Upper Paleolithic, and instead, they had to focus on hunting solitary animals, like deer or moose, and smaller animals like rabbits, beavers, and birds.

The changing climate created other problems for the hunter-gatherers of the Mesolithic. These populations were continuing to increase and strain the environment's ability to support them. At the same time, the rising sea levels forced these larger populations inland. Traditionally, when hunter-gatherers are running low on resources, they move to a new location to find new resources, but in the Mesolithic, there were more people and fewer new locations for those people to move to when resources were scarce. This population strain meant that people were more likely to run into other groups of people on their travels, which increased the amount of contact and conflict between groups. With more people filling up the landscape and fewer places suitable for use, the hunter-gatherers of the Mesolithic had to invent new ways to find resources to support their ever-growing populations. Their solution was to intensify and diversify the food quest. This means that they had to utilize resources that they had always known about but didn't bother with previously because it was too much effort to obtain or eat. This included hunting smaller animals, gathering smaller wild plant resources, and utilizing more marine resources. In some places, the skills and technologies needed to acquire these resources, as well as the relative seasonal abundance of those resources, allowed some groups of these Mesolithic hunter-gatherers to achieve greater levels of complexity than what was seen in the Upper Paleolithic. These groups, known as **complex forager cultures** or intensive hunter-gatherers, didn't appear everywhere, but they did appear in a wide variety of environments. These complex forager cultures featured a new stone tool technology known as **microliths** (Figure 5). Microliths are tiny (about an inch long) bladelets that are

not very useful by themselves but are easy to mass-produce and can quickly and easily be attached to bone, wood, or antler handles to make composite tools. The hunter-gatherers of the Mesolithic used microliths to make harpoons, knives, and daggers, and new tools like sickles and arrows. The production of sickles indicates that these groups of people were utilizing much smaller plant resources, ones with small seeds, for food while the invention of arrows, and the bows to fire them with, is evidence of the smaller animals these hunters were forced to utilize. Because the food resources utilized by complex foragers in the Mesolithic required more labor to acquire and utilize, we begin to see some evidence of a more intensive division of labor in these societies. The division of labor was still largely by gender, with no full-time specialists in the societies but we do see some evidence that jobs were inherited based on gender and more expectations of children contributing to the food quest from Mesolithic sites. In some societies, we also begin to see some evidence that these hunter-gatherers were able to find plant resources, in particular, that were so seasonally reliable and predictable that they were able to spend considerable time in one place and not move around as much as the hunter-gatherers of the Upper Paleolithic. We know that they were staying in one place longer in the Mesolithic because we start to find archaeological evidence of houses that were built to last, made with stronger materials and more substantial foundations, instead of easy to assemble campsites. By the end of the Mesolithic, in some places, there were groups of people living in semi-permanent villages or settlements, utilizing rich inland resources. As the climate continued to change as the Ice Age ended, those groups began to experience population growth followed by resource shortages. This forced those people to begin to experiment with manipulating and growing plant resources to supplement their wild resources when they experienced food shortages.



Figure 5: Mesolithic microliths found in Suffolk, England.  
Source: Wikimedia Commons

Throughout the Paleolithic and the Mesolithic, people relied exclusively on wild plants and wild animals for their food. During the Mesolithic, people relied on some wild plant species intensively, sometimes even encouraging the growth of those species. But they were still wild plants. In the Neolithic, that changed, and humans began to manipulate plants and animals to make them more beneficial to humans – to domesticate plants and animals. The first animal to be domesticated was likely the dog, which was domesticated during the late Upper Paleolithic/Mesolithic for hunting. As the temperate forests replaced

the tundra and prey became less visible to the hunter in the forest cover, dogs were useful because of their strong sense of smell to locate prey. Because they were domesticated for hunting, rather than for pastoral uses, we don't usually include dogs when we talk about the early domestication of animals, which happened thousands of years after the domestication of dogs.

## The Neolithic Revolution and Ancient Civilizations

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Archaeologists generally mark the beginning of the **Neolithic** as 10,000 years ago. Like the Mesolithic, this date has more to do with the climate than the archaeological record. 10,000 years ago, is the beginning of the Holocene, when the last Ice Age ended and the climate on Earth resembled today, in terms of overall vegetation and water distributions and general weather patterns. Archaeologically, we mark the existence of the Neolithic at a site by the presence or absence of artifacts and features associated with plant and animal domestication. Food production, or humans actively controlling and manipulating their food sources, is a relatively new technology for humans. This transition from hunter-gatherers to farmers is sometimes referred to as the “**Neolithic Revolution**”. The term is a little misleading because it makes it sound like this was a fast transition. It was not. This was a slow and gradual transition that took thousands of years and really began in the Mesolithic with the complex forager cultures; however, this transition was revolutionary in that it changed almost all aspects of culture.

### *From Hunter Gatherers to Farmers*

Food production was not invented by a single society. No one culture can claim to be the origin point for farming. Instead, we see that plant and animal domestication appears across the globe in different places but at roughly the same time, around 10,000 years ago. Hunter-gatherers are aware of how to make plants grow. They simply choose not to intervene in the plants' natural growth cycle because taking care of plants is too much work. The same is true with animals. So, plant and animal domestication was not simply the result of people finally figuring out how to manipulate plants and animals. Instead, plant and animal domestication appear to be the result of humans being *forced* to do the hard work of manipulating plants and animals to make them more beneficial to humans. In the short term, being a farmer does not provide a more reliable way to get food than being a hunter-gatherer, but in the long run, it can produce more food per acre, which allows humans to feed substantially larger populations in less space. Farming requires those humans to invest much more time and energy in the food quest, which is why humans avoided it until the Neolithic. By 11,000 years ago, there is evidence of humans domesticating wheat and barley in southwestern Asia and squashes in Central America. By 9,000 years ago, there is evidence of domesticated rice in China.

We can tell if the plants we recover from an archaeological site have been domesticated because when humans domesticated plants, they changed those plants to make them more beneficial to humans and



those changes are visible on the plant itself. The most obvious change is that humans manipulated plants to make the edible parts of the plants larger, to provide more food per plant. Humans also reduced, or got rid of entirely, the natural protective devices that plants had for themselves, got rid of the natural seed dispersal mechanisms on plants, and encouraged plants to have seeds or fruits that all ripened and germinated all at the same time.

When domesticating animals, humans also made changes that can be observed in the skeletal remains of those animals. For animals, humans also used size selection to make animals more beneficial. But unlike plants, humans chose the smaller animals for their domesticates. Smaller animals were easier to take care of because they used fewer resources. Humans also chose animals that had smaller teeth, horns, and tusks, to make the domesticated versions of the animals safer to be around. These changes can take several generations to show up in the skeletal remains of domesticated animals, so archaeologists usually rely on changes in the population profiles of the animals that humans are eating as indicators of whether those humans are using domesticated or wild animals. When humans are hunting wild animals to eat, they typically eat the animals that are the easiest to catch – the elderly and the young. They rarely take the time to differentiate the animals by sex while hunting and so eat equal numbers of male and female animals. When humans are eating animals from a domesticated herd, they do differentiate the animals by sex. In order to maximize the number of animals in the herd, you need many adult females but only one or two adult males. Therefore, when it is time to decide which animal is going to be dinner, farmers and pastoralists usually choose to eat the extra adult male animals. An abundance of adult male skeletons and scarcity of adult female skeletons indicates that those people are eating domesticated animals rather than wild ones.

Unfortunately, to be able to see the changes that humans make to wild plants and wild animals when they domesticate them, archaeologists must recover the remains of the plants and animals in the archaeological record, and this is uncommon because organic material typically does not preserve well. Instead, archaeologists rely on the presence or absence of other materials as indicators of whether or not people were using domesticated plants and animals.

When humans made the transition from being hunter-gatherers to being farmers and pastoralists, it wasn't just the plants and animals that changed. The shift from being food collectors to food producers required almost every other aspect of these societies to change as well. The collection of changes that we see in these societies are what archaeologists call the Neolithic Revolution. This includes:

1. the use of domesticated plants and animals
2. the use of new technologies, especially ground-stone tools and pottery
3. the production of food surplus and therefore the use of food storage
4. the emergence of large, sedentary populations

5. a more rigid division of labor, largely based on gender, and the emergence of defined social hierarchies.

The easiest characteristic of the Neolithic Revolution to see in the archaeological record is the use of new technologies. When hunter-gatherers make the transition to being farmers, they need new tools for farming. So, they begin to make **ground-stone tools**, which start out like the flaked stone tools found in the Upper Paleolithic and Mesolithic but are then polished smooth to make them stronger and less likely to break when used for tasks requiring percussive force (Figure 6). Once polished, these stones were often set into bone or wooden handles to complete the tool. During the Neolithic, farming was conducted with simple hand tools (we don't see plows until thousands of years later), so the most common kinds of ground-stone tools found on Neolithic sites are those associated with food production tasks, such as axes and adzes for cutting down and shaping trees, or hoes for turning up soil. The other new technology from the Neolithic is the invention of **pottery** (Figure 7). Hunter-gatherers used light-weight portable containers to hold their goods, such as baskets, bags made of animal skins, or bowls made of plants. But these containers are not waterproof, didn't last long, and couldn't be used for cooking. Pottery, the first artificial material, is clay that has been shaped and heated until it is hardened and waterproof. It is much more durable than an organic container, capable of being put directly over the fire for cooking, and impervious to damage by rodents, insects, or dampness, but not very portable. Pottery was an important invention for farmers. It allowed them to bring water to their crops and animals, to carry crops back to the village, and store water and food for future use. Another new technology that appeared during the Neolithic (but that is less visible in the archaeological record) is the invention of woven textiles – fabrics made from wool, linen, and cotton, thanks to the domestication of sheep for wool, flax for linen, and cotton.

One of the challenges that farmers face, that hunter-gatherers do not, is the need to produce and store food for the future. When a hunter-gatherer needs food in the future, they simply go out and find additional food resources in the future. Farmers can't do that because crops are not available at all times of the year. Instead, farmers must think ahead and grow more food than they need in the present and store that food to be eaten in the future, which means that they need a way to store that food. Finding evidence of that planning and subsequent food storage is one of the characteristics of the Neolithic Revolution. During the Neolithic, there were no full-time specialists, so every family was a farming-family and every family had to produce their own food surplus and food their own food. In addition to producing large ceramic jars and bins which could be used for food storage, Neolithic farmers also used clay-lined pits associated with their households to store food. However, storing food attracted rodents to the villages of Neolithic farmers. So, even if there is no archaeological evidence for ceramic storage vessels or storage pits, finding mice skeletons on an archaeological site indicates that the people who lived there produced food surpluses.



Figure 6: Ground-stone tools from a Neolithic settlement at Olynthus, excavated by Mylonas in 1928. Archeological Museum, Thessaloniki, Greece

Source: Michael Greenhalgh,

<http://rubens.anu.edu.au/raider5/greece/thessaloniki/museums/archaeological/neolithic/>

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Figure 7: Neolithic pottery from Franchthi Cave, 5800-3200 BC. Archaeological Museum of Nafplio. Source: Wikimedia Commons

Tending to herds of animals and planting and growing crops requires staying near those animals and plants. This means that people in the Neolithic could no longer move around the landscape the way that their predecessors in the Upper Paleolithic, and, to a lesser extent, the Mesolithic, had. Instead, Neolithic farmers developed large, sedentary villages where they lived year-round. Not having to (and not being able to) move around the landscape, combined with the ability to produce more food per acre using domesticated plants and animals, allowed the populations of Neolithic societies to increase dramatically. Settlement sizes in the Neolithic also increased, with many more houses being built in each Neolithic village. These houses were also more complex in design and construction than anything seen in previous periods. Some houses were built out of stone, others were built out of sun-dried bricks, and others were built of wood covered with mud or clay. These houses were built to last and Neolithic villages featured large numbers of these structures that were occupied for long periods of time. We also see the emergence of cemeteries in the Neolithic, or designated spaces for interring the dead that were used repeatedly. Sometimes these were single spaces within the village or settlement, but often these spaces were within each family's living space, helping to establish that family's claim to their land and house as property ownership became important for the first time in human history.

The increased difficulty of getting food from growing crops and tending to domesticated animals meant that the division of labor in the Neolithic was much more rigid than in previous periods. In the Neolithic, division of labor was still primarily based on gender, but those gender roles were much more rigid and featured a lot less overlap in tasks. We can see this archaeologically because the wear-patterns on the

skeletons of men and women from the Neolithic are very different, indicating that these people did very different tasks for most of their lives. We also see that men and women are buried with different kinds of grave goods, again indicating that they did different kinds of activities in life. We also start to see some evidence for part-time craft specialization. In the Neolithic, there were no full-time specialists - everyone's job was still related to obtaining food for their family. However, we start to see some differentiation in the tasks done by members within a family, with new technologies being produced by specific people with specific knowledge. Initially, these tasks would have been related to food production but eventually would give way to the full-time specialty jobs that characterize the Ancient Civilizations. The kinds and amounts of goods found in burials from the Neolithic also provide evidence of the emergence of social hierarchies. Hunter-gatherer societies are generally fiercely egalitarian, with conscious attempts to minimize social differences and social inequalities. But in the Neolithic, with every family producing their own food and food surplus, not every family was going to grow the same amount of food. Not every craft specialty was valued equally. With large populations of people all living close together in a single village, it was going to be much harder for everyone to get along without the help of some leader, such a chief. These leaders, and their families, were often buried in elaborate structures and left with much larger amounts of and higher quality burial items than others in their society indicating the presence of recognized hierarchies within the societies of the Neolithic.

The shift from being hunter-gatherers to being farmers and herders was a significant change for human populations in the Neolithic. Using domesticated plants and animals allowed humans to produce significantly more food per acre, which meant that they could support much larger populations on a lot less land than in previous periods. Larger populations meant that people could engage in activities that required cooperative labor, invent new technologies, and support social hierarchies. There were also costs to becoming farmers. Although domestication increases productivity, it also increases the risk of short-term instability: if their crops failed, farmers faced severe food shortages and famine. Even if crops were successful, farming populations were limited from continuous growth by the spread of diseases through their densely populated settlements. Becoming a farmer didn't cause these diseases to come into existence, rather it set up the conditions under which communicable diseases could spread quickly and easily. Given that farmers relied on producing a lot of a certain few foods, their diets were less healthy and varied than hunter-gatherers (who ate a little bit of a lot of different foods). Their poorer diets meant that they often suffered from chronic malnutrition and nutrient-deficiency-based diseases like rickets and scurvy. Between the diseases and poor nutrition, farmers of the Neolithic were not only shorter people than hunter-gatherers of the Upper Paleolithic but also faced much shorter life expectancies.

Whether the transition from being hunter-gatherers to being farmers was the best or worst decision that humans made, once hunter-gatherers began to transition to farming the practice spread very quickly. This is in part because once you switch to farming and your population increases, it is almost impossible to go back to being a hunter-gatherer. So, instead, as your population increases, you have to acquire more land

to farm, which makes less land available for the hunter-gatherers living around you, and then those hunter-gatherers can't get enough food from the remaining land, so they have no choice but to begin farming as well. 12,000 years ago, almost every human being on the planet was a hunter-gatherer. By 4,000 years ago, almost every human being on the planet was a food producer, with hunter-gatherers left only in environments that were not suitable for farming or herding. This means that once people made the switch to food-producing economies, these economies dramatically changed life and were overall dramatically successful.

### *From Farmers to Cities and Archaic States*

The farmers of the Neolithic lived in societies much more complex than those of the hunter-gatherers of the Upper Paleolithic and Mesolithic. But they were still very different from what we would recognize from history books and very different from our own society today. The farmers of the Neolithic were horticulturalists, not agriculturalists. They relied on hand tools and grew multiple crops at the same time. They had leaders, but those leaders were chiefs, not kings and there were no full-time specialists or class systems. Those came thousands of years after the Neolithic with the emergence of the first **Ancient Civilizations**. Like the invention of plant and animal domestication, the emergence of the first state-level societies, the first Ancient Civilizations, was a turning point in human history. But there is a lot of variation in these Ancient Civilizations. They appear at different times, in different places, and with their own specific characteristics. However, all Ancient Civilizations have six general characteristics in common.

An Ancient Civilization, or Archaic State, is always based on an agricultural economy. This means an economy that specializes in growing a small number of plant species in great quantities to produce massive crop surpluses. These surpluses are made possible by technological innovations such as irrigation and the plow and allow a subsection of the population to produce enough food to feed everyone in that society. But for that to work, the crop surplus must be accumulated by a centralized authority through a formal system of taxation. This crop surplus can then be used to support the second characteristic of the Archaic States, full-time craft specialists. These specialists rely on others to provide their food and can, instead, devote their time to improving craft making and creating new ways of making and building things. The crop surplus also made the third characteristic of Ancient Civilizations possible: large populations, often concentrated in large cities. Large settlements where a substantial portion of the society's population, but usually not the entire population, lived are often the easiest archaeological evidence to identify Ancient Civilizations. The influence of a single Archaic State extended well beyond individual cities, however, and typically included multiple cities and the territories in-between them. The cities of Ancient Civilizations featured complex architecture, as well as complex social organizations. Within the cities, settlement patterns (where people lived) were usually based on occupational specialization rather than kinship, the fourth characteristic of Ancient Civilizations. This was a marked departure from settlements in previous periods where people generally lived and worked with people that they considered themselves

related to. Living with people who performed the same occupation as you, rather than with your family, also made it easier for people in these large settlements to begin to identify with their city, rather than with their lineage or clan and we see a decline in the relative importance of kinship in Ancient Civilizations. In order to maintain control of the taxation system needed to make the redistribution economy of the Ancient Civilization possible, as well as maintaining control of a large population no longer connected through kinship, the Ancient Civilizations are always defined by the existence of a permanent ruling class and State-level political organization. This includes a centralized government and the existence of a permanent class system that divides the entire population into rigid, unequal social groups into which people are born. Finally, Ancient Civilizations typically exhibit a high level of artistic achievement, including the construction of monumental architecture, advances in mathematics, science, and record keeping, and typically an all-encompassing state-religion.

## Case Study: The Rise of the Sumerians

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The oldest evidence of the transition from simple farming villages of the Neolithic to the first cities of Ancient Civilizations comes from **Mesopotamia**. Most of Mesopotamia, the term used to describe the region between the Tigris and Euphrates Rivers, is in modern-day Iraq, although it also includes lands in Iran, Jordan, Syria, Lebanon, Kuwait, and Turkey (Figure 8). There are few natural resources in this region beyond the large alluvial floodplain between the two rivers. However, this region floods unpredictably and was only suitable for agriculture after large irrigation projects were constructed to control the flooding of the two rivers.



Figure 8: This map shows the location and extent of the Fertile Crescent, a region in the Middle East incorporating Ancient Egypt; the Levant; and Mesopotamia. Source: Wikimedia Commons.

At the end of the Neolithic in this region, around 8,000 years ago, there were a series of relatively small farming villages spread out along the Tigris and Euphrates rivers. Hassuna, Samarra, and Halaf are three of those villages. The populations in each village were relatively small, numbering in the few hundreds, maybe a thousand. They utilized domesticated wheat, growing emmer, einkorn, and club wheat, and hunted wild animals, in addition to using domesticated sheep and goats. The sites of Samarran and Halaf



show signs of communal food storage, rather than storage at the household-level, the first sign that these two villages were moving toward becoming cities. The site of Samarran is the furthest south of the three sites and would have received the least amount of rainfall. Here it would have been impossible to support large populations using domesticated plants unless they were also using irrigation. So, it makes sense that this site is also where we find the first evidence of canal building in an attempt to divert and control the Tigris River, and the first signs of the social organizational systems needed to construct large public works like irrigation systems.

Approximately 7,000 years ago, we see a period where droughts were increasing in frequency. This forced the populations of the small late-Neolithic villages to consolidate or disperse to become pastoralists. The villages that consolidated settled in the southern portion of the region, building the first cities at sites like Ubaid and Eridu. During this period, the Ubaid Period (6700-6200 years ago), the potential of irrigation began to be realized and the Mesopotamian Redistribution economic system emerged. This system of redistribution system was organized around religion, with the religious temples, and their leaders, also serving as economic centers, storing surplus and giving it back out as needed. Connecting to the deities allowed local chiefs to gain power, as did controlling the surplus. During this period the first true craft specialists emerge, likely made possible by the surplus food produced by the irrigation systems. New ceramic forms emerge, particularly axes, hammers, and sickles, likely evidence of the lack of raw materials in this region other than fertile soil. This is also when we see evidence of the invention of the wheel, which was designed to make pottery (it will take another 2,000 years before the wheel is turned on its side and used for transportation).

There is some debate about whether sites like Eridu constitute very large villages or the first cities. But by 6100 years ago, true cities have emerged in Mesopotamia. There were several of these cities, including Uruk, Ur, Lagash, and Sumer. Each city operated independently, as city-states, but they were connected through trade networks and often went to war with each other. Each city-state had a large population, with estimates in the tens of thousands. Each city was dedicated to a different deity and had its own temple. The temples were large, visible monuments on the landscape, featuring a stepped construction, and were known as **ziggurats** (Figure 9). In addition to being temples, ziggurats were also used to store surpluses and for redistribution of said surpluses. The leader of the political and economic system was the **En** who was often guided by a council of elders. Around the temple were the craft zones where craft specialists lived and worked. This was a major departure from where people had lived in the past and signaled the decline in importance of kinship as people stopped living near their extended families and started living near people who were doing the same job as them. As people stopped identifying with their lineages and clans, they began to instead identify with the city where they lived, and the deity associated with that city.

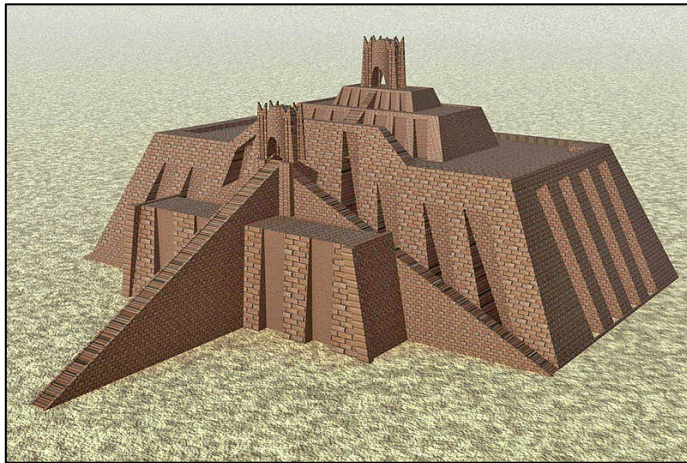


Figure 9: Computer reconstruction of the Ziggurat of Ur-Nammu. From Wikimedia Commons

During this period, known as the Uruk period (6100 – 5100 years ago), we see the first evidence for recording-keeping systems in the form of **Bullae and Tokens**. This is not a true writing system yet, but it does indicate that the scale of trading had increased, and people were now exchanging goods with people they didn't know, and therefore couldn't trust. So, they had to create records of what was being exchanged. The tokens served as markers for different quantities of goods, and they were either sealed inside or pressed into clay balls about the size of a goose-egg, known as bullae. The bullae were then sometimes sealed with a clay seal made from a **cylinder seal**. Cylinder seals were made of carved wood, stone, or bone and served as a sort of signature, indicating the person whom the goods came from (Figure 10).



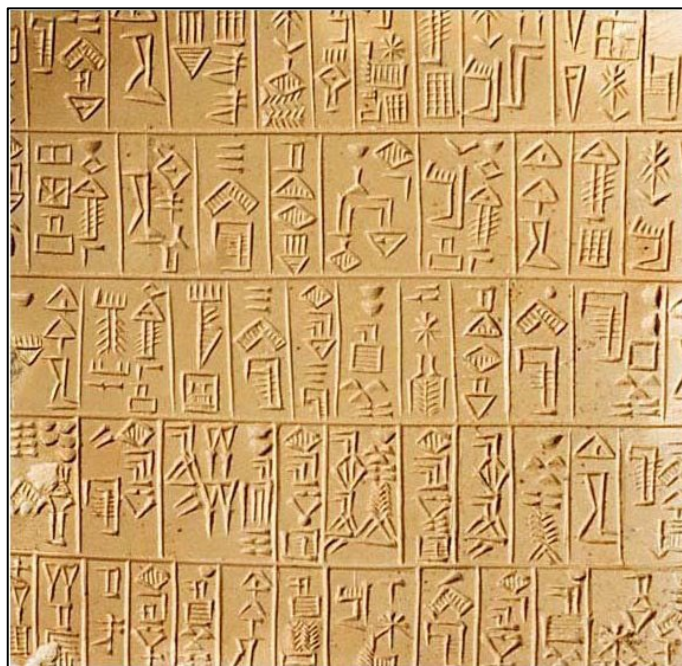
Figure 10: Sumerian Cylinder Seal of King Ur-Nammu at the British Museum. From Wikimedia Commons.

Between 3100 and 2900 BCE, or approximately 5000 years ago, we see a shift in the cities of Ancient Sumerian, as the Ensi decline in importance and a new source of leadership emerges in the form of **lugals**, or kings. During the following period, the Sumerian period (3100 – 2334 BCE), we see trade networks expanding and wheeled transportation becoming important. It is possible that the lugals were able to seize power during this period because of their position as important military leaders who could protect these trade networks. Large palaces, separate from the religious temples, were built during this period and the palaces had storage facilities, indicating that the kings, not the priests, now controlled the

economic system. The large-scale adoption of the agricultural plow during this period indicates that the cities were experiencing some food shortages and had to intensify their food production efforts.

Evidence of the first true writing system, **cuneiform**, comes from the Sumerian Period, dating to approximately 2900 BCE. Cuneiform is a wedge writing system, where initially each symbol stood for an entire word. Later, those symbols came to stand for sounds and syllables, becoming a true alphabet. The writing was made using a special wedge-shaped stick, known as a stylus, to press the shapes into a soft piece of clay that was then left to harden (Figure 11). The invention of cuneiform allowed writing to be used in new ways, and in addition to recording economic transactions, writing could be used to record laws, religious texts, math, astronomy, histories, and political propaganda.

Figure 11: Schøyen Collection MS 3029. Sumerian inscription on a creamy stone plaque. The text is a list of "gifts from the High and Mighty of Adab to the High Priestess, on the occasion of her election to the temple". [Details and transcription of this tablet](#)  
Source: Wikimedia Commons



The Sumerian civilization comes to an end with the rise of the Akkadian State under the rule of Sargon I in 2334 BCE (we know this date because Sargon I had it written down when he conquered all the Sumerian city-states). Sargon I was the leader of Agade, and he came in from the north and conquered all of the Sumerian city-states and replaced their leaders with people who were loyal to him.

## Chapter Summary

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Archeologists divided time before written records in the Old World into three periods based on the stone tools being made: The Paleolithic, Mesolithic, and Neolithic. Archaeology typically begins its focus during the Upper Paleolithic, as this is when Homo sapiens became the dominant hominin in the Old World. People during the Upper Paleolithic were hunter-gatherers, but their tool usage varied more in both type

and composition. The Upper Paleolithic is where we find the invention of new hunting technologies, increased symbolic behaviors, and an explosion of artwork. There are two kinds of artwork from the Paleolithic: Portable and cave art. Portable art was much more common and was usually decorated utilitarian items. The most famous cave art comes from the Painted Caves of Europe - these were likely ritual sites and involved shamans to create art. The Upper Paleolithic art indicates that people had a lot of free time and valued ritualism, and therefore were not struggling to survive. When groups are successful, their populations increase. Increasing population pressure and climate change ushered in the Mesolithic. The Mesolithic unfolded at different times in different places but is largely characterized by the changing climate (from the Pleistocene to the Holocene) and the resulting intensification and diversification in hunting and gathering practices. In some places, where resources were seasonally reliable, hunter-gatherer groups emerged as complex forager cultures, intensively utilizing smaller plant and animal resources, mass-producing microliths, and developing a more sedentary lifestyle. By the Neolithic (beginning approximately 10,000 years ago), people began to experiment with cultivating and domesticating plants and animals. This process took place in different places across the globe at roughly the same time. The collective cultural changes that come with growing domesticated plants and animals is known as the Neolithic Revolution. Although the Neolithic Revolution increased long-term productivity, it increased short-term instability: famine, food shortages, chronic malnutrition, and the spread of diseases were now major problems. Neolithic farmers had shorter life expectancies than Paleolithic or Mesolithic hunter-gatherers. Despite the disadvantages to food production, by 4,000 years ago, almost everyone was a food producer and new types of societies developed in the form of the Archaic State or Ancient Civilizations. The oldest Ancient Civilization, the Sumerians, developed in Mesopotamia and demonstrates how societies went from the villages of the Neolithic to the first cities in an Archaic State.

## Key Terms

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Old World	Neolithic
New World	"Neolithic Revolution"
Upper Paleolithic	Ground-Stone tools
Blade Technology	Pottery
Atlatl	Ancient Civilizations
Portable Art	Mesopotamia
Cave Art	Ziggurats
Mesolithic	En
Pleistocene	Bullae and Tokens
Mega fauna	Cylinder seal
Holocene	Lugul
Complex forager cultures	Cuneiform
Microliths	

## Comprehension Questions

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1. How did people make a living during the Upper Paleolithic? How did they get their food? What kinds of settlements did they live in? What kinds of tools did they use?
2. Why do archaeologists think that people of the Upper Paleolithic were more successful than the hominin groups that came before them? What features contributed to that success?
3. How did the end of the Pleistocene shape the Mesolithic?
4. The Mesolithic was a period of intensification and diversification. What does that mean and what does it look like archaeologically?
5. What is the “Neolithic Revolution”? Why is it so significant in human history?
6. What are the differences between a Neolithic village and a city in an Ancient Civilization?
7. Where does the oldest evidence of Ancient Civilizations come from?

## Critical Thinking and Engagement Questions

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1. Should sites of Upper Paleolithic cave art be open to the public? Why or why not?
2. Is the Mesolithic really a unique period? Or is it just a continuation of trends apparent in the Upper Paleolithic?
3. Given all of the negative consequences of becoming a farmer, was the invention of domestication a good idea in the Neolithic? How would life on earth be different today if we had never invented plant and animal domestication?
4. What are the tradeoffs of the emergence of Ancient Civilizations? Why was this a positive development for human cultures and why was it negative?

## Resource Links

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Most of the information about the Stone Ages is very site and/or region specific. Here are some resources to learn more about specific aspects of the ancient Old World.


- <https://onlinelibrary.wiley.com/doi/full/10.1002/oby.23028> - This article presents a new explanation for one of the most intriguing forms of portable art from the Upper Paleolithic – the Venus Figurines
- <https://archeologie.culture.gouv.fr/chauvet/en> This website has a very cool virtual tour of one of the painted caves in France, Chauvet
- <https://www.smithsonianmag.com/science-nature/comet-upended-life-paleolithic-village-12800-years-ago-180974575/> An interesting article about how a comet may have led to the earliest examples of plant and animal domestication at a site in Syria



- <https://www.catalhoyuk.com/> - This website describes the excavations at a very important and well excavated Neolithic site in Turkey – Çatalhöyük
- <https://search.credoreference.com/content/entry/estarch/neolithic/0> - This *Encyclopedia of Archaeology* entry on the Neolithic provides a lot of specific examples of what the Neolithic looked like in Europe
- <https://www.theguardian.com/inequality/2017/dec/05/how-neolithic-farming-sowed-the-seeds-of-modern-inequality-10000-years-ago> - an interesting article about the consequences of the Neolithic and its impact on us today
- <https://www.britishmuseum.org/collection/galleries/mesopotamia#virtual-tour> – This description of the Mesopotamia exhibit at the British Museum also has a very nice virtual tour of the exhibit

## References

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- Bailey, Geoff and Nena Galanidou  
 2009 Caves, palimpsests and dwelling spaces: examples from the Upper Palaeolithic of south-east Europe. *World Archaeology* 41(2): 215-241. <https://doi.org/10.1080/00438240902843733>
- Bocquet-Appel, J.-P.  
 2011 When the world's population took off: the springboard of the neolithic demographic transition. *Science*, 333 (6042):560-561
- Cobb, Hannah  
 2016 Why the Mesolithic needs assemblages. In *Incomplete Archaeologies: Assembling Knowledge in the Past and Present*. Emily Miller Bonney, Kathryn J. Franklin, and James A. Johnson (editors). Oxford, UK: Oxbow Books. P. 1 - 8
- Cohen, M.N.  
 2009 Rethinking the origins of agriculture. *Current Anthropology*, 50 (5) (2009): 591-595
- d'Errico, Francesco, Laure Dayet Bouillot, Marcos García-Diez, Africa Pitarch Martí, Daniel Garrido Pimentel, João Zilhão,  
 2016 The technology of the earliest European cave paintings: El Castillo Cave, Spain. *Journal of Archaeological Science* 70: 48-65. <https://doi.org/10.1016/j.jas.2016.03.007>.
- Diamond, Jared  
 1999 (1987)  The Worst Mistake in the History of the Human Race. *Discover Magazine*.  
<https://www.discovermagazine.com/planet-earth/the-worst-mistake-in-the-history-of-the-human-race>
- Duhard, Jean-Pierre  
 1993 Upper Palaeolithic figures as a reflection of human morphology and social organization. *Antiquity* 67(254): 83 – 91 DOI: <https://doi.org/10.1017/S0003598X00045087>
- Eren, Metin I. (editor)  
 2012 *Hunter-Gatherer Behavior: Human Response During the Younger Dryas*. London, UK: Routledge
- Fernández-Navarro, Verónica, Edgard Camarós, and Diego Garate,



- 2022 Visualizing childhood in Upper Palaeolithic societies: Experimental and archaeological approach to artists' age estimation through cave art hand stencils. *Journal of Archaeological Science* 140(105574). <https://doi.org/10.1016/j.jas.2022.105574>.
- Fowler, Chris  
 2004 *The Archaeology of Personhood: An Anthropological Approach*. London, UK: Routledge
- McDermott, L.  
 1996 Self-representation in Upper Paleolithic female figurines. *Current Anthropology* 37(2): 227-275
- Pearsall, Deborah M. (ed.)  
 2008 *Encyclopedia of Archaeology*. San Diego, CA: Elsevier Academic Press.
- Peregrine, Peter N. and Melvin Ember (editors)  
 2001 *Encyclopedia of prehistory*. New York, New York: Kluwer Academic/Plenum Publishers
- Pionnier-Capitan, Maud, Céline Bemilli, Pierre Bodu, Guy Célérrier, Jean-Georges Ferrié, Philippe Fosse, Michel Garcià, Jean-Denis Vigne,  
 2011 New evidence for Upper Palaeolithic small domestic dogs in South-Western Europe. *Journal of Archaeological Science*. 38(9): 2123-2140. <https://doi.org/10.1016/j.jas.2011.02.028>.
- Price, T. Douglas (editor)  
 2009 *Europe's First Farmers*. Cambridge, UK: Cambridge University Press.
- Price, T. Douglas and Gary M. Feinman  
 2024 *Images of the Past, Ninth Edition*. New York, NY: McGraw Hill
- Scarre, Chris, Brian M. Fagan, and Charles Golden  
 2021 *Ancient Civilizations, Fifth Edition*. New York, NY: Routledge.
- Simmons, Alan H.  
 2010 *The Neolithic Revolution in the Near East: Transforming the Human Landscape*. Tucson, AZ: University of Arizona Press.
- Tyler, Madeline  
 2018 *Ancient Mesopotamia*. New York, NY: Greenhaven Publishing LLC