Hands On Learning
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PALAEOLITHIC & MESOLITHIC ARCHAEOLOGY PH 1/A

The term 'Stone Age' is used by archaeologists to designate the vast prehistoric time period during which humans used stone for toolmaking. In 1865 John Lubbock subdivided the Stone Age into the Palaeolithic, Mesolithic and Neolithic Periods. These three periods were further subdivided. In reality, the succession of phases differs enormously from one area of the world to another.

The word palaeolithic is derived from two Greek words, *paleos*, meaning old and *lithos,* meaning stone; in other words 'Old Stone-Age'. It covers a very long period beginning with the introduction of the first stone tools by the predecessors of *Homo sapiens* around 2,000,000 years ago and ending in various places between 40,000 and 10,000 years ago.

This was followed by the Mesolithic Period. The word mesolithic is derived from the Greek word *mesos*, meaning middle, and *lithos*, meaning stone; in other words 'Middle Stone Age'. It began in Britain with the end of the last glacial period over 10,000 years ago. At this date temperatures began to rise and Britain was gradually separated from the continent. Mesolithic peoples lived as hunters-fishers. Some settlement sites from this period are known in Britain, including a famous one at Thatcham, Berkshire, although they would only have been inhabited sporadically. Mesolithic cultures lasted in Britain until about 4,500 BC.

Over this enormous period it is possible that many wooden tools were made and used, but none have survived. Stone tools, on the other hand, have been found in huge numbers. Generally speaking as time moves forward these tools show increasingly sophisticated techniques in their production, becoming finer and more carefully designed. More varied kinds of tools were created to be used for specialised tasks

Bunter Pebble



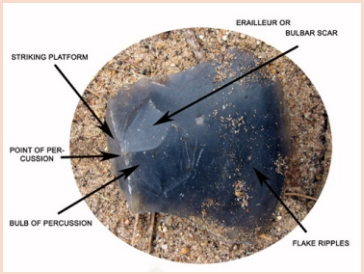
Bunter pebbles are worn pieces of ancient rock that originally formed in mountain ranges to the south and south-west of Britain, such as Brittany in northern France. These were washed northwards into the midlands by powerful streams, 220 million years ago. Then, during the last ice age, some of the pebbles were transported back southwards by ice sheets. From the area around the edge of the ice sheets the River Thames took them as far as Reading by way of what is now the Goring Gap. This pebble is included in this box to remind us of the very different climate and landscape that existed in the Reading area at the end of the last ice age.

How to Identify a Worked Flint

Flint is an ideal stone for making tools as when it breaks it produces very sharp edges. It is found only in chalky areas and where there is no flint other kinds of stone may be used to make tools. There is lot of flint in the soils of Reading and the surrounding area, which often makes it difficult for people to distinguish worked from un-worked stone.

Naturally occurring flint nodules can be broken by the action of frost, or by inadvertent human activity such as ploughing. A piece of flint which has been deliberately struck, however, has characteristic marks that indicate that this is the case.

The point at which a hammerstone hits a flint is called the *point of impact* or *percussion*. The energy dissipated from this point causes the stone to bulge slightly and this bulge is referred to as a *bulb of percussion*. Sometimes, it also leaves a small scar on the bulb, called the *eraillure scar* or *bulbar scar*. The impact can also leave small splits or fissures radiating away from the point of impact. Finally, the impact often leaves *ripples* fanning away from the bulb. These features are indicated in the image on the right.



Clactonian Core



The Clactonian is the name given by archaeologists to an industry of European flint tool manufacture which dates to an interglacial period 300,000-200,000 years ago. Clactonian tools were made by *Homo erectus* rather than modern humans. The term is sometimes applied to early, crude flint tools from other regions which were made using similar methods. It is named after finds made by Samuel Hazzledean Warren at Clacton-on-Sea in 1911.

The Clactonian industry involved striking thick, irregular flakes from a core of flint which was then employed as a chopper. The flakes which were removed would have been used as crude knives or scrapers. This example looks, at first sight, as if it is unworked, but a closer examination shows that one end has been hammered. Many examples of such tools have been found in the Highlands Gravel Pit at Henley-on-Thames, Oxfordshire.

Palaeolithic Hand Axe



Archaeological finds and modern experiments have taught us a lot about how such a finely crafted flint tools were made. The procedure is thought to involve two stages, generally referred to as percussion chipping and pressure flaking. In percussion chipping the core or block of flint is hit with a blow to detach the flint flake. This is usually done with a stone hammer to rough out a lump of stone that may be made into some specific artefact.

The next step is pressure flaking, which is used to create a fine edge to the tool or to shape areas so that it fits neatly into the palm of the hand. As the name suggests, pressure flaking is done by pushing against the stone, rather than striking it. It is thought to have been carried out by placing a pointed tool such as an antler tine or a sharp piece of wood on the edge of the stone and applying an *inward* pressure. This pressure removes a small, thin flake from the stone. Elastic materials, like wood or antler, cause the percussive force to spread out, and to be transmitted more slowly and evenly.

A skilled toolmaker can use the technique to remove exactly what he or she requires. This tool, for example, has had long broad sections removed so that it fits smoothly into the palm of the hand. The black lines which have been painted on it indicate where inward pressure flaking has been applied to create such fine details.

Palaeolithic Hand Axe



This large hand axe has a very distinctive pointed shape. Hand axes must have been used for jobs such as skinning animals and digging for roots, but whether such a narrow blade had a specific purpose is unknown. It is usually assumed that most hand axes from this period were general purpose tools, but it is possible that some were shaped with a more particular function in mind.

Whatever the case, this example shows signs of natural wear and of being immersed in water after it had been used. The sharp edges have been smoothed and it has been stained brown/yellow. Flints which have spent a period in water are often stained like this by the iron oxide in the water. All of these clues suggest that at some point in its history this axe has been tumbled along a riverbed.

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Palaeolithic Hand Axe

This small hand axe shows less sign of staining and wear than the previous example.



Palaeolithic Flint Scraper



Tools like this are often referred to as scrapers, which suggests that they were used to cut and scrape, rather than to hit and break, which the term 'axe' implies. Certainly, the hand axes in this box fit into the hand in a way which suggests that they were used to deliver sharp blows, while this smaller tool seems more appropriate for finer work. However, the way in which these hand tools were used is, in the end, largely guesswork.

This example, like the large hand axe in this box, shows signs of wear and of being immersed in water. It is not known where it was found, but stone tools found in the Reading area, where the Thames and the Kennet meet, often have these characteristics. Although the course of these rivers has changed over the centuries, the area was well washed by melt water in the periods between ice ages.

Palaeolithic Flint Scraper



Sometimes scrapers have a curved cutting edge rather than a straight one. Their purpose is unknown. It is often speculated that they were used to smooth wooden rods so that they could be used to make spear shafts or to construct shelters. Similarly it is suggested that smaller flints, with a tiny nick, may have been used to prepare arrow shafts. However, these suggestions are unproven.

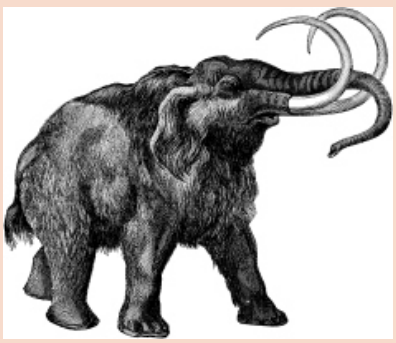
Mammoth Tooth Fragment



Several species of mammoth lived from 4.8 million years ago to about 3,500 years ago. Around 700,000 years ago, the warm climate of the time deteriorated markedly and the savannah plains of Europe, Asia and North America gave way to colder and less fertile steppes. The southern mammoth (*Mammuthus meridionalis*) consequently declined, being replaced across most of its territory by the cold-adapted steppe mammoth (*Mammuthus trogontherii*). This in turn gave rise to the woolly mammoth (*Mammuthus primigenius*) around 300,000 years ago. Woolly mammoths were better able to cope with the extreme cold of the ice ages.

The woolly mammoth was a very successful species, ranging from Spain to North America and are thought to have existed in huge numbers. Mammoths died out at the end of the last ice age, although a few small mammoths survived on Wrangel Island, Siberia, becoming extinct only around 1,700 to 1,500 BC. The reason for their extinction is debated, with a combination of climate change and hunting by humans being one of the most popular explanations.

Mammoth teeth are similar to those of modern elephants. The teeth do not emerge from the jaws vertically like human teeth. Instead, they have a horizontal progression, like a conveyor belt. New teeth grow in at the back of the mouth, pushing older teeth towards the front, where they wear down with use and the remains fall out. Modern elephants spend 20 hours a day eating vegetation. They will eat some 200-300 kg of leaves a day and drink up to 100 litres of water. The movement of the elephant's jaw during chewing is forwards and backwards, unlike cows who use sideways movements to chew the cud. The ridges on the teeth act as two rasps grating upon one another. Mammoth remains - tusks, bones and teeth - have been found in the Reading area.



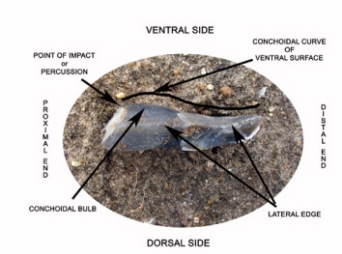
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Palaeolithic Flint Blade



If you turn a flake on its side you can often see that it has a distinct curve which is obvious in this example. This curve reflects the bulb of percussion caused when the flake is struck by a hammerstone. These curves are more pronounced in flakes that have been struck with a hammerstone rather than with a soft hammer.



The photograph on the right labels some of the features, which can also be seen on this blade. The struck or impacted end of the flake is called the *proximal end*. The far end of the flake away from the pint of percussion is termed the *distal end*. The edges of the flake, often still sharp, are called the lateral edges.

Mesolithic Microliths



A microlith is a small stone tool, usually about three centimetres long or less. They come in a variety of shapes including triangles, crescents, trapezoids, rectangles and so on. These two have a triangular profile. Presumably each shape had a different function. It is assumed that they were too small to be used by themselves and would have been set into wooden or bone handles to make composite tools, however no one knows for certain their exact purpose. They may have been set into a rod to create barbed arrows, or perhaps they were used to form barbs on a fishing spear. Fish seems to have played a large part in the diet of many Mesolithic groups living in Britain.

Mesolithic Thames Pick



Tools like this are sometimes referred to as a 'Thames pick', because of the numbers recovered during river dredging and this is one of a large group recovered from a site near Tilehurst, Reading. Another name for the same tool is a tranchet axe. It may have been mounted on a wooden haft. It is often assumed that such tools were used for felling or working timber, but they may have been used for a variety of purposes.

Palaeolithic Flint Core

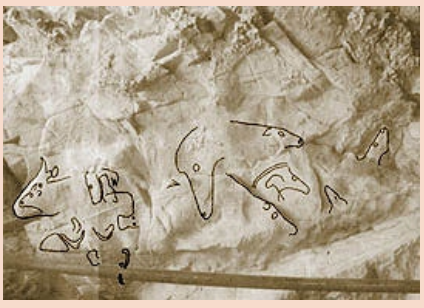


This is a core - the lump of flint left behind after tools have been chipped from it. This example illustrates a feature that is often found on such cores, the so-called *striking platform* - an exposed area of the core stone which is created by the toolmaker first of all and which is then hit at approximately 90º to shatter off smaller fragments.

This example has the words 'La Madeleine' written on one side. This refers to a place called La Madeleine in the Dordogne region of France. This rock-shelter site was first excavated by Capitan and Peyrony in 1928 and proved to be rich in stone and bone tools from the Palaeolithic Period. The site name was used by archaeologists to describe a wider cultural group - the Magdalenian - which is believed to have flourished between 18,000 and 10,000 BC. It is not clear whether the core came from La Madeleine or is thought to be representative of the Magdalenian culture.



The Magdalenian hunter-fisher culture was not confined to France, but has left traces from Portugal to Poland. There is also some evidence of their presence in Britain, although for much of this period most of the country was covered by ice. Magdalenian peoples were responsible for some of most famous examples of stone age art in the world, most famously at Lascaux (right) in France and Altamira in Spain. More recently an example has been found in Britain. In 2003, stone age engravings and bas-reliefs were found on the walls and ceilings of caves at Cresswell Crags, Derbyshire. These are the most northerly finds in Europe and the most extensive collection of prehistoric bas-reliefs in the world.

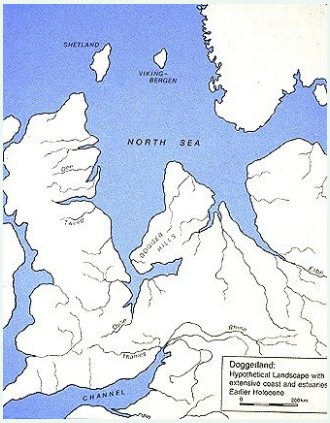


Right: A detail of the reliefs at Cresswell Crags, with some of the figures outlined in black.

North Sea Peat



These lumps of peat were dredged up from the seabed off the coast at Lowestoft, East Anglia. Since the nineteenth century archaeologists have been aware that fishermen working in the North Sea, particularly off Dogger Bank, have hauled up stone tools and clumps of soil which indicated that the area was once dry land and inhabited by humans. A carefully sharpened flint scraper, for example, has been retrieved by Norwegians drilling for oil in 450 feet (137 metres) of water 100 miles east of Shetland. Mammoth and rhinoceros teeth have also been recovered.



In recent years this lost landscape, sometimes called Doggerland, has been surveyed using modern remote sensing equipment. The map on the right is a suggested reconstruction based on this data. It shows that dry land stretched from the present east coast of Britain to the coasts of the Netherlands, Denmark and North Germany. Its highest point would have been the submerged Dogger Bank, marked Dogger Hills on the map.



This landscape would have been home to hunter-gatherer groups and it is their tools that have been found by fishermen. Their territory was destroyed by rising temperatures which caused the ice sheets to melt and the sea level to rise. By 5,000 BC the sea was some 130m (430ft) higher than it had been at glacial maximum and Britain had become an island. For a while the Dogger Hills must have formed a separate island. No doubt for most of the time the encroachment by the sea would have been gradual. However, it is known that about 7,000 BC there was a massive submarine landslide (called the Storrega slide) midway between the coast of Norway and Iceland and that it probably generated a tsunami. Some have speculated that this must have devastated Doggerland, with many kilometres of coast being destroyed within a few hours, perhaps minutes, and many lives lost. However, whatever the details, Doggerland has long since disappeared under the waves, leaving lumps of peat like these to bear witness to its existence.

Above: A satellite image of the North Sea today. Dogger Bank is marked in red.