Flint in North Yorkshire Museum Collections

Flint Collections

Many of the earliest objects in our museums are stone tools. These may be local or are often imported specimens from further afield (often Scandinavia or North America). This series of factsheets attempts to provide a starting point for the museum professional in identifying, cataloguing and storing these artefacts.

Nature of Collections

The majority of the flints in our collections will have been collected by archaeologists. These collections may have been generated by excavations but will more commonly be surface finds, collected from freshly ploughed fields or patches of erosion on moorland.

There has been a long history of flint collection with many of the earlier accessions in our older museums dating back over a hundred years.

Major flint assemblage from White Gill – held at the Yorkshire Museum

The activities of certain archaeologists have generated abundant archives, for example there are major collections of flints in store at the Ryedale Folk Museum donated by Raymond Hayes and Roland Close.

Flints will often be collected in large numbers from a single site or area. Moorland collections made over several decades by different collectors often number in the tens of thousands. At the opposite end of the scale museum collections may include stray finds of single flints, commonly axe-heads or arrowheads, donated by members of the public.

The value of Flint Collections

Flint was mainly used in the prehistoric periods and was worked into a variety of different tools. Archaeological sites from these periods are very difficult to detect and a forgotten box of flints in a museum store may be our only evidence that one existed.

Flint tools include hunting equipment such as arrowheads and domestic items including knives and scrapers. The types of tools present on an archaeological site can indicate the types of activities that were carried out there.

Flint chronology

The technology used to produce tools and the tools themselves changed over time. This means that flints can be used to help date archaeological sites. The principal flint working periods in the region are: -

- Mesolithic (see Fact Sheet 5-6)
- Early Neolithic (see Fact Sheet 7)
- Later Neolithic/early Bronze Age (see Fact Sheet 8)

Fragment of a Palaeolithic hand axe (left) from Redcar compared to a type specimen from Hampshire (right).

Palaeolithic (2.6 million years ago to c. 10000 B.C.) material is unlikely to be present in most museums in the region, with the exception of genuine stray finds (which should be well documented given their rarity) or type specimens from elsewhere (often the River Thames or Europe).

This is because the area was buried under deep ice sheets for most of the Palaeolithic. Genuine artefacts of the period are uncommon north of Derbyshire.

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Storage

Flint is largely inert so needs no special conservation measures or particular environmental conditions. However despite its hardness it is easily chipped so it is preferable to bag items individually wherever possible.

Non-standard box sizes and deterioration of packaging is a common problem with donations from private individuals.

In many cases the flints in museum stores will remain in the packaging in which they were donated. This might include everything from match boxes to envelopes.

The Hingston Collection in the Yorkshire Museum: Finds were donated in brown envelopes carefully marked with the site name, date of find and National Grid Reference.

Diligent collectors may have marked the packaging with useful information such as the site name and date the find was made. It may be desirable to change this packaging to rationalise storage space. If this is the case it is important to transfer as much information as possible from the original packaging as it may be the only available information about the object.

Archaeologists may already have taken great pains to label the surface of individual items with the site name (often as three letter site code followed by the year of the excavation). The combination of the sheer quantity of flints in a collection and the small size of many of the pieces means that this may often be impractical.

Supporting documentation

Lithic donations to museums will be variably documented. In some cases the flints will be fully analysed with a catalogue and illustrated report. The very opposite may be the case in some instances, particularly for the more historic collections when objects were collected for their intrinsic interest rather than their associations.

Flints with poor provenance may be of limited archaeological value

Some collections will be so poorly documented as to have lost much of their meaning. Where provenance cannot be demonstrated from packaging, museums accessions register or information submitted with the donation then it might be worth considering transferring the material to an educational or handling collection.

Historical uses of flint

In the early 17th century the flint-lock gun was invented. This led to vast amounts of gun flints being manufactured through to the early years of the 20th century. These are very distinctive objects (see image to right at actual size), roughly square in shape with abrupt trimming around each edge, and should be easily distinguished from prehistoric material.

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The Properties of Flint

What is Flint?

Flint is a form of silica formed in chalk deposits. In certain areas of the country it occurs as large nodules or tablets and was mined from prehistory onwards. The majority of flint found in the Yorkshire region is from secondary sources, usually small nodules or pebbles collected from local beaches or eroding boulder clay deposits.

Flint blade and flakes with varying amounts of cortex.

These pebbles are normally completely or partially covered in an outer crust known as cortex. This cortex is softer than the flint but is usually well reduced and thin in section. Mined flint will normally have a much thicker and chalkier cortex.

Because flint has been collected from a variety of mixed sources it is often very variable in character. The colour generally ranges in shade from light to dark brown. Toffee coloured pieces and a distinctive red-brown flint are also noted in the region.

Colour variance in Yorkshire flint

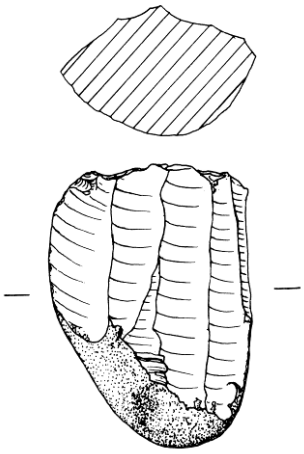
Over time flint may acquire a patina to its surface. This is usually grey or white and will be variable across the flint surface. When backlit the original colour of the flint usually becomes visible on thinner edges. The flake at the top right of the image above has a creamy white patina.

Flint Knapping

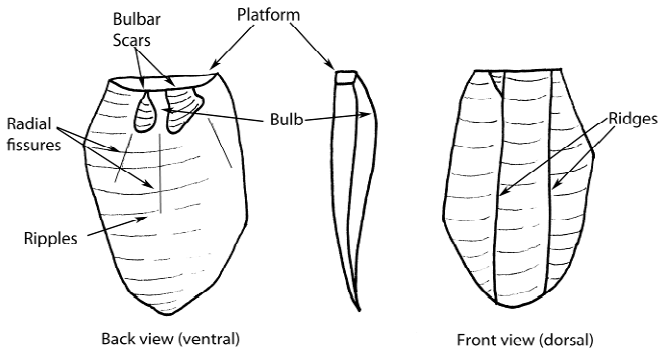
Although flint is a very hard material it is extremely prone to fracture. If a pebble of flint is struck with a hammer (usually another stone or piece of antler) it will split. The normal process is for a flat surface to be located or manufactured on the pebble and for blows to be struck around its edge to remove flakes. These usually have razor sharp edges and need no further modification to make useful cutting implements.

Cores

A core is a nodule or pebble of flint from which flakes have been removed. Cores tend to be amongst the larger pieces in Yorkshire assemblages, although they can also be quite small in size. Unfortunately many large pieces of flint in museum collections are often labelled as cores when they are not. Cores will normally have at least one flat platform. As well as a platform the faces of the core should have a number of flake scars running away from it.



Flakes

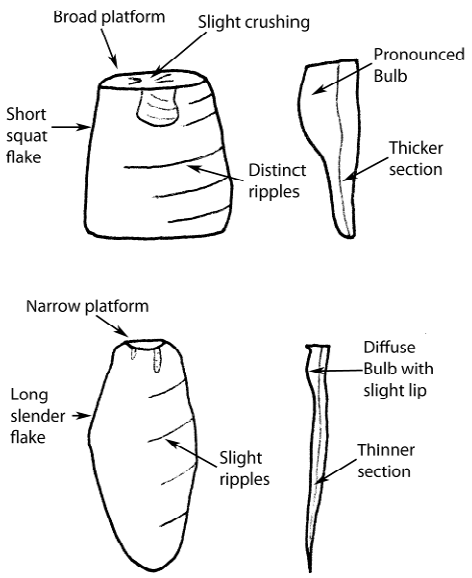


Flakes struck from cores have a number of defining features. On the back of the flake will be a swelling known as the bulb of percussion. This may have one or more small bulbar scars. Below the bulb are a series of ripples that radiate down through the flake. Fissures may also be visible running down the length of the flake. The front of the flake may be covered in cortex or have ridges and scars left from previous flakes.

The Properties of Flint

Hard and Soft Hammers

Different types of hammers were used to remove flakes from cores. The basic techniques are to use a harder stone (hard hammer) or antler (soft hammer). The two techniques produce very different types of flakes.

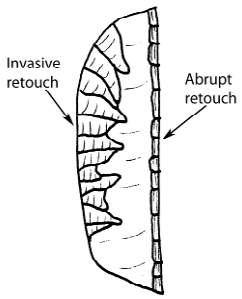


Top: Hard hammer flake
Bottom: Soft hammer flake

Hard hammer flakes are usually squat, stubby and thick in section. The hard hammer transmits more force through the flint leaving a pronounced bulb of percussion and distinct ripples. Soft hammer flakes tend to be longer and thinner. The force of the blow dissipates through the flint more gradually leaving a diffuse bulb, often with a slight lip that can be detected with a finger nail.

Retouch and Tools

The edges of a freshly knapped flake can be extremely sharp. To produce more specialist tools retouch was employed to modify the edges.



This retouch is often abrupt to strengthen or blunt the edge, perhaps to allow it to be handled comfortably or to reinforce it for scraping or piercing. Retouch can also be invasive with long narrow flakes extending into the object to form a sharp cutting edge. This sort of retouch is often seen on arrowheads and is created by applying direct force to the edge of the flint with an antler or bronze implement. It is often referred to as pressure flaking.

Debitage

As well as cores and flakes the knapping process usually produced a good deal of less regular waste material known as debitage.

These may include broken fragments of flakes, small chips (usually less than 10mm in size) and shattered angular fragments. The later category is often very difficult to distinguish from naturally shattered material.

Burnt flint

Many flints were either purposely or accidentally burnt following their discard. The simplest explanation is that waste chips and redundant tools were simply swept in to the camp fire as a convenient method of disposal.

A collection of burnt flint including an arrowhead (left). Note the crazed white surfaces and fragmentary nature of most of the pieces.

Burnt flint becomes chemically altered. Its colour changes to either grey or white. The surfaces become crazed and eventually the object will shatter. Although most burnt flint is too shattered to allow the form and date of the original object to be determined it is archaeologically important as it can indicate where camp fires or hearths were located.

Mesolithic [c.8500 - c.3800 B.C.]

The Mesolithic period

This is the first major period in which flint was utilised in the Yorkshire region. The period follows the end of the last Ice Age and for the early part of the period the British Isles were still physically connected to the continent by a land bridge.

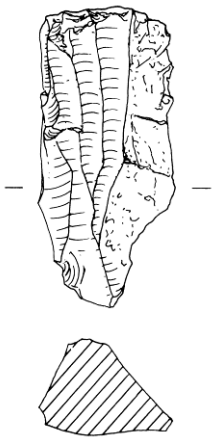
Mesolithic people were hunter-gatherers and are likely to have been highly mobile, moving around the landscape to exploit natural resources as they became available from season to season.

Blades

Selection of blades
(all images are actual size unless stated)

Mesolithic flint technology was driven by the production of blades. These are essentially flakes with parallel sides and are usually twice as long as they are wide. Blades are common on Mesolithic sites as are the blade cores from which they are produced.

General characteristics

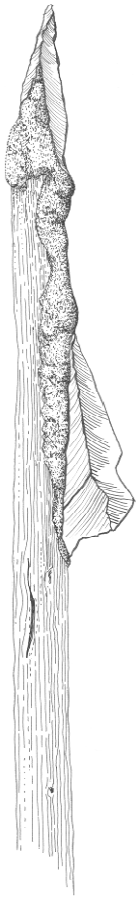


Maximising raw material appears to have been important in the Mesolithic. Prepared cores were probably carried vast distances so that the tool kit could be replenished on the spot.

Cores are well maintained and it is likely that soft antler hammers were used for much of the knapping. These usually produce well balanced flakes with thin sections and diffuse bulbs of percussion.

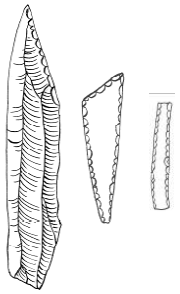
The top edge of the core was usually trimmed prior to a flake being detatched to remove small spurs and ridges left from previous removals. This provided a more stable platform and ensured even and regular removals.

Microliths



Microliths are the most recognizable item of the Mesolithic tool kit. The most common interpretation of these items is as the tips and barbs of arrows (see left).

Microliths come in many shapes and sizes and this can be helpful in allowing relative dating.



Left: early obliquely blunted point

Middle: late scalene triangle

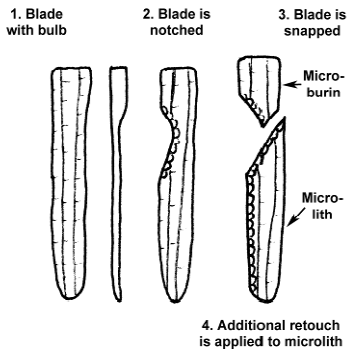
Right: very late rod

Early Mesolithic sites produce large, broad microliths like these from Pointed Stone, Bransdale.

Early microliths are usually obliquely blunted points, isosceles triangles or are retouched along one or more edges.

Later Mesolithic assemblages produce smaller and narrower microliths with geometric shapes. Scalene triangles and backed blades are very common in the Yorkshire region. These very small examples are from West Bilsdale.

In the very late Mesolithic needle like rod microliths appear. These have abrupt retouch along both long edges. This example was recovered from archaeological excavations at Street House in 1985.



Microliths were manufactured from sections of blades. The top of the blade (with the thicker bulb) was often removed by notching one side to allow the blade to be snapped. The discarded bulbar end with notch is known as a microburin. Early flint collectors thought that these were engraving tools (see Burins on Factsheet 6).

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Mesolithic [c.8500 - c.3800 B.C.]

Scrapers

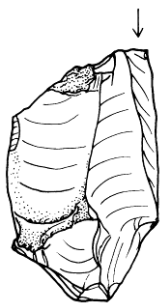
Scrapers are fairly ubiquitous throughout prehistory. They are generally less chronologically distinctive than other artifact types. Scrapers are modified blades or flakes with retouch along one or more edges. The principal use of scrapers would be for removing hair and fat from animal hides and it is assumed that sites with large assemblages of scrapers were base camps.

End scrapers from Street House near Loftus

In the Mesolithic period scrapers tend to be based on blades or elongated flakes. Retouch is often limited to the end only.

Very small circular scrapers are also an acknowledged type of the period. They are often quite crude with limited, abrupt retouch.

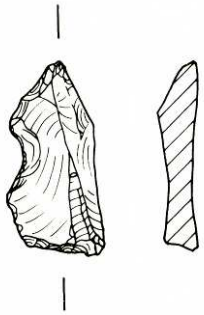
Burins



Burins are a frequent component of Mesolithic assemblages. They are usually based on flakes that have been modified by the removal of a narrow spall or splinter from one or more of its edges. These tools may have been used for engraving or carving antler or bone. This example is from Highcliff Nab, Guisborough. The arrow on the line illustration shows the engraving edge.

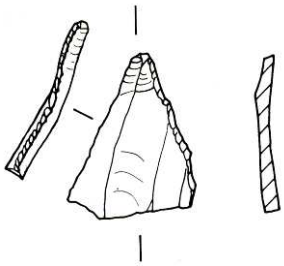
Piercers and awls

Piercers and awls are similar items, both made on flakes or blades.



Piercers normally have a pointed end with retouch on one or both edges and were probably used for creating holes in leather or wood. They were a heavy duty tools and often have a thick cross section.

Awls have retouch on alternate edges so that when they are twisted they drill a hole. They normally have a thinner cross section and were probably used to work lighter materials than piercers.



Both of these examples are from the hunting camp at Highcliff Nab near Guisborough.

Saws

Saws from Street House near Loftus

A wide variety of other tools are present on Mesolithic sites. These may include saws (blades or flakes with small denticulations or notches along one or more edges).

Early Neolithic [c.3800 - c.3000 B.C]

The Neolithic Period

The Neolithic sees a change from hunter-gathering to farming. Ceramics are introduced in the period. Generally speaking the method of knapping is little changed from the Mesolithic with blades and flakes produced with diffuse bulbs of percussion and with well worked out cores. As a result it can be difficult to tell Mesolithic and early Neolithic assemblages apart if diagnostic artefacts such as arrowheads are not present.

Leaf shaped arrowheads

The microlith is completely abandoned in the Neolithic period and is replaced by the leaf-shaped arrowhead.

Leaf arrowheads from East Cleveland

These are made on thin flakes with invasive retouch on one or both sides forming the distinct leaf shape.

Variations include the kite shaped arrowhead. This example is from Eston Nab near Middlesbrough. There is a wide variance in workmanship from functional to artistic as can be seen in the examples.

Other Tools

Less frequent tools include serrated flakes or blades and polished flint axes (image is not to scale)

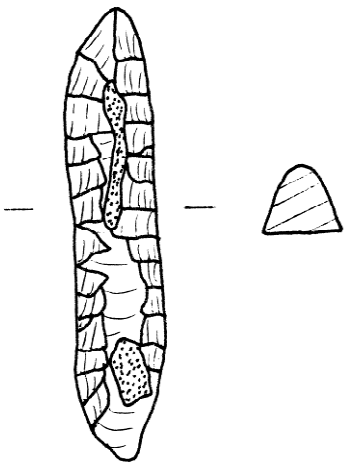
Scrapers

Scrapers based on long flakes or blades with retouch around the end, current in the Mesolithic, continue into the Early Neolithic. Rounded flakes were also used to produce end scrapers like this example.

Disc scrapers are another common type. These are usually on short round flakes with retouch around both edges and the distal end. This example is from Street House.

Knives

Knives were made on long flakes or broad blades. They are often shaped like a letter D. One edge was backed with steep retouch with the cutting edge either plain or with invasive retouch.



Fabricators

Fabricators are a poorly understood flint type. They are finger shaped with at least one flat side and usually have the appearance of being well worn and abraded. They may have been used for working leather. Other suggested uses include strike-a-lights. They continue in use in the later Neolithic and early Bronze Age.

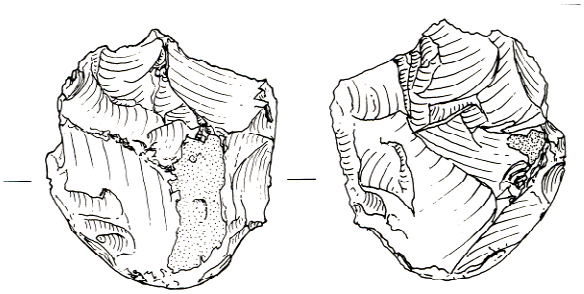
Late Neolithic/early Bronze Age [c.3000 – c.1500 B.C.]

The Later Neolithic/early Bronze Age

This period sees the introduction of new monument types including stone circles and henges. Metal is introduced and society becomes more hierarchical.

Cores

There is a major change in core technology in the early part of this period. Cores are much less regular, often with multiple platforms with limited amounts of flakes taken from each.



The disc shaped core appears in this period and may sometimes have been used to produce a thin flake as a blank for arrowheads.

Flakes

Antler hammers appear not to be used in this period meaning that all knapping was done with a hard hammer. These produced thicker squatter flakes, with pronounced bulbs of percussion (see Fact Sheet 4). Core platforms are no longer trimmed leaving spurs and ridges at the top of flakes.

Arrowheads

Despite a seeming regression in core and flake technology a wide range of fancy tools were produced including a variety of arrowheads.

Left: Chisel arrowhead – the wide tip encouraged blood loss in the target.

Right: Oblique arrowhead in a deep red flint.

These include chisel, tranchet and oblique types (collectively termed transverse arrowheads) which are introduced in the later Neolithic.

The Barbed and Tanged arrowhead (right) of the early Bronze Age is perhaps the most distinctive object of the period.

Scrapers

Scrapers tend to be similar in many respects to earlier periods; however they will normally be made on shorter, hard hammer struck flakes. The retouch may be more invasive and penetrate further into the body of the scraper.

One very distinctive type of scraper known as a 'thumbnail' appears in the early Bronze Age. These are small, usually under 3cm across and with abrupt retouch around the majority of their edges.

Fancy items

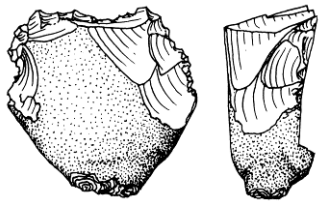
A number of high status flint objects were manufactured in this period. As well as arrowheads these include polished knives and flaked knives (see left).

It is quite possible that the very best quality flints were ceremonial and are often found in graves of the period.

Very fancy items include daggers and sickles but their distribution is limited.

Later prehistoric flint working

From the later Bronze Age (c.1500 B.C) there is a consensus that flint knapping deteriorated in quality, perhaps as a result of more widespread use of metal.



Left: Late Bronze Age scraper, note the large amount of remaining cortex and crudely executed retouch.

The flint industry appears to have become much more task focussed with any suitable chunk of flint serving as a core with flakes struck off with a hard hammer. Earlier flints were sometimes scavenged and reused. Later knapping scars can often be seen cutting through pre-existing patinas. The tools that can be identified in this period are generally more utilitarian and basic than in the previous eras.

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