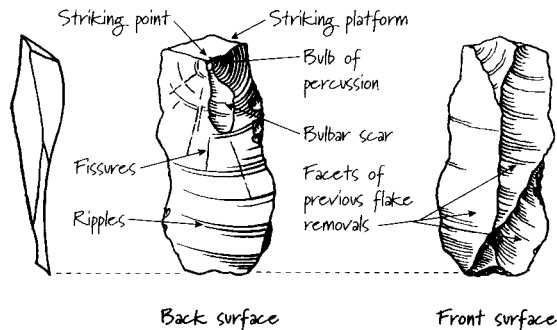


## HOW TO RECOGNISE A WORKED FLINT

It is possible to find worked flints almost anywhere in the Brecks. Tools were made by striking a prepared flint 'core'. Hand-struck flakes typically have the following features:

- ◆ A striking platform, which is a remnant of the upper side of the core;
- ◆ A striking point, where the blow fell, often leaving a pimple at the point of impact;
- ◆ A swollen 'bulb of percussion', bulbar scar, fissures and ripples, caused by shock waves travelling through the flint;
- ◆ Facets of previous flake removals on the front surface of the flake.

If you find an interesting specimen show it to one of the local museums listed below.



## TO FIND OUT MORE ABOUT FLINT

◆ For displays about prehistoric and modern flint knapping visit the Ancient House Museum (Thetford); Moyses Hall Museum (Bury St Edmunds), Mildenhall Museum, and Brandon Heritage Centre.

◆ A visit to the Neolithic flint mines at Grimes Graves is an unforgettable experience. For further information, including opening times, contact: 01842-810 656.

◆ See pits and mounds created by the Brandon gunflint miners at Lingheath. Go to High Lodge Visitor Centre near Brandon, and follow the Cycle Trail route west towards Brandon Country Park.

◆ Explore traces of the gunflint industry at Brandon. Visit the Heritage Centre (George Street). See angular waste flakes built into the walls of the town, along Gashouse Drove and in cottages along Thetford Road. There were knappers' workshops behind the 'Coach and Horses' and the aptly-named 'Flint-knappers Arms'.

## INTRODUCTION

The Brecks is the flint capital of Britain. Look almost anywhere on the ground surface, or at the buildings - especially churches and older houses - and you will see flint. It has played a major part in the history and landscape of the area.



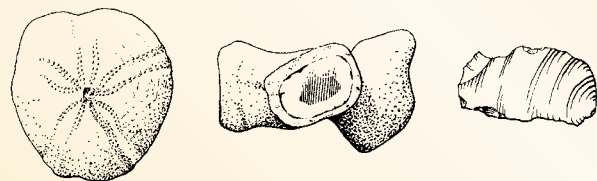
© Annie Pattison

The flint capital of the Brecks is Brandon. Its town sign is a flint knapper, symbolising a link with this mineral which goes back into remote prehistory, spanning the centuries from 'flint axe to gunflint'.

## GEOLOGY

*'The oldest industrial mineral in the world.'*

Flint is a hard, steely grey mineral found as rounded nodules in the chalk beds of Southern and Eastern England, although it may be other colours when weathered. It is a form of silica, and comes from the remains of sea creatures, especially sponges and sea urchins, which collected on the sea-bed when the chalk was being formed in Cretaceous times, about seventy million years ago.



Harder than the chalk in which it is found, flint does not dissolve in water and so is left behind after its matrix has weathered away. Though it is very hard and cannot be cut, it is easy to work by breaking, chipping and flaking because it fractures readily. Broken flint has razor-sharp edges, which made it an ideal material for use by prehistoric people before the invention of metal tools.



## ABOUT THE BRECKS



The Brecks is 370 square miles/940km<sup>2</sup> of countryside in Norfolk and Suffolk

The Brecks is one of the great natural areas of Britain. It is a place of strange beauty and hidden stories which go back to the Stone Age.

Ancient heathland once covered huge areas of the Brecks, created by the axes of prehistoric farmers and the nibbling teeth of sheep and rabbits. 'Brecks' were temporary fields cultivated for a few years and then allowed to revert to heath once the soil became exhausted. Sand storms were once a regular occurrence, such as the one which engulfed the village of Santon Downham in 1668. Through many centuries the heaths, and the mysterious, fluctuating lakes known as meres, became home to a distinctive range of plants and animals.

Over the last hundred years the ancient character of the Brecks has been changed forever. The large-scale pine plantations of Thetford Forest and the use of modern farming technology have transformed much of it into more productive land. The remaining stretches, and the more open parts of the forest, are now vital areas for wildlife conservation. The Brecks is an ideal area for quiet recreation, and the forests now welcome over 1½ million visitors each year.

## DISCOVERING THE BRECKS

Find out more about the natural and cultural heritage of Brecks with publications by the Brecks Countryside Project:

- ◆ "Wild Brecks", a nature conservation booklet
- ◆ "Historic Brecks", a landscape booklet
- ◆ "The Brecksfile": a multimedia resource file for schools (KS 2)
- ◆ Leaflet packs
  - 'Riding in the Brecks' • 'Cycling in the Brecks'
  - 'Walking in the Brecks'
- ◆ Brecks topic leaflets:
  - 'Getting to know the Brecks' • 'Wild Places in the Brecks'
  - 'Historic Places in the Brecks' • 'Birds of the Brecks'
  - 'Warrening: The Story of Rabbits in the Brecks'

For more information contact Tourist Information Centres at Brandon, Bury St Edmunds, Newmarket, Swaffham and Walton, or the Ancient House Museum, Thetford; or visit the Brecks website [www.brecks.org](http://www.brecks.org).



Designed by The Ark Design Co. Text: Anne Mason. Illustrations: Hosts Spalding and Jane Bottomley. Cover photographs © Ancient House Museum, Thetford, and H. Tyrell Green

## FROM FLINT AXE TO GUN FLINT



## The Brecks



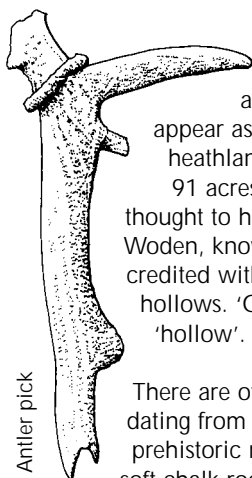
## THE STONE AGE

*'Used by a people who had not the use of metals'*

The Brecks has one of the earliest known archaeological sites in Britain, at High Lodge near Mildenhall. The Palaeolithic artefacts found in the silt bed of a pre-glacial river are of flint, and include scrapers, handaxes and worked flakes. There are even piles of waste flakes left by the flint workers five hundred thousand years ago.



A flint scraper from High Lodge



Antler pick

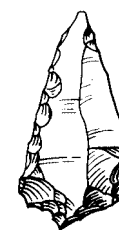
The Brecks also has the largest Neolithic mining site in Britain, at Grimes Graves. Here the mines appear as shallow depressions in an area of heathland covering about 91 acres / 37 ha. The name 'Grimes' is thought to have come from the Saxon god Woden, known as 'Grim', who was credited with making the grassy hollows. 'Grave' is the Saxon word for 'hollow'.

There are over seven hundred pits, dating from 2,800 to 2,000 BC. The prehistoric miners dug deep into the soft chalk rock, and made a complex underground system of tunnels and galleries to gain access to high-quality black 'floorstone' flint. They used shovels made from animal shoulder blades and antler picks to remove about seventy per cent of the floorstone.



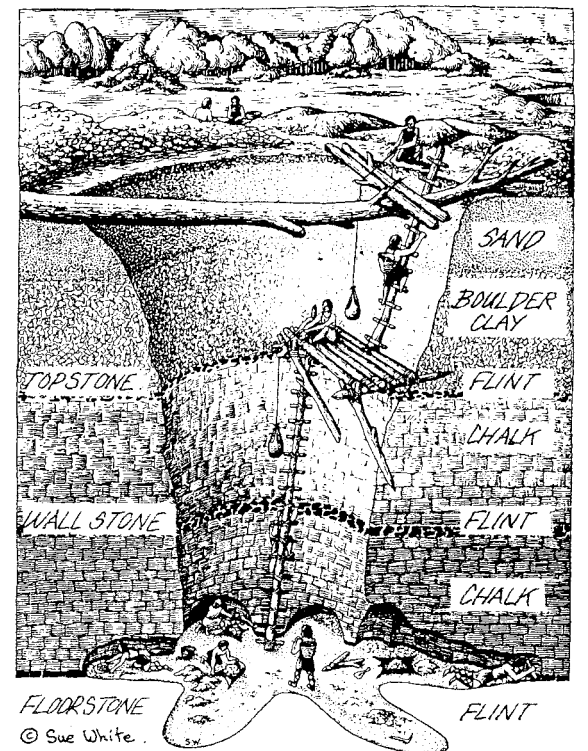
Underground galleries at Grimes Graves

© Derek Edwards/Aerial Archaeology



Archaeologists have estimated that it would have taken twenty men about one hundred days to dig one shaft, and then another forty days of work by six men to remove the flint. The miners would have used as many as one hundred and fifty antler picks in the process.

Visitors can descend a ladder into one of the pits at Grimes Graves, about 46 ft / 14 m deep, and look along the galleries. The flint was raised to the surface in baskets or skin bags. The process of shaping the flints into rough-outs of tools such as axes and knives took place on knapping floors, of which many have been found on the western and northern parts of the site. The flint was then traded over a wide area of Britain, and it is thought that the tools were perfected at their destination. There is no evidence of domestic settlement at Grimes Graves; the miners either travelled to the mines each day or camped nearby, as mining was a short-term, seasonal occupation.



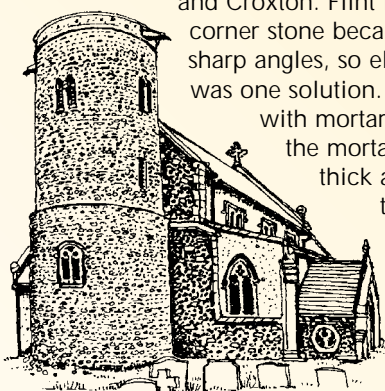
© Sue White

Diagrammatic section through a flint mine shaft

## MEDIAEVAL USES OF FLINT

*'A black wall wroughte of flint'*

In the Brecks some of the earliest flint structures are the round towers of churches such as Beachamwell and Croxton. Flint is not suitable as a corner stone because it does not make sharp angles, so eliminating corners was one solution. The flints were laid with mortar, as bricks are, but the mortar had to be very thick and stiff to prevent the flints rolling away, and only a few courses could be laid at a time.



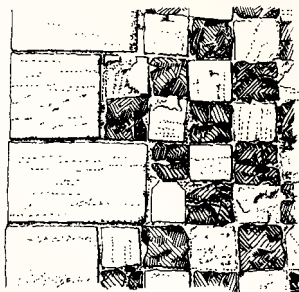
A late Saxon round tower, St Peter's Church, Merton

Flint's decorative qualities were exploited from the fourteenth century

onwards, especially in 'flushwork' and chequered panelling. The nodules were partly trimmed or knapped into rectangular blocks. After splitting, both halves were set in the wall with the new faces exposed. The mortar between the flints was sometimes filled with tiny flakes of flint in a process called 'galleting'. When brick or freestone was used in alternate squares with flint, it produced a chess-board or chequer pattern. This was used to great effect on clerestories, parapets and plinths, and to enrich porches and towers. Flint pieces were used to make sacred monograms, petitions to saints and inscriptions of benefactors' names.

Most churches in the Brecks were built of flint.

Beachamwell has elaborate flushwork at the top of the tower; Hilborough and Mildenhall have richly decorated flint parapets and porches; Lynford and Elveden are almost entirely of flint; Thompson has flint panels; East Harling's porch is superb, and at Santon Downham, around the base of the tower, the names of those who bequeathed money in their wills to the church from 1463 to 1504 are inscribed in flint.



Flushwork at St Peter's Church, Thetford



The Gatehouse, Thetford Priory

Other important flint buildings include the fortified manor house of Weeting Castle, Thetford Warren Lodge, and the gatehouse of Thetford Priory.

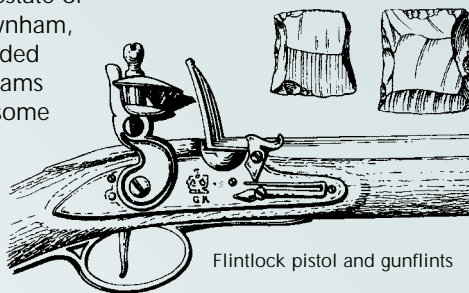


Thetford Warren Lodge

## GUN-FLINTS

*'Brandon flint - more certain in its fire and lasting longer than any other'*

There is no documentary evidence for when or where sparks from flint were first used to fire gunpowder, but flintlock guns were being used in France about 1600. There is a written record of an order received by London gunsmiths in 1661 to provide 15,000 'flintstones cutt' for the garrisons in Tangier and Ireland. The Board of Ordnance controlled the arsenal of weapons, and its Master-General was a cousin of Lord Cadogan who owned the estate of Santon Downham, which included the chalk seams containing some of the best black flint.



Flintlock pistol and gunflints

At the beginning of the Napoleonic Wars nine Brandon gunflint makers were commissioned by the Board to supply 360,000 flints a month, worth £4500 in a year. In 1813 fourteen flint masters were contracted to supply 1,060,000 musket flints a month, worth about £18,000 annually, giving employment to 160 knappers and miners.

Brandon flint knappers were superior because they used a point-headed hammer rather than the round-headed ones used in other parts of the country. Ironically, it is supposed to have been a French prisoner-of-war in forced labour near Brandon who suggested that the point-headed hammer, as used in his native France, was best for flaking flints! After the Napoleonic Wars had ended gunflints were exported to North and South America, Africa, New Zealand, Spain, Russia, China and Malaya. During the Crimean War Brandon supplied eleven million flints annually to the Turkish Army, and there were then three masters employing thirty-six knappers. Brandon flints were still in use in Abyssinia in 1935, and even in 1950 2,000 gunflints were being made each day, mainly for export to Africa.

## MINING

The flint was mined principally at Lingheath, 1½ miles / 2 km south-east of Brandon. Though it is now farmland, the area was once covered with shafts and mounds of chalk, each dug by a miner using crowbar, spade and single-pronged pick. The shafts were oriented to the mid-day sun, and constructed in a turning series of descending stages. One miner



Pony Ashley, the last miner at Lingheath, c.1925

picturesquely described this as 'bubberhutching on the sosh', a term perhaps derived from 'bobby-hutch' (a covered carriage or seat) and someone being 'on the sosh' (staggering the worse for alcohol). Toe-holds were cut into the chalk walls, to a depth of up to 40 ft / 12 m, and the chalk and flint were heaved up stage by stage, often on the head of the miner, to be piled around the shaft in a horseshoe-shaped mound.



Mounds of flint and chalk on Lingheath

The excavated flint was measured in 'jags', about one horse-load, equal to a ton. A miner earned about 11 pence a jag, perhaps bringing to the surface three and a half jags in a six-day week. The best flint was actually termed 'bests' and inferior flint was 'seconds'.

## KNAPPING

The flint was taken to Brandon to the knappers' workshops to be made into gunflints. This involved the three operations of quartering, flaking and knapping.

To quarter the nodule, the knapper wore a leather pad on his left knee and a leather apron. He rested the nodule on the pad and used an iron hammer to tap it, gently severing it along a line of cleavage and so producing a square edge from which flakes could be struck.



Mr H. Field quartering a flint, c.1930

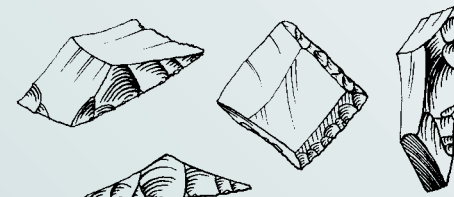
The quarter had to be struck at exactly the correct spot and angle to dislodge the flake. The aim was to produce long, parallel-sided flakes with even edges. A skilled flaker could produce between 5 and 7,000 in a day, while an expert could strike as many as 10,000!



Trimming gunflints with a flaking hammer

Three hundred could be produced in an hour by experienced knappers.

The largest gunflints were for muskets, smaller ones for carbines or rifles and the smallest for pistols. The cores left after the flaking process were squared up and sold to builders, and the remaining waste was piled up in huge heaps at the eastern end of town, to be used for walls and as ballast for roads, and later railways. The long wall at Gashouse Drove was built of this material.



The records of the gunflint industry show that the skills of knapping were passed on through the same families. Look at the gravestones in Brandon Churchyard and you will see noted names such as Basham, Field and Snare; many of them died of 'knapper's rot', a form of the lung disease silicosis which was the result of inhaling razor-sharp flint dust for many years. Of eight men in one workshop, seven died before they reached fifty, while in another a father and his three sons all died within four years of each other.

There is still some demand for flints for church restoration, repairs to listed buildings and new buildings in the vernacular style. Flint is no longer mined in the Brecks, and is supplied today from quarries near Holt, which produce grey flint rather than the traditional black.