

Geology: Flint in Bucks

You cannot live in south Bucks without being aware of flint. Follow a path



Flint rubble masonry



**Former Amersham
Workhouse, built by
George Gilbert Scott.
Photo Kevin Quick**

across a ploughed field in the Chilterns, and you will see a scatter of these off white nodular pebbles poking out of the soil. On some steeply sloping fields, the flints can be so thick on the ground that there may be scarcely any soil to offer a bed for sown grain. A dairy farmer once told me that one reason why he switched to arable was that cows often injured their hooves on the razor sharp flint fragments that poked through the pastures. Gardeners will often dig up flints from the brown clays that cover so much of the Chiltern plateau.

So many of the mediaeval churches have walls built partly of flint rubble, and who has not seen the numerous cottages and garden walls and older public buildings in which flint, often knapped to expose the grey glassy interior, has been regularly laid to give that distinctive appearance so beloved of estate agents' sales photographs?

What is flint? It is composed of two of the most common elements making up the earth's crust – silicon and oxygen. It is silicon dioxide, the same chemical compound as quartz, but it is unlike that mineral in one very important way: quartz has a regular crystalline arrangement of its constituent atoms, whereas flint is said to be cryptocrystalline, with the bonds between the atoms oriented in random multiple directions. It is this quality that gives flint its distinctive mechanical qualities – most notably that



Flint artefact showing conchoidal fractures

when it is broken, instead of the flat shiny surfaces characteristic of quartz, it has what is called a conchoidal fracture: pieces flake off the main body of the fragment leaving a rounded hollow scar with small curving ridges reminiscent of a seashell – or conch. How flint is formed is something of a mystery. In England it only occurs in the chalk rock laid down in the cretaceous era. Chalk is the accumulation on the seabed of innumerable microscopic shells called coccoliths, and it is suggested that hollows in the chalk layers formed by burrowing creatures or sponges, were filled by mineral concretions that gelled to form the irregular shaped pebbles.

There is an important characteristic of flint – when it is fractured, razor sharp edges are produced. It is this property that has made flint so important in human history. Various minerals such as flint, chert, or obsidian have been used for hundreds of thousands of years by human or humanoid creatures to make sharp edged tools. Flint is the best and most effective minerals or rocks for the making of stone tools, whether crude hand held hacking and cutting implements, skillfully crafted arrowheads and spearheads, or finely polished. An accomplished craftsman could shape the irregular nodule, repeatedly striking the flint with another stone, or perhaps an antler or piece of bone to produce the final shape.



**Flint Axe
above.
Arrowhead
right.**

Flint tools are commonly found in excavations of stone age sites – the Palaeolithic, Mesolithic, and Neolithic periods of human occupancy of Bucks. It can be a small pleasure in a fieldwalking exercise to find lying on the surface of the bare soil some such artefact brought up by the plough. Of course, in later periods of human history, as the Bronze and Iron Ages followed, stone tools no longer are to be found.





Gunflint

However, one type of flint artefact sometimes may be turned up from the soil. Nicely squared or rectangular flints were used in firearms right the way through to the nineteenth century. A metal, mechanism would strike the flint to generate a spark, so igniting the powder charge of a flintlock weapon.

Flint is characteristically a mineral found in South Bucks where the cretaceous age chalk is predominant. But it is a surprise in North Bucks to find occasional scatters of flint fragments littering the fields.

Sometimes, I dig up flint in my back garden here in a region of Jurassic outcrops near Buckingham town, some thirty kilometres from the Chiltern chalk escarpment. How did it get here? There are two possible explanations. In the first place, the flint may have been deposited by glacial ice or by fluvio-glacial meltwater. Ice sheets that once covered so much of Midland England had swept up masses of rock fragments and clay and sand and dumped them across the landscape. Some of this material included flints. Another explanation is that in the distant past, the chalk now forming the Chilterns once extended north and west covering the whole of the county. Chalk is a soluble rock affected by water charged with carbon dioxide, so that over North Bucks it was dissolved away. The flint nodules were not soluble, so remained as a residual scatter on the land surface long after the disappearance of the chalk in which they had been formed.
