

Worked flint is one of the most common finds on archaeological sites since it was the basic raw material for tool, implement and weapon manufacture on these islands from 800,000 BC until at least 1000 BC. However, it is only in the Neolithic that we have evidence for the systematic exploitation of flint through mining.

Flint occurs in chalk deposits that can be found across eastern England as far north as Yorkshire, and in certain other locations in the British Isles. It can be obtained from so-called superficial deposits (tills, brickearth, clay-with-flints, and as beach cobbles, etc), although its exposure to weathering and rolling introduces flaws that often reduce its accurate flaking qualities. In areas of limited flint or no flint, other siliceous stones, cherts and quartzite were used instead. Good quality flint is likely to have been encountered when ditches were being dug in chalkland for monument building but that does not seem to have been the trigger for mining: a recent dating programme (*Gathering Time* by A Whittle, F Healy and A Bayliss 2011) has shown that the earliest flint mines in Sussex significantly predate these monuments.

Flint mines were first noted by antiquarians during the late seventeenth century, with excavations being carried out in Sussex and Norfolk during the nineteenth century. Some early investigations failed to reveal the true depth or character of the pits which led to interpretations of the hollows as dwellings. It was not until later in the nineteenth century that their true identity as mines was understood after excavations by Cannon Greenwell, and in the early twentieth century by Cecil Curwen and others. Excavations continued throughout the twentieth century at various sites including Grimes Graves in the 1970s.

Flint was extracted by digging roughly circular pits or shafts until the seams of flint were located. In some of the shallower workings these pits were enlarged or undercut to obtain more flint. At the base of very deep shafts a series of radiating galleries (tunnels) was dug. These followed the high quality 'floorstone' flint layer

enabling more of it to be extracted than was encountered just at the base of the shaft.



Galleries at the base of the shafts at Grimes Graves.

The depth of some of these mines is remarkable (up to 13 m deep at Grimes Graves, Norfolk), particularly as the chalk and spoil were removed using only fairly basic tools - 'picks' made from antlers, 'shovels' made from cattle bones. The spoil was presumably removed using baskets or other containers. At some of the mines at least two seams (topstone and wallstone) of flint were dug through in order to get to the highly prized lower flint deposits (floorstone). Ladders would have been needed in the deepest shafts. It can only be imagined how dark and dangerous these places were: small chalk cups have been recovered from some sites which may have been used with animal fat and wicks as lamps.



How the Grimes Graves shafts may have been accessed. © Historic England

Flint mining was dangerous and would have been labour intensive. It demonstrates a high level of organisational and technical skill. It represents the first 'industrial' activity yet seems in some respects to have been unnecessary: superficial deposits were utilised extensively and sometimes produced large core tools/axes. It is possible that the act of mining had special significance that was transmitted to artefacts made from flint obtained in that way. Finds of carved chalk objects (cups, balls, phalli etc), of animal bone and human bones, and of careful arrangements of objects (e.g. two antler picks and a Cornish greenstone axe placed around the skull of a rare wading bird at Grimes Graves) support the idea. Additionally, at Grimes Graves special objects such as finely decorated Grooved Ware vessels and antler picks were placed on chalk platforms, while fires lit at some shaft bases do not seem to have been used for cooking. They may relate to rituals associated

with the act of mining itself – possibly connecting burning, renewal and cleansing through the use of fire.

A couple of flint mines have also been investigated in Scotland (e.g. Den of Boddam, Aberdeenshire) and Ireland (sites in County Antrim, Northern Ireland) but only on the Breckland in Norfolk and the South Downs in Sussex was exploitation on an industrial scale. Intriguingly it seems the two deep mining complexes operated at quite different times: those on the South Downs during the earliest Neolithic (from as early as 4000 until c. 3600 BC), that at Grimes Graves during the later Neolithic (2650–2400 BC), a thousand years later.

With the advent of metal, flint was used less and many of the mines ceased to be used. New working at Grimes Graves occurred in the Bronze Age but rather than mining, the Neolithic spoil heaps were now exploited for useable raw material. Flint mines were sporadically used thereafter until the medieval period when flint was incorporated into buildings. The invention of the flintlock gun in the seventeenth century led to a resurgence of flint mining and knapping with Brandon becoming a major centre producing and exporting over one million gunflints a month. Today, flint knapping continues with master flint masons being creative with buildings, and master knappers like Jon Lord and Phil Harding making replicas and using their skill to understand flint scatters and knapping sequences.

Further Reading

Holgate, R. 1991. *Prehistoric Flint Mines*. Princes Risborough: Shire Archaeology

Russell, M. 2000. *Flint Mines in Neolithic Britain*. Stroud: Tempus.

Barber, M., Field, D. and Topping, P. 1999. *The Neolithic Flint Mines of England*. London: English Heritage

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