

## ARTICLES

### A Left-hander Handaxe from Upperton, near Watlington, Oxfordshire and its Geological Context.

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#### SUMMARY

*This paper considers a newly found Palaeolithic handaxe and its geological and geomorphological context. Consideration of the local drift deposits help to explain the artefact's condition. The manufacture of the handaxe suggests it was made for use by a left-handed person.*

In 2001, an Acheulian flint handaxe was found in the garden of Upperton Farm Cottage, Upperton, near Watlington, Oxfordshire (National Grid Reference 6566794120). The handaxe was recovered from a pile of disturbed sediment which also contained small and medium sized flints and 18th and 19th century brick and tile fragments. This debris resulted from the digging of foundations for an extension that was constructed in 1994 (Clarke, pers. comm.). One possible explanation for the occurrence of a Palaeolithic artefact here is the disturbance of local Wallingford Fan Gravels, which comprise remnants of sediments that were deposited during the extreme climatic conditions of the Pleistocene era. The Wallingford Fan Gravels owe their formation to cycles of freezing and thawing on the Chiltern Hills which caused massive downhill movement of sediments and re-deposition of these at lower levels in the landscape around modern-day Wallingford. Artefacts deposited by archaic humans in the Wallingford area during or immediately before these climatic fluctuations, would either be caught up in mass downhill movements of sediment or, if deposited on a topographically low land-surface, buried by incoming material. Although erosion has surely carried away much of the original Wallingford Fan Gravel formation over the thousands of years since deposition, remnants of this Pleistocene sediment remain, wherein lie clues to an archaic occupation of the region by Palaeolithic humans and beneath which lie preserved, Pleistocene land-surfaces.

Pleistocene human activity in the Upperton region is otherwise attested by more than 30 Palaeolithic handaxes that were recovered during early twentieth century commercial extraction of Wallingford Fan Gravels at Rombold's Pit (sometimes 'Rumbles Pit'), Ewelme,<sup>1</sup> less than 2 kilometres southwest of Upperton Farm Cottage. Other local gravel pits – Turner's Court (Farm) Pit and Gould (or Gold's) Grove have also yielded significant finds of Pleistocene age (see Fig. 1 below; collections now housed at the Pitt Rivers Museum, Ashmolean Museum and Reading Museum).

<sup>1</sup> W. J. Arkell, 'Palaeoliths from the Wallingford Fan-gravels', *Oxoniensia*, viii-ix (1945), 1-18; D. A. Roe, *A Gazetteer of the British Lower and Middle Palaeolithic sites* (CBA Research Report 8, 1988), 249; D. A. Roe, 'The Palaeolithic Archaeology of the Oxford Region', *Oxoniensia*, lix (1994), 11; Wessex Archaeology, *The English Rivers Palaeolithic Project, Regions 7 (Thames) and 10 (Warwickshire Avon). Report No. 1* (1994-5), 178; J. J. Wymer, *Lower Palaeolithic Archaeology in Britain, as represented by the Thames Valley* (1968), 99-101; J. Wymer, *The Lower Palaeolithic occupation of Britain*, i (1999).

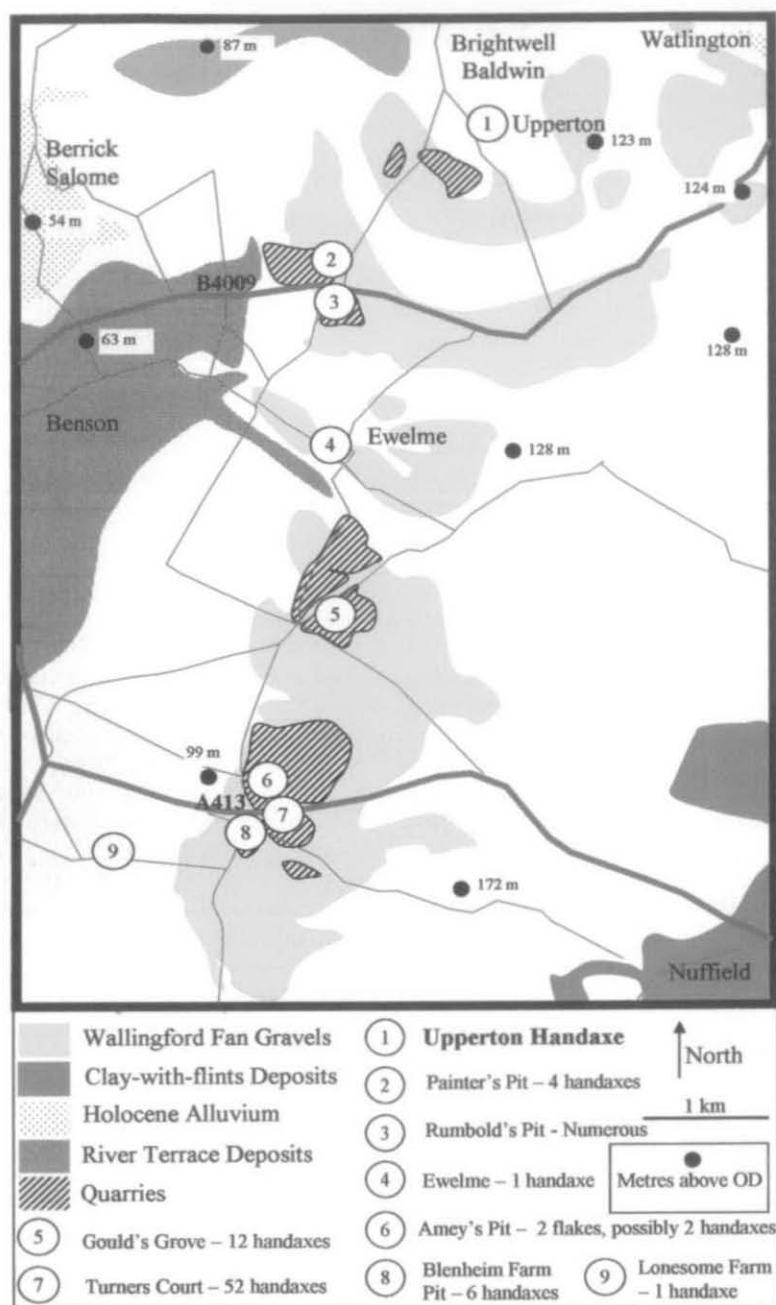


Fig. 1. A map showing the location of the Upperton handaxe findspot; local drift deposits; and associated Palaeolithic artefact find localities (after Wessex Archaeology<sup>2</sup> and Ordnance Survey).

<sup>2</sup> Wessex Archaeology, *The English Rivers Palaeolithic Project, Regions 7 (Thames) and 10 (Warwickshire Avon)*, Report No. 1 (1994-5), 175-83.

## ARTEFACT DESCRIPTION

The moderately sized, somewhat pointed handaxe shown in Fig. 2 was made from a nodule of grey to honey-coloured flint. Remnants of the natural, outer surface of the flint remain on both faces of the tool demonstrating that the nodule used was no thicker than the fully-shaped tool and quite probably a small, locally acquired nodule from the Chilterns. The edges of the artefact are generally worn and somewhat chipped suggesting that the handaxe has suffered damage over the thousands of years since it was made, used and deposited. However, it is significant to note that one face of the tool is substantially more worn and weathered than the other. The different condition of either face of the handaxe is discussed in relation to the geological context below. The surviving dimensions of the artefact are: Length: 100 mm.; Breadth 58 mm. and Thickness 26 mm.

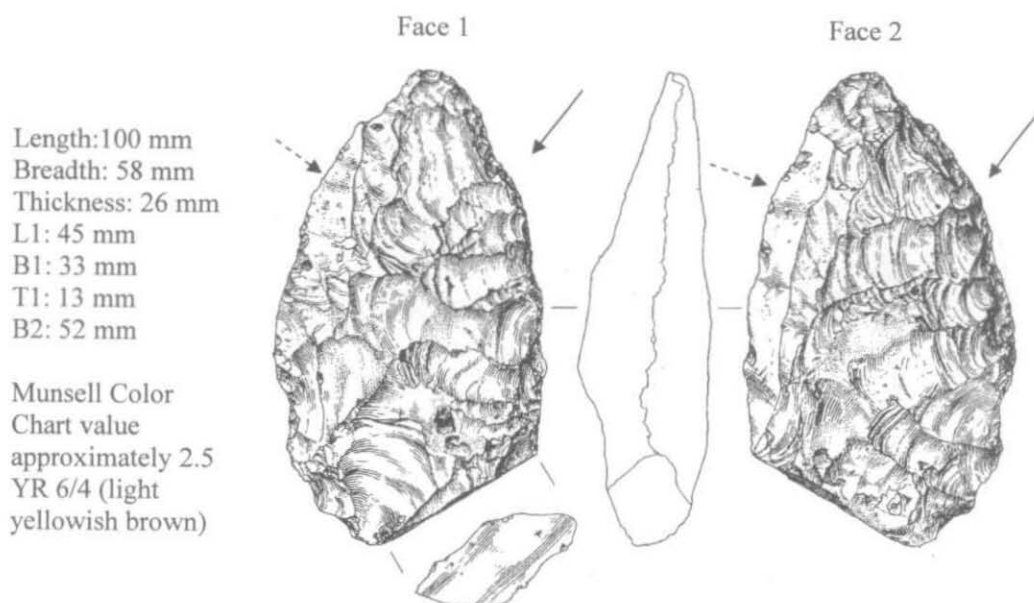


Fig. 2. The handaxe from Upperton Farm Cottage, Upperton, near Watlington, Oxfordshire. The dotted arrows indicate single flake scars on the left edge of each face of the tool, whilst the solid arrows indicate the more intensively flaked, right edge, of each face. Drawing by Jeff Wallis.

Some interesting technological characteristics of the tool are observed in the pattern of flake removals that shaped the handaxe and the oblique truncation at the butt end. With regard to the flake scar pattern, the tool appears to have been made with the most finely shaped, cutting edges on the right hand side of both faces (when the tool is orientated as shown in Fig. 2). The left-hand side of each face largely comprises a single, long flake scar which runs the length of the edge. These elongated scars were clearly created before the removal of flakes on the opposite face, since the latter truncate the former. The skilful and symmetrical application of this knapping technique suggests that it was a deliberate and carefully executed strategy. A modern butchery experiment demonstrates that moderately pointed handaxes such as the Upperton find were designed for use with the index finger extended

along one edge of the tool.<sup>3</sup> This hand-hold both supports and balances the cutting edge during use, as illustrated in Fig. 3. Assuming that pointed handaxes were held with the point directed away from the palm (as indeed seems likely considering the relatively butt-oriented weight distribution of pointed handaxes) the Upperton example, with its carefully shaped cutting edges on the right side of either face, indicates a left-handed hold.

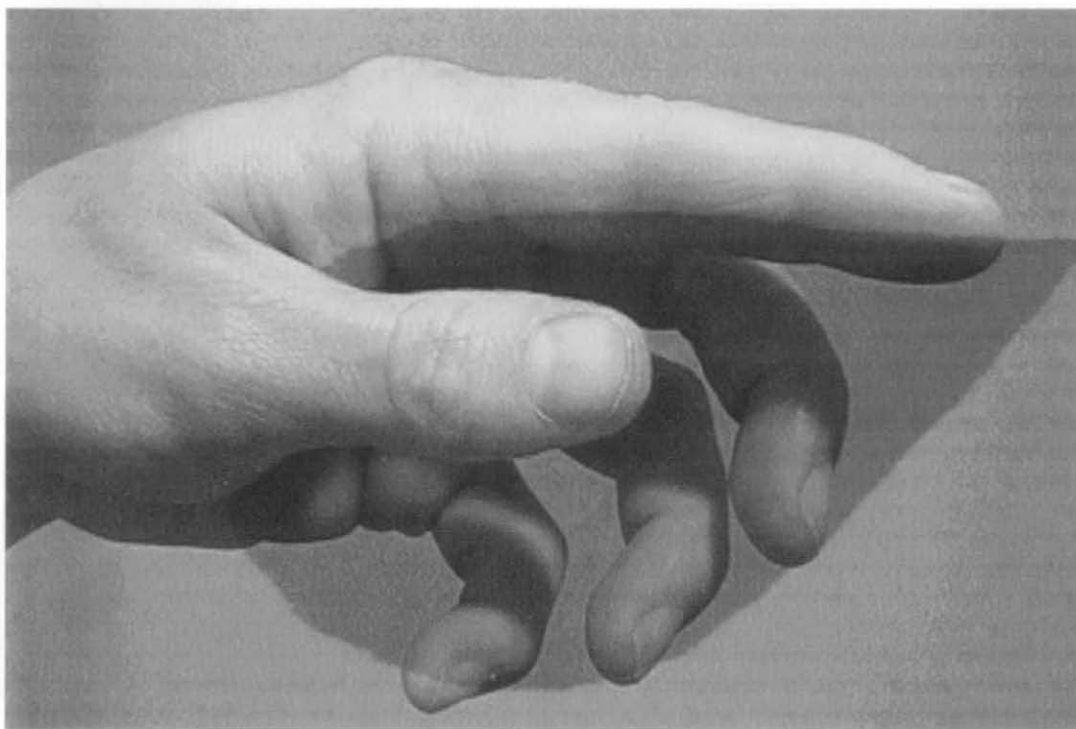


Fig. 3. The left-handed hold position suggested for the Upperton handaxe.

Preferential use of one hand (generally the right hand) in humans is thought to have evolved alongside language capabilities and (stone) tool-using behaviour and is associated with functional specialisations in the left hemisphere of the brain, specifically, the 'broca's area'.<sup>4</sup> Modern human societies have a ratio of right-handed to left-handed individuals of 8:1 or 9:1. The relationships that exist between brain lateralization, handedness, tool-use and language are the subject of lively debate in evolutionary circles. Some authors favour an early date for the onset of human brain lateralization and view its antecedents in the

<sup>3</sup> V. Winton, *A study of Palaeolithic Artefacts from selected sites on the deposits mapped as Clay-with-flints of Southern England, with particular reference to Handaxe manufacture* (BAR ccclx, 2004), 89-113.

<sup>4</sup> M. C. Corballis, 'From Mouth to Hand: Gesture, speech, and the evolution of Right-handedness', *Behavioral and Brain Sciences*, 26, 199-260; P. V. Tobias, 'The Brain of *Homo habilis*: A new level of organization in Cerebral Evolution', *Journal of Human Evolution*, 16 (7-8) (1989), 741-61; N. Toth, 'Archaeological evidence for preferential Right Handedness in the Lower and Middle Pleistocene and its possible implications', *Journal of Human Evolution*, 14 (1985), 607-14.

tool-using behaviours of our nearest living relative, *Pan troglodytes*, the chimpanzee.<sup>5</sup> This would imply that increased tool-use (and tool-making) by hominins after the evolutionary divergence of the *Homo* and *Pan* clades, from 5-8 million years ago onwards, stimulated the development of those neurological faculties of the left hemisphere that eventually led to both language production and modern human dexterity. It is therefore significant that the Upperton handaxe shows a clear preference for careful shaping along the right edge of either face. The left-handed, archaic human that made and used the Upperton handaxe some hundreds of thousands of years ago, was something of an oddity in a small group of predominantly right-handed, linguistically able, Pleistocene hunter-gatherers.

The oblique truncation at the butt end of the tool is likely to be a deliberate feature as it is a flaked rather than a natural surface incidentally incorporated into the tool shape. In fact, truncations of this sort are not uncommonly encountered on Palaeolithic handaxes from southern England and northwestern Europe. The functional significance of oblique truncations on the butt of handaxes is not clear and may prove to be purely stylistic. Naturally flat areas of flint, or flat areas of cortex on the butt of a handaxe are sometimes termed *méplat*. It is possible that continued research and better dating of sites could relate the production of handaxes with oblique butt truncations to a particular period of early human activity: in a similar vein, it has recently been suggested that 'twisted ovate' handaxes are a stylistic cultural marker for a period when early human populations were cut-off from mainland Europe by the formation of the English Channel.<sup>6</sup>

#### THE WALLINGFORD FAN GRAVELS

The Wallingford Fan Gravels are a sequence of chalky flint gravels which are predominantly decalcified and disturbed by freeze thaw processes in the uppermost sections. Most often the deposits are located at the base of the Chilterns escarpment at a height between 90 – 120 m. O.D., on the more resistant Melbourn Rock, which is found at the base of the Middle Chalk. The gravels can also be found covering the Upper Greensand and Lower Chalk. Successive solifluction events, possibly coupled with fluvial processes, appear to have brought material down from the Chilterns escarpment and therefore the likely parent materials include the Chalk and the superficial drift deposits capping it. Particularly note-worthy superficial deposits are those mapped by the British Geological Survey as 'Clay-with-flints'. Although of a heterogeneous nature<sup>7</sup> (variously comprising gravel, loess and clay) the Clay-with-flints deposits have great preservation potential for Palaeolithic flint artefacts and *in situ* sites.<sup>8</sup> Generally speaking, it seems that both the tenacious nature of the clays and the association with solution features in the Upper Chalk (which create depressions on the landsurface and thereby act as sediment traps) account for the preservation of Palaeolithic sites on the deposits mapped as Clay-with-flints in southern England.

<sup>5</sup> E. V. Lonsdorf and W. D. Hopkins, 'Wild Chimpanzees show Population-level Handedness for Tool use', *Proceedings of the National Academy of Sciences of the USA*, 102 (2005), 12634–8.

<sup>6</sup> M. J. White, 'Twisted Ovate Bifaces in the British Lower Palaeolithic: Some Observations and Implications', in N. Ashton, F. Healy, and P. Pettitt (eds.) *Stone Age Archaeology: Essays in Honour of John Wymer* (1998), 98–104.

<sup>7</sup> J. Loveday, 'Plateau deposits of the southern Chiltern Hills', *Proceedings of the Geological Association*, 73 (1962), 83–102.

<sup>8</sup> J. E. Scott-Jackson, *Lower and Middle Palaeolithic artefacts from deposits mapped as Clay-with-flints: A new synthesis with significant implications for the earliest occupation of Britain* (2000).

The Wallingford Fan Gravels, in part derived from the deposits mapped as Clay-with-flints, have been previously described through careful monitoring of exposed sections in three nearby gravel pits: Amey's Pit, Hall's Pit and Grundon's Pit.<sup>9</sup> The Wallingford Fan Gravels slope away from the high ground on average by just 1.5 degrees.<sup>10</sup> Two distinct gravel units are identified, separated by the fine-grained, Gould's Grove Member, which contains an organic soil horizon.<sup>11</sup> Molluscan fauna from the Gould's Grove member indicate cold climatic conditions, with arctic, alpine species; the mammalian fauna and pollen additionally suggest an open, herb dominated, glacial environment with streams and lakes.<sup>12</sup> It is possible that the Upperton Farm Cottage handaxe represents human presence under these conditions.

## GEOMORPHOLOGICAL PROCESSES

The chalk and superficial deposits in the area have been subject to a number of geomorphological processes which could have affected the condition of the Upperton handaxe and which complicate the issue of relating the artefact to a particular period of time. These include frost action, fluvial activity, *in situ* solution, and clay translocation. Frost action is clearly evident in the Wallingford Fan Gravels. The deposits display features associated with severe cryoturbation in the upper layers for which Whittow<sup>13</sup> tentatively suggests a late Devensian age. The strength of the cryoturbation is evidenced by the presence of vertically inclined flint pebbles and involutions. The area has also been subjected to slow denudation and reduction of the landsurface by frost action. As the climate ameliorated freeze-thaw processes were replaced by solifluction and fluvial activity and the products of frost action would have been selectively removed.

Chalk underlying the Wallingford Fan Gravels is highly susceptible to solution resulting in an uneven interface between the two (e.g. as exposed in Amey's Pit in 1973). It is therefore possible that the Upperton handaxe derives from a pocket of sediments that now fill a solution feature in the upper levels of the Chalk bedrock. This could account for the artefact's preservation at the Upperton locality in modern times, whilst the general covering of Pleistocene-aged, Wallingford Fan Gravels is too insubstantial to have been mapped in this precise location.

Elsewhere at Amey's pit, a unit described as 'Clay-with-flints' (undoubtedly derived from the superficial deposits of the Chilterns hills and plateaux) was sealed in by the Wallingford fan Gravels.<sup>14</sup> This suggests that the Clay-with-flints was soliflucted from the Chilterns escarpment prior to the movement of the Wallingford Fan Gravels. Further excavation would be necessary to determine the date of deposition for either deposit and to assess whether the inferred sedimentation episodes relate to one or more cold stages of the Pleistocene era. In general terms, it is possible to assert that an association with the Wallingford Fan Gravel formation would indicate that the Upperton handaxe is of Middle Pleistocene age (780, 000 to 127, 000 years ago).

<sup>9</sup> J. B. Whittow 'The Wallingford Fan Gravels', in D. Roe (ed.) *Quaternary Field Guide to the Oxford Region*. (1976), 44 and Fig. 22; A. Horton and J. B. Whittow, 'Oakley Wood Pit, Benson', in E. R. Shephard-Thorn and J. J. Wymer (eds.) *Guide book for Excursion A5* (10th Int. Un. Quat. Res., Birmingham 1977), 18–22.

<sup>10</sup> A. Horton, B. C. Worssam and J. B. Whittow, 'The Wallingford Fan Gravel', *Phil. Trans. Roy. Soc. B* 293 (1981), 215–55.

<sup>11</sup> Horton *et al.*, *ibid.*

<sup>12</sup> Horton *et al.*, *ibid.*

<sup>13</sup> Whittow, *ibid.*

<sup>14</sup> Horton *et al.*, *ibid.*

## DISCUSSION AND CONCLUSION

The condition of the Upperton handaxe suggests that the artefact was buried in one position for a long period of time, with the more worn face lying exposed to damage, whilst the better preserved surface was protected. This could indicate that the handaxe was deposited on a land-surface close to where Upperton Farm Cottage now stands and later covered by incoming debris moving down from higher ground during an intensely cold climatic episode. This would explain why one face is in very sharp condition, whilst the other, and the tool edges, are rather blunted and damaged. Although an isolated and undated find, the left-hander Upperton handaxe is an important reminder of the archaeological potential of the area and in itself provides notable evidence of the sophisticated technological behaviour of archaic humans in southern England.

## ACKNOWLEDGEMENTS

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