

‘A CAUSE FOR WONDER’: PRELIMINARY OBSERVATIONS ON FURTHER PALAEOLITHIC SURFACE FINDS BY RON WAITE FROM AROUND NUNEATON, WARWICKSHIRE

Anne Graf¹

ABSTRACT

An extensive selection of the Palaeolithic surface material of quartzite, andesite and flint is described, collected over many years from around Nuneaton, Warwickshire, by Mr. Ron Waite. The majority of the material is of Mode 1 or 2 manufacturing technique, with numerous bifaces and chopper-cores. A few pieces may derive from pre-Anglian occupation contemporary with that at nearby Waverley Wood, Warwickshire, also on the line of the former pre-Anglian Bytham River. The twisted form of several bifaces possibly hints at a rare Midlands Hoxnian presence. Potentially later artefact types newly recognised in quartzite include a core-axe, picks and possibly prepared cores, perhaps from Marine Isotope Stage (MIS) 9–7, while a quartzite discoidal core, backed knives and an andesite transverse scraper may be of similar date, or may even suggest a Mousterian presence in the Middle Devensian (MIS 3). Artefact distribution seems to relate to the present (post-Anglian) drainage system, and may reflect elements of Palaeolithic landscape use and activity areas. Quartzite artefacts from other British sites are briefly discussed.

INTRODUCTION

It seems appropriate in this tribute volume to ‘Mac’ (the late Mr. R.J. MacRae), to whom quartzite artefact studies owe so much, to introduce the Waite collection with Mac’s own words (1991: 18):

‘It was a cause for wonder a decade ago that numbers of flint and quartzite handaxes were being picked up on the surface of ploughed fields in what seemed a most unlikely place: the border of northeastern Warwickshire with Leicestershire....where the discoveries have been made by Mr. R Waite’

Mr. Ron Waite, cycling out from his home in Nuneaton (Figure 1), had begun in the 1970s to focus on Palaeolithic finds of quartzite, flint, andesite and other igneous rocks (see, for example, Saville & Shotton 1973). Himself an accomplished knapper in both flint and quartzite, he was already making major fieldwork contributions to Midlands Mesolithic and other lithic studies, (Saville 1974, 1975, 1977a & b, 1981a & b, 1994; Saville & Shotton 1975; Wise 1990; Brown 1993b). Mr. Waite’s Palaeolithic discoveries continue, recently extending into Staffordshire, with many Warwickshire finds donated to Warwickshire County Museum, finds mainly from Leicestershire to that county’s museums service, but a large number retained in his private collection (Table 1).

Several of Mr. Waite’s Palaeolithic finds have been recorded and published over the years, chiefly by Alan Saville, the late Professor Shotton and the staff of local museums (Saville & Shotton 1973 & 1974; Saville 1986 & 1988; Pickin 1988; Shotton 1988; MacRae 1991;

¹ ‘Ultima Thule’, 8 Welbeck Avenue, Leicester LE4 0ED.

<i>Category</i>	<i>Detail/ref. (EN = temporary entry no.)</i>	<i>Finds area</i>	<i>No. of items (both natural & worked)</i>	<i>Initially examined by A.G.</i>
Personal gifts	Known	Warks.	3	Yes
	Not yet traced	?	Possibly <10	-
Leics. County Museum	Accessioned	Leics.	443	Yes
	EN2114	Mostly Warks.	308	Yes
	EN2115	High Cross Pit, Warks.	91	Yes
	EN2724	Leics.	60	Yes
	EN6647	Leics. & Warks.	111	-
	EN6654	Leics.	c.30	-
	EN6655 (via A. Saville)	?Leics. & Warks.	Large collection	-
Waite Private Collection	1 st Loan ('Handaxes' Boxes 1–3)	Warks.	133	Yes
	Remainder	?Warks.	?	-
Warks. County Museum	?	?Warks.	?	(Some published)
Total				1038

Table 1. Waite material — initial quantification

Brown 1992 & 1993a; Wymer 1996 & 1999; Graf 2002; Lang 2004; Lang & Keen 2005). However these publications, detailing some 25 handaxes and alluding to much other material, have merely scratched the surface in terms of the quantities he has collected, and therefore the present project has been initiated to record the remainder. Mr. Waite has most kindly agreed to loan his private collection, the first items of which were received in the Spring of 2005, with many more to follow in due course. A full measured catalogue is intended, but this paper aims to indicate the general character of those artefacts already examined, and the future potential. In the light of the recent exciting discoveries in quartzite and andesite at Waverley Wood Farm Pit, Bubbenhall, Warwickshire, just 20km south of the present study area (Lang & Keen 2003; Keen *et al.* in prep.), it also aims to remind fieldwalkers and excavators of the important presence of non-flint lithic artefacts in this region.

A preliminary examination (Table 2) has rapidly confirmed the importance of the items retained by Mr. Waite in his own collection, and the accuracy of his present view (Waite pers. comm. 2004) that many of his earlier finds (often those donated) he would no longer judge to be worked in the light of greater experience of quartzite fracture characteristics. The writer would agree with MacRae's comments (1986: 9–10) on the need for experience in recognising genuine human workmanship in quartzites. The criteria of Saville (1988: 77) have been applied, but some identifications remain tentative. However, any even slightly doubtful items have been excluded from what follows, being merely listed for completeness in Appendix 1. This paper will concentrate on the unusual quantity and quality of the main classifiable types of quartzite and andesite artefacts believed to be of Palaeolithic age, and will not discuss other items accompanying them, some of which could be more recent. Because of the unstratified nature of the material, its Palaeolithic age cannot ultimately be proved, but has always to be inferred, with due caution, on grounds of characteristic typology and/or rolled condition.

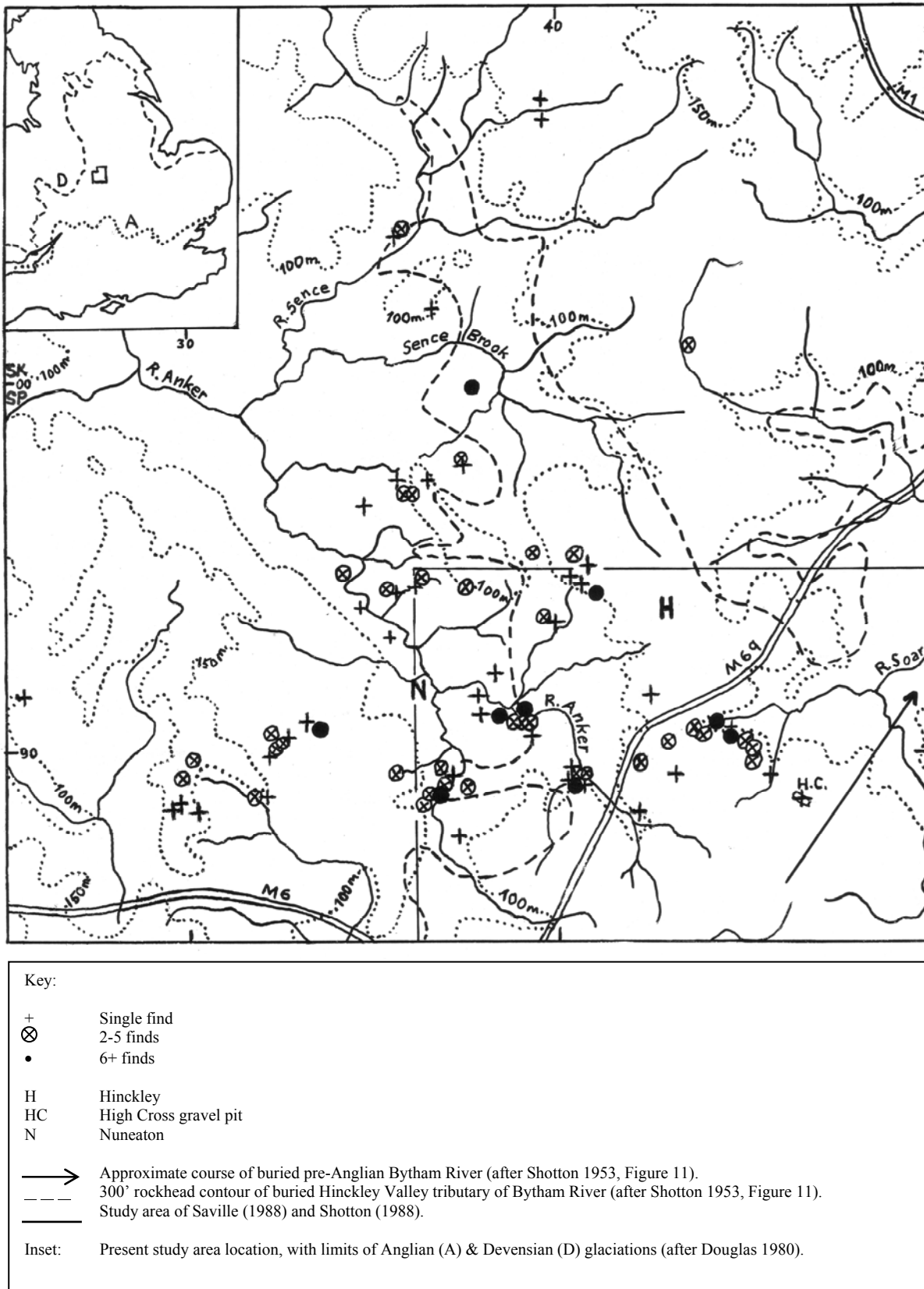


Figure 1. Waite Palaeolithic findspot locations, in relation to previous study areas and pre- and post-Anglian drainage

Even this first inspection has made clear that the collection documents a much denser Palaeolithic occupation than often postulated for this region (Roe 1988: 4–5; Wymer 1988: 11 & 18–19; 1999: 3–4); a greater use of local and other rock sources; a wider range of tool types than previously identified in quartzite; an extended date range in post-Anglian time; and a distribution that may well reflect dynamic aspects of Palaeolithic landscape use.

PHYSICAL SETTING AND RAW MATERIALS (Figure 1)

Outside the urban centres of Nuneaton and Hinckley, the study area is one of mainly rural river valleys, of subdued relief (Figure 1). The Palaeolithic finds rest on the thick mantle of various, largely Anglian, drift deposits covering most of the area and filling the pre-glacial Hinckley Valley, a former major tributary of the now-buried Bytham River (Figures 1 & 2; Douglas 1980; Rose 1989; 1994). The Bytham River may have formed the main entry route to the region for early humans from the rest of the continent, as shown at such sites as Pakefield (Parfitt *et al* 2005; Roebroeks 2005), High Lodge (Ashton *et al.* 1992) and Waverley Wood (Shotton *et al.* 1993), but was overwhelmed and its deposits deeply buried by the Anglian ice and its drift deposits (widely interpreted as from Marine Isotope Stage (MIS) 12, c. 480,000 BP). The final Oadby Till of the region, and succeeding late-/post-glacial outwash Dunsmore Gravel, are now thought possibly to date from MIS 10 (Keen 1999; Hamblin *et al.* 2000). No further ice cover is known to have reached this area (Figure 1, inset). The present regional drainage, and the land-surface on which the finds occur, succeeded and were shaped on these deposits (Figure 2).

DRIFT AND DRAINAGE

The glacial tills contain workable flint (L. Cooper pers. comm.), brought to the region for the first time (Rice 1972: 70), much of it from the Lincolnshire Wolds (Henson 1983). Its small size and unexciting quality were perhaps factors in the use of quartzite as an alternative (Keen pers. comm.; Lang 2004: 141); the quartzite flakes in the Waite material are a minimum 80mm in length, flint flakes only half that on average.

The flint and other erratics suggest ice advances from both north/north-westerly and north-easterly directions at different times, with intervening periods of mostly stoneless glacial lake clay deposition, and of outwash sands and gravels (Hains & Horton 1969: 89–103; B.G.S. 1982; 1994; Worssam & Old 1988: 100–105; Bridge *et al.* 1998: 98–117; to whom the following account is indebted). The drift is thickest in the central part of the area, drained by the rivers Anker, Sence and Sence Brook (Figure 1), flowing northwest to the Tame and then the Trent. A ridge of higher drift runs north-south through Hinckley (Figure 1) and is capped in the south by a plateau of late/post-glacial Dunsmore Gravel outwash, rich in quartzite cobbles. The remnant high terrace deposits of this Gravel grade further south into the Avon No. 5 terrace (Bridge *et al.* 1998: 115) of MIS 9 date (Maddy *et al.*, 1991), a date which accords with the suggested MIS 10 date for the final Oadby Till. In the east of the study area the headwaters of the Soar drain off the central ridge north-eastwards, also to the Trent. On the southern edge of the area, the main English watershed results in the headwaters of the River Sowe flowing south to the Avon and ultimately to the Bristol Channel.

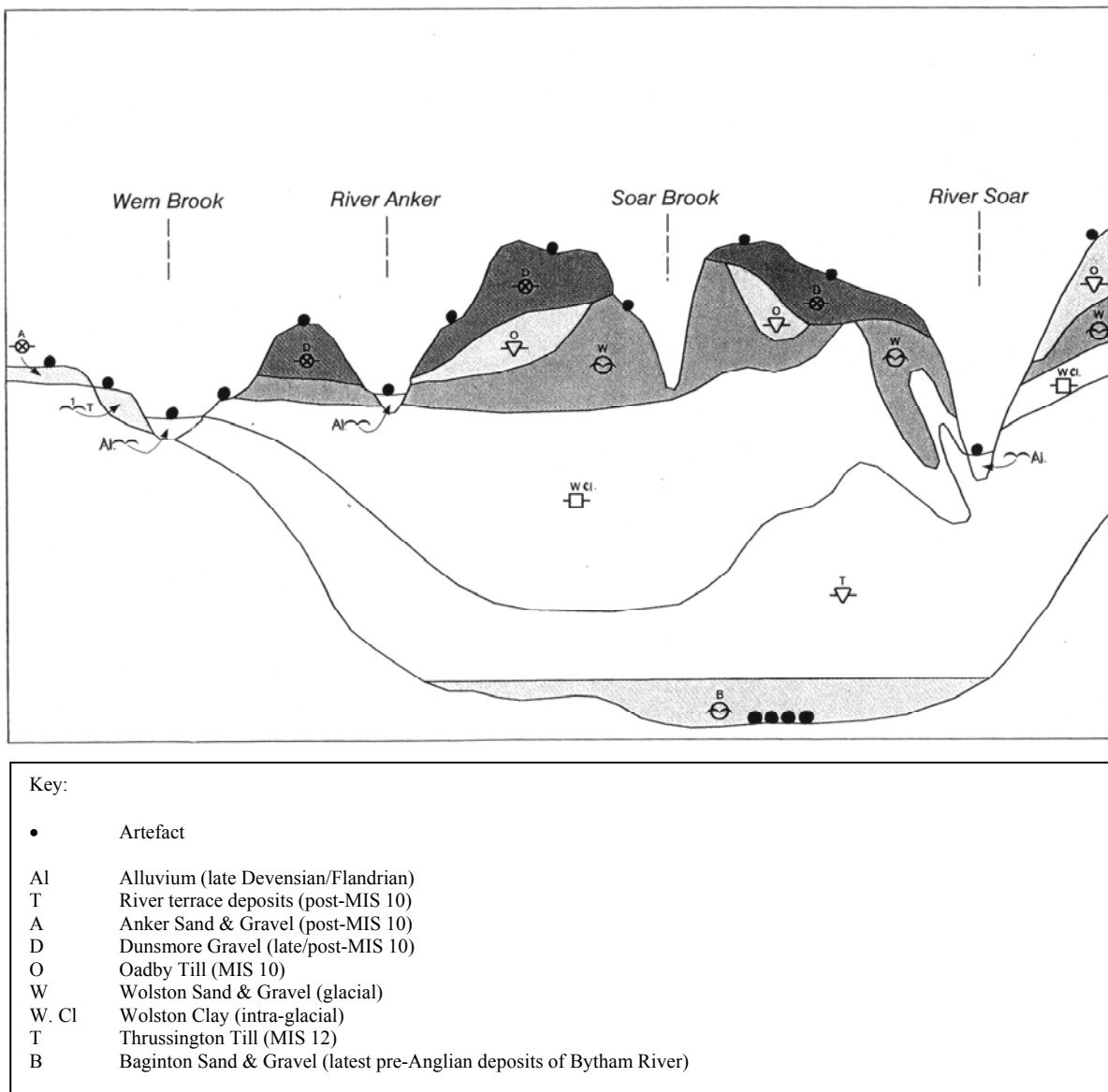


Figure 2. Schematic cross section of the study area's Quaternary deposits, showing the relative positions of the Waite (surface) and Waverley Wood artefacts (projected: at base of Bytham River pre-Anglian deposits). [after B.G.S.1994]

SOLID GEOLOGY

The southwest of the study area is bounded by the high ground of an outcrop of Cambrian and Ordovician sandstones and shales, with the Warwickshire Coalfield and the Precambrian Caldecote Volcanics; the related Precambrian igneous rocks of Charnwood Forest lie on the high ground to the northeast (Figure 1). All these have contributed blocks or cobbles of tuffs and other igneous rocks, quartzite, quartz, sandstone, mudstone or limestone to the superficial deposits of the area, represented (worked or unworked) in the Waite material, for example, some in sandstone/quartzite from near Weddington, c. SP 350 940 (labelled 'Wedrock' by Mr. Waite). Two of the andesite artefacts have been suggested by Leicestershire Museum's geologists as originating in erratic material from North Wales and from the local Charnian

deposits respectively (Graf 2002: 22 & 31), in contrast to the likely origins of the Waverley Wood porphyritic andesites in Lake District erratics (Shotton & Wymer 1989; Keen *et al.* in prep.).

Triassic strata underlie the centre of the study area, and the basal Triassic sandstones and conglomerates (formerly termed ‘Bunter’ pebble beds) outcrop as the Polesworth Formation on its western edge, and more extensively in the Midlands to the north and west. Derived ‘Bunter’ cobbles were characteristic of the Bytham River deposits, and such cobbles today form a main constituent of all the tills and glacial, river and basal alluvial gravels. Quartzite was thus freely available in local unvegetated exposures as a raw material for Palaeolithic tool-makers, but it is unclear whether the preponderance of quartzite in the Waite material originates in collector bias. The quartzite origins and knapping qualities as well summarised (Jones 1982; Toth 1985; MacRae 1986; MacRae & Moloney 1988; Hardaker & MacRae 2000) are reflected in the present collection.

LANDSCAPE DEVELOPMENT (MIS 10)

No post-MIS 10 ice sheet is known to have covered the study area (Figure 1, inset). Periglacial conditions in the cold periods of MIS 8, 6, 4 and 2 are likely to have caused solifluction and colluvial action on all hillsides, though only a dozen or so ‘head’ deposits are in fact thick enough to be mappable in the study area (Worssam & Old 1988: 102; Bridge *et al.* 1998: 116). Small spreads of terraces formed on streams, and alluvium accumulated in valley floors, but no other major changes are known to have taken place. The present landscape from which the finds have been recovered thus dates largely from the end of the MIS 12/10 glaciation(s).

THE FINDS

General

The sheer quantity of artefacts is startling for the Midlands, where it constitutes a significant body of new evidence. For example, Waite’s 76 bifaces from the present study area alone can be compared with the 67 published from the whole of Warwickshire (Lang 2004:11–39, A2), or 35 from Leicestershire and Rutland (Graf 2002: 25).

The finds must all be regarded as surface material, though a few have been found in quarry spoil heaps or gravel deposits (e.g. High Cross Pit: Table 1; Figure 1). Mr. Waite has retrieved those pieces which he has found ‘visually impressive’ (Waite pers. comm.). He has returned many times to productive locations, where he has often noted ‘pebble-picked’ concentrations, which, as Hardaker (this volume) and McNabb (2001) point out, may be areas of surface enrichment through ablation over time.

Most artefacts are small, around 100mm or less, and not exceeding 200mm in length, consistent with a cobble/pebble raw material source, whether of flint or quartzite. Condition varies, perhaps reflecting multi-period visits. Most pieces are rolled, but a few are sharp, discounting sharp edges resulting from modern damage. The non-flint flakes and cores at the Beaker site of Meol Brace, Shropshire (Barfield 1997) warn that fresh-looking surface finds not of unequivocal Palaeolithic type may well be of much younger age.

Typology (Table 2)

Core tools (>50%: Figures 3–8a) and cores (>30%: Figures 8b–10a) dominate the collection (Table 2), and include some unusual types. There are also some of the less frequently recovered flakes and flake tools (Figures 10b, 11). Certain classes of artefact grade into one another, such as cores and scrapers on split cobbles; and it can be difficult to distinguish retouched, utilised and edge-damaged flakes. Formal percussors or hammerstones do not feature in the Waite material, but areas of battering on other artefacts have been noted, possibly caused by percussive use. Among bifaces, notable absences to date are ovates (except one unusual andesite example: Graf 2002: 22 & Figure 4), flat-butted (*bout coupé*) cordates, cleavers and tranchet finishes. Comments follow on a few unusual features.

Bifaces (Table 3; Figures 3–5)

Elements of Roe's (1968) or Wymer's (1968) biface classifications have been used, though the cobble/pebble raw material creates many typological idiosyncrasies (Inskeep 1988: 237; Jones 1982: 11; Toth 1985: 113). The bifaces can be simply classed as pointed (straight-sided), sub-cordate (convex-sided) or a few cordates (with edges all round the butt). One quarter have the angled butt, or *méplat* (for ease of handling?) described by Wymer (1968: 55), Lee (2001: 74–5) and Hardaker (2003: 26–8).

One half of the quartzite bifaces, surprisingly, are on flakes, and there are greater numbers of 'refined' (regular, finely-flaked) as opposed to 'crude' (irregular, hard-hammer flaked) bifaces (Figures 3–5). Posnansky (1963: 385) remarked on similar high-quality workmanship in quartzite, sandstone and andesite bifaces from the Trent gravels.

Over 10% of the bifaces, though there are no ovates, have a twisted edge or tip (Figures 3a & b), which may be purely incidental to creating the desired overall shape (Hardaker pers. comm.). However, twist-dominated assemblages were shown to date from late MIS 11 or early MIS 10 by White and Schreve (2000: 20–22), and twists before or after seem virtually unknown. If the twist is a deliberate stylistic feature of the Waite material, one might suggest a similar date for those particular artefacts, which would offer a rare hint of Hoxnian human presence in the Midlands. This is otherwise hard to demonstrate (Lang & Keen 2005), although at least three flint twisted ovates were recorded by Posnansky (1963: 364–5, 376) from the Trent gravels, with another from Hopton, Derbyshire. However, the suggested re-dating of the Oadby Till to MIS 10 (Hamblin *et al.* 2000) adds a further complication to this question.

Nearly half the bifaces have noticeable extra wear at their tips, a feature also noted by Pickin (1988). Such extreme wear has not been observed on other edges, but also occurs on the points of the backed knives (see below). Although the tip is often the area most vulnerable to damage (see Chambers 2003: 72), and in fact over a third of the Waite Collection biface tips are broken, we may still here be seeing traces of use wear (cf. Saville 1977b: 4–7 regarding 'worn-edge' Mesolithic implements).

Heavy-duty tools: core-axe, picks (Figures 6–7)

Three unusual types of heavy-duty implement are present, weighing over 1kg each and in rolled condition: a bifacial core axe, two unifacial triangular picks and five unifacial elongated picks. The size and weight of some of these pieces illustrates the robustness and

strength of their makers and users, perhaps comparable with the hominid represented at Boxgrove (Roberts and Parfitt 1999). Possibly similar implements from Berinsfield, Oxfordshire (Jones 1982: 9), from terraces dating perhaps to MIS 6 to 4 (Wymer 1999: 56–7), may be derived from reworking of earlier deposits, as Britain is thought to have been unoccupied at this time (Ashton & Lewis 2002). Such tool types, sometimes in similar materials, though far distant geographically, are known in central Africa from Acheulian or immediately post-Acheulian (Sangoan) layers (McBrearty 2001: 91), which may offer a comparison with their suggested dating here.

Type ('Definite' items only)	Bunter quartzite	Quartzites and sandstone (? non-Bunter)	Flint	Andesite	Quartz	Total
Core tools						
Bifaces	45	5	25	1	-	76
Roughouts	13	-	3	1	-	17
Core-axe	1	-	-	-	-	1
Picks	7	-	-	-	-	7
Scrapers on split cobble	5	-	-	-	-	5
Cores						
Unifacial chopper-cores	13	-	-	-	1	14
Bifacial chopper-cores	19	1	1	1	-	22
Migrating-platform cores	14	-	2	-	-	16
Split-cobble cores	11	-	-	-	-	11
?Prepared cores	5	-	-	-	-	5
Discoidal core	1	-	-	-	-	1
Flake tools						
Backed knives	1	1	-	-	-	2
Transverse scraper	-	-	-	1	-	1
(?Retouched) flakes	6	-	-	-	-	6
(?Utilised) flakes	3	-	-	-	-	3
Unmodified flakes	4	1	18	1	1	25
Total	148	8	49	5	2	212

Table 2. Types and materials of Waite artefacts examined to date (see Appendix 1 for further 'possible' identifications)

Bifaces	Bunter quartzite	Quartzites and sand stone (? non-Bunter)	Flint	Andesite	Total
Pointed	20	4 (incl. 1 percussor?)	12	-	36
Unifacial/near unifacial	11	-	-	-	11
Subcordate	9	1	3	-	13
Cordate	3	-	3	-	6
'Dinky' (L<65mm)	2	-	3	-	5
Ovate	-	-	-	1	1
Unclassified	-	-	4	-	4
Total	45	5	25	1	76

Table 3. Biface types and material

Chopper-cores, bifacial or unifacial (Figures 8b and c)

As Toth (1985: 106–7) points out, many so-called core-tool forms could simply be by-products of flake manufacture, and not genuinely intended tool forms. Wymer (1982: 55) therefore prefers the term ‘chopper-core’ to the use of ‘chopper’ (unifacial) or ‘chopping-tool’ (bifacial), and here they are all grouped with cores, a category into which they blend.

Unifacial chopper-cores have here been strictly defined as such when human work is confined to one face of the edge, though many appear deliberately made on a blank with a natural ancient facet or break on the other face, which provides in effect a bifacial edge.

Prepared? cores (Figure 9)

It was thought worth drawing attention to five examples of split cobbles from the Waite collection which differ markedly in their concept and reduction sequence from the others. They are not worked like the split-cobble cores as a simple, single-platform variant of the migrating-platform cores described by White and Ashton (2003: 599). Instead, as in the Levallois technique, stages of work on different surfaces of the core are involved. A flaking surface (the top, naturally-split cobble surface) is centripetally prepared into a domed surface, for removal of a flake of shape predetermined by this convexity, struck from a striking platform created at right angles to this flaking surface on a rounded ‘cortical’ end of the cobble.

Some morphological resemblance to classic ‘tortoise’ cores is inherent in the natural shape of all split cobbles; and it is clear ‘in embryo’ in these five examples. However, both the preparation of the surfaces and the eventual removal of the intended flakes seem limited in practice. This makes it difficult to confirm the identification in this restricted number of examples.

Despite these limitations, these pieces still seem to approach the essence of the Levallois technique, perhaps in somewhat abbreviated form. A similar ‘reduced Levallois’ approach has been noted by White and Ashton (2003: 602) at other European sites also using pebble raw material (in these cases flint), this being perhaps the common factor with the Waite material. White and Ashton also note the likelihood of many separate such innovations occurring, with frequent failures, before successful forms became the standard. Perhaps the Waite pieces are an example of such experimentation, with the technique in its infancy.

‘Proto-Levallois’ techniques start around 350ka at Purfleet in this country (White & Ashton 2003: 603–4). Levallois technique is rare in the Midlands, but a few examples are known both in Leicestershire (Graf 2002: 31) and in the Trent gravels (Posnansky 1963: 379), none of which, however, is in quartzite. It is hoped that drawing attention to this potential core type may encourage further search elsewhere and perhaps produce clearer examples.

Discoidal core (Figure 10a)

This thin flat core has four large centripetal removals from the flaked surface, whose outer edge also has one large and three small breaks. Whereas the Levallois technique needs abundant high-quality rock (Wymer 1999: 49; 80) discoidal technique is usable with small poorer-quality or non-flint material (McNabb 2001: 22). However it is not uncommon in various parts of the world to find Levallois cores grading into discoidal cores when they

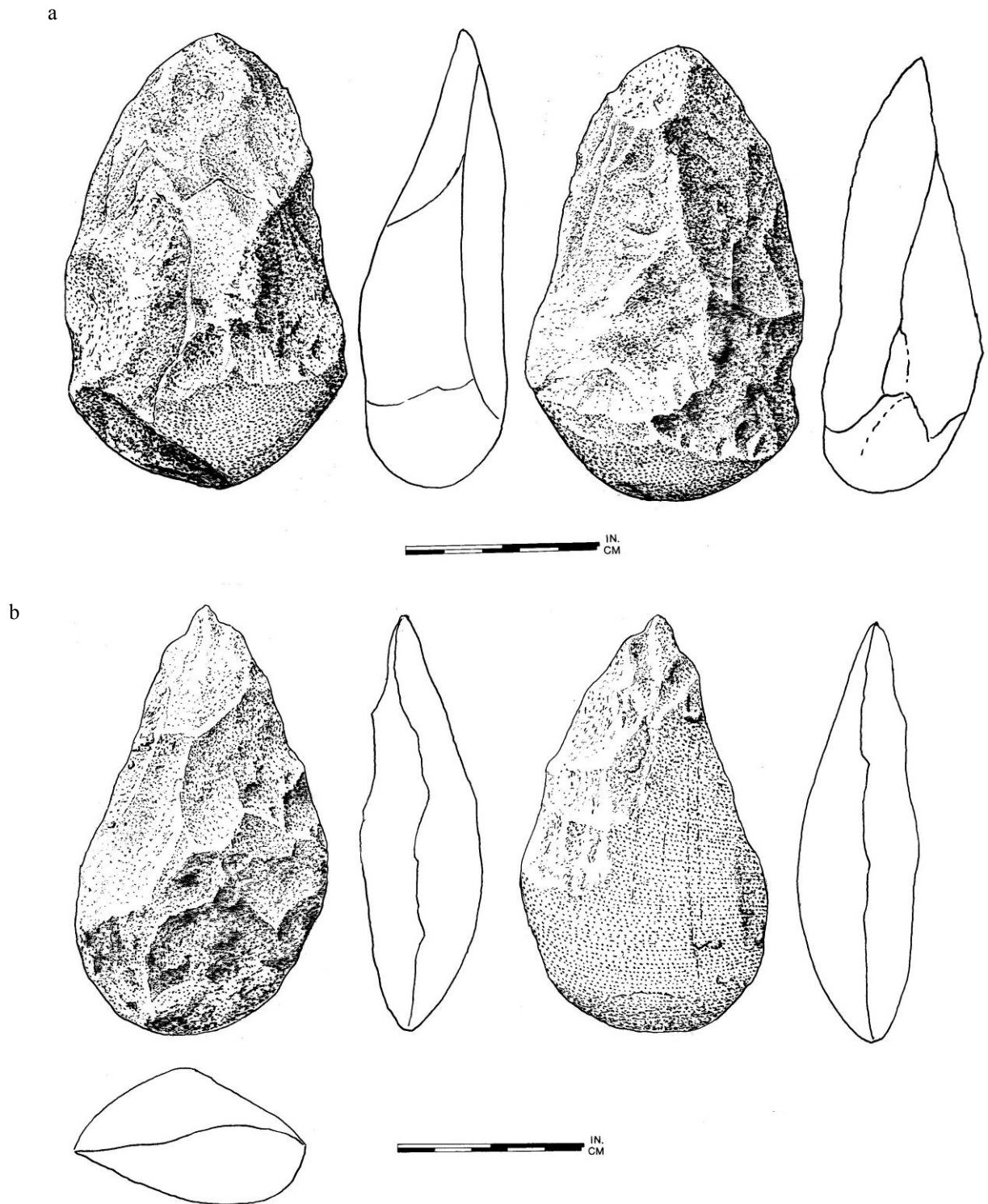


Figure 3. (a) Quartzite subcordate biface, twisted edge, possibly on flake. Burton Hastings: Bramcote Hill. Outline & photo Saville (1988), (b) Quartzite pointed biface, twisted tip, on flake. Burton Hastings: Burton Fields Farm. Illustrations by T.R. Hardaker. [See Appendix 2 for a full catalogue of illustrated pieces]

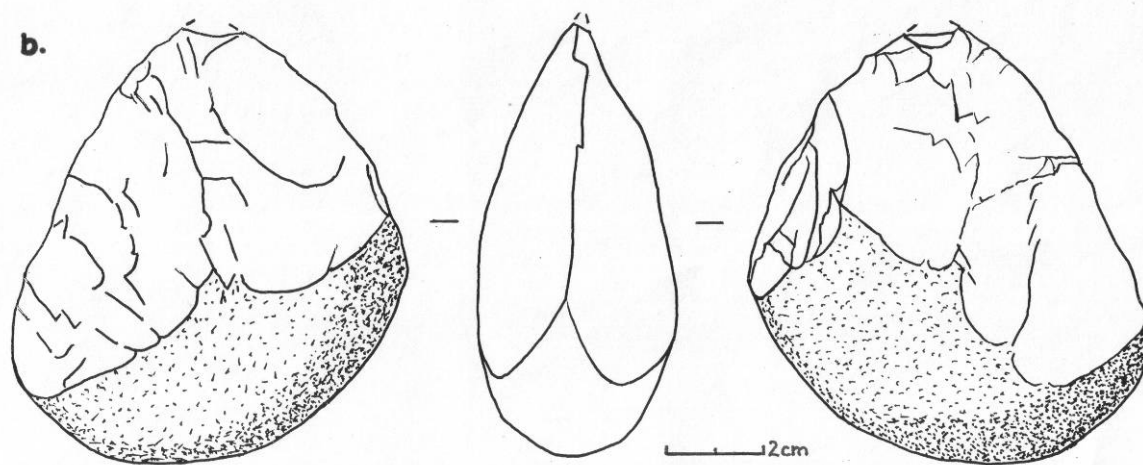
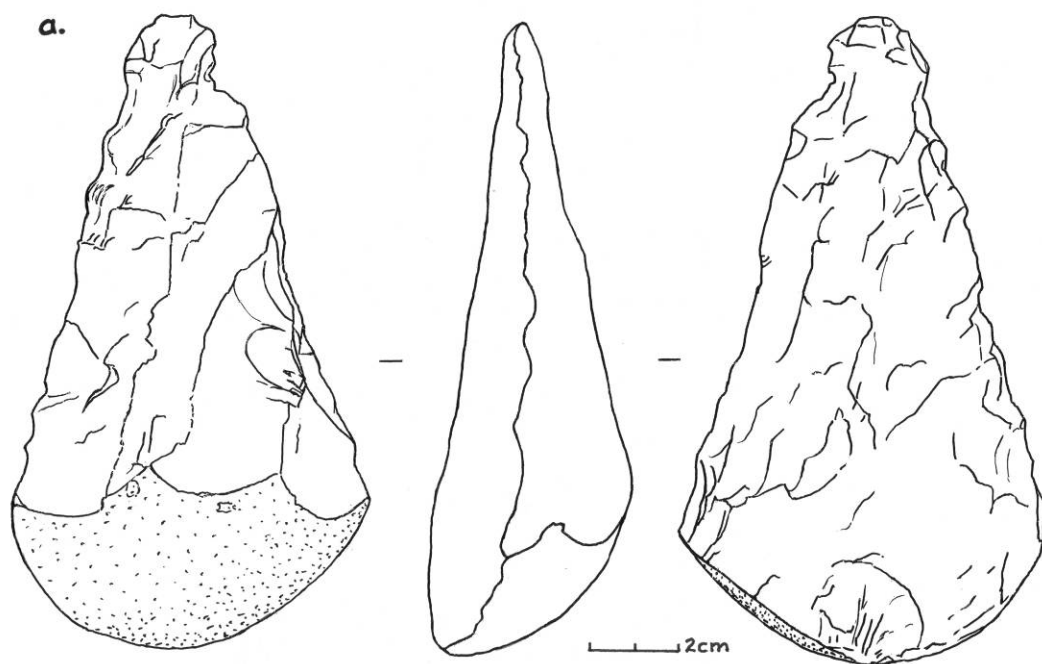


Figure 4. (a) Quartzite plano-convex pointed biface, near-ficron, on flake. Burton Hastings: Burton Fields Farm, (b) Quartzite subcordate biface, on flattish cobble. Burton Hastings: Bramcote Hill Field 1. [Illustrations by the author]

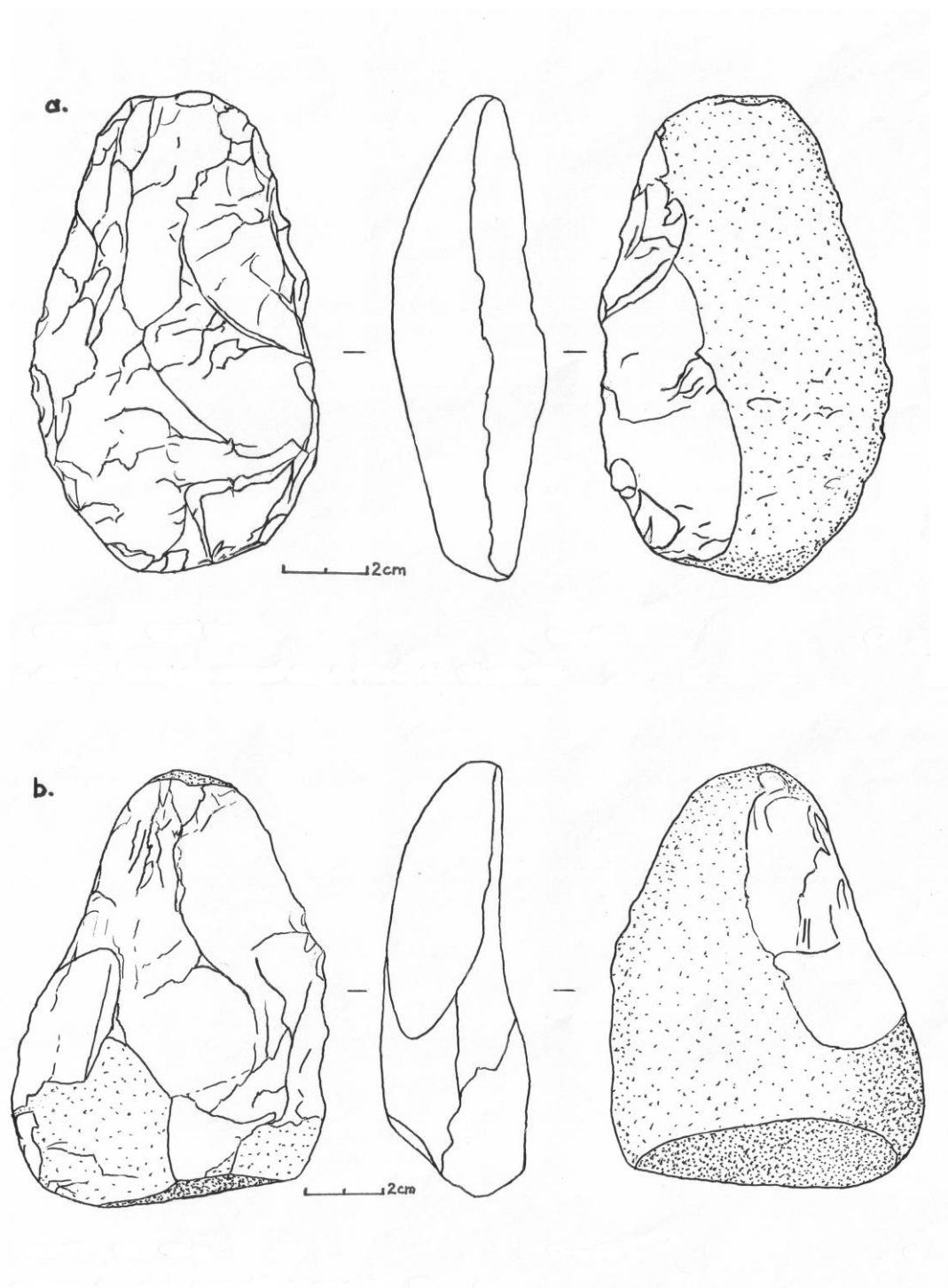


Figure 5. (a) Quartzite cordate biface, on flake, rounded tip, near-uniface. Resembles item 5b. Nuneaton: 'Weddington Meadows' Field 3, (b) Quartzite subcordate biface, on naturally-split cobble. Nuneaton: 'Weddington Meadows' Field 7. [Illustrations by the author]

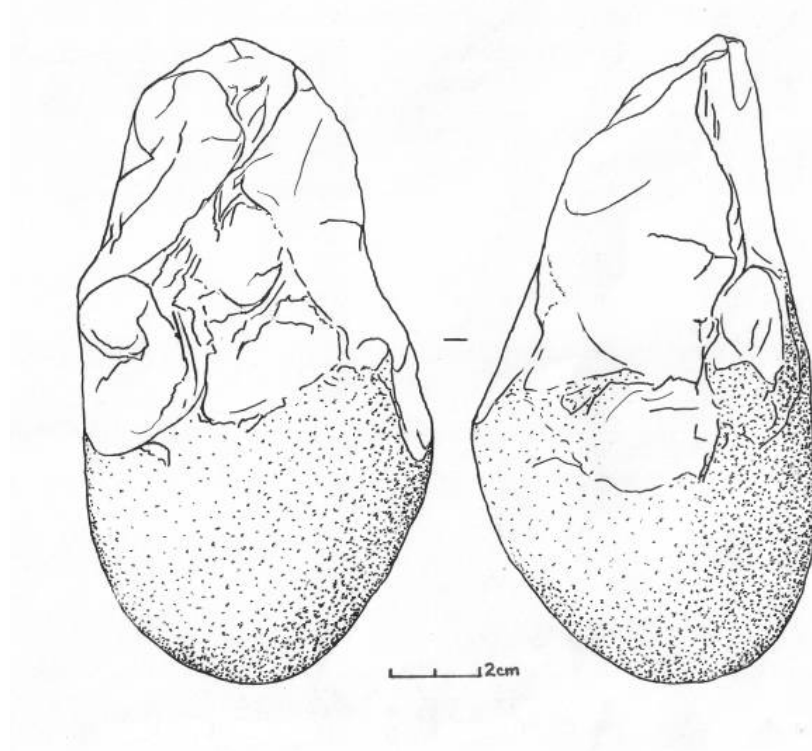


Figure 6. Quartzite bifacial core-axe, on plano-convex cobble. Nuneaton: Stockingford Field 16.
[Illustration by the author]

become too small following repeated use but continue to be worked discoidally (cf. Clark & Kleindienst 1973: 92). In Britain, the discoidal core type has been described in a more biconical form at Oldbury, Kent (Cook & Jacobi 1998), where the cobble flint raw material was evidently suited to discoidal technology. Again, as with the cores discussed above, cobble raw material may be a factor in common with the Waite example. Specimens in quartzite were present at Creswell Crags, Derbyshire/Nottinghamshire (*Ibid.* 133), in MIS 3 deposits. A flat flint example resembling this quartzite specimen of Mr. Waite's was found in the MIS 8 Trent gravels at Hilton, Derbyshire (Posnansky 1963: 376), and in France possible discoidal technology occurs in MIS 6 and 7 (Cook & Jacobi 1998: 133–5).

Backed knives (Figure 10b)

The tips are the working ends of these pointed pieces and resemble those of handaxes, bifacially trimmed, but differ in the treatment of the central and lower part of one long edge. On this edge in the example in Figure 10b, the butt and one side of the plain, broad platform of the original transverse flake have been left unworked to provide a wide 'backing', like an extended *méplat*, perhaps for comfortable grip during use. In Britain, broadly comparable backed pieces occur in Mousterian levels at Creswell Crags, Derbyshire/Nottinghamshire (Jacobi pers. comm.). Of a similar broad time period, though again a distant comparison, bifacial and unifacial backed knives, some in similar materials, are a component of various Late Acheulian and Sangoan industries in sub-Saharan Africa, for example at Kalambo Falls (Clark & Kleindienst 1973: 95).

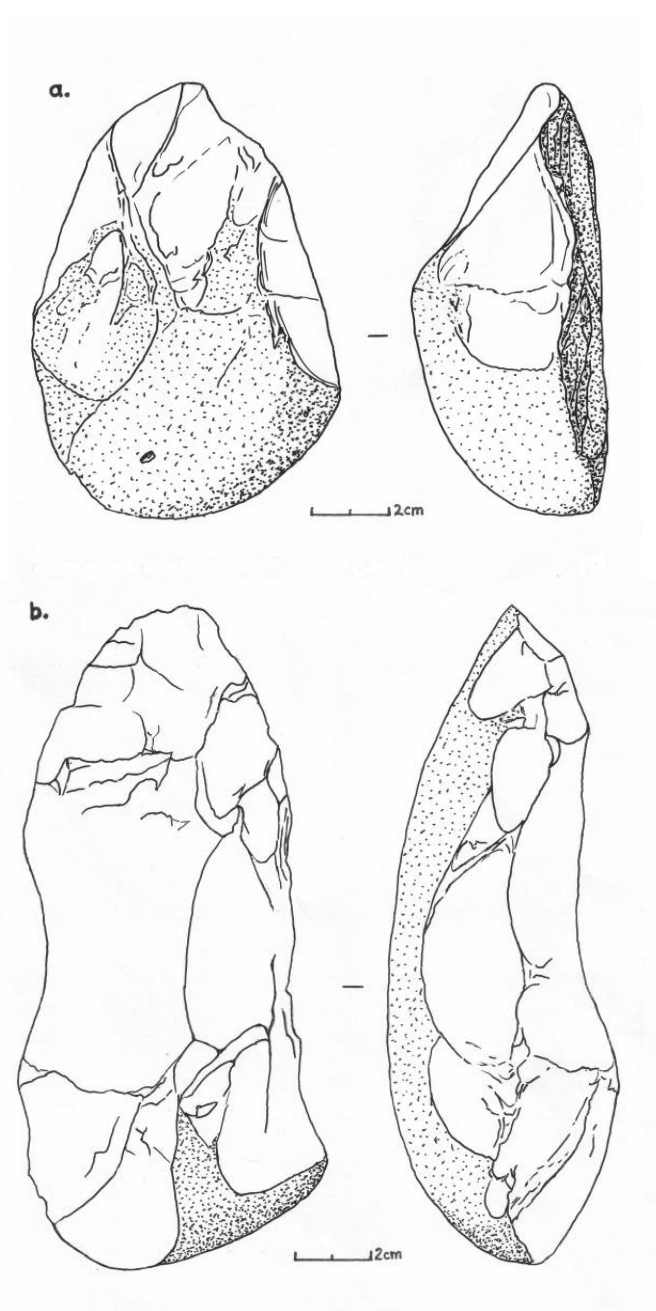


Figure 7. (a) Quartzite unifacial triangular pick, on plano-convex cobble. Nuneaton: Attleborough Field 7, (b) Quartzite unifacial elongated pick, on long flat-based naturally-split cobble. Nuneaton: Stockingford Field 14. [Illustration by the author]

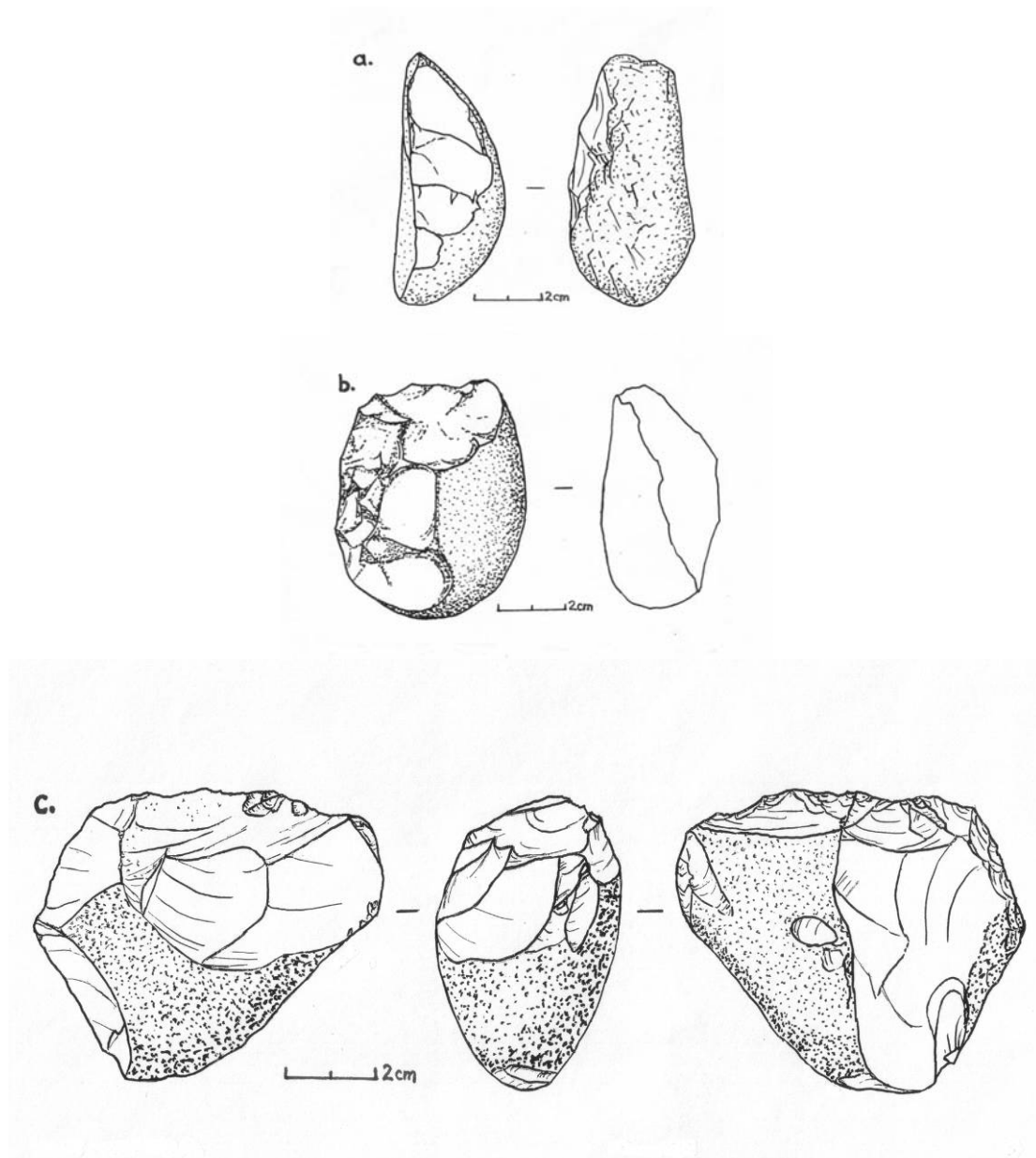


Figure 8.(a) Quartzite core-scraper on small naturally-split cobble. Higham-on-the-Hill: 'corner site', road to Wykin, (b) Quartzite unifacial chopper-core, on small cobble. Copston Magna: High Cross gravel pit, (c) Flint bifacial chopper-core, on small cortical cobble. Nuneaton: 'Weddington Meadows' Field 6. [Illustrations by the author]

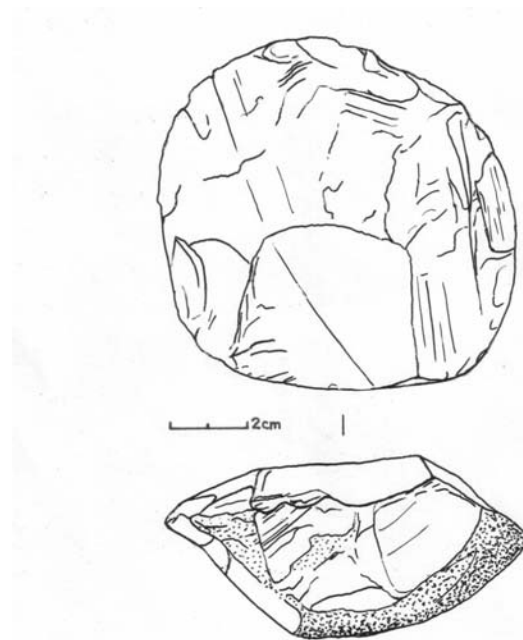


Figure 9. Quartzite prepared? core, on naturally-split cobble. Nuneaton: Attleborough, Field 9.
[Illustration by the author]

Transverse Scraper on discoidal flake (Graf 2002: 31)

This piece is not unlike a Mousterian *racloir déjeté* (Jacobi pers. comm.).

DISTRIBUTION (Tables 4–5; Figure 1)

The findspots of the Waite material recorded to date do not necessarily fully represent what may be present, being merely where Mr. Waite has successfully searched. He has generously made available his detailed recording system, using finds labels and maps at 1:10,000 scale. In spite of occasional idiosyncrasies, almost all finds are assignable to a single field or group of fields, and sometimes to particular areas or exact findspots within the field. It will be important to add a record if possible of where he has searched unsuccessfully, since the blank areas are significant for our understanding of the whole distribution pattern.

With these provisos, the findspots are presented in Figure 1. Of the 94 findspots (62 in Warwickshire, 32 in Leicestershire), over 50% are single isolated finds; just over 30% are modern fields yielding between two and five finds, and only 9 are fields with more than five finds (Table 4). The finds cannot be said to represent a single assemblage, but a palimpsest of overprinting of debris from single events such as animal kills, or dispersed activities, or agglomerations from repeated visits to favoured locales, often waterside locations (cf. Isaac 1984; Pope & Roberts 2005).

An example of such agglomerations is provided by the largest concentration of material discovered by Mr. Waite, which lies on a plateau-edge in four or five adjoining fields at Bramcote Hill, Burton Hastings (c. SP 405 892 – see Table 4 & Figure 1), and has yielded over 250 Palaeolithic artefacts (Brown 1992; Pickin 1988; Saville 1988; Shotton 1988), before being planted with trees, though only 20 of these artefacts formed part of the present study material. It may be speculated that this concentration reflects the potential desirability

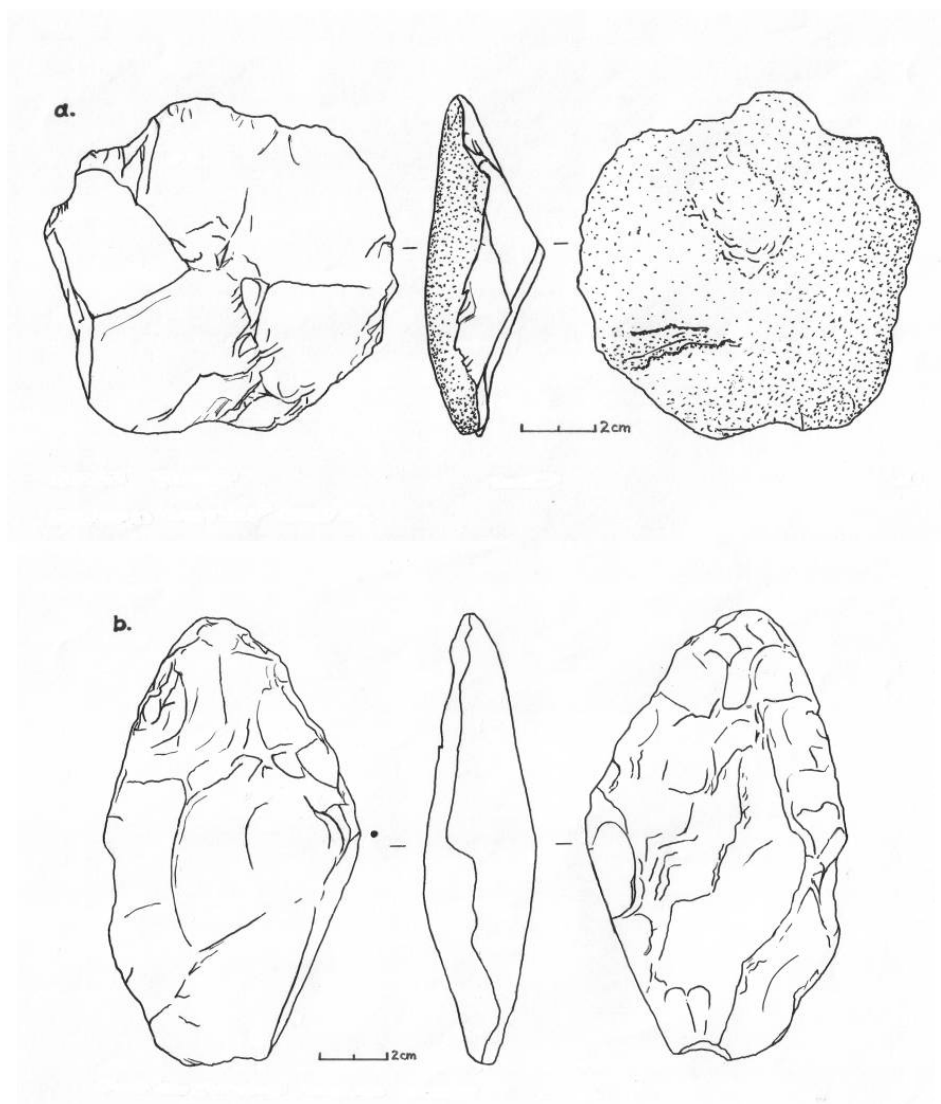


Figure 10. (a) Quartzite flat discoidal core, lenticular section, on cobble. Nuneaton: 'Wem Field 3, (b) Quartzite backed knife on transverse flake. Astley: Field 20. [Illustrations by the author]

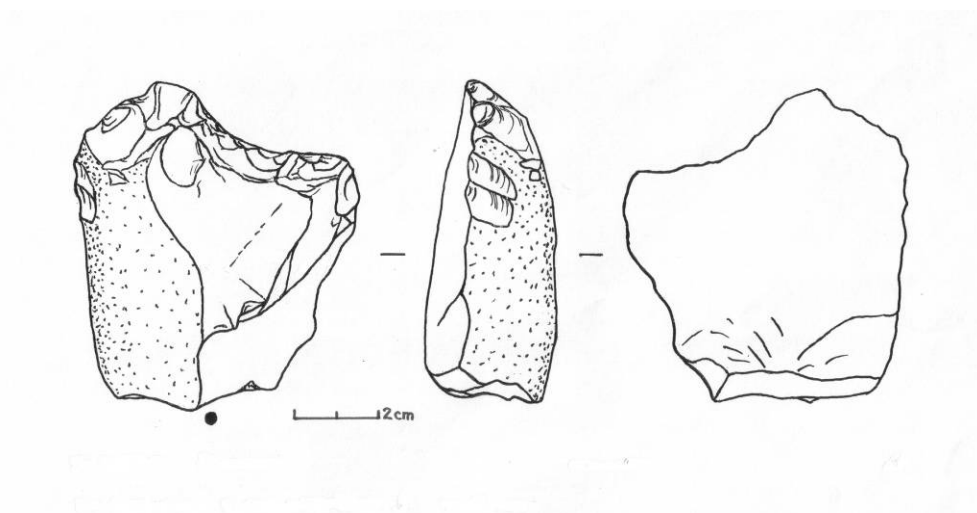


Figure 11. Retouched flake/scrapper. Shackerstone: Barton-in-the-Beans Field 1. [Illustration by the author]

of its location, where various different resources were possibly available: a favourable hunting stance with a view of the valley below; abundant cobbles for tool-making possibly obtainable from the Dunsmore Gravel of this plateau, at least in cooler periods of reduced vegetation cover (Wenban-Smith 1998: 95; Hardaker, this volume); and potentially a junction of different ecological zones downslope. These zones at times might have included areas of groundwater flow and marshy conditions, with peat containing disseminated calcareous tufa (Worssam & Old 1988: 105), such as recur today throughout the region at the valley-side outcrops of the Wolston Gravel over the less permeable Wolston Clay (Bridge *et al.* 1998: 117). Such an outcrop is mapped here below the plateau edge, and may have produced similar ecological zones in the past, possibly foci of early activity, perhaps comparable to the situation at the waterhole at Boxgrove (Pope & Roberts 2005).

Little relationship to the pre-Anglian Bytham River and Hinckley Valley topography can be observed (Figure 1), largely because this is now so deeply buried in this area (Figure 2). However, one such possible relationship suggested itself to Professor Shotton (1988), who observed that the distribution of the biface finds then available to him and Alan Saville seemed closely linked to the above plateau deposit of glacial outwash gravel. Shotton suggested that the bifaces had eroded out onto the surface from within the body of this gravel, which, since it was outwash, he regarded as consisting of material, including the artefacts, picked up from pre-glacial surfaces.

Professor Shotton's hypothesis now seems unlikely, not least in view of the fact that some of the bifaces were of flint. In pre-Anglian times the nearest flint source probably lay at least 90km away, in the chalk of the Chilterns or the Lincolnshire Wolds. There is little evidence that Lower Palaeolithic hominids travelled so far to acquire raw materials (Féblot-Augustins 1997), and it seems more likely that the flint artefacts are all post-MIS 10, *pace* Lang (2004: 69 & 151) and Lang & Keen (2005). Relatively few items of the Waite collection display the extreme rolling and abrasion that might be expected from glacially-transported material, and furthermore the Dunsmore Gravel in the region has not been recorded as producing any artefacts (Keen pers. comm.). Waite searched the deposits of that and the Wolston gravel in the High Cross Pit, Copston Magna, Warwickshire (Leics. Mus. EN2115: Figure 1) for seven years, unproductive except for a few dubious worn quartzites possibly from pre-glacial times and a single unifacial chopper-core (Figure 8b), for which an intrusive origin cannot be ruled out (Waite pers. comm.). The more numerous items found by Mr. Waite since 1988 and now available for study are clearly not, as it seemed to Shotton, exclusively related to glacial gravels, but undoubtedly occurred, as Mr. Waite has always maintained, on a wide variety of geological deposits (Table 5).

It thus seems possible that at least some of Mr. Waite's finds may originate in Palaeolithic activity on the land surfaces of the deposits on which they occur, implying that these may constitute remnants of fossil post-MIS 10 Palaeolithic land surfaces; or at least result from activity in that immediate vicinity on former cover now removed by ablation and erosion. The relationship of topography to finds may be grossly simplified and summarised as:

1. On plateau tops or interfluves. Finds approximately *in situ*, with allowance for any plough disturbance, but maybe with surface enrichment by erosion/ablation of former cover.
2. On slopes. Broadly *in situ*, or carried down from nearby upslope positions.
3. In valley bottoms. Some *in situ*; some transported, either down-valley by fluvial action, and/ or down valley sides by colluvial/solifluction processes.

No. of finds examined.	Site	NGR of field Centre	Geology within modern field
13	Hinckley, Leics: 'Hollycroft Fields'	c. SP 411 941	Wolston Clay (intra-glacial Lake Clay).
12	Burton Hastings, Warks: 'Bramcote Hill Field 1'	c. SP 405 891	?Wolston Clay, Wolston Sand & Gravel (intra-glacial) Dunsmore Gravel (Late/Post-MIS 10).
10	Burbage, Leics: 'Burbage House Farm Site 2'	c. SP 443 907	Oadby Till (2 nd , NE ice sheet), alluvium.
8	Nuneaton, Warks: 'Attleborough Field 2'	c. SP 384 910	Mercia Mudstone Group, Anker Sand & Gravel (Post-MIS 10), Anker 1 st terrace, alluvium.
8	Nuneaton, Warks: 'Stockingford Field 6'	c. SP 336 906	Till (undifferentiated).
8	Stretton Baskerville, Warks: 'Attleborough Field 8'	c. SP 391 911	Mercia Mudstone Group, Thrussington Till (1 st , N/NW ice sheet), Anker Sand & Gravel.
7	Burbage, Leics: 'Burbage House Farm Site 1'	c. SP 447 903	Oadby Till.
6	Nuneaton, Warks: 'Wem Brook Field 3'	c. SP 367 889	Outwoods Shale Formation (U. Cambrian), Lamprophyre & Hornblende Diorite (Ordovician intrusives), Thrussington Till, alluvium.
6	Sutton Cheney, Leics: 'N. of Eleven Acre Covert'	c. SP 379 999	Lake clay (intra-Anglian).
5	Burton Hastings, Warks: 'Burton Fields Farm'	c. SP 430 901	Oadby Till, Dunsmore Gravel.

Table 4. Modern fields with 5 or more finds, with their geology. [Source: B.G.S. 1982; 1994]

Geological deposit	No. of findspots on that deposit type	Approx. %
MIS 12/10: tills, lake clays, intra-Anglian glacio-fluvial gravels (see Figure 2)	38	40%
(...of which Wolston Sand & Gravel)	(4)	(4%)
Late/Post-MIS 10: glacio-fluvial gravels, river terraces, head, alluvium (see Figure2)	13	14%
(...of which Dunsmore Gravel)	(3)	(3%)
Triassic Mercia Mudstone, mudstones with siltstones	12	13%
Triassic Bromsgrove Formation mudstones	1	1%
U. Carb. Middle Coal Measures mudstones, siltstones & seatearths with coal	1	1%
Two or more geological deposits within modern field	26	28%
Findspot not recorded	3	3%
Total	94	100%

Table 5. Geology of findspots, defined by modern field, or spot location where available [Source: B.G.S. 1982; 1994]

This reading would suggest a broad correlation between at least some of the findspots and early *foci* or dispersed activity locations across the Palaeolithic landscape. No post-MIS 10 ice-sheet cover is yet known from the area (Figure 1, inset; Bowen *et al.* 1986; Clark *et al.* 2004). There is a clear potential in the region for the relatively intact survival of plateau or interfluvial land surfaces, like those of somewhat younger age excavated at Glaston, Rutland (Cooper 2001; 2004) and Launde, Leicestershire (Cooper 1997), of the Early Upper and Final Upper Palaeolithic, respectively. Comparable preservation of upland sites has been reported in southern Britain on the clay-with-flints deposits (e.g. Scott-Jackson 1997; Winton 2004), and is also suggested for areas of the Northern Drift, Oxfordshire (Hardaker, this volume). Accordingly, some of Waite's finds may indeed reflect original Palaeolithic distribution and landscape use patterns, in contrast to the entirely derived and transported collections unavoidable in most fluvial gravel contexts.

Some support for this has been noticed in the finds distribution. Two very similar tiny unifacial handaxes, BH/46 and 122, come from the Bramcote Hill concentration, and may suggest the work of one individual; as may two other near-unifaces in Weddington Meadows 3 and 7 (Figures 5a & b), and two very similar quartzite bifacial chopper-cores close together in Astley fields 21 and 23 (c. SP 300 890). A possible area of specialised activity is suggested by the finding of the core-axe and one of the elongated picks in the same field, with two other picks close by, all in the Stockingford area (c. SP 322 900). Distinctive knapping technologies may have produced the rare discoidal core and one of the possibly-prepared cores from the same findspot at SP 367 889. Such combinations may hint that some finds are roughly *in situ* and that evidence of original activity locations may exist, though much more work needs to be done before any firm conclusions can be drawn.

Fuller study of the composition and situation of other major artefact concentrations, for example the present or absence of knapping debris, the range of artefact types and the raw materials represented, should enhance our understanding of how early humans were using this Midlands landscape.

DISCUSSION

Raw material choices

The raw materials in the Waite collection, especially quartzite, are used both for less specialised artefacts and also for a variety of more refined and formal tools and for specialised cores. This wide use of raw materials contrasts with that at Waverley Wood, Warwickshire (Keen *et al.* in prep.), where quartzite use seems mainly for choppers and cores, with just one or two fairly unrefined bifaces, andesite being used for the few refined bifaces. A similar possible division of raw materials was suggested at Feltwell, Norfolk, though here bifaces were in flint (Hardaker & MacRae 2000: 53). Selective use of raw materials, sometimes for simple *versus* complex tool forms, can be noted in many European Middle Pleistocene industries, for example, at Bilzingsleben, Germany, in MIS 11 (Mania and Mania 2005: 104–5) or Pontnewydd Cave, North Wales in MIS 7 (Aldhouse-Green *et al.* 2004: 100). Closer to home, and a little later in date, in the Mousterian (MIS 3) material at Creswell Crags, the bifaces are in clay-ironstone and other forms in quartzite (Jacobi pers. comm.) In contrast, at present, the Waite collection seems to show use of each raw material for a wide variety of tools and functions; but it must be remembered that we are looking at a palimpsest of material

formed over a long period of time. That leads to the difficult matter of chronology, which is briefly considered next.

Dating

At one end of the time range, the derivation of a few worn items from pre-Anglian deposits has already been admitted possible, though unlikely; while at the other, non-flint lithics are documented in the Holocene (Barfield 1997). The possible date range for the region's non-flint lithics, and by implication the Waite material, therefore runs from perhaps 500ka for Waverley Wood, to 50ka at Creswell Crags, and possibly even 5ka or later in the Holocene.

For surface material such as this, typology can offer some, albeit limited, dating information. 'Mode 2' Acheulian bifaces predominate in the collection, but the numerous 'Mode 1' chopper-cores suggest a possible mix or overlap of traditions. Any 'Clactonian' element perhaps reflects a separate re-colonisation pulse early in the climatic ameliorations of MIS 11 and/or 9 (White & Schreve 2000: 17–19). Possibly later in type, formal flake tools include backed knives, one on a transverse flake, and a transverse scraper on a discoidal flake (Graf 2002: 31), the latter most commonly found as a Mousterian type (Jacobi pers. comm.). These, together with the discoidal and possibly-prepared cores, the picks and possibly also the 'dinky' handaxes, in Mr. Waite's striking phrase, may hint at a more evolved Middle Palaeolithic technology, perhaps none of them even out of place in the brief Mousterian reoccupation of Britain in MIS 3.

The Waite Collection in context

Consideration of other collections which include concentrations of quartzite may help place the Waite material in a wider context. British pre-Anglian sites are largely associated with very early major river systems. In contrast to the Waite material, there is only a simple industry in quartzite at Waverley Wood and Feltwell, Norfolk, on the Bytham River course, with finer bifaces in other materials, and this situation is echoed in the fairly simple quartzite surface material associated with the Northern Drift, the major precursor of the Thames (Hardaker 2001; this volume), though this material is not stratigraphically dated.

Quartzites from the Oxfordshire gravel pits in MIS 6 and later Thames terraces were presumably reworked from earlier levels in view of the lack of evidence for a human presence in Britain at this time (Ashton & Lewis 2002). They included in their limited quartzite type repertoire a higher proportion of more refined bifaces, though many more were in flint, as in the Wolvercote Channel material of MIS 9 (Tyldesley 1986; 1988), the latter perhaps accompanied by quartzite flakes and flake tools (MacRae 1988). The Devensian material at Berinsfield, though possibly also reworked from earlier deposits, widened the quartzite type range to include heavy-duty items possibly similar to those in the Waite material (Jones 1982).

Away from the Thames, gravel pits on pre- and post-Ipswichian lower reaches of the Warwickshire Avon (Whitehead 1988) and head deposits on the Bristol Avon terraces (Lacaille 1954; Hack 2002) produced no greater quartzite type variety. Further north in MIS 7 at Pontnewydd Cave, North Wales, local rocks were used for the tool repertoire, but with relatively few quartzites (Aldhouse-Green *et al.* 2004: 99). A limited range of quartzite types was present in the Trent gravels of MIS 8 and 6, though with high quality workmanship in some of the quartzite, sandstone and andesite bifaces (Posnansky 1963), notable also in the

surface ovate at Little Alne, Alcester, Warwickshire (Clifford 1943). A small group of quartzites from the Trent was thought to resemble those of Pin Hole Cave, Derbyshire (Armstrong 1942).

In the Late Middle Palaeolithic collection from Pin Hole and other Creswell Crags sites on the other hand, the quartzite group included a much wider variety of artefact types, such as naturally-backed knives, discoidal cores and a recurrent Levallois flake (Jacobi pers. comm.). Although bifaces and chopper-cores form the vast majority of the Waite collection, some of the other types present in small quantities are perhaps best matched at Creswell Crags.

CONCLUSION

The overwhelming preponderance of bifaces and chopper-cores in the Waite material encourages assignment of most of the occupation and activities it represents to the earlier stages of the British Palaeolithic, probably after the Anglian (and possible MIS 10) glaciation and before the apparent MIS 6 desertion of Britain, though as we have seen, some material may be younger still. This ongoing use of quartzite after the Anglian introduction of secondary sources of flint into the region is perhaps not too surprising in view of the derived nature and small size of the flint.

The area concerned lies on the north-western edge of the known Palaeolithic world, where visits were previously thought to have been brief and infrequent, partly reflecting the absence of primary high-quality chalk flint sources. However, the flint and quartzite artefacts which Mr. Waite has gathered with such care and skill over the years now show a far greater overall finds density than anyone had realised or expected, thus casting doubt over the 'short visit' theory; their distribution includes localised concentrations which certainly represent, however imperfectly, former Palaeolithic activity foci.

The material therefore has immense interest, despite its unstratified nature, and is of real importance for our understanding of how best to use this kind of evidence and our knowledge of the density and dynamics of Palaeolithic occupation, not just in the area around Nuneaton, but in the Midlands more generally. And who at this stage can say that the best finds are not still to come? As MacRae put it, a cause for wonder indeed.

APPENDIX 1: 'POSSIBLE' ADDITIONAL FINDS IDENTIFICATIONS

<i>Possible items (less clearly identifiable)</i>	<i>Bunter quartzite</i>	<i>Quartzite or sandstone (?Non-Bunter)</i>	<i>Flint</i>	<i>Andesite (an.) or other Igneous (ig.)</i>	<i>Other (qz.. = quartz; l'st. = limestone)</i>	<i>Total</i>
Core tools						
Bifaces	1	-	-	2 ig.	-	3
Roughouts	5	-	-	1 ig; 1 an.	-	7
Picks	-	1	-	-	-	1
Scrapers on split cobble	2	-	-	-	-	2
Point	-	-	1	-	-	1
Segmental chopping-tool	-	-	-	-	1 l'st (?)	1
Tested/modified pieces	24 (incl. 2 percussors?)	3	1	1 ig.	3 qz.	32
(?Utilised) cobble point	1	-	-	-	-	1
Cores						
Bifacial chopper-cores	12	-	-	1 an.	1 qz.	14
Unifacial chopper-cores	16	-	-	1 an.	-	17
Migrating-platform cores	1	-	1	-	-	2
Split-cobble cores	9	-	-	-	-	9
Flake tools						
Scrapers	-	-	3	-	-	3
(?Retouched) flakes	2	-	-	-	-	2
Unmodified flakes	-	-	1	-	-	1
Total	73	4	7	3 an; 4 ig.	4 qz; 1 l'st.	96

APPENDIX 2: CATALOGUE OF ILLUSTRATED PIECES

<i>Figure no.</i>	<i>Description:</i>
3a	Quartzite subcordate biface, twisted edge, linguete-type, possibly on flake, Burton Hastings: Bramcote Hill. SP 4051 8911. Waite object ref. BH/12. Gift to R. J. MacRae (now Hardaker Collection).
3b	Quartzite pointed biface, twisted tip, on flake; fine parallel shallow dorsal flaking; near-uniface; dark mineral encrustations. Burton Hastings: Burton Fields Farm. c. SP430 900. Waite Collection Box 1, object ref. BH/1.
4a	Quartzite plano-convex pointed biface, near-ficron, on flake; long fine parallel shallow dorsal flaking (1 edge); flat 'apron' effect round bulb. Burton Hastings: Burton Fields Farm. c. P4300 9010. Waite Collection Box 2, object ref. BFF/98.
4b	Quartzite subcordate biface, on flattish cobble; fine parallel shallow flaking on one face of straight edge. Burton Hastings: Bramcote Hill Field 1, quadrant 'C' (southwest). c. SP4055 8905. Waite object ref. BH/115. Gift to A. Graf.
5a	Quartzite cordate biface, on flake, rounded tip, near-uniface. Resembles item 5b. Nuneaton: 'Weddington Meadows' Field 3, spot ref. A. c. SP3565 9417. Waite Coll Box 2.
5b	Quartzite subcordate biface, on naturally-split cobble, rounded tip, near-uniface. Resembles item 5a. Nuneaton: 'Weddington Meadows' Field 7, spot ref. B. c. SP3630 9461. Waite Collection Box 2.
6	Quartzite bifacial core-axe, on plano-convex cobble; triangular-section, rounded tip. Nuneaton: Stockingford Field 16, spot ref. 'X' c. SP3232 9043. Waite Coll Box 1.
7a	Quartzite unifacial triangular pick, on plano-convex cobble; triangular-section roughly pointed tip with central ridge. Nuneaton: Attleborough Field 7, spot ref. 'Q' c. SP 3918 9067. Waite Collection Box 2.
7b	Quartzite unifacial elongated pick, on long flat-based naturally-split cobble. Long edges alternately-flaked to create 2 parallel ridges along top; rounded tip, partly bifacially-worked. Nuneaton, Stockingford Field 14, spot ref. 'ZX' c. SP 3234 9020. Waite Box 2.
8a	Quartzite core-scraper on small naturally-split cobble. Parallel flaking along one long edge, creating slightly-convex scraper edge. Higham-on-the-Hill, 'corner site', road to Wykin. c. SP393 952. Leics. Mus. ref. L.A77.1995.1, on display in Jewry Wall Museum, Leicester.
8b	Quartzite unifacial chopper-core, on small cobble, flaked from one edge and end. Copston Magna: High Cross gravel pit. c. SP465 889. Leics. Mus. ref. EN2115.Q45.
8c	Flint bifacial chopper-core, on small cortical cobble; thermal removals on part of one face; opaque milky inclusion one end; one long edge bifacially-flaked. Nuneaton: 'Weddington Meadows' Field 6. c. SP 3610 9434. Waite Collection Box 3.
9	Quartzite prepared ?core, on naturally-split cobble with angled quartzite bedding. 'Preferential' flake removed from slightly-prepared domed top surface, struck from platform with two flake-scars. Nuneaton: Attleborough, Field 9, spot ref. 'X' c. SP3939 9048. Waite Box 2.
10a	Quartzite flat discoidal core, lenticular section, on cobble with heavily-abraded and scarred area on cortex, and dark (agricultural machinery?) mark. Nuneaton, 'Wem Field 3'. c. SP 367 889. Leics. Mus. ref. EN2114.36.
10b	Quartzite backed knife on transverse flake; half platform left as 'backing'; both edges of tip retouched, inversely and normally. Astley Field 20, spot ref. 'A' c. SP 3010 8990. Waite Box 2.
11	Retouched flake/scraper. Retouch shapes 'nose' or shoulder, and large notch. Possible brachiopod fossil revealed within quartzite top surface, perhaps showing marine origins of raw material (R. Clements, pers. comm.). Shackerstone: Barton-in-the-Beans Field 1. c. SK 397 075. Leics. Mus. ref. EN2724.29.

ACKNOWLEDGEMENTS

Ron Waite above all, for his cooperation, for patiently tolerating intrusions and questions, providing much location information, agreeing the temporary loan of a large part of his private collection for recording, and for many donations over the years to public institutions. Alan Saville, for much help and for most kindly agreeing to the transfer of a large body of older Waite material from his safekeeping back to the Midlands for future study. The Aggregates Levy Sustainability Fund Shotton Project (now National Ice Age Network), University of Birmingham, for financial help with transport of finds from Edinburgh, and with photographic and other costs. Richard Pollard and other staff for much help and continuing access to the Leicestershire County Council Collections Resources Centre, Barrow-upon-Soar. Terry Hardaker for much time and patient instruction and assistance on quartzite identification, for commenting on an initial draft of this paper, for expertly drawing Figures 3a & b, for access to forthcoming publications and to his reference collection, and for field visits. Alex Lang for help in sorting material at Barrow-upon-Soar Resources Centre, and for access to his thesis. The late David Keen for discussion, for comment on an initial draft of this paper, and on identifications, for access to forthcoming publications, and for field visits. Jim Rose also for advice and field visits. Nick Ashton and Roger Jacobi for access to the British Museum collections and, as also the late John Wymer and Derek Roe, for much assistance with identifications. Derek Roe also for commenting on an initial draft, and for access to the MacRae collection at the Donald Baden-Powell Quaternary Research Centre, Oxford. Responsibility for any dubious identifications remains, however, with the author. Emma Jones and Ben Wallace of Warwickshire County Council Museum and Field Services for much information and reference material. An anonymous referee for helpful suggestions on the draft paper. My husband, Alan Briggs, as always, for his support in so many ways.

BIBLIOGRAPHY

- Aldhouse-Green, S., Jackson, H. & Young, T. 2004. Lithics, raw materials and ochre: interrogation of data from the Middle Pleistocene hominid site of Pontnewydd Cave, Wales. In E.A. Walker, F. Wenban-Smith & F. Healy (eds.) *Lithics in Action: papers from the conference Lithic studies in the year 2000*: 93–104. Oxford: Oxbow Books.
- Armstrong, A.L. 1942. Palaeolithic man in the North Midlands. *Journal of the Derbyshire Archaeological & Natural History Society* 63: 28–60.
- Ashton, N. & Lewis, S. 2002. Deserted Britain: declining populations in the British Late Middle Pleistocene. *Antiquity* 76: 388–396.
- Ashton, N.M., Cook, J., Lewis, S.G. & Rose, J. (eds.) 1992. *High Lodge: Excavations by G. de G. Sieveking 1962–68 and J. Cook 1988*. London: British Museum.
- B.G.S: British Geological Survey. 1982. *Coalville*. England and Wales Sheet 155. Solid and Drift Geology. 1:50,000. Nottingham: Keyworth.
- B.G.S: British Geological Survey. 1994. *Coventry*. England and Wales Sheet 169. Solid and Drift Geology. 1:50,000. Nottingham: Keyworth.
- Barfield, L.H. 1997. Caught short in Shropshire. *Lithics* 17/18: 66–69.
- Bowen, D.Q., Rose, J. & McCabe, A.M. 1986. Correlation of Quaternary glaciations in England, Ireland, Scotland and Wales. *Quaternary Science Reviews* 5: 299–340.
- Bridge, D.McC., Carney, J.N., Lawley, R.S., & Rushton, A.W.A. 1998. *Geology of the country around Coventry and Nuneaton. Memoir for 1:50,000 Geological Sheet 169 (England and Wales)*. British Geological Survey. London: The Stationery Office.
- Brown, W. 1992. Burton Hastings: further Palaeolithic finds from Bramcote Hill, WA 5088 (SP 405 892). *West Midlands Archaeology* 35: 54–55.
- Brown, W. 1993a. Attleborough: Palaeolithic finds from Horeston Grange (SP 3780 9150). *West Midlands Archaeology* 36: 81–82.
- Brown, W. 1993b. Attleborough: Neolithic axe fragment (SP 3905 9110). *West Midlands Archaeology* 36: 81, 83
- Chambers, J.C. 2003. Like a Rolling Stone? The identification of fluvial transportation damage signatures on secondary context bifaces. *Lithics* 24: 66–77.
- Clark, C.D., Gibbard, P.L. & Rose, J. 2004. Pleistocene glacial limits in England, Scotland and Wales. In J. Ehlers & P.L. Gibbard (eds.) *Quaternary Glaciations: extent and chronology*: 47–82. Elsevier B.V.
- Clark, J.D. & Kleindienst, M.R. 1973. The Stone Age cultural sequence: terminology, typology and raw materials. In Clark, J.D. (ed.) *Kalambo Falls Prehistoric Site*. II: 71–106. Cambridge: Cambridge University Press.

- Clifford, E.M. 1943. Palaeolithic implements from Little Alne, Alcester, Warwickshire. *Proceedings of the Prehistoric Society* 9: 52–54.
- Cook, J. & Jacobi, R. 1998. Discoidal core technology in the Palaeolithic at Oldbury, Kent. In Ashton, N. Healy, F. & Pettitt, P. (eds.) *Stone Age Archaeology: essays in honour of John Wymer*: 124–136. Oxford: Oxbow Books.
- Cooper, L. 1997. Launde (SK 80 03). *Transactions of the Leicestershire Archaeological & Historical Society* 71, 91–93.
- Cooper, L. 2001. The Glaston glutton and other strange beasts. *Rescue News* 83: 1–3.
- Cooper, L. 2004. The hunter-gatherers of Leicestershire and Rutland. In P. Bowman & P. Liddle (eds.) *Leicestershire Landscapes*: 12–29. Leicestershire Museums Archaeological Fieldwork Group Monograph No. 1. Leicestershire County Council.
- Douglas, T.D. 1980. The Quaternary deposits of western Leicestershire. *Philosophical Transactions of the Royal Society of London* B258: 259–286.
- Féblot-Augustins, J. 1997. *La circulation des matières premières au Paléolithique*. ERAUL vol.75. Liège.
- Gibbard, P.L. & Zalasiewicz, J.A. (eds.) 1988. *Pliocene – Middle Pleistocene of East Anglia: Field Guide*. Cambridge: Quaternary Research Association.
- Graf, A. 2002. Lower and Middle Palaeolithic Leicestershire and Rutland: progress and potential. *Transactions of the Leicestershire Archaeological & Historical Society* 76: 1–46.
- Hack, B. 2002. Collections of Lower Palaeolithic artefacts from Abbots Leigh, Somerset. *Lithics* 23: 48–51.
- Hains, B.A. & Horton, A. 1969 (3rd edn.). *British Regional Geology: Central England*. London: HMSO.
- Hamblin, R., Moorlock, B. & Rose, J. 2000. A new glacial stratigraphy for eastern England. *Quaternary Newsletter* 92: 35–43.
- Hardaker, T. 2001. New Lower Palaeolithic finds from the Upper Thames. In S. Milliken & J. Cook (eds.) *A very Remote Period indeed: papers on the Palaeolithic presented to Derek Roe*: 180–198. Oxford: Oxbow.
- Hardaker, T. 2003. Some thoughts on a stray Upper Thames handaxe. *Lithics* 24: 21–31.
- Hardaker, T. & MacRae, R.J. 2000. A lost river and some Palaeolithic surprises: new quartzite finds from Norfolk and Oxfordshire. *Lithics* 21: 52–59.
- Henson, D. 1983. The flint resources of Yorkshire and the East Midlands. *Lithics* 6: 2–9.
- Inskip, R.R. 1988. Africa: everything but flint. In R. J MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 235–242. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Isaac, G.L.I. 1984. The archaeology of human origins: studies of the Lower Pleistocene in East Africa 1971–1981. In F. Wendorf & A. Close (eds.) *Advances in Old World Archaeology* 3: 1–87. New York: Academic Press.
- Jenkinson, R.D.S. 1984. *Creswell Crags: Late Pleistocene sites in the East Midlands*. British Archaeological Reports British Series 122. Oxford: B.A.R.
- Jones, P.R. 1982. The Berinsfield quartzite palaeoliths and their significance. In R.J. MacRae. Palaeolithic artefacts from Berinsfield, Oxfordshire: 8–11. *Oxoniensia* 47: 1–11.
- Keen, D.H. 1999. The chronology of Middle Pleistocene ('Wolstonian') events in the English Midlands. In P. Andrews & P. Banham (eds.) *Late Cenozoic Environments and Hominid Evolution: a tribute to Bill Bishop*: 159–168. London: Geological Society.
- Keen, D.H., Hardaker, T. & Lang, A.T.O. In prep. A Lower Palaeolithic industry from the Cromerian Baginton Formation of Wood Farm Pit, Bubbenhall, Warwickshire, UK. Submitted to *Journal of Quaternary Science*.
- Lacaille, A.D. 1954. Palaeoliths from the lower reaches of the Bristol Avon. *The Antiquaries Journal* 34: 1–27.
- Lang, A.T.O. 2004. The Lower and Middle Palaeolithic of the region north and west of the Cotswolds: a case study from a peripheral archaeological area. Unpublished MPhil thesis, University of Liverpool.
- Lang, A.T.O. & Keen, D.H. 2003. A further andesite handaxe from Waverley Wood Quarry, Warwickshire. *Lithics* 24: 32–36.
- Lang, A.T.O. & Keen, D.H. 2005. 'At the edge of the world...' Hominid colonisation and the Lower and Middle Palaeolithic of the West Midlands. *Proceedings of the Prehistoric Society* 71, 68–83.
- Lee, H.W. 2001. *A study of Lower Palaeolithic stone artefacts from selected sites in the Upper and Middle Thames Valley, with particular reference to the R.J. MacRae Collection*. British Archaeological Reports British Series 319. Oxford: B.A.R.
- McBrearty, S. 2001. The Middle Pleistocene of east Africa. In L. Barham & K. Robson-Brown (eds.) *Human Roots: Africa and Asia in the Middle Pleistocene*: 81–98. Bristol: Western Academic & Specialist Press.
- McNabb, J. 2001. The East Midlands and the Palaeolithic Archaeology of Western Doggerland. (Unpublished contribution to East Midlands Archaeological Research Framework, Leics. & Rutland Sites and Monuments Record) (http://www.le.ac.uk/archaeology/pdf_files/emidpal/pdf) accessed 01/07/02.
- MacRae, R.J. 1986. Tool manufacture in quartzitic and similar rocks in the British Palaeolithic. *Lithics* 7: 7–12.

- MacRae, R.J. 1988. Wolvercote Channel quartzite assemblage: an additional note. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 165–166. British Archaeological Reports British Series 189. Oxford: B.A.R.
- MacRae, R.J. 1991. New Lower Palaeolithic finds from gravel pits in Central Southern England. *Lithics* 12: 12–19.
- MacRae, R.J. 1999. New Lower Palaeolithic finds in Norfolk. *Lithics* 20: 3–10.
- MacRae, R.J. & Moloney, N. (eds.) 1988. *Non-flint stone tools and the Palaeolithic occupation of Britain*. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Maddy, D., Keen, D.H., Bridgland, D.R. & Green, C.P. 1991. A revised model for the Pleistocene development of the River Avon, Warwickshire. *Journal of the Geological Society of London* 148: 473–484.
- Mania, D. & Mania, U. 2005. The natural and socio-cultural environment of *Homo erectus* at Bilzingsleben, Germany. In C. Gamble & M. Porr (eds.) *The Hominid Individual in Context: archaeological investigations of Lower and Middle Palaeolithic landscapes, locales and artefacts*: 98–114. Abingdon: Routledge.
- Parfitt, S.A., R.W. Barendregt, M. Breda, I. Candy, M.J. Collins, G.R. Coope, P. Durbidge, M.H. Field, J.R. Lee, A.M. Lister, R. Mutch, K.E.H. Penkman, R.C. Preece, J. Rose, C.B. Stringer, R. Symmons, J.E. Whittaker, J.J. Wymer and A.J. Stuart 2005. *The earliest record of human activity in northern Europe*. Nature 438, 7070:1008–1012.
- Pickin, J. 1988. Burton Hastings, Palaeolithic finds from Bramcote Hill (SP 405892; PRN5088). *West Midlands Archaeology* 31: 32.
- Pope, M. & Roberts, M. 2005. Observations on the relationship between Palaeolithic individuals and artefact scatters at the Middle Pleistocene site of Boxgrove, UK. In C. Gamble & M. Porr (eds.) *The Hominid Individual in Context: archaeological investigations of Lower and Middle Palaeolithic landscapes, locales and artefacts*: 81–97. Abingdon: Routledge.
- Posnansky, M. 1963. The Lower and Middle Palaeolithic industries of the English East Midlands. *Proceedings of the Prehistoric Society* 29: 357–394.
- Rice, R.J. 1972. Geomorphology. In N. Pye (ed.) *Leicester and its region*: 59–83. Leicester: Leicester University Press, for the British Association.
- Roberts, M.B. & Parfitt, S.A. 1999. *A Middle Pleistocene hominid site at Earham Quarry, Boxgrove, West Sussex*. English Heritage Archaeology Report 17.
- Roe, D.A. 1968. *A Gazetteer of British Lower and Middle Palaeolithic Sites*. Council for British Archaeology Research Report 8.
- Roe, D.A. 1988. The study of non-flint artefacts in the British Palaeolithic: its value and significance. In R. J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 1–9. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Roebroeks, W. 2005. Life on the Costa del Cromer. Nature 438, 7070: 921–922.
- Rose, J. 1987. Status of the Wolstonian glaciation in the British Quaternary. *Quaternary Newsletter* 53: 1–9.
- Rose, J. 1989. Tracing the Baginton-Lillington Sands and Gravels from the West Midlands to East Anglia. In D.H. Keen (ed.) *The Pleistocene of the West Midlands: Field Guide*: 102–110. Cambridge: Quaternary Research Association.
- Rose, J. 1994. Major river systems of central and southern Britain during the Early and Middle Pleistocene. *Terra Nova* 6: 435–443.
- Saville, A. 1974. A Group I Cornish Greenstone axe from Sharnford, Leicestershire. *Transactions of the Leicestershire Archaeological & Historical Society* 49 (1973–4): 57–58.
- Saville, A. 1975. A polished greenstone axe fragment from Fillongley. *Transaction of the Birmingham and Warwickshire Archaeological Society* 87 (1975): 128–129.
- Saville, A. 1977a. Perforated whetstones of Bronze Age type from Warwickshire. *Transactions of the Birmingham and Warwickshire Archaeological Society* 88 (1976–77): 126–127.
- Saville, A. 1977b. Two Mesolithic implement types. *Northamptonshire Archaeology* 12: 3–8.
- Saville, A. 1981a. Honey Hill, Elkington: A Northamptonshire Mesolithic site. *Northamptonshire Archaeology* 16: 1–13.
- Saville, A. 1981b. Mesolithic industries in Central England: an exploratory investigation using microlith typology. *Archaeological Journal* 138: 49–71.
- Saville, A. 1986. Two palaeoliths from north-east Warwickshire. *Lithics* 7: 3–6.
- Saville, A. 1988. The Waite collection of Palaeolithic quartzites from the Nuneaton area of Warwickshire. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 67–88. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Saville, A. 1994. Caldecote (SP 3418 9444). *West Midlands Archaeology* 38: 76–78.
- Saville, A. & Shotton, F.W. 1973. An Acheulian flint hand-axe from near Burton Hastings, Warwickshire. *Proceedings of the Coventry District Natural History & Scientific Society* 4 (7): 214–217.

- Saville, A. & Shotton, F.W. 1974. A Palaeolithic hand-axe from Abbey Farm, Wolvey, Warwickshire. *Proceedings of the Coventry District Natural History & Scientific Society* 4(8): 241–244.
- Saville, A. & Shotton, F.W. 1975. Two stone implements from N.E. Warwickshire. *Proceedings of the Coventry District Natural History & Scientific Society* 4: 279–282.
- Scott-Jackson, J.E. 1997. A study of Lower and Middle Palaeolithic artefacts found in relation to deposits mapped as clay-with-flints on the chalk downlands of southern England. *Quaternary Newsletter* 83: 47.
- Shotton, F.W. 1953. The Pleistocene deposits of the area between Coventry, Rugby and Leamington and their bearing on the topographic development of the Midlands. *Philosophical Transactions of the Royal Society of London* 237 B646: 209–260.
- Shotton, F.W. 1988. The Wolstonian geology of Warwickshire in relation to Lower Palaeolithic surface finds in north Warwickshire. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 89–94. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Shotton, F.W. & Wymer, J.J. 1989. Handaxes of andesitic tuff from beneath the standard Wolstonian succession. *Lithics* 10: 1–7.
- Shotton, F.W., Keen, D.H., Coope, G.R., Currant, A.P., Gibbard, P.L., Aalto, M., Peglar, S.M. & Robinson, J.E. 1993. The Middle Pleistocene deposits of Waverley Wood Pit, Warwickshire, England. *Journal of Quaternary Science* 8, 293–325.
- Toth, N. 1985. The Oldowan reassessed: a close look at early stone artefacts. *Journal of Archaeological Science* 12: 101–120.
- Tyldesley, J.A. 1986. *The Wolvercote Channel handaxe assemblage: a comparative study*. British Archaeological Reports British Series 153. Oxford: B.A.R.
- Tyldesley, J.A. 1988. Quartzite implements recovered from the Wolvercote Channel, Oxfordshire. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 159–164. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Wenban-Smith, F. 1990. Researching the Early Palaeolithic: an organisational manifesto. *Lithics* 11: 16–23.
- Wenban-Smith, F. 1998. Clactonian and Acheulian industries in Britain: their chronology and significance reconsidered. In N. Ashton, F. Healy & P. Pettitt (eds.) *Stone Age Archaeology: essays in honour of John Wymer*: 90–97. Oxford: Oxbow Books.
- White, M. & Ashton, N. 2003. Lower Palaeolithic core technology and the origins of the Levallois method in North-western Europe. *Current Anthropology* 44: 598–609.
- White, M.J. & Schreve, D.C. 2000. Island Britain – Peninsula Britain: palaeogeography, colonisation, and the Lower Palaeolithic settlement of the British Isles. *Proceedings of the Prehistoric Society* 66: 1–28.
- Whitehead, P. 1988. Lower Palaeolithic artefacts from the lower valley of the Warwickshire Avon. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 103–122. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Winton, V. 2004. *A study of Palaeolithic artefacts from selected sites on deposits mapped as clay-with-flints of southern England with particular reference to handaxe manufacture*. British Archaeological Reports British Series 360. Oxford: B.A.R.
- Wise, P.J. 1990. The Warwickshire Stone Axe survey – recent work. *West Midlands Archaeology* 33: 30–33.
- Worssam, B.C. & Old, R.A. 1988. *Geology of the country around Coalville. Memoir for 1:50,000 geological sheet 155 (England and Wales)*. British Geological Survey. London: H.M.S.O.
- Wymer, J.J. 1968. *Lower Palaeolithic Archaeology in Britain, as represented by the Thames Valley*. London: John Baker.
- Wymer, J.J. 1982. *The Palaeolithic Age*. London: Croom Helm.
- Wymer, J.J. 1988. A reassessment of the geographical range of Lower Palaeolithic activity in Britain. In R.J. MacRae & N. Moloney (eds.) *Non-flint stone tools and the Palaeolithic occupation of Britain*: 11–23. British Archaeological Reports British Series 189. Oxford: B.A.R.
- Wymer, J.J. 1996. *The English Rivers Palaeolithic Project: Regions 7 (Thames) and 10 (Warwickshire Avon): Report No. 1, 1994–1995*. Salisbury: Trust for Wessex Archaeology.
- Wymer, J.J. 1999. *The Lower Palaeolithic occupation of Britain*. Vols. 1 & 2). Salisbury: Wessex Archaeology & English Heritage.