THE LOWER PALAEOLITHIC ARTEFACTS OF THE BYTHAM RIVER SYSTEM OF CENTRAL ENGLAND

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ABSTRACT

The deposits of the Bytham River, that flowed across central England until the Anglian glaciation (Marine Isotope Stage 12) overrode and destroyed it, have been exposed in many places, mostly in the context of gravel extraction, from Waverley Wood near Coventry in the west to Pakefield near Lowestoft on the East Anglian coast. Many of these sites have yielded artefacts. The present paper concentrates on large, detailed samples from Waverley Wood, Feltwell and Warren Hill collected by the late R.J. MacRae and the late Terry Hardaker. These samples draw attention to the fact that during Marine Isotope Stage 13 or earlier, an extensive Lower Palaeolithic population was spread across middle England and those inhabitants made use of whatever raw materials were available on site. The sites reported reflect localities where access to gravel extraction plants was permitted and a long-term watching brief could be maintained. The finds comprise mainly quartzite artefacts from Waverley Wood in the west, quartzite with some flint at Feltwell, and flint at Warren Hill in the east, and provide a perspective on how raw materials influenced artefact design within the region, prior to c. 450,000 yrs BP.

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INTRODUCTION

The Bytham River was identified by Rose (1987, 1994 & 2009) following on from preliminary work by Hey (1976) and Clarke & Auton (1982). The evidence takes the form of sands and gravels, sands and silts located in a buried valley that extends from the area of Stratford upon Avon near Coventry eastwards to Pakefield, near Lowestoft, on the present North Sea coast and indeed beyond into the present region of the North Sea (Figure 1). The deposits that provide the evidence for this river system are distinctive in that they are composed, almost entirely, of material derived solely from the palaeo-catchment and free of materials transported into the region by glaciation. Hence, their pre-glacial age attribution and their restricted range of source lithologies suitable for artefact production are relevant for our understanding of early Palaeolithic artefact production. 'Pre-glacial' in this context is understood as Marine Isotope Stage (MIS) 13 and earlier, as the Anglian glaciation (MIS 12) is interpreted as that which overrode the area and terminated the river system, and destroyed the catchment by erosion and burial beneath glacial deposits (Perrin et al. 1979; Rose 2009).

The palaeo-valley system comprises three parts: a western part that ends east of Castle Bytham; a central part that no longer exists because the landscape has since been eroded

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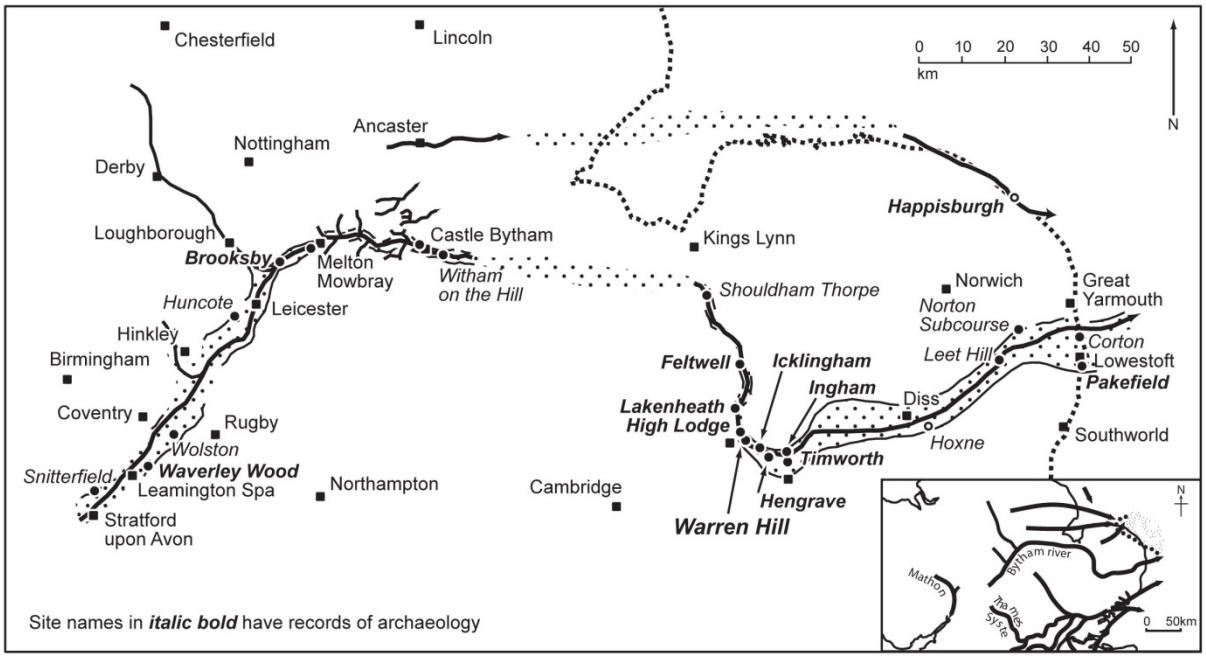

Figure 1. The location and course of the Bytham River, showing the extent of evidence available and sites with archaeological remains. The inset figure shows the wider context of the river system (taken from Rose (2009), with permission).

by glaciation, and now forms the Fen Basin; and an eastern part beginning at Shouldham Thorpe and extending to the North Sea coastline (Figure 1). Alternative views have been published concerning the origin of the deposits attributed, in this paper, to the Bytham River system and readers are referred to these, along with independent critiques of such interpretations (Gibbard et al. 2009, 2012 & 2013; Bridgland et al. 2014; West et al. 2014; Westaway et al. 2015).

The sediments of the Bytham River system reflect the fluvial processes operating along the catchment. The sands and gravels are the products of extensive braid plains or, at significant bends in the valley, massive point bars; the sands are the products of deposition by a lower energy river system in the form of sub-aquatic dunes or ripples; and the silts, at sites like High Lodge, are overbank deposits of a meandering river. The sedimentary processes in operation in the Bytham River are important for this study, as active braidplains and subaquatic dunes and ripples are unsuitable sites for human occupance, and artefacts found in these sands and gravels and sands are likely to have been derived from erosion of an existing braidplain or valley side. Alternatively, the overbank deposits which comprise the material of a typical vegetated floodplain have a high probability of being a host locality for in situ artefact production or usage. A case can be made that braidplains are suitable for occupation when they become vegetated, although such deposits are subject to reworking and the derivation model referred to above is still likely to occur. Should derivation not occur and an in situ artefact assemblage survive from a braidplain location, then the character of the evidence will depend upon whether location was on a palaeo-bar or at a palaeo-pool. When located on a palaeo-bar vegetation and soil development will have developed and the context for the archaeology will be characterised by sand and gravel altered by soil material. When located at the margins of a pool or material that has been washed into a pool, the archaeology will be hosted in finer-grained sediment and organic material and the potential will exist for the

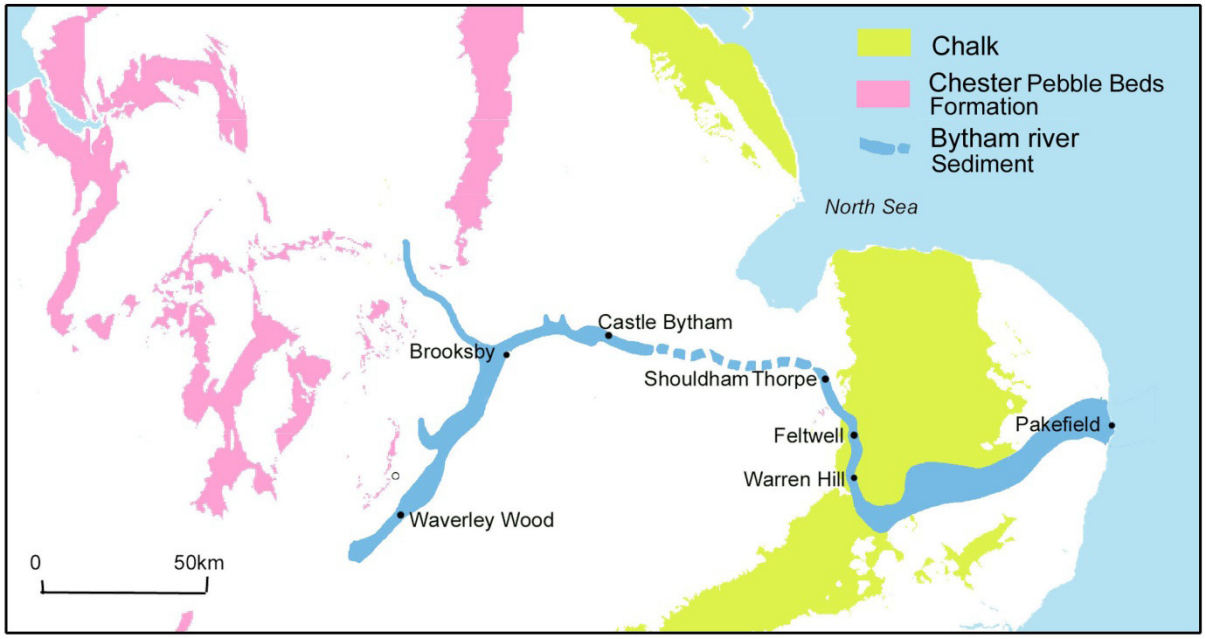

Figure 2. The present-day distribution of Chester Pebble Beds (Bunter) and Chalk lithologies. These rocks are the sources, respectively, of the quartzite and flint raw material for artefacts found at sites along the track of the Bytham River.

identification of other human activity, such as in the form of trampling.

Hitherto the artefacts associated with the Bytham complex have not been considered as a whole. Sites with recorded archaeology are shown in Figure 1, and individual studies of the artefacts have been published for a number of these sites. These consist of (from west to east) Waverley Wood (Shotton & Wymer 1989; Shotton et al. 1993; Lang & Keen 2005), Brooksby (Stephens et al. 2008), Feltwell (MacRae & Moloney 1988; MacRae 1999), Lakenheath (Ashton & Lewis 2005), High Lodge (Ashton et al. 1992), Warren Hill (Wymer 1985; Wymer et al. 1991; Hardaker 2012 & 2017), Icklingham (Wymer 1985; Bridgland et al. 1995), Hengrave (Rose & Wymer 1994), Ingham (Wymer 1985), Timworth (Wymer 1985) and Pakefield (Parfitt et al. 2005). Other sites have been observed by the authors but are not yet recorded in reviewed literature.

This paper chiefly compares three assemblages where the late Terry Hardaker (TH) and the late R.J. MacRae have collected items: Waverley Wood, Feltwell and Warren Hill (Tables 1 & 2). Artefacts from these sites provide a good cross-section of the pre-MIS 12 Lower Palaeolithic artefact style in central England, varying as they do according to the available raw material. Their interest lies in the effect raw material had on the typology of the tools produced.

Source materials and artefact type

In the region of the Bytham River catchment two contrasting source materials were preferred for the manufacture of stone tools by the Palaeolithic inhabitants of MIS 13 or earlier. In the west, the Bunter quartzites from the Triassic beds (Chester Pebble Beds Formation of the Sherwood Sandstone Group) were the main source. In the east, flint from the Cretaceous Chalk was used (Figure 2). Additionally, the Bytham River carried quartzites downstream of their outcrop so that occasional quartzite artefacts are also found as far east as the Warren Hill site and beyond.

Table 1 compares the numbers and

Table 1. Summary of artefacts from Waverley Wood, Feltwell and Warren Hill. Red = >5%; bold red >10%.

Material	Type	Waverley Wood		Feltwell		Warren Hill	
		no.	%	no.	%	no.	%
HANDAXES							
Quartzite	Pointed handaxe	8	3.8	2	<1.0	0	0
Flint	Pointed handaxe	1	<1.0	29	**12.7**	0	0
Quartzite	Pointed biface	2	<1.0	0	0	2	<1.0
Flint	Limande handaxe	0	0	2	<1.0	0	0
Flint	Ovate handaxe	0	0	24	**10.6**	7	1.6
Flint	Cleaver	0	0	2	<1.0	0	0
Andesite	Handaxe	5	<1.0	0	0	0	0
Flint	Handaxe tip	1	<1.0	0	0	0	0
Flint	Handaxe butt	0	0	2	<1.0	0	0
Flint	Handaxe roughout	0	0	5	2.2	3	<1.0
TOTAL Handaxes (n = 95)		***17***	***8.2***	***66***	***29.1***	***12***	***2.8***
CORE/CORE TOOLS							
Quartzite	Core	86	**40.9**	5	2.8	0	0
Flint	Core	0	0	15	8.3	18	4.2
Quartzite	Chopper core	30	**14.3**	1	<1.0	0	0
Quartzite	Split Cobble core	44	**21**	2	1.1	0	0
Quartzite	Core/knife	3	1.4	0	0	0	0
Quartzite	Core or point	1	<1.0	0	0	0	0
Quartzite	Blade core	1	<1.0	0	0	0	0
Quartzite	Chopper	5	<1.0	2	1.1	0	0
Quartzite	Trihedral point	7	3.4	0	0	0	0
TOTAL Core/core tools (n = 220)		***177***	***85.1***	***25***	***11***	***18***	***4.2***
FLAKE-BASED							
Quartzite	Retouched flakes	2	<1.0	1	<1.0	0	0
Flint	Retouched flakes	0	0	3	1.7	27	6.3
Quartzite	Flake	7	<1.0	10	5.5	1	<1.0
Flint	Flake	0	0	119	**66.1**	342	**79.7**
Quartzite	Worked point	1	<1.0	0	0	0	0
Quartzite	Scraper	2	<1.0	0	0	0	0
Flint	Scraper	0	0	2	1.1	14	3.3
Flint	Notched piece	0	0	0	0	13	3
TOTAL Flake-based (n = 544)		***12***	***5.8***	***135***	***59.5***	***397***	***92.5***
OTHER							
Flint	Hammerstone	0	0	0	0	2	<1.0
Quartzite	Debitage	1	<1.0	0	0	0	0
Flint	Proto-Levallois Core*	0	0	1	<1.0	0	0
TOTAL Other (n = 4)		***1***	***<1.0***	***1***	***<1.0***	***2***	***<1.0***
GRAND TOTALS		***207***	***100***	***227***	***100***	***429***	***100***

* A possible proto-Levallois core

percentages of artefacts from the three sites in terms of their lithology and whether they are handaxes, cores and core tools, flakes and 'others'. The difference between pointed handaxes and pointed bifaces is that the biface tool is less worked than the handaxe. The flake category includes flakes, retouched flakes, worked points, scrapers and notched pieces, whilst the 'others' consist of hammerstones, a possible proto-Levallois core and debitage. Table 2 shows the percentages of raw materials from each site. It is clear that all sites have yielded large samples and that there are three quite different populations. These findings, which provide a substantial basis for further analysis, are discussed below.

WAVERLY WOOD

The archaeology from Waverley Wood, prior to 2006 was published by Keen et al. (2006) when 79 artefacts had been found. Further regular searches by TH were carried out until the pit closed in 2012, yielding a current total of 207 artefacts (Table 1). The geology of the site is described in Shotton et al. (1993) and Keen et al. (2006). The Quaternary succession overlies Mercia Mudstone bedrock into which the Bytham River valley has been eroded. The Bytham River Baginton Formation deposits, located in the palaeo-valley consist, from the base upwards, of Waverley Wood Member red brown muddy sands forming a bar structure dissected by channels with organic remains and archaeology. This is overlain or cut-out by the Thurmaston Member gravel and the Brandon Member, well sorted sands. The succession is completed by the reddish brown Thrussington Member Till of the Wolston Formation deposited by a glacier moving from the northwest during the Anglian Stage (MIS 12).

The site first received attention when Shotton and Wymer (1989; see also Shotton et al. 1993) reported the earliest artefact finds. This sample was taken from a channel at the base of the river-transported sediments, which also included climate-proxy evidence showing that the landscape at the time of deposition had developed in a temperate climate. However, although there is no evidence that any of the artefacts are derived from the location where they were manufactured or used, the sensitivity to erosion of the climate-proxy evidence, the fact that there exists a cluster of artefacts composed of a similar distinctive lithology (andesite), and the fact that the handaxes are fresh, suggests that transport distances were minimal. Visually, the assemblage was dominated by a large, symmetrical, pointed handaxe made of andesite (Figure 3), together with two other andesite handaxes and a few quartzite tools. Subsequently, despite a watching brief, no further reports of stone tools occurred until 2004 when a further handaxe turned up from excavation of a channel in another part of the quarry (Figure 4) (Lang & Keen 2005). In the meantime, the publication by MacRae and Moloney (1988), the standard work on non-flint artefacts in the British Isles, began to awaken archaeologists to the fact that not all Palaeolithic stone tools were made of flint, especially away from the geological flint sources in the southeast.

From 2004 TH began paying regular visits

Table 2. Percentage raw materials of the artefacts from the three study sites

Site name	*% quartzite*	*% flint*	*% other*
Waverly Wood	99.71	0.05	0.24
Feltwell	10.1	89.9	0
Warren Hill	0.07	99.3	0

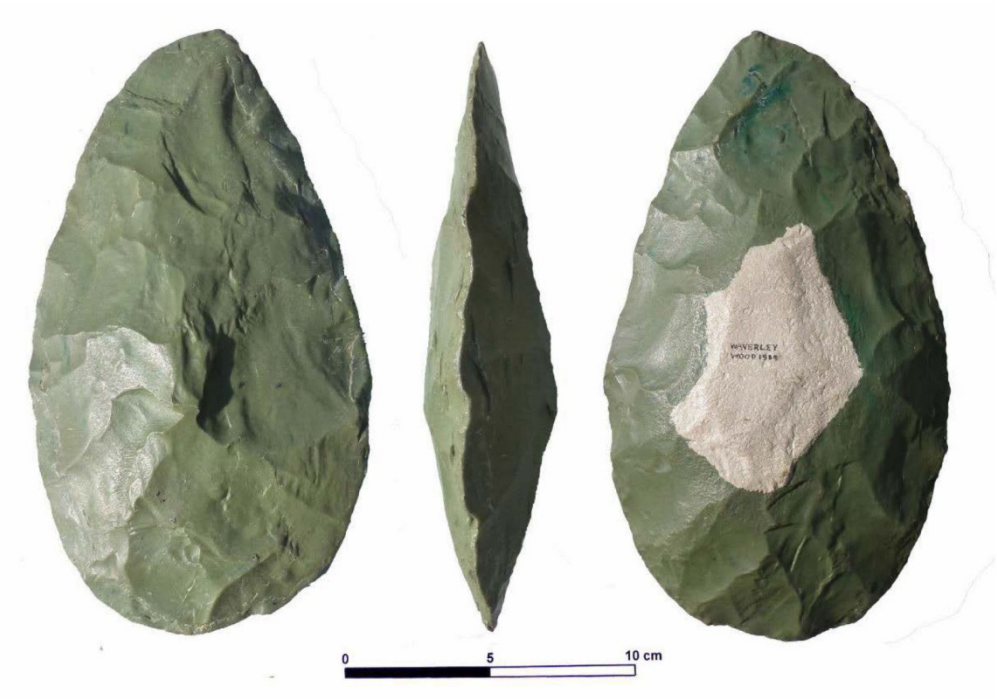

Figure 3. A cast of a finely made andesite handaxe from Waverley Wood.

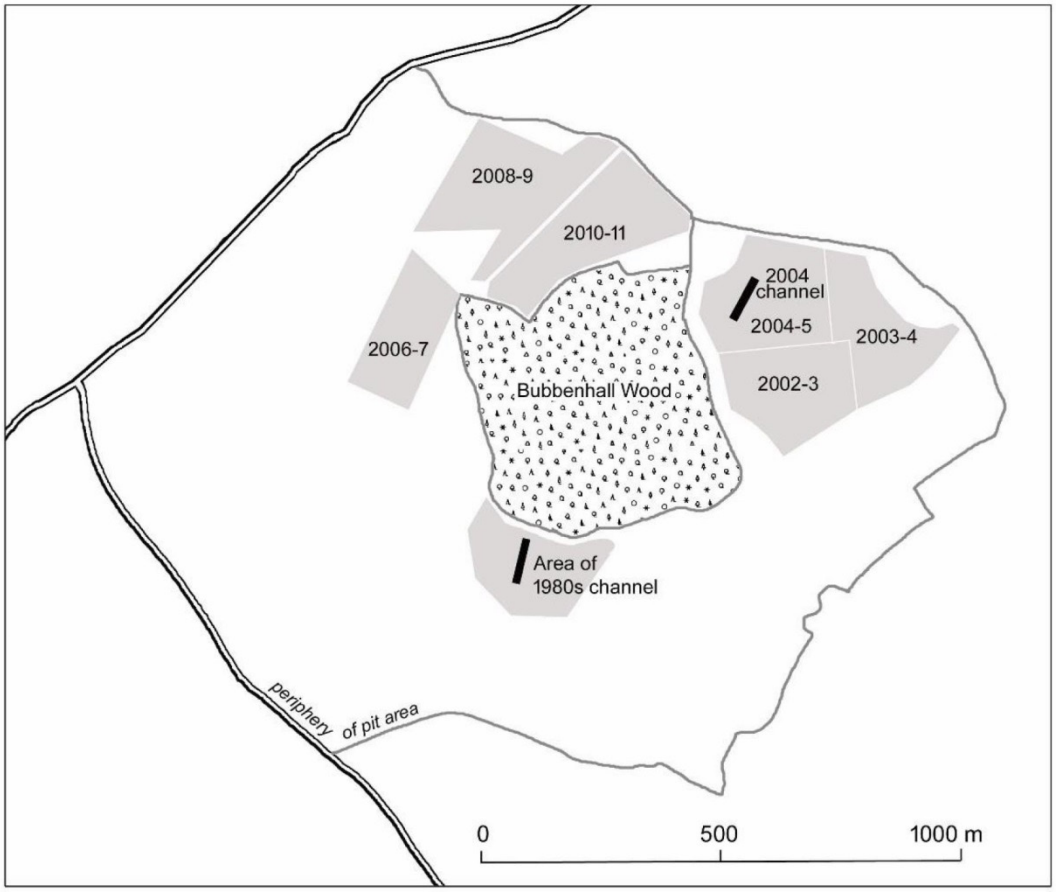

Figure 4. The Waverley Wood quarry complex showing relevant excavation stages. The earlier stages are unshaded.

to the quarry and immediately began finding large numbers of quartzite tools. It is suspected that the previous watching brief had concentrated on the search for the spectacular handaxes without being aware that there were less obvious artefacts of quartzite coming from the pit.

Searches included an examination of the reject heaps. At Waverley Wood these reject heaps comprise the clasts over 40 mm diameter which do not go through the grading plant (Figure 5) and are composed mainly of quartzite cobbles, quarried from the palaeo-surface that represents the interface between the bedrock in the area (Mercia Mudstone) and the overlying Bytham River gravels (Thurmanston Member of the Baginton Formation: Maddy 1999). Over the period 2004–2013 artefacts found in the reject heaps were over 99% quartzite (Tables 1 & 2). These artefacts were not derived only from a channel context, but from over a wide region as gravel extraction moved across the quarried area (Figure 4). This is at variance with the conclusions of Keen et al. (2006) when it was proposed that all the artefact finds were associated with the channel and it is now clear that artefacts were distributed over a wider region in the vicinity of the channel.

Weathering and abrasion of the quartzite artefacts varies from sharp to very rolled, suggesting some have been transported from their original location while others have not moved far. And there is a notable absence of smaller artefacts such as flakes, indicating that smaller clasts have been winnowed away or removed during the grading process used during aggregate production (Table 1). Transport of the artefacts would have been in the form of sorting by the Bytham River as it shifted its bedforms and/or by meltwater rivers associated with the oncoming glaciation causing channel scour

Figure 5. A typical reject heap, Waverley Wood pit, showing preponderance of Bunter quartzite cobbles from the pit floor, derived from the Triassic, Chester (Bunter) Pebble Beds Formation.

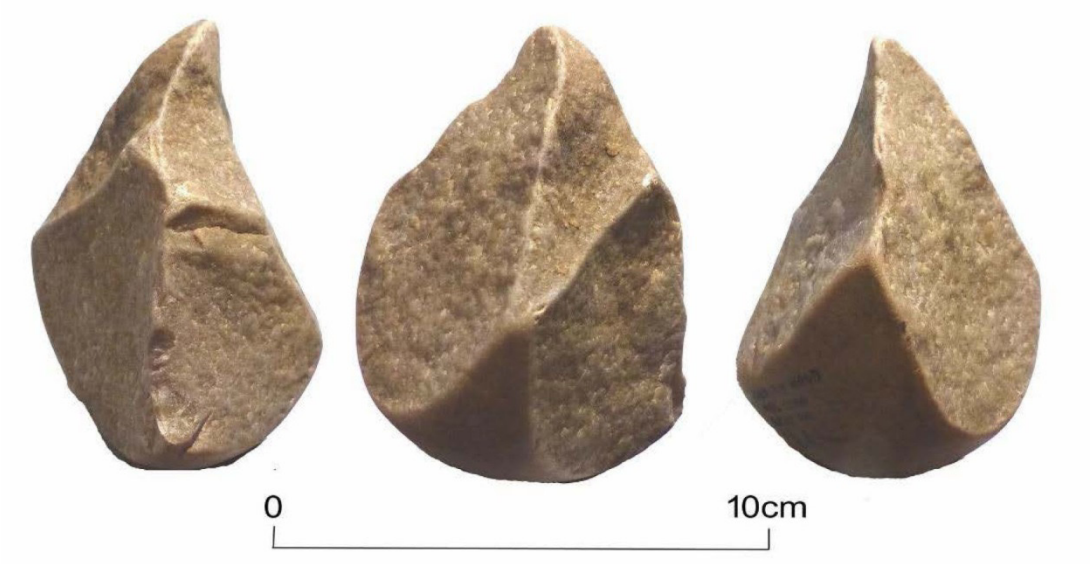

Figure 6. A typical trihedral point from Waverley Wood.

and subsequent deposition of the Wolston Formation. The general impression is that human occupation ranged all over this landscape although it was never far from the river.

During the period of monitoring by TH (2004–2013) artefacts were found at every visit (14 visits) from an area covering approximately 1 km^2 (Figure 4). Eighty-five percent of the 207 artefacts are core-based (Table 1), amongst which there are seven trihedral points and one blade core (Figure 6). The trihedral point seems to have been a speciality at this site. Other examples have come from the Northern Drift in Oxfordshire (Hardaker 2017). There was only one flint artefact in the whole assemblage, a handaxe tip found in 2005. Only 8.2% of the artefacts were handaxes of some type.

In summary, Waverley Wood, the most westerly of the artefact sites associated with the Bytham drainage system, has demonstrated the need for regular inspection of ongoing gravel extraction sites if a representative assemblage of the Lower Palaeolithic archaeology is to be obtained. The manager of Waverley Wood pit, John Green, has taken an exemplary lead in allowing regular visits and assisting with logistics. As a consequence we have a balanced view of the industries of this enigmatic, but important site, showing that pre-MIS 12 occupants were capable of top quality work while at the same time using their skills to fashion intractable quartzite.

FELTWELL (FRIMSTONE'S QUARRY)

The archaeological site at Feltwell is located to the east-northeast of the village at the lower, western margin of the degraded Chalk escarpment. This site exists because of sand and gravel extraction carried out by Frimstone Ltd until the closure of the quarry in about 2010. The site contains three main sedimentary units overlying Chalk bedrock. The basal unit is a reddish brown sand and gravel with c. 40% quartz and quartzite material, c. 60% flint and traces of far-travelled materials from the Jurassic and Carboniferous rocks of midland England. Sedimentary structures and palaeocurrent directions indicate a river flowing from north to south. Together these properties indicate deposition by the Bytham River flowing in a valley at the west side of what is now the Chalk escarpment. The western side of the river valley has since been removed by the Anglian (MIS 12) glaciation that eroded the Wash and Fen Basin (Perrin et al. 1979).

In places this unit is capped by a clay-rich palaeosol, but usually the upper beds have been removed by erosion. It is from this lower, reddish brown sand and gravel that the in situ artefacts were recovered (Figure 7).

These deposits are overlain in the northern part of the quarry by sub-horizontally bedded sands and gravels with palaeocurrent structures indicating flow towards the west. These beds are composed predominantly of fresh and weathered flint, much of which is angular and the unit as a whole is characterised by very well developed intra-formational ice-wedge casts. This unit is interpreted as periglacial fan gravels, deposited by water flowing from the Chalk escarpment at the east and entraining weathered and unweather flint and, locally, Bytham Sands and Gravels. The age of this unit is not known. It is not known if this unit contains artefacts; however, the unit was quarried at the time that archaeology was being found, and the clast lithology is similar to many of the implements. As many of the artefacts were collected from the reject heaps, it is possible that this unit could be a source of some of the finds. The third unit is located at the southwest of the quarry. Here the Bytham Sands and Gravels are overlain, or replaced, by a complex body of sands, sands and gravels and chalky diamicton. These units have been studied by Gibbard et al. (2012) and are the product of subsequent glaciation of the region. These beds are devoid of artefacts.

The site was monitored from the mid-1990s by R.J. MacRae and TH until its closure about 2010 although small-scale gravel grading continued to work through the excavated

Figure 7. The base of the Feltwell sand and gravel quarry showing the chalk bedrock overlain by Bytham River sediments (clearly seen in inset). The rounded quartzite clasts are visible along with the reddish brown colour of the sand matrix. The arrow indicates the location of an artefact find. A section in the Bytham Sands and Gravels are is visible below the digger although much of this area is hidden by spoil.

Figure 8. R.J. MacRae searching for artefacts on the Feltwell rejects pile in 1999 showing a mixture of flint and quartzite.

material after closure. Searches included examination of reject heaps (Figure 8). Eric Secker and family from the nearby village of Feltwell also took an interest in the site and were able to make more visits because of their proximity, and their finds up to 1999 are incorporated into the data used in Tables 1 and 2. MacRae (1999) reported that many of the fine pointed handaxes found by the Secker family, that are in sharp condition, were found over a short period, suggesting that there was a concentration in one part of the pit. Eric Secker and family tended to look only for handaxes and thus the relative proportions of typologies in the list may be a skewed towards this form (Table 1).

The artefacts from Feltwell are nearly 90% flint; the remainder are quartzite derived from cobbles transported from the west by the Bytham River (Figures 7, 9 & 10). The quartzite artefacts include two handaxes and ten core tools. Whereas the flint tools are frequently in sharp condition, most of the quartzites show edge abrasion indicating river transport (Figure 9), and indeed in some cases there is evidence of a surface polish caused by wind abrasion (Peter Worsley, pers. comm.) reflecting exposure on a land surface (probably a river bar) during a polar desert climate. However, not all quartzite artefacts are abraded (Figure 10) indicating that they were made close to where they were found.

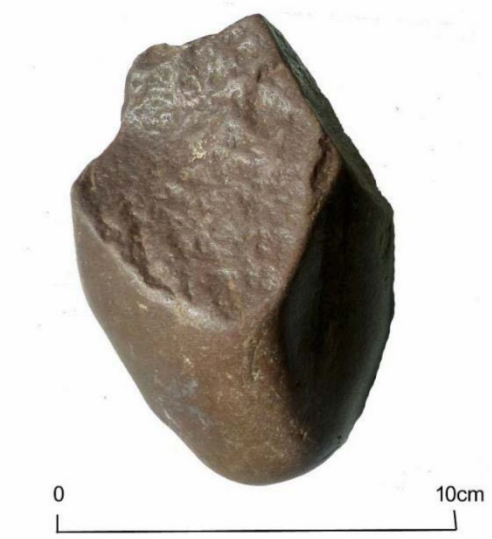

Figure 9. An edge-rounded chopper-core from Feltwell indicating transport since formation. The polished surface clearly visible is likely to be the product of sand abrasion whilst resting on an open land surface in polar desert conditions.

Figure 10. A chopper-core taken from the base of the Bytham Sands and Gravels at Feltwell. Note the sharp edges and the absence of abrasion since the flakes were removed, indicating minimal or no transport since manufacture. Note also that, as is often the case with sharp quartzite tools, there is no sign of damage through usage on the tip.

The presence of a possible proto-Levallois core (Figure 11) (Bolton 2015) in the collection is noted here for the sake of future research. The identification and provenance is not secure, but it is possible that it was derived from the upper fan gravel unit at the north end of the quarry.

In summary, the artefacts at Feltwell are dominated by flint, which has a local provenance, although far less easily worked quartzite cobbles, transported to the sites as bedload by the Bytham River are manufactured locally. The activities of local collectors have increased the sample size and contributed to a rich array of flint handaxes.

WARREN HILL, SUFFOLK

This site was exploited for sand and gravel on a small scale from the late 19th until the mid-20th century and is now an area of spoil heaps and small, low angle exposures. The site lies in the path of the Bytham River but unlike the other sites the artefact source is seen on the present-day surface as well as in buried context. A small test pit excavated in 1991 (Wymer et al. 1991) and extended in 1992, and more extensive excavations by Wymer and Rose in 2002 verified that artefacts occur within the gravels, and are also found at the present-day surface. The geological succession at the site consists of Chalk bedrock overlain by fine, well sorted, silty sands, followed by bedded sands and gravels with flow directional structures towards the east. The artefacts are

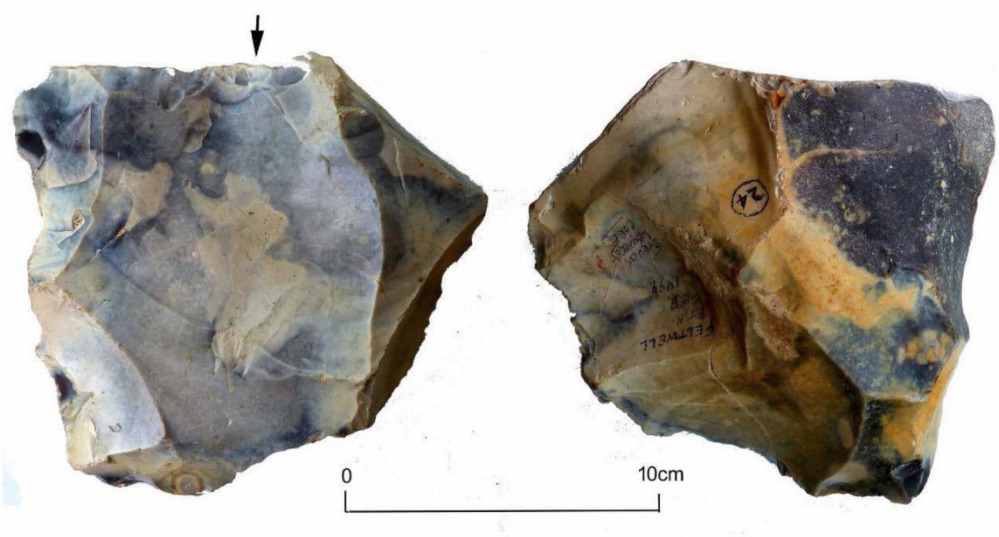

Figure 11. A possible proto-Levallois struck core from Feltwell. Although the identification of this artefact is not confident, and its provenance to lithological unit is not secure, it is recorded here for future research.

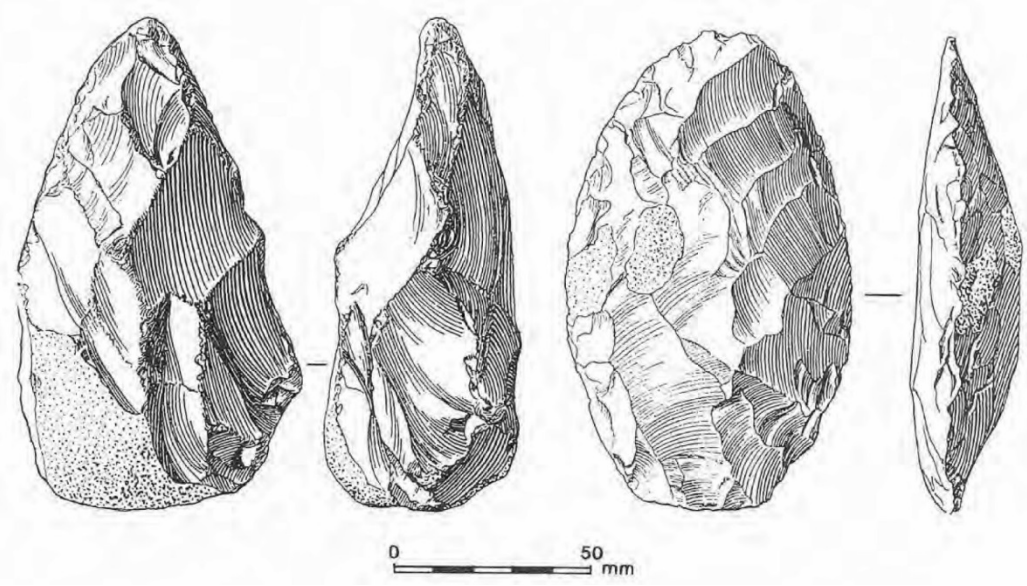

Figure 12. Handaxes from Warren Hill: crude style pointed (left), refined ovate style (right). Courtesy John Wymer.

derived from the sands and gravels and the present land surface (Hardaker 2012). This succession is described in Bridgland et al. (1995) who attribute the sands to the Ingham Sands and Gravels which is the regional name for the Bytham River deposits, and Gibbard et al. (2009) who interpret them as of glaciofluvial origin, although without any evidence for glacially sourced material. A detailed description of the sediments and discussion of their implications is are in preparation (Rose et al. in prep.).

A full account of the surface artefacts was published by Hardaker (2012). The two handaxe styles are shown in Figure 11. Solomon (1933) argued that the cruder handaxes were of earlier date, although subsequent finds include examples which seem to be half-way between the two styles. Artefacts found at the surface cannot be attributed to any stratigraphic position.

The fieldwalking programme undertaken from 1998 until 2012 revealed that handaxes or handaxe roughouts comprised 2.8% of the artefact assemblage at Warren Hill (Figure 12), while 92.5% of the artefacts are flake-based (Table 1, Figures 13 & 14). The 19th- and early 20th-century collectors paid money for handaxes, but were not interested in flakes; and photographs from the British Museum, kindly provided by Nick Ashton, show quarrymen sieving for handaxes as a commercial product, thus revealing a process that would provide a biased perception of the frequency of handaxes, relative to flakes and other debitage. This factor was underlined through the discovery during the 2002 excavation of an old 'cache' of discarded non-handaxe artefacts that had been dumped along with datable scrap such as a Swan ink bottle with a metal screw cap datable to the 1920s.

One feature of the Warren Hill artefacts that contrasts sharply with the Waverley Wood and Feltwell assemblages is the lack of winnowing of small artefacts reflecting the absence of reject-heap searches. The majority of flakes have a long dimension between 10 and 50 mm and vary from sharp to rolled (Figure 12). The slight typological clustering of tools from the surface collection (Hardaker 2012) suggests that Warren Hill excavation sites are close to an original living site with degrees of abrasion reflecting the transport path from the point

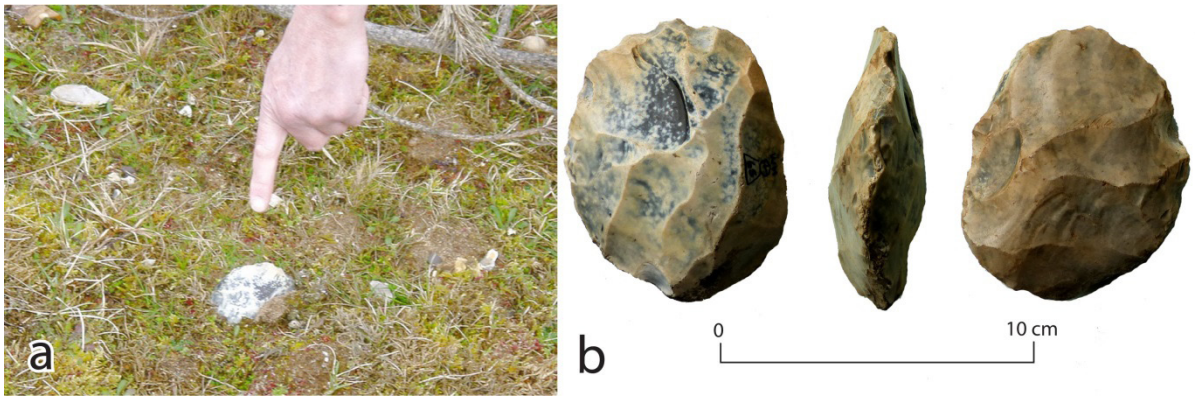

Figure 13. A surface-find handaxe from Warren Hill. a) The find at the surface before removal. b) The find in suitable photographic position. Note that this is typical of many of the small find handaxes found at Warren Hill..

Figure 14. Flakes from Warren Hill showing sharp and rolled examples and different patinations.

of origin to the final point of deposition.

In summary, the artefacts from Warren Hill are dominated by flint, which is available on the hillsides adjacent to the site and within the Bytham River deposits, but still retains a presence of quartzite (0.07%) which is present as clasts in the river gravels. The long-held belief that the artefact assemblage is dominated by handaxes (over 2000 recorded: Roe 1968) is not verified by the fieldwalking search-process, but the fresh condition of a high proportion of the tools suggests that provenance is local, probably from the adjacent valley bottom and sides.

DISCUSSION

Examination of the types and composition of artefacts from Waverley Wood, Feltwell and Warren Hill along the catchment of the

Bytham River provide a clear statement of the importance of source material for artefact production (Tables 1 & 2). Local material dominates: quartzite in the west and flint in the east. However, the large sample sizes reveal that other materials are also used, whether it is the highly workable andesite at Waverley Wood or the more difficult quartzites at Feltwell and Warren Hill.

The existence of the andesite handaxes at Waverley Wood introduces a challenge for our understanding of either human activity in terms of the transport of manufactured implements, or Quaternary glaciation in terms of dating the first glaciation of west-midland England. The source of the andesite is attributed by Shotton and Wymer (1989) to the Borrowdale Volcanic Group of the Lake District on the basis of petrographic analysis, although local clasts of glacial erratic andesite (occasionally seen on the pit floor, but with a different colour, appearance and source) were also used. Archaeological experience of artefact provenance suggests that it is improbable that the manufactured artefact would be transported some 250 km from the Lake District to the Waverley Wood locality and that its presence is the consequence of a lucky chance find of an ideal, thin slab of glacially transported, easily-worked andesite that enabled the maker to produce such a fine handaxe. The quality, size and symmetry of the Borrowdale Volcanic andesite handaxe (Figure 3) reinforces the premise that prior to MIS 12, humans in Britain were capable of making finely crafted tools, and thus quality alone is not a very good guide to age.

Within the geological and environmental context (Keen et al. 2006) an alternative explanation for the find at Waverley Wood is that the handaxe was transported to west-midland England from the region of the Lake District by those who manufactured and used the implement. This is not unrealistic as that over the period concerned, the climate of midland England was at times Mediterranean in style (Candy et al. 2010) and the duration of such climates extended over many hundreds of years. Furthermore the distance involved is small compared to that from which the human group had travelled to reach England. Also, there are no other fragments of Borrowdale Volcanic andesite found at Waverley Wood, and an artefact of such quality, relative to those composed of the indigenous quartzite, could have made retention of the implement especially worthwhile. The absence of similar artefacts from further north and closer to the source area is readily explained by glacial erosion of that region during the numerous glaciations that have eroded and changed the landscape of northern England since MIS 13.

Be that as it may, rather than thinking this must have been the work of a separate human group, it simply tells of the latent capability to make fine stone tools that in 99% of cases remained unfulfilled because of the constraints caused by the raw materials available.

A further point about composition of the artefacts is the fact that despite the proximity to flint bedrock, occupants chose to use quartzite for toolmaking. This may suggest that there is a particular quality about quartzite that was not present in flint, possibly a robustness that was useful for heavy duty work.

Examination of the samples used in this study also shows the importance of the resources available for collection. For instance, the involvement of local collectors or commercial sieving for financial reward leads to an artificial concentration on handaxes relative to all other tools. Likewise searches based on reject heaps lead to a preference towards material greater than a

given size. Cultural perception also plays a part and the lack of attention given to the quartzite tools prior to the work of MacRae and Moloney (1988) also leads to a bias in the record from a locality. Likewise, the importance of surface collection (Hardaker 2012), depending upon the transfer of clasts/artefacts to the land surface by soil and geomorphological processes provides a relatively unbiased concentration of potentially suitable host material.

The relative abundance of artefacts along the course of the Bytham River demonstrates the importance of this major river system for early human activity, and although none of the material can be defined as in situ with respect to the point of manufacture, the relative abundance of un-abraded material, from a variety of lithologies indicates that transport distances are small or very small and those responsible for manufacturing the implements were present in the vicinity, reinforcing the findings from the floodplain site at High Lodge, only 1 km to the north of Warren Hill, where in situ manufacture did take place (Ashton et al. 1992). This abundance of artefacts leads to the proposition that the Bytham River system was a preferential habitat for early humans, and this would be supported by the fauna recorded at other sites such as High Lodge (Ashton et al. 1992) and Waverley Wood (Shotton et al. 1993). However, care must be taken with such an assumption, as storage and preservation is preferential in sediments deposited along the main course of a river catchment relative to sediment-free headwater valleys, adjacent hillside slopes and plateaux.

What the artefacts do show is that human occupation occurred prior to the Anglian glaciation. The artefacts probably give us the best cross-section we have of artefact manufacture in MIS 13 or earlier through a substantial slice of middle England. They go a long way to proving that even at this early time humans were present outside the southeastern flint zone where so much of our Lower Palaeolithic story has previously been played out. They suggest that although flint was by far the favourite raw material of early humans, absence of flint was not a barrier to artefact manufacture. Whatever was available was used, whether the easily-worked but rare andesites from Waverley Wood or the more ubiquitous Bunter quartzite cobbles found along the whole stretch of the Bytham River course. That message is echoed worldwide in the Lower Palaeolithic: lack of suitable raw material seldom prevented humans from making tools wherever they were, in Africa, the Middle East, Asia or Europe.

The Bytham River assemblages, together with the sterling work performed by Ron Waite in the midlands (Graf 2004 & 2011), are strong pointers to the need for more attention to be given to discovering the extent of early human occupation in middle England (Howard et al. 2007). How far north did they go? When were they first there? Isolated sites like the Neanderthal Pontnewydd cave in north Wales (Aldhouse-Green et al. 2012), the Lincolnshire Wolds (Hardaker 2017) or Bramcote Hill in Leicestershire hint that more awaits discovery, as demonstrated by the recent archival study of north-midland England (Bridgland et al. 2014).

CONCLUSIONS

- A quantitative assessment of archaeological finds is provided from three sites located along the pre-MIS 12 Bytham River of midland and eastern England.
- The types of artefacts that constitute these finds reflect the search processes adopted: the use of reject-heaps, selection of aesthetically attractive objects, fieldwalking and the record of surface finds.

- The influence of financial gain by the sale of handaxes, or the lack of awareness of a given type of tool, such as a quartzite chopper has also influenced the composition of records.
- The discovery of a fine implement made of Lake District andesite introduces a disciplinary debate with conflicting models requiring either glacial transport of source rock to the findspot (and hence manufacture) site, or human transport of artefact from the source-rock locality (and hence manufacture) to the find site.
- The quantitative study verifies the fact that local rock provides the dominant source of material for the production of artefacts at each locality.
- A conundrum is highlighted by the fact that the ready availability of suitable material (flint) does not preclude the use of apparently less-suitable material (quartzite) when this is also available, maintaining the challenge of what factors determine material selection.
- The Bytham River catchment was a suitable environment for the pre-MIS 12 inhabitants of midland England.

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