

Lithic analysis from Bevere, Worcestershire (WSM 38559)

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Introduction

An archaeological prospection carried out in 1982, consisting of a random field walking surface collection, recovered 31 knapped stones and 1 hammer stone from Bevere, Worcestershire (NGR: SO 8410 5960). Although the assemblage contains no diagnostic dateable artefacts, a substantial number of the analysed lithics exhibit manufacture characteristics associated with Mesolithic stone tools typology. It is assumed that the lithic scatters represent a portion of some prehistoric activities, but whether multiple occupations occurred is not recognised.

Aims

This study attempts to establish the *chaîne opératoire* (operational sequences), concept first formulated by Leroi-Gourhan (1943). This approach examines the different stages of lithic exploitation. The sequences begin with the acquisition of raw material, followed by the reduction of nodules and cores, the removal of blanks from cores and the manufacture and use of tools and finally, the discard of the artefacts (Bar-Yosef *et al.* 1992). An addition to these sequences is the post-depositional disturbance of the site and even excavation strategy, as these will have an effect on our understanding of the *chaîne opératoire*. The lithic analysis hopes to characterise the type of site, and to determine the lithic techno-complexes, functionality and chronology.

Method

The worked stones recovered during field walking were classified individually. A range of attributes was recorded following standard systems (e.g. Inizan, Roche and Tixier 1992) to explore knapping technology. These relate to the characteristics of technological category, tool type, portion, reduction sequence, raw material, colour, condition and type of butt. Dimensions were measured in millimetre, and were divided into L (length): the distance between the proximal and distal ends; W (width): the maximum distance between the two sides of the artefact measured perpendicular to the length; and T (thickness): the maximum thickness of the artefact perpendicular to the length. The comments category was used to record various attributes such as thermal alteration, post-depositional breakage, retouch, wear, scar direction, type of bulb, and blank termination failures i.e. non-feather termination.

Raw material

The site of Bevere lies on the third (main) terrace of the Severn valley (British Geological Survey), which contains a variety of river gravels. This includes quartzite, hard sandstone, chert, grit, porphyrite and keratophytic tuff (Mitchell, Pocock and Taylor 1962: 113-115). Coarse gravels with abundant fragments of Eskdale and other northern granites are also present (*ibid.*).

Virtually all of the worked stone recovered from the site is flint. The only exceptions to this pattern are one flake and one whole bladelet of white fine grained chert; and one granite (pegmatite) hammer stone. The majority of the worked flint has a translucent mottled grey appearance, whose provenance may come from the chalk lands of Lincolnshire (Barfield 2002: 3; Pierpoint 1981) and/or the Yorkshire Wolds (Pierpoint 1981). There are also some black pieces, which are generally located within the chalk lands of South and Southeast England; and a variety of brown flints, which may originate from the glacial British East Coast erratic (*ibid.*). The granite hammer stone is very different from the neighbouring igneous outcrops, such as the Malvern; but, as mentioned above, it is found within the valley deposits. The source of chert commonly derives from the Pennine limestone (Williams, Richardson and Richardson 1987: 366), but also in southern areas such as Portland limestone (Palmer 1999: 53-54). However, the pebble content of the gravels within the valley's third and second drift deposits includes chert amongst other type of rocks (Mitchell, Pocock and Taylor 1962: 113-115), and thus it may have been obtained within the vicinity.

Provenancing lithic artefacts' raw material can recognise movement of the stone themselves. However it is not suggested here that the people, who occupied the site concerned, would have necessarily extracted the natural stones from their source of origin. Indeed, available drift deposits may provide the required nodular pieces, and curation of the lithic may have occurred through time. Dorsal coverage of cortex is found amongst twelve pieces, which relates mainly to secondary reduction sequence. Cortex type varies from thick (3 mm) to very thin; and from light orange/brown to white, but none of them constitute a pattern in this assemblage.

Debitage

The lithic assemblage is very limited, consisting of 31 worked stones whose total weight is *c.* 120 gr. and a granite hammer stone whose weight is *c.* 300 gr. and measures 600 mm in diameter, and has one battered surface. The worked lithics are divided into 3 bladelets (with a mean of 9.6 mm wide), 3 blades (with a mean of 15.6 mm wide), 21 flakes and 4 chunks (Appendix 1). Amongst the flakes, there are 6 pieces which show that a laminar knapping

technique was employed, which created straight edges and parallel ridges. These pieces may have been blades instead, but after breakage they became 'flakes'. Indeed, a blade is generally regarded to be an artefact whose length is twice its width, whereas a flake has a lesser length to width ratio. These possible blades vary in width from 12 to 14 mm (apart from one which may have been a long blade and is 32 mm wide), which makes them comparable to bladelets. Certainly, a bladelet is essentially a small blade whose maximum width is of 12 mm (Owen 1982: 2). In the assemblage there are also 9 flint gravels, which do not exhibit clear pattern of manufacture nor use. The total weight of this flint gravel is of c. 70 gr.

At least two tools have been identified in the assemblage. Artefact no. 5 is a flint distal end of a bladelet point with a medial right direct fine retouch. This retouch may have modified the blank in order to facilitate its hafting into an organic shaft (Figure 1). This specimen may have been used as a projectile point as there are traces of impact against a hard surface. Artefact no. 17 is a borer on a flake with two perforating points. The points were shaped employing thin bifacial retouch along converging edges, and both appear to have been heavily utilised (Figure 1). There is another possible projectile point, artefact no. 2, which is a distal end of a flint blade with partial direct left edge wear, and also seems to have marks of impact on the tip (Figure 1).

A total of eight retouched artefacts have also been identified. This classification corresponds to the debitage, which shows signs of having been deliberately retouched by percussion or pressure flaking along one or more edges or part of edges. Amongst them, there are 3 abrupt, 2 fine, 1 sub-parallel, 1 bifacial and 1 scraper retouch type.

It is estimated that most of the artefacts have been discarded after breakage. Indeed, there are only 8 intact pieces (7 flakes, 1 bladelet), and the rest of the assemblage consists of 4 distal ends, 6 proximal ends and 13 medial fragments. Although post-depositional disturbance, such as plough damage, is evident in a number of artefacts, preliminary inspection of the assemblage suggests that a third of the debitage have been utilised or damaged by utilisation. This utilisation is indicated by a series of small irregular spalls, which have flecked off the edges of the flakes/blades. Although the majority of the assemblage is in fairly fresh condition, with practically no ridge damage, some of the edge wear could have been the result of accidents, e.g. a flake being stood on. However, the wear produced by the utilisation of an artefact's edge is more consistent than the completely irregular unsystematic removal of a number of spalls resulting from an accident.

Knapping technology

The blades and bladelets (artefact nos. 1, 2, 4, 5, 6, & 7) were removed by indirect percussion. This method involves striking a punch-like object, often made of antler or wood, with a hammer. This technique requires a carefully prepared core with an even platform and regular ridges (Whittaker 1994: 33). The indirect percussion is also perceivable from the type of butts that the blades/bladelets have. The butts are mainly faceted, which indicates that the core platforms were prepared to prevent the punch from slipping. This core preparation is also exhibited within the butts of 6 laminar flakes. Alternatively they may have been struck with a pressure flaking crutch, which also necessitates such meticulous arrangements. Deliberate retouch was probably done by direct percussion, although some implements were surely shaped by using pressure flaking. Soft hammer seems to have been largely employed; as lipped butts, vague point of percussion and diffuse bulbs predominate amongst the debitage. Hard hammers were also used and this is apparent from the granite hammer stone included in the assemblage. Unfortunately the total absence of cores does not allow us to further understand the striking techniques employed. However, there are four pieces with opposed scar orientation which suggests that accidents of debitage, like hinge fracture, may have been corrected from an opposed platform core which was created later in the knapping sequence.

Discussion

Judging by the moderately fresh, unrolled appearance of the majority of the assemblage, it is estimated that the lithic artefacts have not moved very far horizontally from its original position. This suggests that some form of occupation occurred in the area concerned. Although the overall frequency of tools, retouched flakes/blades, and utilised blanks is low, the assemblage contains a little amount of evidence for industrial activities. The presence of 1 or 2 points indicates that hunting may have taken place there. The borer and the rest of the debitage suggest that some domestic crafts, such as piercing, cutting, and the repairing/re-sharpening of artefacts may have happened. The absence of burins, scrapers, denticulates, notches, etc., implies little diversity of activities. In addition to this, the debitage does not show signs of having been extensively utilised. The artefacts might have been employed in few occasions for the execution of one particular task. Furthermore, due to the virtual lack of flakes/blades from primary reduction sequence and cores, it is believed that the roughing-out and most of the knapping of the artefacts took place elsewhere.

The information discussed above may indicate that the site was sporadically visited by small group of people in the Mesolithic period. Some of the activities employed may be connected with hunting. Although Mesolithic short-term hunting camps were often situated on higher grounds and base camps generally in river valley locations (Barton 1992), this lithic

assemblage does not represent *a priori* the waste of neither type of sites. The interpretation of such a limited collection is indeed difficult, but the date of at least most of the artefacts is likely to be of the Mesolithic period. Although no typically Mesolithic tools, such as microliths, have been found, some of the artefacts falls in the leptolithic category representative of the later Upper Palaeolithic industries of the continent (Magdalenian and Azilian), and the Mesolithic techno-complexes in general. Furthermore, the presence of chert amongst the artefacts is often associated with the Mesolithic, and allows us to differentiate the Mesolithic from later lithic industries (Barfield 2002: 3).

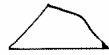
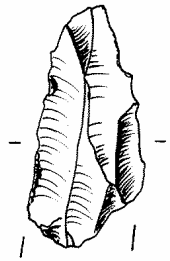
Although it is assumed that this assemblage only constitutes a small fraction of the tools and debitage used and discarded by prehistoric people in Bevere, and therefore hinders our knowledge, it enables us to integrate the data within a broader archaeological framework, enhancing the poor lithic record of the county; and it may encourage professionals and amateurs to conduct further research and fieldwork. Indeed, however detailed our descriptions may be, they contribute little to our understanding of how societies in the past were reproduced under particular conditions, so long as they are studied in isolation.

Conclusion

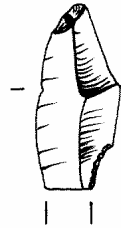
This study has attempted to characterise the site of Bevere based on a limited lithic assemblage recovered from its surface. A standard analytical approach has been employed and it has been established that some stone artefacts may have been utilised for hunting in the Mesolithic period. Projectile points and a borer (used for piercing) show indications of having been used. Some retouched pieces may have been utilised to carry out further tasks. Even unretouched blanks were also of considerable value as they have distinctive use wear patterns. Some knapping, such as retouching and re-sharpening was also conducted on site, but only a small amount of activities have been recognised; and moreover the roughing-out of the artefacts may have been undertaken elsewhere. The artefacts were manufactured employing skilful techniques, such as indirect percussion, and prismatic cores were used to obtain small blades. Despite the limited information available, this analysis successfully identified manufacture and utilisation of Mesolithic stone tools techno-complex.

Bibliography

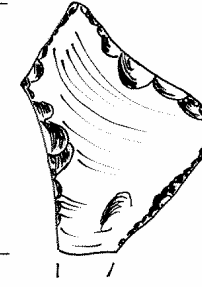
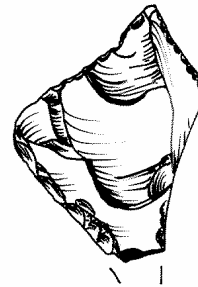
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No. 2



No. 5



No. 17



5 cm

Figure 1. Lithic artefacts from Bevere (drawn by the author).

Appendix 1. Lithic record of Bevere (NGR: SO 8410 5960).

No.	Tech. Category	Tool type	Portion	Reduction sequence	Raw material	Colour	State	Butt	L	W	T	Comments
1	Bladelet		Whole	Tertiary	Chert	Pale greyish white	Moderate	Punctiform	26	9	4	
2	Blade		Distal	Tertiary	Flint	Mottled grey	Good		30	14	5	Partial direct edge wear.
3	Flake		Distal	Secondary	Flint	Black	Good		25	18	12	Pronounced bulb & ripples, inverse right edge wear.
4	Blade		Proximal	Tertiary	Flint	Mottled grey	Moderate	Facetted	33	16	3	Direct proximal left abrupt retouch & medial edge wear. Nearly whole piece
5	Bladelet	Point	Distal	Tertiary	Flint	Pale grey	Moderate		23	10	3	Opposite scars & medial right direct fine retouch.
6	Bladelet		Proximal	Tertiary	Flint	Mid brown	Good	Facetted	21	10	2.5	Direct proximal left sub-parallel retouch & ventral lip.
7	Blade		Medial	Secondary	Flint	Dark mottled grey	Patinated		37	17	9	Inverse single edge wear.
8	Flake/ chunk		Medial	Secondary	Flint	Dark mottled grey	Moderate		35	20	9	Severe plough damage.
9	Flake/ blade		Medial	Secondary	Flint	Light brown	Good		21	12	2.5	Pronounced ripples & laminar technique.
10	Flake/ blade		Proximal	Tertiary	Flint	Mid mottled grey	Moderate	Facetted	20	14	4	Opposite scars, direct left marginal abrupt retouch & laminar technique.
11	Flake/ blade		Proximal	Tertiary	Flint	Mid mottled grey	Good	Dihedral	21	13	4	Inverse right medial edge wear.
12	Flake		Medial	Tertiary	Flint	Greyish white	Patinated		20	14	3	
13	Flake		Proximal	Tertiary	Flint	Greyish black	Good	Flat	16	14	3	Laminar, small bulbar scar & partial edges wear.
14	Flake		Proximal	Secondary	Flint	Mottled white	Moderate	Cortical	15	11	4	
15	Flake		Medial	Secondary	Flint	Mid greyish brown	Moderate		15	14	3	Laminar & opposite orientation scars.

Appendix 1 (cont.)

No.	Tech. Category	Tool type	Portion	Reduction sequence	Raw material	Colour	State	Butt	L	W	T	Comments
16	Flake		Medial	Secondary	Flint	Mottled grey, light orange cortex	Slightly abraded		24	17	2.5	Fresh break (plough?).
17	Flake	Borer	Medial	Tertiary	Flint	Brownish grey	Good		32	23	5	Fresh break, thin bifacial retouch along the edges, wear broken edge.
18	Flake		Whole	Tertiary	Chert	White	Moderate	Flat	19	22	5	Direct proximal thin retouch, semi-pronounced bulb & fresh break.
19	Flake		Whole	Primary	Flint	Mid greyish brown	Good	Facetted	27	31	8	Partial edge wear.
20	Chunk		Medial	Tertiary	Flint	Black	Good		25	18	9	Multiple fresh fractures (plough?).
21	Chunk		Medial	Tertiary	Flint	Mid brownish grey	Patinated		28	24	11	Multiple fresh fractures (plough?).
22	Flake		Medial	Secondary	Flint	Black, thick orange brown cortex	Good		31	32	11	Laminar technique, opposite scars, possible long blade (plough damage).
23	Flake /chunk		Medial	Tertiary	Flint	Dark brownish grey	Patinated		20	21	7	Thin bifacial retouch on one side & edge wear, severely damaged.
24	Chunk		Medial	Tertiary	Flint	Mottled grey	Good		17	14	9	Multi-directional scars.
25	Chunk		Medial	Tertiary	Flint	Mottled grey	Patinated		31	22	11	Edge wear.
26	Flake		Whole	Secondary	Flint	Black	Good	Flat	18	15	3	Medium bulb, lip.
27	Flake /chunk		Whole	Tertiary	Flint	Dark mottled grey	Good	Dihedral	30	17	9	Plough damage.
28	Flake		Whole	Tertiary	Flint	Light brown	Good	Flat	22	14	5	Laminar, lip, naturally backed, partial direct edge wear.
29	Flake /chunk		Whole	Secondary	Flint	Black, thin orange brown cortex	Good	Flat	26	31	7	Severe inverse edge wear, multi-directional scars, plunge terminal.
30	Flake		Distal	Secondary	Flint	Mottled grey, thin light brown cortex	Moderate		17	31	7	Multi-directional scars, direct distal abrupt retouch.
31	Flake		Whole	Tertiary	Flint	Mid brown	Good	Facetted	23	21	6	Opposite scars, bulbar scar.

