

## APPENDIX II

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Report on artefacts submitted for analysis from Welton-le-Wold, Lincolnshire.

### Introduction.

Three bifaces and a flake were submitted for analysis. Such a small sample can not be considered as an assemblage, nor can it be considered as a representative sample of one, since the size of the original assemblage is not known. Consequently it is only possible to treat any observations made on these artefacts as 'isolated moments' in the broader continuum of both tool behaviour, and the pieces' depositional life history. Readers are cautioned against making too much of these data. A summary of the details of each artefact are presented in table 1. The reader should be familiar with the table before continuing.

### Circumstances of discovery and the total artefact count.

The quarry in which the Welton-le-Wold artefacts were discovered has a long history of investigation going back to the 1880s (Alabaster and Straw, 1976; Wymer, 1996). But Palaeolithic artefacts and Pleistocene mammalian remains were only discovered there between 1969 and 1973 (Alabaster and Straw, 1976), and as these authors ruefully admit, it was not possible to study the site in a regular and systematic way. The fauna and artefacts were described briefly in a short appendix to Alabaster and Straw's paper written by P.J. Boylan. All the fauna was recovered *in-situ* from the sections, but only two of the artefacts were (*ibid*, 79-80). These were both bifaces and were labeled 'Handaxe A' and 'Handaxe B'. The first of these was not figured by Alabaster and Straw but is clearly Lincoln Museum designation 56.70 following the notation used here. This piece was illustrated by Wymer and Straw (Wymer and Straw, 1977) as their figure 1.1. The second biface, figured as B in Alabaster and Straw, is Lincoln Museum designation 39.76. This was illustrated by Wymer and Straw as their figure 1.2. The other two artefacts were recovered from a spoil tip adjacent to part of the long quarry section. There seems no reason to doubt that they came from the deposits described. 'Handaxe C' was illustrated by Wymer and Straw as their figure 1.3. It is here referred to as Lincoln Museum designation 40.76. It is with the next artefact that a certain amount of confusion has arisen and why these illustrations have been referred to here in detail. In his written appendix Boylan described this piece as 'Handaxe D'. He suggested, because of the nature of the flint, that typological identifications on the bifaces were difficult. In fact this is not a biface, it is a medium sized flake with a small amount of retouch-like working on one portion of the edge. A large accidental flake scar from a platform break (see below) may have contributed to the piece being identified as a biface; to a non-technologist it could resemble a big thinning scar. This piece is Lincoln Museum designation 41.76, and is correctly identified by Wymer and Straw who do not illustrate it. Somewhere along the way it has become part of the literature that there are four bifaces and a flake from the site. However the truth is there are only three bifaces and one flake.

### Condition, surface appearance, raw material.

Staining is here taken to be a particular form of discoloration of the surface of a flint artefact. The flint acquires a hue that varies from pale yellow/brown to a deep reddish or mahogany colour. It is generally assumed to be a reaction by the surface of the flint to ferrous oxides dissolved in ground water, but other substances such as manganese can also induce staining (Wymer, 1968). All four artefacts are stained, showing various degrees of intensity and colour differentiation. Staining may also have affected the artefacts differently depending on what kind of flint they are made out of. The two coarse grained flint bifaces (39.76 and 40.76) appear to have acquired a similar staining with 39.76 showing a darker orange colour presumably reflecting a longer exposure to the staining agent. The staining on these two is quite different to that on the two fine grained artefacts which also show differential exposure. The biface 56.70, is more deeply stained—a darker reddish orange; the flake 41.76 shows a much paler discoloration. There is some link between condition and staining too. 39.76, the more deeply stained of the bifaces made from granular flint, has the arêtes between its flake scars visibly more worn (i.e. rounded) than 40.76. Also, were more recent differentially patinated damage scars are not present on the biface's edge, the edges of 39.76 are more rounded suggesting a greater degree of rolling/transport abrasion. Similarly, 56.70 the more stained of the pieces made on fine grained flint, also has its arêtes more rounded than the flake 41.76.

The biface 56.70 is the only one of the four artefacts to show any evidence of patination on its surface. Patination is here taken to be the presence of another form of surface modification, in this case it appears as a discoloration that ultimately can turn a whole flint artefact white. In its earliest phases it is a blueish, or

milky discoloration. It is associated with alkaline sediments (Wymer, 1968). Already stained artefacts can become patinated as the latter process overprints the staining, or the reverse may happen. In the case of 56.70 the patination visibly overprints the staining which is still visible as a dark stain beneath. I have seen flints which have been recovered from dry sandy soils or coversands, and which are fresh gray or black in colour patinate within a few minutes of exposure to sunlight or to the air, or both. The presence of the early stages of patination on 56.70 may possibly suggest a period of exposure after the initial burial of the piece in alkaline sediments.

A more detailed discussion on the evidence for rolling as a reflection of artefact transport is presented by Chambers in Appendix III of this report.

In summary it is possible that the more deeply stained of the four artefacts were exposed to the staining agent longer, possibly indicating a slightly earlier burial, and that the patination on one artefact may imply a period of re-exposure at the surface, but this is largely speculative. It is possible that flint type has affected the staining process but the sample is too small to be certain. In terms of overall condition there is nothing to preclude these artefacts being broadly contemporary.

### **Typology, technology, and blanks.**

Typology is here taken to be what was made, and technology how it was made. The flake, 41.76 is the easiest to deal with. This is a medium sized hard hammer side struck flake. A portion of its distal and left lateral edges (proximal down and dorsal toward you) are made up of natural scars identified by non-conchoidal ripple marks and a dull surface appearance, contrasting with the normally shinier surface appearance of stained or patinated percussion generated flake scars. That the dorsal face has natural scars indicates this flake came from the surface of a nodule and so was located quite early on in the knapping sequence of that part of the nodule/core it came from. One large proximal flake scar, and possibly the truncated scar to its left, represent shatter scars (type 1a platform break, see figure 1). The conchoidal ripple marks for the larger of the two scars originate from the point/cone of percussion on the ventral, indicating the missing fragment responsible for the scars actually removed the butt of the flake. This type of platform break is consistent with the spontaneous shatter that sometimes occurs during percussion. The right hand margin of the dorsal face has two percussion scars that can not be explained by shatter as they are too invasive and do not originate from the proximal end of the flake. These are remnants of genuine percussion scars. They are over printed at the edge by smaller and less invasive scars which originate from the edge itself (as do the two larger ones). At this same place on the edge, ventrally, is a localised patch of small scars resembling retouch. This must be what Wymer (Wymer and Straw, 1977) described as edge damage resulting from use. If so the damage is unlike the shallow invasive damage known as *mâchures* (Ashton, et al., 1992; Bordes, 1971) that results from chopping antler.

Typologically the bifaces represent a heterogeneous group of artefacts. The typological identifications are presented in table 1. A simple comparison of outline shape is presented in figure 2. Strictly speaking only the blank for 39.76 can be identified with any confidence. This was a flat and elongated clast of gray flint. A thickish band of cortex is present, medially, on both faces, and continuing unbroken around the edges. Wymer and Straw (1977) suggest the cobble may have been taken directly from the chalk. The other two bifaces have no cortex. One of them 56.70 may well have been made on a smallish flake. On one face a small scar near the tip shows the flat positive characteristics of a ventral face as opposed to the negative concave appearance of a flake scar. 40.76 may also have been made on a flake although no evidence of a relict ventral can be seen. The identification is based on the marked plano-convex profile seen in the long cross section.

Tips, sides and butts present some intriguing features. All three of the bifaces are elongated (i.e.  $W/L \leq 0.5$ ), but not markedly so (i.e.  $W/L \leq 0.25$ ), and so have relatively long edges. 40.76 and 56.70 have combinations of straight or sinuous edges when seen in profile, while 39.76, the most 'pointed' of the three has straight edges in profile above the cortex (where later damage does not obscure the character of the edge). In planform, table 1 and figure 2 indicate all three bifaces would have been symmetrical or nearly so. 56.70 and 40.76 have predominantly convex edges (the former only just). 39.76 had straight edges in planform above the cortex. All three have had their tips damaged, presumably by subsequent rolling or transport. The butts of the three bifaces are interesting as they are all worked. That of 39.76 raises an interesting general question concerning the working of biface butts. This is the most elongated of the three with thinning and shaping of the straight sides creating a markedly convergent tip/upper portion. As with most 'pointed' bifaces, the centre of balance is low down, located in the bottom third of the biface. This is the area where most of the cortex is located, i.e. the biface's margins in this lower third are mostly unworked. This part of the biface seems not to have been intended for use. So why then flake the butt itself, while

leaving most of the margins of the lower third unworked? Not all bifaces, no matter how carefully shaped and extensively worked were used solely for cutting purposes. A small number of them have clusters of incipient percussion cones in the middle of their flat faces indicating use in a task very different from that we normally associate bifaces with (Wymer, 1958). There appears no functional reason for flaking the butt on 39.76, it is not associated with a nest of percussion cones and there appears no evidence of battering on the butt itself. This may be a window on Middle Pleistocene psychology in regards to what counted for acceptable practice in hominin social technology in some population groups; although for the moment the glass in this particular window remains frosty and difficult to see through.

56.70 and 40.76 both show a similar pattern in terms of how their butts were worked. Tentatively I would suggest that this is a response to the idea expressed above, that both were made on flakes. In the case of 40.76 the working of the butt is almost all from the flat face (probably the ventral) onto the convex face (probably the dorsal). Consequently, the working is quite steep and accompanied by step fractures. The butt was finished off by turning the biface over and, in one corner of the butt, flaking back onto the planar surface. On biface 56.70 the opposite has been done. The butt is worked from the dorsal onto what is interpreted as the old ventral face of the flake. Again the working is steep but step fractures have not been produced this time. The working here is so intense it creates a flat to slightly indented base. With the working of the edges described below, 56.70 resembles an attempt to make a small *bout coupé*, and in outline shape it resembles this kind of biface more than anything else. In terms of their bases both 40.76 and 56.70 show a strong similarity in approach to working, but this is probably occasioned by the need to trim the base of a thick flake blank – so similarity in this case would not be cultural/typological, but an artifice of technological necessity.

There are some interesting details concerning the overall approach to knapping and biface working present on two of the bifaces. Details of the knapping strategies applied to 39.76 are obscured by the damage on the edges incurred during transport, as well as the later differentially patinated damage scars which have removed portions of the biface's edges and tip. However knapping patterns are discernable on the remaining two bifaces. One edge of 40.76 has a series of long invasive and sub-parallel thinning and shaping scars whose flakes were detached from that edge. They are on the convex face (dorsal), and suggest, though it is difficult to be certain, that all or most of this edge was thinned and shaped from the former planar (ventral) face. On the opposite edge it is not possible to identify the strategy of thinning and shaping that was applied. In addition both faces of 40.76 show evidence of trimming and regularisation. These are short, non-invasive scars, whose flakes were taken from the edge in order to finalise shape and regularise edge outline. They visibly cut into the larger and more invasive thinning and shaping flakes. (Caution should always be applied in distinguishing these from damage scars resulting from transport. In this case, these artefacts only show a very minimum degree of transport damage and so this explanation can be discounted from the interpretation of these particular scars.)

Although impossible to prove, I have the strongest subjective impression that 56.70 was a slightly larger biface that has been re-flaked perhaps during manufacture, or re-sharpened into the shape it has now. It is this re-working that has given it the fortuitous appearance of a small atypical *bout coupé*. On the left lateral edge (looking at it with the base down and the relict ventral face of the original flake blank facing you) there are a series of edge trimming and regularisation scars that bite deeply into a series of comparable but slightly longer flake scars previously taken from along the same edge. From the angle suggested by the plane of the older scars, the biface was originally wider than it is now, or at least there was more of this particular edge than is currently present. Given that the base has already been noted to have been intensively worked (also from the dorsal onto the ventral) I would like to suggest that the flaking on the base of the biface is also a product of re-sharpening or re-flaking. From the appearance of the thinning and shaping flake scars at the tip and on the old dorsal face, the current shape of the tip of the biface may also be a result of the re-flaking. If so, then the re-flaking may have proceeded something like this. Someone picked up an already smallish biface made on a flake (alternatively they were correcting a manufacturing fault). They re-shaped the base and one side. This was by inverse flaking – from the dorsal onto the ventral. As they worked up the side they flipped the biface over and reshaped the tip from the same side by direct flaking – from the ventral onto the dorsal. From the staining and patination evidence on 56.70 it is clear that both the fashioning of the biface to begin with, as well as the re-sharpening/re-working, if correctly interpreted, both occurred before the long term burial of the artefact during which time it became stained, and possibly patinated in a later episode of exposure. It is also worth noting that the arêtes on this re-worked ventral face appear slightly less worn and rounded than do the arêtes on the opposite face.

In summary these artefacts show quite a lot of diversity in a number of important technological features. Their shapes appear to be a reaction to a path of least resistance approach taken to flaking the blanks. There is clearly some attempt to 'tidy up' the shape on at least one biface. The rather curious shape of

another may be a result of trying to prolong its useful life. Other than this there is little else that can be said. The reaction to blank type demonstrated in the Welton-le-Wold bifaces is fully in line with ideas concerning the limitations that *sometimes* affect biface shape. (Ashton and McNabb, 1994; White, 1998)

#### **Age and chrono-stratigraphic interpretation.**

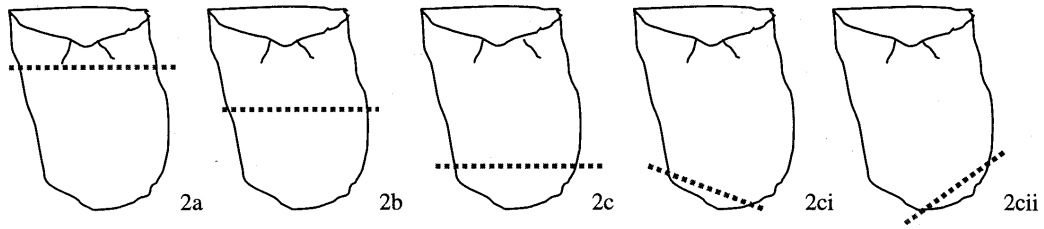
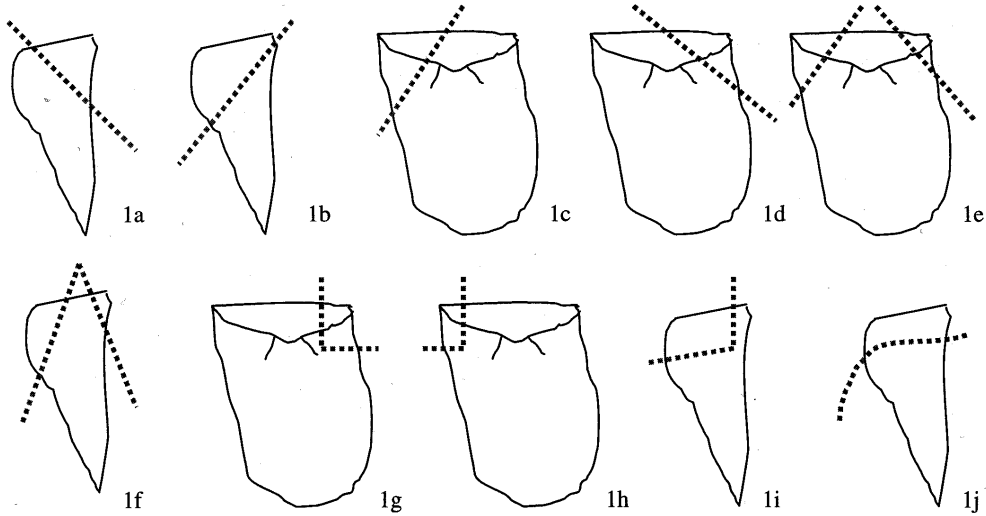
Wymer and Straw (1977) noted that the type of bifaces represented by the small Welton-le-Wold sample could have dated from the Hoxnian to the end of the Wolstonian as the Pleistocene stratigraphy of Britain was then understood. Bridgland (Bridgland, in prep) picks up this point but extends its lower limits further back in time. Ample evidence now exists for the occupation of Britain by hominins in pre-Anglian (MIS 12) times (McNabb, 2002). Disputing the identification of the Welton Till and Calcethorpe Till as being of a Saalian (MIS 10 – 6) equivalent age, Bridgland asserts that these two tills could easily be Anglian, making the cold climate gravels within which the artefacts and fauna were recovered pre-Anglian in age. This is an intriguing suggestion, and if ultimately proven to be true it renders the Welton-le-Wold artefacts the most northerly evidence of pre-Anglian occupation in Britain yet discovered. Additionally it would locate early occupation well away from the Bytham River Valley (Lewis, 1998) where much of the East Anglian and Midlands evidence for early occupation has so far been found. Like the valley of the Bytham, the valley occupied by the Welton Gravels in which the artefacts occurred was an east/west trending one, and it too was destroyed by subsequent glacial advance. Additionally the gravels contained an earlier temperate fauna reworked into later cold climate gravels. The Bytham also contains temperate sediments overlain by, in its latest phases, cold climate sediments (Collcutt, 1999). If Bridgland's suggestion is ultimately supported it could be argued that early occupation of eastern England was up the valleys of major eastward flowing rivers north of the pre-Anglian Thames, which is itself in pre-Anglian times strangely lacking in the evidence of human occupation (McNabb, 2002). But this remains speculative for the moment. For now it is merely important to reiterate Wymer and Straw's earlier caution about using the artefacts to date the deposits below the Welton Till, and to set them into the context of current research agendas. The age of the Welton-le-Wold artefacts must rest solely on the identification of the age of the Welton Till. This must be established by means other than archaeological evidence.

Description	Artefact No. 56.70	Artefact No. 40.76	Artefact No. 39.76	Artefact No. 41.76
Artefact type	Biface	Biface	Biface	Flake
Length in mm	84	99	119	Max L Axial L 99.5 81
Width in mm (Bordes 'm')	54	63.5	71	As rt. ang. to L 73 90
Thickness (Bordes 'e')	25	39	37	31 31
Width @ 0.5 L (Bordes 'n')	51	62	63	/
Dist. From max W to base (Bordes 'a' Roe 'L1)	29	40	50	/
Roe B1	37	45	47	/
Roe B2	51.5	57	60	/
Roe Th1	17	20	18.5	/
Flint type	Fine grained with inclusions	Grainy with cherty inclus.	Grainy	Fine grained with inclusions
Blank	Probably flake	Indeterminate (possibly flake)	Flat elongated cortical pebble	/
Sides in profile	One straight one sinuous	One sinuous one v. sinuous	One straight one too damaged	/
Sides in planform	Predominantly convex (tending to straight in lower third)	Predominantly convex	Probably straight but obscured by later damage scars.	/
Butt	Thinned from one face to make flat butt	Almost all worked from one face	All worked	/
Cross section in long profile	Lenticular irregular	Plano-convex	Lenticular irregular	/
Stained	Extensive, very dark reddish/orange	Dark yellow to pale orange	Reddish orange	Pale brown
Patinated	Gray and over prints staining. Patchy	No	No	No
Bordes (1961) type	Thick; ovate/sub-cordiform	Thick; sub-cordiform	Thick lanceolate	/
Roe (1968) morphology	'ovate' type (only just), top left quadrat	'ovate' type, top left quadrat	'ovate' type, top left quadrat	/
Wymer type	Small handaxe	Sub-cordate	Pointed	/
Illustrated	Wymer and Straw 1977 fig 1.1. Alabaster and Straw 1976 not figured	Wymer and Straw 1977 figure 1.3. Alabaster and Straw 1976 Handaxe C	Wymer and Straw 1977 figure 1.2. Alabaster and Straw 1976 Handaxe B	Wymer and Straw 1977 not figured. Alabaster and Straw 1976 Handaxe D
Condition	Slightly worn with some rounding of arêtes. Edges show nibbling and chattering but are still sharp in places. Arêtes on former ventral and on tip on opposite face appear slightly less rounded	Quite sharp, arêtes only slightly rounded. Edges show only minimal sporadic chipping and not much rounding. Tiny promontories on edges still present in places.	Worn-rolled. Arêtes are rounded off. Extensive differentially patinated chipping along edges and tip. Where edges are undamaged they show rounding and chattering with tiny promontories on the edges removed.	Sharp. Arêtes are not rounded off or worn. Edges show very minute nibbling – Wymer interprets most extensive patch of edge damage as use ware.

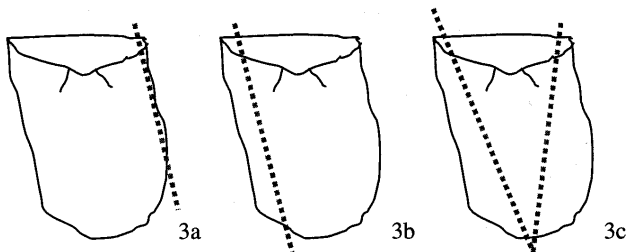
Table 1. Summary of details of artefacts from Welton-le-Wold, Lincolnshire.

## Percussion breaks on flakes

### 1. Platform breaks (1k other platform break)

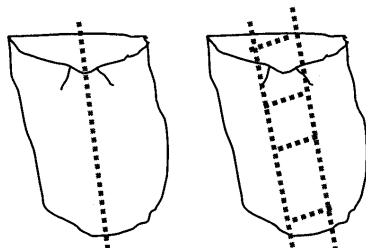


### 2. Flexion/body breaks (2d other body break)



### 3. Lateral breaks

(3d other lateral break)



### 4. Siret fractures

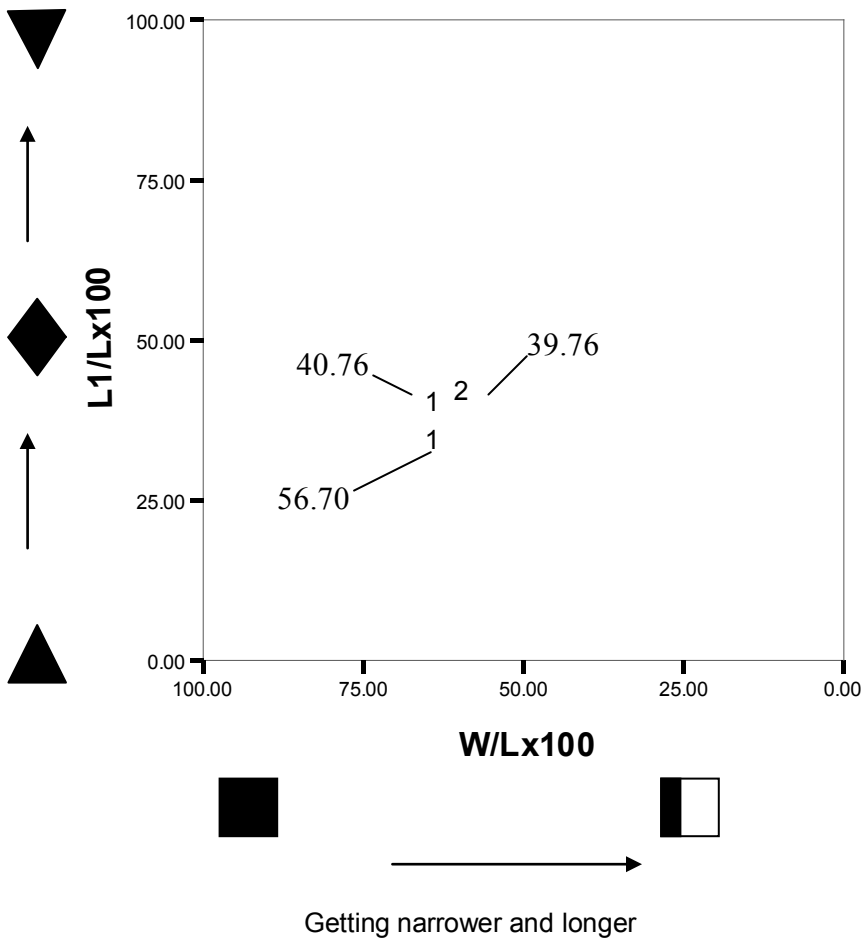
(4c other siret fracture)

### 5. Hinge

### 6. Plunge

### 7. Step fracture

Figure 1. Break patterns noted on flakes after McNabb 1992. In plan flakes are proximal uppermost and ventral towards you. In profile flakes are proximal uppermost and ventral to the left. NB. Hinges and plunges are not technically breaks – they are included for the sake of completeness.



**Key**

**Symmetrical or nearly so**

1. knapped edges are *predominantly convex*.
2. knapped edges are *predominantly straight*
3. knapped edges are *predominantly concave* (break of curve in lower third of biface)
- 4. knapped edges are concavo-convex (break of curve in middle third of biface)**
5. Both edges are irregular

**Clearly asymmetric**

6. knapped edges are *predominantly convex*.
7. knapped edges are *predominantly straight*
8. knapped edges are *predominantly concave* (break of curve in lower third of biface)
- 9. knapped edges are concavo-convex (break of curve in middle third of biface)**
- 10. Both edges are irregular**
11. Edges are a mixture of two of the above

Figure 2. A simple diagram to show relationship between position of maximum width (Roe's L1/L) and length to width ratio (Roe's W/L), and the shape of the knapped portions of a biface's edge. A subjective measure of symmetry (edge types 1-5) is also incorporated into the diagram. For a site with a large number of bifaces no artefact labels would be present.

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