







Research Article

Big enough to matter: on the frequency and chronology of giant handaxes in the British Lower Palaeolithic

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Hypertrophic ‘giant’ handaxes are a rare component of Acheulean assemblages, yet have been central to debates relating to the social, cognitive and cultural ‘meaning’ of these enigmatic tools. The authors examine giant handaxes from the perspective of the British record and suggest that they are chronologically patterned, with the great majority originating from contexts broadly associated with Marine Isotope Stage 9. Giant handaxes tend to have higher symmetry than non-giants, and extravagant forms, such as ficrons, are better represented; they may therefore be linked to incipient aesthetic sensibilities and, potentially, to changing cognition at the transition between the Lower and Middle Palaeolithic.

Keywords: Britain, Lower Palaeolithic, MIS 9 (~300 000 years ago), Acheulean handaxes, stone-tool morphology, symmetry

Introduction

The extreme paucity of hominin fossils and organic artefacts from the Lower Palaeolithic means that our understanding of early hominin culture, society and cognition is largely reconstructed from lithic technology, particularly handaxes. These bifacial tools first appeared in Africa around 1.76 million years ago (Mya) (Lepre *et al.* 2011), marking a departure, cognitively and physically, from the core and flake-based technology of the preceding Oldowan toolkit (Toth & Schick 2018; Wynn & Gowlett 2018). Precisely what purpose(s) handaxes served—for example, whether they had a novel practical function or were an

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innovation that made certain tasks easier—has been the subject of extensive study and debate (e.g. de Mortillet 1883; Isaac 1977; Keeley 1981). The existence of hypertrophic ‘giant’ handaxes is often singled out as something different; their sheer size and weight making them functionally dubious (although functional explanations cannot be entirely ruled out).

Handaxes have been posited as a means of mediating social position within hominin societies, possibly through display (e.g. Gamble 1999: 125–41; McNabb 2007: 354; see also papers in Gamble & Porr 2005). Consequently, giant specimens factor heavily in social interpretations that look to establish the broader meaning behind handaxes. ‘Oddities’ from the British record, such as the Furze Platt and Shrub Hill giants, were central to Kohn and Mithen’s (1999) provocative hypothesis that overlarge and symmetrical handaxes were used in Darwinian displays of male fitness. Spikins (2012) relates these qualities to expressions of patience and thus trustworthiness. White and Foulds (2018), meanwhile, approach high incidences of bilateral symmetry, often a feature of giant forms, from a different angle, using a neurological basis to suggest that hominins derived pleasure from producing a visually pleasing object. Similarly, Wynn and Berlant (2019) suggest that ‘overdetermined’ handaxes, such as giants, might provide insight into the incipient aesthetic sensibilities of the handaxe makers. Giant handaxes might thus be understood to result from a peak shift response; the exaggeration of already pleasurable attributes (in this case, size) in order to elicit a heightened emotional response.

High levels of symmetry have often been discussed alongside gigantism in handaxe research; however, while recent studies have paid overdue attention to diachronic trends in symmetry (e.g. Hodgson 2015; White & Foulds 2018; Hoggard *et al.* 2019), giants have largely been ignored. This article therefore seeks to address three key questions in our understanding of giant handaxes, while focusing on the British record:

1. What is the frequency of giant handaxes in Britain and can chronological patterning be detected?
2. What are the dominant morphologies of giant handaxes and is there a link between gigantism and high degrees of symmetry?
3. Can any patterns identified in Britain also be seen in European handaxe assemblages?

Materials and methods

The British Lower Palaeolithic record is well suited to answering questions of long-term non-directional trends in stone tool typology and technology. The Acheulean, of which handaxes are considered the *fossile directeur*, occurs in Britain from Marine Isotope Stage (MIS) 13 (~500 thousand years ago (kya)) at the latest, and as early as MIS 15 (~600kya) given the most recent dates from Fordwich and the Bytham River terraces (Davis *et al.* 2021; Lewis *et al.* 2021; Key *et al.* 2022). During the Middle Pleistocene (781–126kya), global climatic oscillations produced a predictable pattern of colonisation, settlement and abandonment, with waves of hominins populating the British landscape during the warmer interglacials and abandonment or local extinction characterising the cooler glacial periods (White &

Schreve 2000; Shipton & White 2020). These colonisation and localised extinction events have been associated with distinct, temporally constrained patterns within the British Acheulean record that may represent changes to culturally maintained handaxe morphology (Bridgland & White 2014, 2015; White & Bridgland 2017; White *et al.* 2018, 2019).

In order to explore the questions set out above, we obtained length data from a sample of 4160 handaxes from 47 Acheulean sites spanning MIS 15 to MIS 9. For the purposes of this article, we treat the numerical designation for each interglacial as shorthand for deposits covering the main warm peak and bracketed by the prolonged warming and cooling limbs evident in the marine isotope record (e.g. MIS 11 represents the MIS 12–11–10 cycle), with each cycle lasting roughly 100 000 years. Approximate dates for the warm phases of each stage relevant to this paper are as follows: MIS 15 ~610–560 kya; MIS 13 ~524–474 kya; MIS 11 ~427–364 kya; MIS 9 ~328–301 kya. While many of the sites selected are well-excavated and well-dated ‘flagship’ sites, others represent more mixed ‘dredger’ assemblages (e.g. Dunbridge; *sensu* Gamble 1996), are only tentatively dated (e.g. Whitlingham) or were subject to some degree of bias in collection and curation, not least for size (e.g. Furze Platt). These disadvantages cannot be ignored but are offset by the size of the dataset. A recent discovery of further giant handaxes in Britain since the acceptance of this article is acknowledged here (Ingrey *et al.* 2023). These may potentially be of MIS 9 date but further work is required to verify this.

Symmetry data were generated for a subset of 2988 of these artefacts using Hardaker and Dunn’s (2005) FlipTest (v0.9). This provides each artefact with an Index of Asymmetry score, with lower scores indicating greater planform symmetry, to a minimum of 1 (i.e. perfect symmetry). Index of Asymmetry scores can then be converted into six symmetry classes, ranging from Class 1 (near perfect symmetry) to Class 6 (very low symmetry) (see online supplementary material (OSM) section 2). A full rationale behind the sites selected for the dataset, their age attribution and the methods used in the analyses is available in the OSM section 1.

Results

Distribution and frequency of giant handaxes in Britain

Figure 1 displays length data for the 4160 handaxes within our sample. The mean length is 115mm (± 34 mm). The normal distribution indicates that a small group of handaxes fall outside of the bell curve above approximately 220mm (around three standard deviations above the mean). As no clear definition is currently available as to what constitutes a giant handaxe, we use these findings as the basis of a rubric to divide the handaxes in our dataset into four length categories: small (<80mm), average (80–150mm), large (150–220mm) and giant (>220mm) (Table 1; see OSM section 2 for further details).

Of the 42 handaxes classed as giants (Table 2), 33 can be confidently assigned to the MIS 10–9–8 climatic cycle, which marks the final expressions of the Acheulean in Britain. Of the remainder, five are from contexts that are presently undated but are potentially of MIS 9 date, a single example comes from an MIS 11 context, two from MIS 13 contexts and one is in a derived state within MIS 6 gravels and most probably originates from older deposits. This clearly demonstrates that while constituting only one per cent of the British Pleistocene

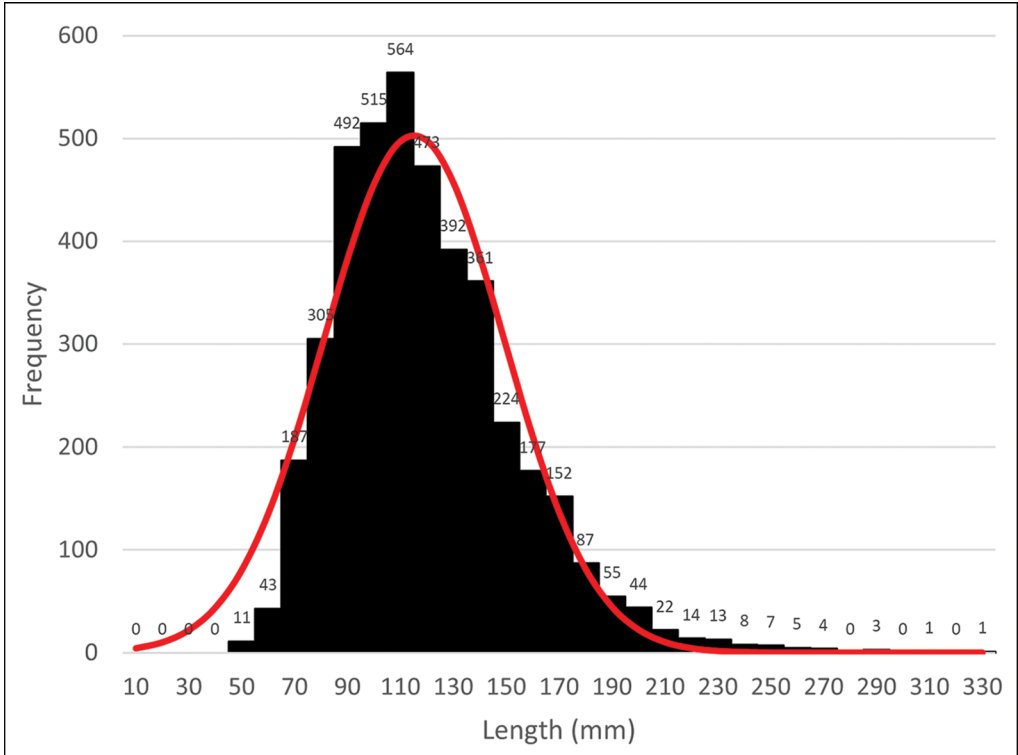


Figure 1. Histogram displaying the distribution of British Lower Palaeolithic handaxes according to length showing a normal distribution (red line). Each bin corresponds to 10mm increments (figure by Frederick Foulds).

archive, giant handaxes are most frequent in assemblages from MIS 9 contexts. This enhances the chronological patterning identified in Roe’s morphometric groups (Roe 1968; Bridgland & White 2014, 2015; White *et al.* 2018). Giant handaxes predominantly occur in Roe’s Group I (pointed, with cleavers) and Group III (plano-convex, i.e. Wolvercote), both associated with MIS 9. Giants also occur in the assemblage from Broom, on the Devon/Dorset border, in proportions comparable to other MIS 9 sites, although this assemblage defies

Table 1. Handaxes within the dataset grouped according to length class and divided according to MIS stage. *Note that the single giant handaxe associated with MIS 6 is the Stanton Harcourt giant, which is likely to be derived from older deposits.

MIS stage	Small	Average	Large	Giant	Total
MIS 6*	–	–	–	1	1
MIS 9	250	2102	418	38	2808
MIS 11	139	299	26	1	465
MIS 13	120	516	61	2	699
MIS 15	5	119	63	–	187
Total	514	3036	568	42	4160

Table 2. Giant handaxes (>220mm) in the British Lower Palaeolithic in order of increasing length (see Table S1 for dating references).

Site	Length (mm)	Type	Probable Age
Hillingdon L.B.	221	Point	MIS 9
Hillingdon L.B.	222	Cleaver	MIS 9
Canterbury West	223	Point	MIS 9
Hillingdon L.B.	223	Ovate	MIS 9
Thetford	224	Pointed/Ficron	MIS 9
Warsash	225	Pointed	MIS 9
Ruscombe	226	Ovate	MIS 9
Furze Platt	227	Pointed	MIS 9
Hillingdon LB	227	Pointed	MIS 9
Hillingdon LB	228	Pointed	MIS 9
Broom	229	Ovate	MIS 9
Cookham	230	Pointed	MIS 9
Furze Platt	230	Ficron	MIS 9
Cuxton	233	Ficron	MIS 9
Hillingdon L.B.	233	Pointed	MIS 9
Reculver	233	Pointed/Ficron	MIS 9
Romsey	235	Pointed	MIS 9
Broom	236	Pointed/Ficron	MIS 9
Furze Platt	237	Pointed/Ficron	MIS 9
Seven Kings	238	Ficron	MIS 9
Hillingdon L.B.	239	Ficron	MIS 9
Furze Platt	242	Ficron	MIS 9
Whitlingham	242	Pointed	?MIS 9
Wolvercote	244	Pointed/Sub-cordate	MIS 9
Keswick	245	Pointed/Sub-cordate	?MIS 9
Sturry	245	Ovate	?MIS 9
Warsash	248	Pointed	MIS 9
Cuxton	249	Pointed	MIS 9
Biddenham	253	Pointed	MIS 9
Warsash	253	Ficron	MIS 9
Cuxton	254	Pointed	MIS 9
Swanscombe	259	Pointed	MIS 11
Warren Hill	260	Ovate	MIS 13
Warsash	262	Ovate	MIS 9
Whitlingham	265	Ficron	?MIS 9
Sonning	266	Ficron	?MIS 9
Stanton Harcourt	269	Pointed/Ficron	MIS 6
Broom	282	Pointed	MIS 9
Canterbury West	285	Ficron	MIS 9
Shrub Hill	285	Point	MIS 13
Cuxton	307	Ficron	MIS 9
Furze Platt	323	Point	MIS 9

classification in terms of Roe’s groups. Most of the handaxes from this site are produced on Upper Greensand chert rather than flint and show a higher proportion of ovate and asymmetrical ‘lopsided’ handaxes compared to other MIS 9 assemblages (Hosfield & Green 2013).

Other than the giants, there is little visual difference in handaxe size between interglacials (Figures 2 & 3). Average size varies by only 10–20mm, although MIS 11 does have a higher percentage of small handaxes, while MIS 15 handaxes appear larger overall. A one-way analysis of variance (ANOVA) demonstrates that there is a statistically significant difference in handaxe length between the MIS stages ($F(2) = 92.37, p = <0.001$). Application of Tukey’s honestly significant difference (HSD) post-hoc analysis found statistically significant pairwise differences between all the MIS stages under analysis (see Table S3). This confirms that handaxes associated with MIS 15 are, on average, larger than those from the other MIS stages, as Figures 2 and 3 suggest, and that handaxes associated with MIS 11 are, on average, smaller (see OSM section 3). We note, however, that our MIS 15 sample is based on two sites, Brandon Fields and Fordwich, the latter of which evidences the use of naturally elongated pipe-flint that may have fostered the production of larger, minimally worked bifacial tools. We are thus hesitant to suggest the pattern seen in MIS 15 is real until an increased dataset for this period is available.

Additionally, the post-hoc analysis reveals that handaxes from MIS 13 and MIS 9 are, on average, larger than the intervening MIS 11, with handaxes from MIS 9 also being on average larger than those from MIS 13. The reason for this relationship between handaxe length and

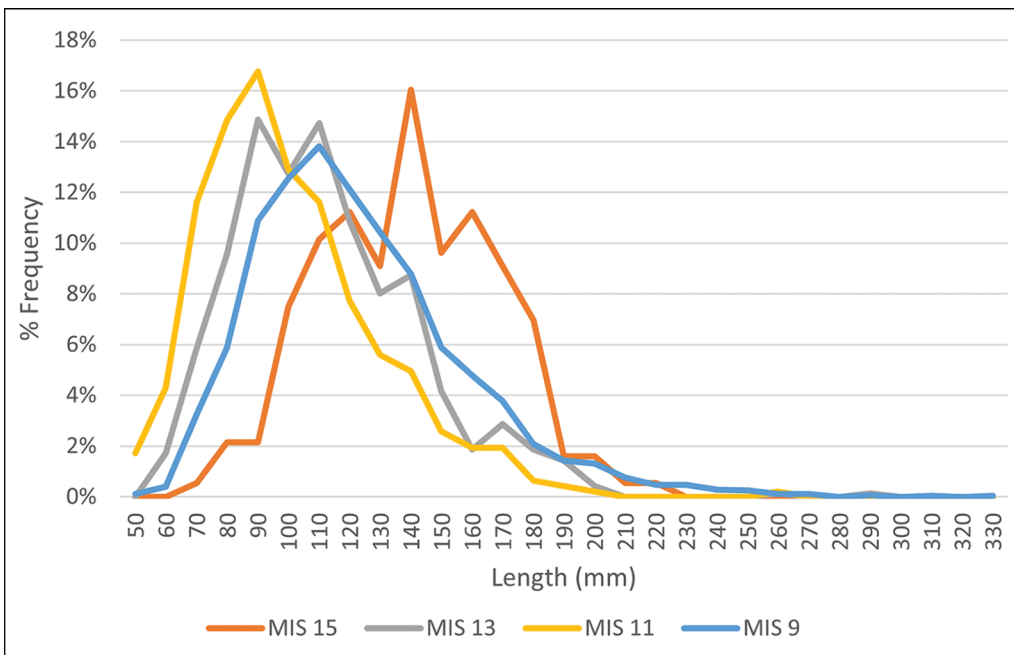


Figure 2. A comparison of handaxe length in Britain between MIS 15, 13, 11 and 9. Handaxes are grouped into 10mm bins, as per Figure 1. The figure shows that there appears to be limited variation in the length of handaxes between MIS 13, 11 and 9, while MIS 15 displays a greater degree of larger handaxes (figure by Frederick Foulds & Mark White).

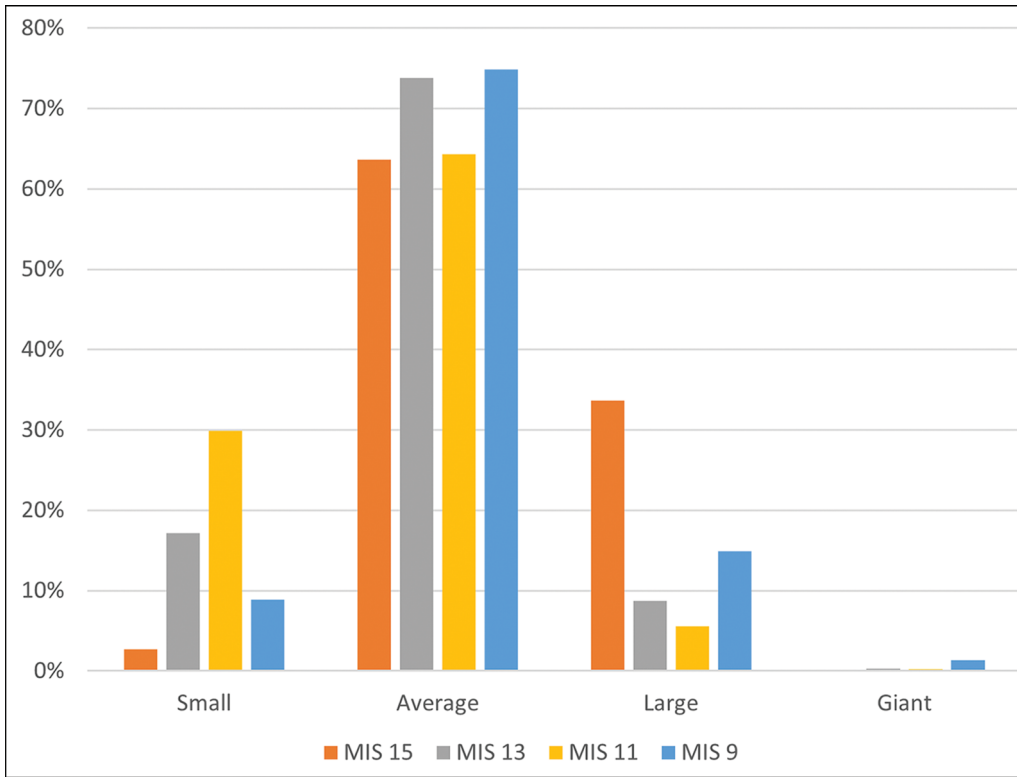


Figure 3. A comparison of handaxe length between MIS 15, 13, 11 and 9, with handaxes grouped according to length class. As per Figure 2, MIS 15 displays a greater proportion of handaxes in the large class, while small handaxes are much more limited. MIS 11 displays a greater proportion of small handaxes. Giant handaxes represent a very small percentage of the total assemblage, emphasising their status as extreme outliers beyond the usual variation in handaxe length (figure by Frederick Foulds & Mark White).

MIS, and whether it relates in any way to cultural differences concerning the recolonisation of Britain during each interglacial period, requires further testing that is beyond the scope of this article.

The majority of giant handaxes are from sites in the Thames Valley and its southern tributaries, although they are also found in the Norfolk Yare, the Axe Valley and Solent River deposits. They mostly occur in areas where primary chalk-flint outcrops were locally available (Figure 4), perhaps suggesting that one key factor in the production of giants may have been the abundance of large nodules, although this does not seem to have been an obstacle in flint poor areas upstream of the Goring Gap at Wolvercote and Stanton Harcourt (see below), nor does it seem to have inspired gigantism at older sites similarly situated near a good source of flint (e.g. Boxgrove, Elveden). The apparent absence of giant handaxes from the flagship MIS 9 Thames site at Stoke Newington represents a collection-bias issue. The original collector, Worthington Smith, gave away most of the largest and most attractive handaxes to distinguished visitors (White 2023), some of which may now be found in collections outside the British Museum and some of which are lost. Smith illustrated several in his 1894 book *Man, the primeval savage*, but the locations of most are currently unclear.

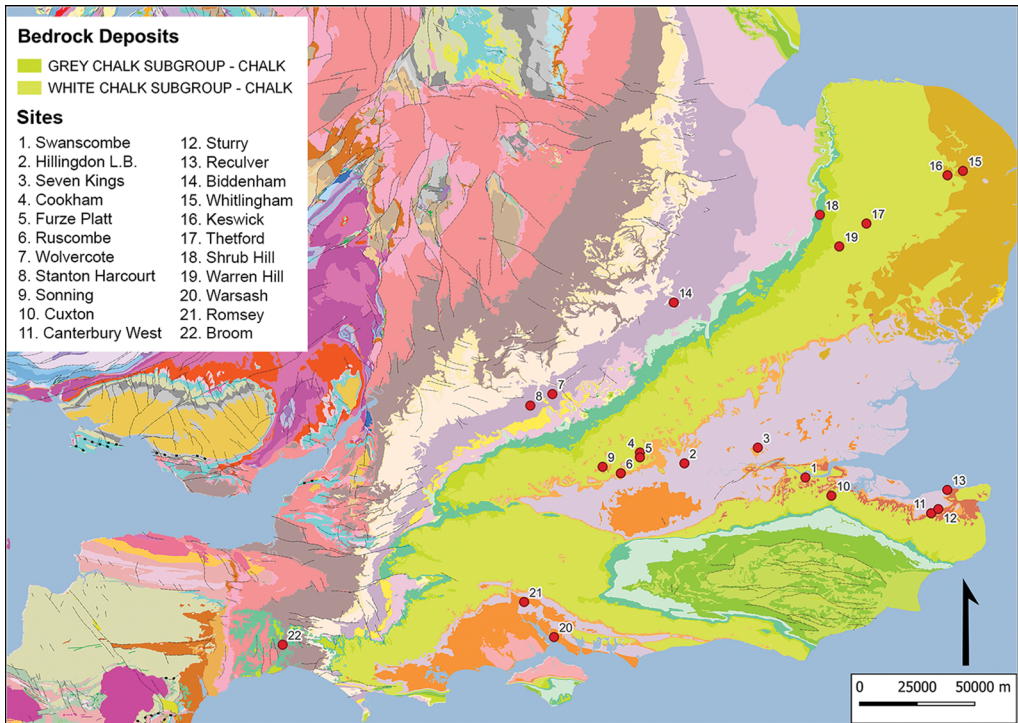


Figure 4. Geological map displaying the locations of sites with giant handaxes in relation to underlying bedrock geology, coloured as per the British Geological Society scheme. Colours for chalk bedrock are highlighted in the legend. Note that large clasts in overlying superficial deposits largely reflect local geology and ‘exotic’ raw materials would generally be smaller in size (map by Frederick Foulds, sources: ESRI, GTOPO30, Shuttle Radar Topography Mission (SRTM) and National Elevation Data (NED) data from the USGS. Contains British Geological Survey materials © NERC 2023 published under the Open Government Licence v3.0).

The typology of giant handaxes

Thirty-five (83%) of the giant handaxes identified in the British record are pointed in form, predominantly lanceolate or ficron types (Figure 5). Ficrons are rare forms characterised by a pointed planform with biconcave edges (Figure 6), which have been identified as part of a typological pairing with chisel-ended cleavers (Roe 1968; Cranshaw 1983) that is now argued to be chronologically restricted to MIS 9 (Wenban-Smith 2004; Bridgland & White 2014, 2015; Davis *et al.* 2016; White & Bridgland 2017; White *et al.* 2018). Possible reasons for the connection between gigantism and pointed/ficron forms are discussed below, but it is important to note that while many giants are ficrons, not all ficrons are giants; overall ficrons range in length from 63 to 307mm.

Gigantism and symmetry

In order to investigate whether handaxe symmetry increases with size, we focus primarily on MIS 9, as this is the period in which most giant forms within the dataset fall and for which the greatest amount of symmetry data was available. A simple scatter plot of length versus Index

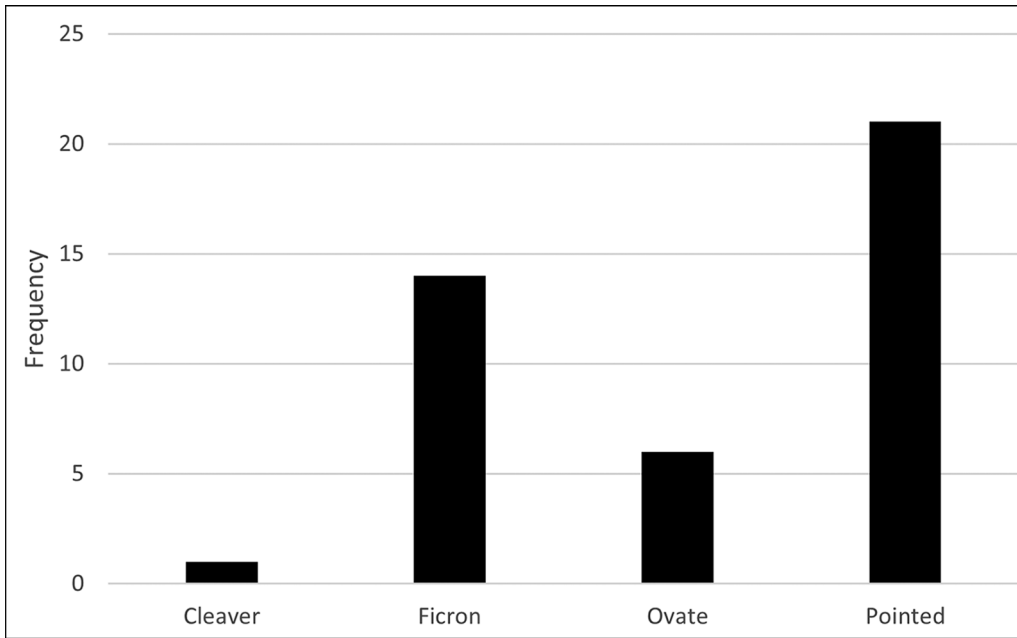


Figure 5. Frequency of morphological types represented by handaxes classified as 'giant' ($\geq 220\text{mm}$; $n = 42$) (figure by Frederick Foulds).

of Asymmetry scores for MIS 9 handaxes indicates that there is a great deal of variation in the sample (Figure 7) (see OSM section 4 for details of symmetry analysis), although there is a weak negative correlation between length and Index of Asymmetry score ($r(2352) = -0.16$, $p = <0.001$), suggesting, to some extent, that as size increases handaxes become more symmetrical.

When MIS 9 handaxes are assigned to size categories, the pattern of increasing symmetry with size is further emphasised (Figure 8). A one-way ANOVA demonstrates a statistically significant difference between the AI scores of the different length categories ($F(2) = 14.13$, $p = <0.001$). A Tukey's HSD post-hoc analysis shows significant pairwise differences in Index of Asymmetry scores between giant and average-sized handaxes, with an average difference in Index of Asymmetry scores of -1.80 ($p = <0.01$), and also between large and average-sized handaxes, with an average difference of -0.63 ($p = <0.001$). In both cases this indicates that handaxes within the larger size categories have lower AI scores (and thus increased symmetry). There is no statistically significant difference in Index of Asymmetry scores between average-sized and small handaxes. Although the available symmetry dataset for MIS 15–11 is much smaller, and suffers from inherent biases, it is noted that MIS 11 displays a similar trend to MIS 9 (see OSM section 4 for further discussion).

The higher levels of symmetry seen in large and giant handaxes during MIS 9 and MIS 11, however, belies the overall trend in symmetry in the British record (White & Foulds 2018; Hoggard *et al.* 2019). Symmetry within the wider handaxe assemblage is highest during MIS 13 and 11, when the modal symmetry class is 2 (very high levels of symmetry) compared to 6 (very low levels of symmetry) for MIS 9 (Figure 9). This might indicate that appearance and

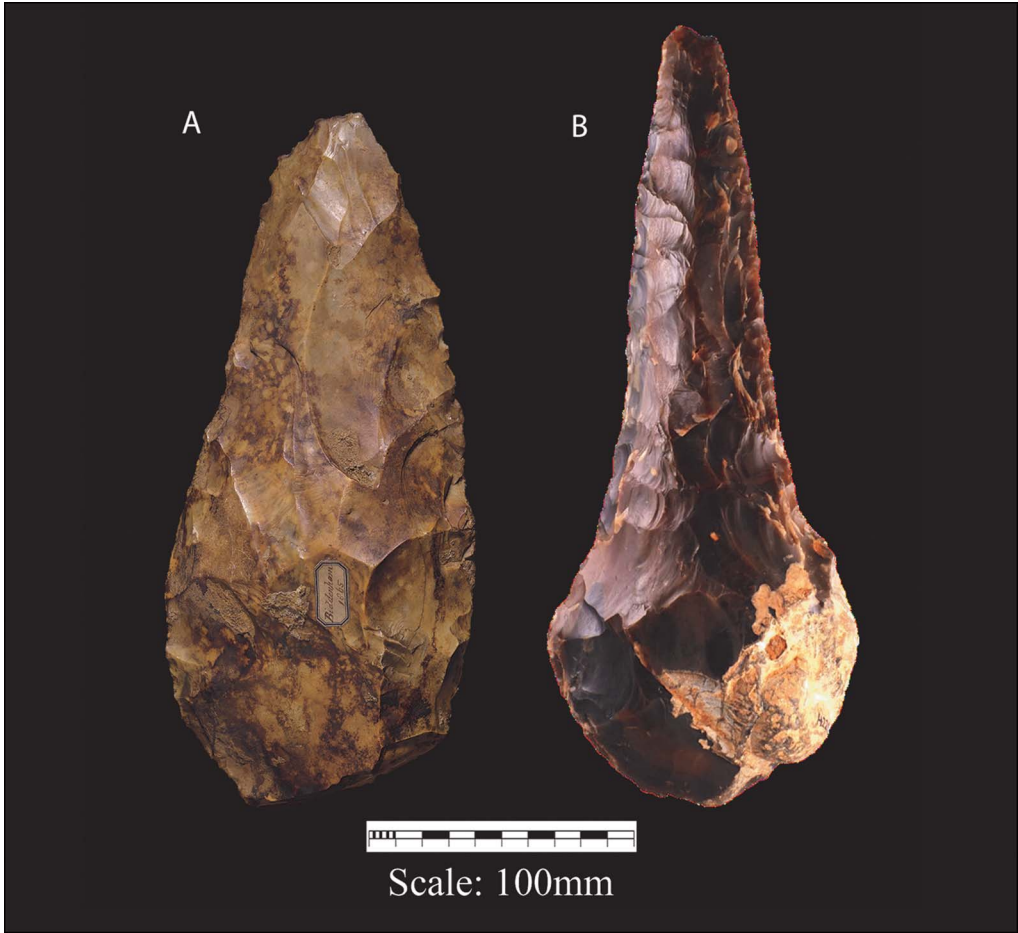


Figure 6. Examples of giant pointed and ficron handaxes: A) the 'Beast of Biddenham' (length = 253mm); B) a giant ficron from Canterbury West (length = 285mm) (photographs courtesy of the British Museum (A) and The Seaside Museum, Herne Bay (B)).

finesse was only a concern for MIS 9 hominins when large handaxes were being made, although it is equally clear that symmetry is an extremely variable quality with many smaller examples also reaching high levels of symmetry. Only the smallest (<100mm in length) and most roughly or quickly made handaxes tend to fall into the lowest symmetry classes.

Discussion

Giant handaxes have been frequently cited in key discussions of hominin culture, society and cognition. Our data show that they became more prevalent in Britain just prior to the Lower–Middle Palaeolithic transition (~300–250kya). This period in Britain has already been established as a period of increasing archaeological complexity, with the regional picture showing a succession of stone tool industries that starts with a non-handaxe phase, followed by the appearance of handaxes and then a final phase in which apparently hierarchical core working

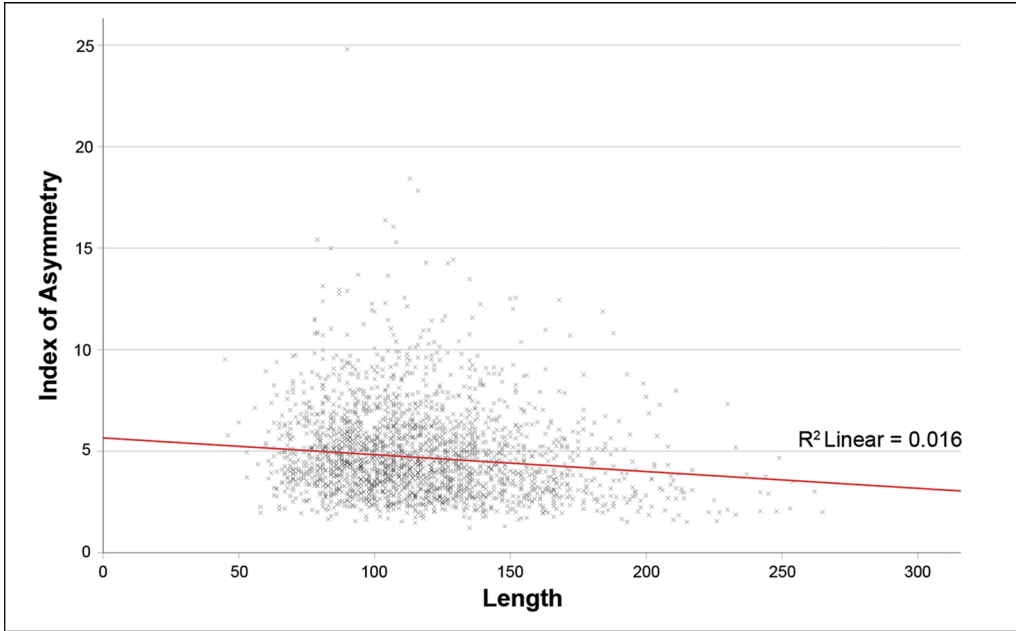


Figure 7. Scatter plot comparing length and AI scores for 2354 British MIS 9 handaxes. The trend line indicates an R^2 value of 0.02 (figure by Frederick Foulds & Luke Dale).

(also known as proto-Levallois) becomes more prolific (Bridgland *et al.* 2013; Bolton 2015; White & Bridgland 2017; Rawlinson 2021; Rawlinson *et al.* 2022). The attribution of giant handaxes to MIS 9 adds to this complexity.

The presence of giant handaxes seems unrelated to local raw materials. Some have been found long distances from suitable raw material; for example, at Wolvercote and Stanton Harcourt, on the Thames terraces west of the Goring Gap, a region lacking both bedrock flint and large, high-quality flint clasts (MacRae 1987; Bridgland 1994). Good-quality raw material was located some 25–40km away, indicating that either flint nodules or, more likely, finished handaxes were deliberately carried to these sites (Lee 2001; Ashton 2008). This can be compared to evidence of longer raw material transfer distances at Caune de l’Arago, France (Wilson 1988)—another site from which a giant has been recovered—indicating a significant investment in time and energy that far exceeds that involved in the more typical Lower Palaeolithic transfer distances of less than 5km (Féblot-Augustins 1993). The need for handaxes more generally within areas with a paucity of suitable raw material emphasises the potential for the presence of giant handaxes to have carried some additional meaning or ‘value’, perhaps extending beyond the ‘performative’ aspects of their production (cf. Gamble 1999: 125–141; McNabb 2007: 354; see also papers in Gamble & Porr 2005). Another possibility is that giant handaxes were produced at distant raw-material sources with the intention of an extended use-life through progressive resharpening, which may have led to the distinctive plano-convex form of several Wolvercote handaxes (Ashton 2008). When considered through this lens, the giant Wolvercote handaxes may represent tools that had been prematurely discarded and, consequently, were less intensively reduced.

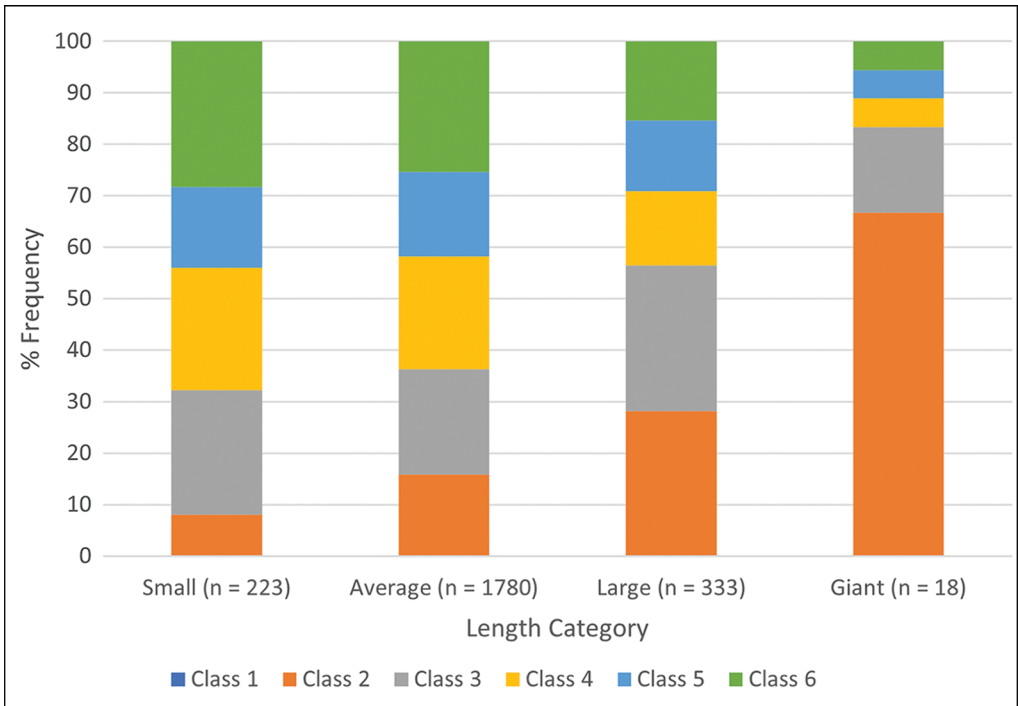


Figure 8. Stacked bar chart displaying the percentage frequency of symmetry classes within each of the four size classes, which appears to indicate an increase in the frequency of bandaxes falling into symmetry classes 1–3 (virtually perfect to high symmetry; see OSM 2) as size increases (figure by Frederick Foulds).

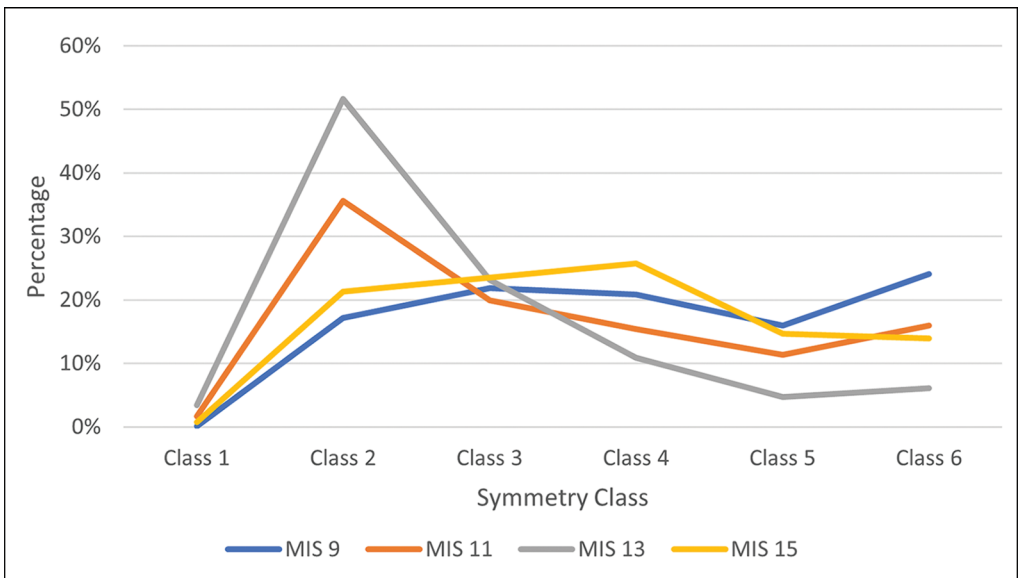


Figure 9. A comparison of the percentage frequency of bandaxes falling into each symmetry class within MIS 15–9 (figure by Frederick Foulds).

That giant handaxes are often ficrons, a type otherwise rare in Britain, is also worthy of note. Large, symmetrical ficrons are visually striking objects, with that from Canterbury West described as “magnificent” by the collector and antiquarian Armstrong Bowes, and the Cuxton giant as “flamboyant” (Wenban-Smith 2004: 14; Knowles 2023). The relationship between size and ficron morphology is unclear but could indicate a desire to maintain length while reducing width in the upper and central portions of the handaxe. This may have taken place in order to correct errors in planform symmetry or to extend use-life through resharpening (Davis *et al.* 2016). Studies of Acheulean assemblages have shown that those with high mean length tend towards being narrower (Gowlett 2013) and it has been suggested that the narrowness of longer bifaces may have been introduced to control weight (Crompton & Gowlett 1993; Gowlett 2005). Alternatively, ficrons may represent an inherent design choice, decided upon before flaking began for reasons that are now lost to us. As Gowlett (2013) notes, the decision to create an elongated form must have been deliberate due to the special effort required to produce them; with no more than 5–10 per cent of Acheulean handaxes displaying pronounced elongation, the suggestion that forms, such as ficrons, may have had some type of inherent meaning must be considered. In any case, there is a clear and intriguing association between extravagant form, large size and high symmetry that seems to transcend purely technical functionality and approaches artistry.

While giant handaxes have been described as essentially functionless objects, experiments have shown that replicas exceeding the largest British giant can still be used effectively (Key & Lycett 2016); giants could also have been used two-handed (Crompton & Gowlett 1993), as digging tools (Khaksar & Modarres 2024) or as static implements across which materials were drawn (Foulds *et al.* 2017). Nevertheless, when considering their unusual forms and high symmetry, it seems likely that British giant handaxes had some enhanced meaning beyond their basic functionality (e.g. Kohn & Mithen 1999; McNabb 2007; Spikins 2012).

Wynn and Berlant (2019) suggest that the 1.7Mya giant handaxe from the African Olduvai FLK West site was probably the product of an individual producing a form that was personally gratifying with no consideration of community-based aesthetic judgement: in essence, it did not form part of a normative social tradition and was either idiosyncratic or potentially produced with another (single) individual in mind. Community-based standards in aesthetics appear to have emerged much later, tentatively around 500 000 years ago (500kya), as indicated by an increased attention to features such as twisted profiles and the rare use of ‘framing’ effects to preserve fossils on areas of cortex (White *et al.* 2019; Wynn & Berlant 2019). The interest in producing giant handaxes may reflect an aesthetic peak shift, or an exaggeration of pleasing visual qualities (in this case, symmetry and size). For White and Foulds (2018), the peak-shift effect was linked to a sensory pleasure-reward system associated with the production of any handaxe (perhaps relating to their associations with pleasurable activities, such as food production and social contact), which were in turn heightened by the production of peak-shifted ‘rarities’, including giants. As well as the increased ‘kick’ enjoyed by the maker, such objects may also have inspired awe or fear in observers (cf. Spikins 2012).

Giant handaxes may also have had a semiotic role. Pope and colleagues (2006: 54) suggested that discarded handaxes had stigmergic qualities—displaying an unintentional organisation—and that their structured discard in the natural environment could mark “game

intercept opportunities, freshwater or other resources”. It is easy to imagine that the visually striking giants would have served particularly well in this role; the structured discard of such objects may have facilitated a ‘release from proximity’, or the ability to maintain social ties remotely through the use of these tools as an intermediary (Pope *et al.* 2006: 53).

The presence of giant handaxes earlier in the Lower Palaeolithic and across the Acheulean world demonstrates that the ability and desire to produce them pre-dated MIS 9 and is not exclusive to Britain. At Caune de l’Arago, in southern France, a finely made, 330mm-long lanceolate handaxe was excavated from layer P, dating to MIS 14 (Barsky & de Lumley 2010). De Mortillet (1883) noted several handaxes longer than 230mm in younger deposits (~MIS 11 and 9) from northern France—three from St Acheul (Somme), one from Thennes (Somme), two from Vaudricourt (Pas-de-Calais) and two from Montguillain (Oise)—although vague provenance and the complex nature of the terrace deposits means that none of these can be more securely dated. Occasional giants have also been found in the Levant and Middle East, such as the 220mm roughout from Qesem cave in Israel, dating to 420–200kya (Barkai *et al.* 2013), while a 265mm-long basalt handaxe was found at Wadi Dabsa, Saudi Arabia (Foulds *et al.* 2017). A more persistent production of large handaxes, picks and cleavers has been recognised at Porto Maior in north-west Spain, dating to MIS 8–7, suggesting African affinities (Méndez-Quintas *et al.* 2018). Foulds *et al.* (2017) usefully recorded 23 assemblages from Africa, where the longest handaxe from Olduvai is 330mm (TK LF, Bed II, 1.4 Myr; Tanzania), from Isenya is 253 mm (level VI, 700kya; Kenya) and from Kalambo Falls is 350mm (B5, 300kya; Zambia). Other sites in southern Europe and the Levant have also been compared to the African Acheulean record (e.g. Moncel *et al.* 2015), where there is a greater emphasis on cleavers, picks and larger handaxes that are often made on flakes and classified under the broader term ‘Large Cutting Tools’.

The phenomenon in Britain during MIS 9, however, displays a rather different technological approach over a limited period, with greater adherence to symmetry and form. This is highlighted by comparison with contemporaneous sites in western Europe. For France, the Somme Valley provides the closest comparisons (Lamotte & Tuffreau 2016). The assemblage from Cagny l’Epinette has 33 handaxes, with the largest less than 170mm in length, while Revelles has 52, all under 190mm. The slightly older assemblage (MIS 10) from Ferme de l’Epinette has 31 handaxes, all smaller than 180mm. In the Paris Basin, the complex at Soucy is attributed to MIS 9 (Lhomme 2007). The rich assemblage from site 3 (level P) contains 178 handaxes with a maximum length of 155mm, and no specimen from the other Soucy sites exceeds 180mm (Lhomme, *pers. comm.*). The sequence at Orgnac in the Ardèche dates from MIS 10 to 8 and the 79 handaxes are all less than 200mm in length (Moncel *et al.* 2012; Moncel *pers. comm.*). In Brittany, at Menez-Dregan, levels 5 and 6 have been dated to MIS 9 (Ravon *et al.* 2022). All 29 handaxes are under 160mm in length (García-Medrano, *pers. comm.*), although intractable raw materials of predominantly sandstone and microgranite beach pebbles are probably responsible for their comparatively small size.

Raw materials may also be a factor at Atapuerca (northern Spain), where Gran Dolina (TD10.1) and Galería (II and III) are broadly attributed to MIS 9 and MIS 11–8, respectively. At both sites, a mix of quartzite, sandstone and Neogene chert were used for handaxe

manufacture, often with the use of flakes as blanks. None of the 63 handaxes exceeds 180mm in length (García-Medrano *et al.* 2023; García-Medrano *pers. comm.*).

The increased production of giant handaxes during MIS 9 in Britain appears to reflect a distinctive material culture unique to the region, one of many small-scale variations on the broader Acheulean technocomplex present in a ‘cultural mosaic’ across northern Europe from around 600kya, which permitted social cohesion within groups occupying large high-latitude ranges (Ashton & Davis 2021). Further analysis of sites beyond those discussed above is needed to identify any similarities or differences between the British and European records in terms of chronological patterning and typological preferences.

Conclusion

Giant handaxes appear to be a phenomenon that increased in importance with the final expressions of the Acheulean in Britain, particularly in assemblages dating from MIS 9, immediately before the Lower–Middle Palaeolithic transition. They were typically pointed or ficron in type and were generally highly symmetrical. The attention paid to ‘superfluous’ size and symmetry, the extravagant shape of many of the large ficrons and the occasional evidence of anomalously long material transfer distances strongly suggest that giant handaxes were objects imbued with additional meaning or value. As previously suggested, this value may have been personal, social or cultural; the great size and unusual shape may have appealed to incipient aesthetic tastes, representing a ‘peak shift’ in design through the exaggeration of size.

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Data statement

Data underpinning this research is available from the authors on request.

Supplementary material

To view supplementary material for this article, please visit <https://doi.org/10.15184/aqy.2024.30>.

References

- ASHTON, N. 2008. Transport, curation and resharpening of lithics in the Lower Palaeolithic. *Lithics* 29: 6–17.
- ASHTON, N. & R.J. DAVIS. 2021. Cultural mosaics, social structure, and identity: the Acheulean threshold in Europe. *Journal of Human Evolution* 156: 103011. <https://doi.org/10.1016/j.jhevol.2021.103011>
- BARKAI, R., A. GOPHER, N. SOLODENKO & C. LEMORINI. 2013. An Amudian oddity: a giant biface from late Lower Palaeolithic Qesem Cave. *Tel Aviv* 40: 176–86. <https://doi.org/10.1179/033443513X13753505864160>
- BARSKY, D. & H. DE LUMLEY. 2010. Early European Mode 2 and the stone industry from the Caune de l'Arago's archeostratigraphical levels "P". *Quaternary International* 223: 71–86. <https://doi.org/10.1016/j.quaint.2009.12.005>
- BOLTON, L. 2015. Assessing the origins of Levallois through lower Palaeolithic core variation: a comparative study of simple prepared cores in northwest Europe. Unpublished PhD dissertation, University of Southampton.
- BRIDGLAND, D.R. 1994. *Quaternary of the Thames*. London: Chapman & Hall.
- BRIDGLAND, D.R. & M.J. WHITE. 2014. Fluvial archives as a framework for the Lower and Middle Palaeolithic: patterns of British artefact distribution and potential chronological implications. *Boreas* 43: 543–55. <https://doi.org/10.1111/bor.12059>
- 2015. Chronological variations in handaxes: patterns detected from fluvial archives in north-west Europe. *Journal of Quaternary Science* 30: 623–38. <https://doi.org/10.1002/jqs.2805>
- BRIDGLAND, D.R. *et al.* 2013. An enhanced record of MIS 9 environments, geochronology and geoarchaeology: data from construction of the High Speed 1 (London–Channel Tunnel) rail-link and other recent investigations at Purfleet, Essex, UK. *Proceedings of the Geologists' Association* 124: 417–76. <https://doi.org/10.1016/j.pgeola.2012.03.006>
- CROMPTON, R.H. & J.A. GOWLETT. 1993. Allometry and multidimensional form in Acheulean bifaces from Kilombe, Kenya. *Journal of Human Evolution* 25: 175–99. <https://doi.org/10.1006/jhev.1993.1043>
- CRANSHAW, S. 1983. *Handaxes and cleavers: selected English Acheulean industries* (British Archaeological Reports British Series 113). Oxford: BAR.
- DAVIS, R.J. *et al.* 2016. The Palaeolithic record of Warsash, Hampshire, UK: implications for late Lower and early Middle Palaeolithic occupation history of Southern Britain. *Proceedings of the Geologists' Association* 127: 558–74. <https://doi.org/10.1016/j.pgeola.2016.09.005>
- 2021. Palaeolithic archaeology of the Bytham River: human occupation of Britain during the early Middle Pleistocene and its European context. *Journal of Quaternary Science* 36: 526–46. <https://doi.org/10.1002/jqs.3305>
- DE MORTILLET, G. 1883. *Le Préhistorique, antiquité de l'homme*. Paris: Reinwald.
- FÉBLOT-AUGUSTINS, J. 1993. Mobility strategies in the late Middle Palaeolithic of central Europe and western Europe: elements of stability and variability. *Journal of Anthropological Archaeology* 12: 211–65. <https://doi.org/10.1006/jaar.1993.1007>
- FOULDS, F.W.F. *et al.* 2017. A large handaxe from Wadi Dabsa and early hominin adaptations within the Arabian Peninsula. *Antiquity* 91: 1421–34. <https://doi.org/10.15184/aqy.2017.153>
- GAMBLE, C. 1996. Hominid behaviour in the Middle Pleistocene: an English perspective, in C.S. Gamble & A.J. Lawson (ed.) *The English Palaeolithic reviewed*: 66–71. Salisbury: Trust for Wessex Archaeology.
- 1999. *The Palaeolithic societies of Europe*. Cambridge: Cambridge University Press.
- GAMBLE, C. & M. PORR (ed.) (2005) *The hominid individual in context: archaeological investigations of Lower and Middle Palaeolithic landscapes, locales and artefacts*. London: Routledge. <https://doi.org/10.4324/9780203007693>
- GARCÍA-MEDRANO, P., M.H. MONCEL, E. MALDONADO-GARRIDO, A. OLLÉ & N. ASHTON. 2023. The western European Acheulean: reading variability at a regional scale. *Journal of Human Evolution* 179: 103357. <https://doi.org/10.1016/j.jhevol.2023.103357>
- GOWLETT, J. 2005. Seeking the Palaeolithic individual in East Africa and Europe during the Lower-Middle Pleistocene, in C. Gamble & M. Porr (ed.) *The hominin individual in context*:

- archaeological investigations of Lower and Middle Palaeolithic landscapes, locales and artefacts: 50–67. Abingdon: Routledge.
- 2013. Elongation as a factor in artefacts of humans and other animals: an Acheulean example in comparative context. *Philosophical Transactions of the Royal Society B: Biological Sciences* 368: 20130114.
<http://doi.org/10.1098/rstb.2013.0114>
- HARDAKER, T. & S. DUNN. 2005. The Flip Test – a new statistical measure for quantifying symmetry in stone tools. *Antiquity Project Gallery* 79. Available at:
<https://www.antiquity.ac.uk/projgall/hardaker306/> (accessed 16 March 2023).
- HODGSON, D. 2015. The symmetry of Acheulean handaxes and cognitive evolution. *Journal of Archaeological Science: Reports* 2: 204–8.
<https://doi.org/10.1016/j.jasrep.2015.02.002>
- HOGGARD, C.S., J. McNABB & J.N. COLE. 2019. The application of elliptic Fourier analysis in understanding biface shape and symmetry through the British Acheulean. *Journal of Paleolithic Archaeology* 2: 115–33.
<https://doi.org/10.1007/s41982-019-00024-6>
- HOSFIELD, R.T. & C.P. GREEN. 2013. *Quaternary history and palaeolithic archaeology in the Axe Valley at Broom, south west England*. Oxford: Oxbow.
- INGREY, L., S.M. DUFFY, M. BATES, A. SHAW & M. POPE. 2023. On the discovery of a late Acheulean ‘giant’ handaxe from the maritime academy, Frindsbury, Kent. *Internet Archaeology* 61. <https://doi.org/10.11141/ia.61.6>
- ISAAC, G.L. 1977. *Olorogesailie: archaeological studies of a Middle Pleistocene lake basin in Kenya*. Chicago (IL): University of Chicago Press.
- KEELEY, L.H. 1981. *Experimental determination of stone tool uses: a microwear study*. Chicago (IL): University of Chicago Press.
- KEY, A.J. & S.J. LYCETT. 2016. Influence of handaxe size and shape on cutting efficiency: a large-scale experiment and morphometric analysis. *Journal of Archaeological Method and Theory* 24: 514–41.
<https://doi.org/10.1007/s10816-016-9276-0>
- KEY, A.J. *et al.* 2022. On the earliest Acheulean in Britain: first dates and in-situ artefacts from the MIS 15 site of Fordwich (Kent, UK). *Royal Society Open Science* 9: 211904.
<https://doi.org/10.1098/rsos.211904>
- KHAKSAR, S. & R. MODARRES. 2024. How good are giant handaxes in utilitarian functions? An experimental assessment. *Journal of Archaeological Science: Reports* 53: 104301.
<https://doi.org/10.1016/j.jasrep.2023.104301>
- KNOWLES, P.G. 2023. A magnificent ficron and assemblage containing cleavers from Canterbury: a reanalysis of the collection of Dr Thomas Armstrong Bowes and a problem of provenance. *Lithics* 41: 5–28.
- KOHN, M. & S. MITHEN. 1999. Handaxes: products of sexual selection? *Antiquity* 73: 518–26.
<https://doi.org/10.1017/S0003598X00065078>
- LAMOTTE, A. & A. TUFFREAU. 2016. Acheulean of the Somme basin (France): assessment of lithic changes during MIS 12 to 9. *Quaternary International* 409: 54–72.
<https://doi.org/10.1016/j.quaint.2015.08.058>
- 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: BAR.
- LEPRE, C.J. *et al.* 2011. An earlier origin for the Acheulean. *Nature* 477: 82–85.
<https://doi.org/10.1038/nature10372>
- LEWIS, S.G. *et al.* 2021. A revised terrace stratigraphy and new ESR geochronology of the early Middle Pleistocene Bytham River in the Breckland of East Anglia, UK. *Quaternary Science Reviews* 269: 107133.
<https://doi.org/10.1016/j.quascirev.2021.107113>
- LHOMME, V. 2007. Tools, space and behaviour in the Lower Palaeolithic: discoveries at Soucy in the Paris basin. *Antiquity* 81: 536–54.
<https://doi.org/10.1017/S0003598X00095570>
- MACRAE, R.J. 1987. The great giant handaxe stakes. *Lithics* 8: 15–17.
- McNABB, J. 2007. *The British Lower Palaeolithic: stones in contention*. Abingdon: Routledge.
- MÉNDEZ-QUINTAS, E., M. SANTONJA, A. PÉREZ-GONZÁLEZ, M. DUVAL, M. DEMURO & L.J. ARNOLD. 2018. First evidence of an extensive Acheulean large cutting tool accumulation in Europe from Porto Maior (Galicia, Spain). *Scientific Reports* 8: 3082.
<https://doi.org/10.1016/j.quaint.2020.01.005>
- MONCEL, M.-H., A.-M. MOIGNE & J. COMBIER. 2012. Towards the Middle Paleolithic in western Europe: the case of Orgnac 3 (south-eastern

- France). *Journal of Human Evolution* 63: 653–66.
<https://doi.org/10.1016/j.jhevol.2012.08.001>
- MONCEL, M.H. *et al.* 2015. The early Acheulian of north-western Europe. *Journal of Anthropological Archaeology* 40: 302–31.
<https://doi.org/10.1016/j.jaa.2015.09.005>
- POPE, M., K. RUSSEL & K. WATSON. 2006. Biface form and structured behaviour in the Acheulean. *Lithics* 27: 44–57.
- RAVON, A.-L., P. GARCÍA-MEDRANO, M.-H. MONCEL & N. ASHTON. 2022. Acheulean variability in Western Europe: the case of Menez-Dregan I (Plouhinec, Finistère, France). *Journal of Human Evolution* 162: 103103.
<https://doi.org/10.1016/j.jhevol.2021.103103>
- RAWLINSON, A.A. 2021. The Purfleet interglacial: an examination of change and complexity in core and flake technology during the final Lower Palaeolithic. Unpublished PhD dissertation, Durham University.
- RAWLINSON, A.A., L. DALE, N. ASHTON, D.R. BRIDGLAND & M.J. WHITE. 2022. Flake tools in the European Lower Paleolithic: a case study from MIS 9 Britain. *Journal of Human Evolution* 165: 103153.
<https://doi.org/10.1016/j.jhevol.2022.103153>
- ROE, D.A. 1968. British Lower and Middle Palaeolithic hand axe groups. *Proceedings of the Prehistoric Society* 34: 1–82.
<https://doi.org/10.1017/S0079497X00013840>
- SHIPTON, C. & M. WHITE. 2020. Handaxe types, colonization waves, and social norms in the British Acheulean. *Journal of Archaeological Science: Reports* 31: 102352.
<https://doi.org/10.1016/j.jasrep.2020.102352>
- SMITH, W.G. 1894. *Man, the primeval savage: his haunts and relics from the hill-tops of Bedfordshire to Blackwall*. London: E. Stanford.
- SPIKINS, P. 2012. Goodwill hunting? Debates over the ‘meaning’ of Lower Palaeolithic handaxe form revisited. *World Archaeology* 44: 378–92.
<https://doi.org/10.1080/00438243.2012.725889>
- TOTH, N. & K. SCHICK. 2018. An overview of the cognitive implications of the Oldowan Industrial Complex. *Azania: Archaeological Research in Africa* 53: 3–39.
<https://doi.org/10.1080/0067270X.2018.1439558>
- WENBAN-SMITH, F.F. 2004. Handaxe typology and Lower Palaeolithic cultural development: ficrons, cleavers and two giant handaxes from Cuxton. *Lithics* 25: 11–21.
- WHITE, M.J. 2023. Collectors, class and conflict at the lower palaeolithic discovery at Stoke Newington, 1878–1884. *World Archaeology* 54: 516–27.
<https://doi.org/10.1080/00438243.2023.2170456>
- WHITE, M.J. & D.R. BRIDGLAND. 2017. Thresholds in lithic technology and human behaviour in MIS 9 Britain, in M. Pope, J. McNabb & C. Gamble (ed.) *Crossing the human threshold: dynamic transformation and persistent places during the Middle Pleistocene*: 165–92. Abingdon: Routledge.
- WHITE, M.J. & F. FOULDS. 2018. Symmetry is its own reward: on the character and significance of Acheulean handaxe symmetry in the Middle Pleistocene. *Antiquity* 92: 304–19.
<https://doi.org/10.15184/aqy.2018.35>
- WHITE, M.J. & D.C. SCHREVE. 2000. Island Britain – peninsula Britain: palaeogeography, colonisation, and the Lower Palaeolithic settlement of the British Isles. *Proceedings of the Prehistoric Society* 66: 1–28.
- WHITE, M.J. *et al.* 2018. Well-dated fluvial sequences as templates for patterns of handaxe distribution: understanding the record of Acheulean activity in the Thames and its correlatives. *Quaternary International* 480: 118–31.
<https://doi.org/10.1016/j.quaint.2017.03.049>
- WHITE, M.J., N. ASHTON & D.R. BRIDGLAND. 2019. Twisted handaxes in Middle Pleistocene Britain and their implications for regional-scale cultural variation and the deep history of Acheulean hominin groups. *Proceedings of the Prehistoric Society* 85: 61–81.
<https://doi.org/10.1017/ppr.2019.1>
- WILSON, L. 1988. Petrography of the lower Palaeolithic tool assemblage of the Caune de l’Arago (France). *World Archaeology* 19: 376–87.
- WYNN, T. & T. BERLANT. 2019. The handaxe aesthetic, in K.A. Overmann & F.L. Coolidge (ed.) *Squeezing minds from stones*: 278–303. Oxford: Oxford University Press.
- WYNN, T. & J. GOWLETT. 2018. The handaxe reconsidered. *Evolutionary Anthropology* 27: 21–29.
<https://doi.org/10.1002/evan.21552>