Reduction Models and Lithic Variability in the Middle Palaeolithic of Southwest France

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Introduction

The study of Neanderthal behaviour is a central topic in current discussions of the origins of anatomically modern humans and the apparently concomitant 'Middle to Upper Palaeolithic transition'. A major theme of the debate relates behavioural changes reflected in the archaeological record to cognitive development within anatomically modern human groups either as they move out of Africa or emerge locally from regional archaic populations (e.g. papers in Mellars and Stringer 1989; Mellars 1990; Stringer, Aitken and Mellars 1993).

The organisation of lithic technology is a major unit of comparison between the 'archaic' Mousterian populations of Europe (Neanderthals sensu lato) and 'moderns' (Cro-Magnon). Research into Mousterian technology has progressed over a century, and has largely been dominated by the work of François Bordes, who grouped assemblages into major variants on the basis of typological and technological traits (Bordes 1953, 1961). Broadly, these main variants reflect the dominance of scrapers in a non-Levallois (Quina Mousterian) or Levallois context (Ferrassie Mousterian), the dominance of denticulates (Denticulate Mousterian) or of bifaces and backed knives (Mousterian of Acheulian Tradition or MTA), or are defined in a negative sense as possessing low frequencies of all of the above typological forms (Typical Mousterian). Although Bordes later admitted that such variants are conservative (1981), and form points in a continuum of variation (Geneste 1985), they have remained as a useful heuristic system. Recent interpretation of assemblage variation has tended to take a holistic view of this assemblage patterning, relating technology to raw material procurement and transport (Geneste 1985, 1989), settlement type and occupation intensity (Rolland 1981; Rolland and Dibble 1990; Dibble and Rolland 1992), subsistence strategies (Stiner and Kuhn 1992) and other variables in the context of a dynamic adaptive system.

A major hypothesis to arise out of this 'holistic paradigm' are the tool reduction models of Harold Dibble and Nicholas Rolland, which have been outlined in a series of publications with two joint syntheses to date (Rolland 1977, 1981; Dibble 1984, 1987a, 1987b, 1988a, 1988b, 1989; Rolland and Dibble 1990; Dibble and Rolland 1992). Although the predictions of the reduction models have only been tested against a relatively small database in Southwest France and the Near East, they have been surprisingly well-


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received as a major explanation of Mousterian variability (e.g. Jelinek 1988; Otte 1992). In view of this, it is important to make two points: that reduction models remain to be tested against the wider Mousterian database, and that they cannot explain major aspects of variation such as the frequencies of type fossils or primary flaking strategies (Mellars 1992). Previous work on Lower Palaeolithic (Pettitt 1992) and Middle Palaeolithic (Reynolds 1988) industries failed to support the predictions of the models, as have most aspects of the preliminary analysis presented here. It follows that although tool rejuvenation certainly did occur, at least in the Quina Mousterian (Meignen 1988; Turq 1992), we should be cautious of exaggerating the important of tool reduction in lithic variability. Instead, we should look to more influential factors such as primary flaking strategies. This paper presents some preliminary results of an ongoing analysis of Mousterian assemblages in terms of tool reduction, with some predictions for future research. It suggests that any understanding of Middle Palaeolithic variability must be seen as a reflection of conscious adaptive decisions made in response to the nature of available raw material, within the context of overlying mobility strategies, ultimately constrained by conceptual frameworks. It is to such factors that research should be addressed.

The Mousterian

Although the 'Mousterian' traditionally refers to the Middle Palaeolithic industries of the last interglacial and glacial (Mellars 1967), Middle Palaeolithic flake technology has a considerable duration being present at Pontnewydd, Wales, before 225 kyr (Green 1984) and at Messevin, Belgium, before 250 kyr (Cahen 1984; Otte 1992), with the latest examples dating to around 35 kyr (papers in Farizy 1990). The actual chronological limits of the Mousterian have always been open-ended (Bordes 1977).

Middle Palaeolithic technology is defined by flake-based assemblages, produced using Levallois or non-Levallois (disc core, multiple platform core) primary flaking (e.g. Bordes and Bourgon 1951b; Bordes 1953). The dominant tool forms are various scrapers, points, denticulates and notches, with a lesser but often significant component of bifaces, choppers and 'Upper Palaeolithic' forms such as endscrapers and burins. Although Levallois and non-Levallois primary flaking methods appear sophisticated (Turq 1989, 1992; Boeda 1988; Van Peer 1992; Wänhammer-Smith 1992), with differential treatment of raw material transported over distances of up to 100 km in Southwest France (Geneste 1985, 1989) and 300 km in Eastern Europe (Feblot-Augustins 1993) and regional variants in type fossils (Bordes 1981), the overall picture is of an archaic and repetitive technology (Rolland 1981, 19).

Despite some lingering disputes over the chronostratigraphic correlation of sites (Laville 1988), some chronological patterning is visible. This primarily reflects cyclical changes in primary flaking strategies, with fluctuations in Levallois and Quina (e.g. some 'Salami-Slice') methods through the late Riss and early Wurm, as well as some chronological patterning of specific type fossils including the bifaces and backed knives of the MTA (Mellars 1988; Rolland 1988).

Such lithic variability and the existence of 'forward planning' of this technology in the landscape (Roebroeks et al. 1988) appear relatively sophisticated to us, and the long chronological range of the Middle Palaeolithic indicates its adaptive success. However, we should remember ultimately that it reflects the behaviour of a different species or subspecies of human which eventually became extinct, and which quite probably operated in a different conceptual world than succeeding Upper Palaeolithic groups (Pettitt forthcoming; Pettitt and Schumann forthcoming).

Reduction models

Dibble and Rolland's tool reduction models make predictions at two levels of variability: the morphometrical attributes of specific tool and flake forms and the overall composition of assemblages reflected in various ratios of tools, untreated flakes and cores (see especially Rolland 1977, 1981; Dibble 1988a). These predictions reflect models of the mechanics of tool reduction, and the behavioural context in which it takes place.

To Dibble, differences in the frequencies of various lateral and transverse scraper forms can be explained by the intensity and means of rejuvenation of a flake. His model relates resharpening to parsimonious use of raw material in situations where the resource may be scarce. Thus, he proposes, as the edge of an untreated flake dulls through use it may be retouched producing a single lateral or transverse scraper. Further resharpening may modify the piece into a double scraper, with subsequent removals possibly bringing one or two ends to a point (convergent scraper, limace). Thus, the majority of Bordes' scraper types represent merely points of discard in a continuum of reduction, with no real stylistic or functional significance in themselves (Dibble 1987b, 1988a; Rolland 1981, 35 for 'stylistic neutrality'). As the discrimination of Mousterian points from convergent scrapers has always been moot (Bordes 1954a), these have also been included in the reductive continuum (Holdaway 1989; but cf Solecki 1992). Such factors, if true, may indicate that 'mental templates' in the Middle Palaeolithic were more generalised than has been assumed, and therefore have major implications for Neanderthal cognition (Dibble 1989).

Dibble's model makes predictions relating to the metrical attributes of scrapers at various points in the reductive scheme. As resharpening is a process of removal, pieces will decrease in size and length as the process develops. Thus, Dibble predicts the following:

1. Convergent and transverse scrapers, representing the end points of the
reductive process, should be shorter than single and double forms which have received relatively light rejuvenation;

2. Widths will essentially remain similar as these reflect the lower prehensile limit of a flake, beyond which the piece cannot be held usefully, and they, therefore, reflect the lower limits of reductive potential;

3. Retouch intensity (invasiveness) will increase as reduction progresses, and one can, therefore, expect this to be greatest among convergent and transverse forms.

One can also expect the following:

4. An increasing 'index of reduction', along the sequence (Kuhn 1990), whereby retouch intensity increases relative to the flake's thickness.

One assumption of these predictions is that the initial blanks selected for use were of similar size: if larger blanks were deliberately selected to receive more intense reduction one might expect an overall similarity of scraper size (Dibble pers. comm.). If this is so, then retouched flakes are probably unrepresentative of the unretouched element (Ashton pers. comm.). Thus, as supposed relationships between platform size and flake dimensions (Dibble 1987a, 39) are dubious, comparison of the retouched to unretouched element may prove fruitful.

Rolland's work attempts to explain why reduction might occur in the first place, and how this might affect overall assemblage composition. Ultimately, the intensity of tool reduction is assumed to be related to the intensity of occupation of caves and rock-shelters and the relative scarcity of raw material (Rolland 1981). This model makes predictions regarding the relative frequencies of cores, unretouched flakes and tools within assemblages. Although the contribution of sampling to variability is difficult to negotiate with the current published data, if these can be controlled the model should have something to say about overall assemblage quantity: i.e. one can logically expect more intense occupation to produce greater amounts of occupational debris.

To Dibble the two most important factors relating to the intensity of utilisation of resources are (a) the ratio of tools to unretouched flakes (the implement frequency), and (b) the ratio of cores to tools and unretouched flakes. His reasoning here is logical:

"Under conditions where more intense utilisation of the lithic resources is taking place, one would expect to see more flakes produced per core, and the selection of more of those flakes to be made into tools" (1988a, 193).

Rolland (1977) demonstrated higher implement frequencies for the Charentian Mousterian (Quina, Ferrassie) and lower ones for the Le Moustier group (Typical, Denticulate, MTA), albeit with high degrees of variation. He noted that:

"Flake to core ratios vary cohesively with implement frequencies, strengthening the case in favour of raw material economising", and that "implement frequencies are clearly dependent on Racloirs [scrapers]" (1981, 23).

From this, we can expect the following under conditions of intense occupation in which raw materials were treated in a parsimonious way:

1. Less cores to flakes/tools;
2. Higher implement frequencies;
3. A high scraper index correlating with the increased implement frequency; and
4. The possibility that more intense occupation will produce numerically larger assemblages.

Preliminary results: Combe Grenal

The Combe Grenal rock shelter, located on the south side of the Dordogne river, east of the village of Domme, is one of the most informative Middle Palaeolithic sites of the dissected limestone plateaux of the Perigord. Although it has received the attention of various researchers since at least 1811, the most informative excavations have been those of François Bordes in the 1950's (Bordes 1972). The deposits at Combe Grenal reach a depth of nearly 13 metres, and take the form of three major stratigraphic units which have been assigned to the Riss III, Wurm I and Wurm II stadials on the basis of faunal and palynological comparisons. A total of 65 archaeological horizons have been identified, with 9 Riss III Achellean levels underlying 55 Mousterian levels of the Early Wurm. These Mousterian levels, which contain all of the major variants recognised by Bordes, have played an important role in the recognition and interpretation of Mousterian variability, and still form a major data-set for analysis.

The relevant metric attributes of scrapers and denticulates from four levels of Combe Grenal were recorded. The levels were selected to represent numerically strong assemblages and relatively good examples of the Quina Mousterian (MQ: levels 23 and 26) and the Denticulate Mousterian (MD: levels 14 and 20) which, according to the reduction models, represent relatively heavily and lightly reduced assemblages respectively. All of these levels belong to the Wurm II stadial with cold conditions prevailing and a general dominance of reindeer in levels 23 and 26, co-dominance of red deer in 20 and the dominance of horse in 14. (Chase 1983). On the basis of stratigraphic correlation with the isotopic record the Wurm II levels at Combe Grenal date to between 65 and 73 kyr ( Mellars 1988), although TL dates for these levels have come out at around 44 kyr.
Locally available nodular flint was used for up to 90% of the assemblages, with some use of a fine-quality translucent brown flint probably procured from within 10-100 km of the site (Turq 1989, 1992). Locally available quartz was used for no more than 5% of each assemblage. This reflects the typical pattern of Mousterian sites in this region (Geneste 1985, 1989). No differential treatment of material by procurement group could be identified, although this remains a promising area of future research.

Table 1 presents lengths, widths and thicknesses for scraper types from these levels. It can be seen that standard deviation is quite high for all forms (occasionally over 50% of the mean), a pattern found in most attributes of the material studied. The lengths of scraper forms are consistent with Dibble’s predictions, although the pattern is not as clear as one might expect: mean differences are small and the deviation from the mean masks any convincing pattern. However, including the supposedly lightly reduced Denticulate assemblages in this analysis might mask any potential for recognising the effects of reduction: taking level 26 alone, convergent forms had a higher mean length than single and double forms, as one would not expect from the predictions.

Mean widths are fairly similar, although again with high deviation from the mean, falling into a similar range as material from La Quina and Tabun (Dibble 1989, 418). One would not expect such high variation if these widths represent prehensile end-points. A major problem with this hypothesis is that it assumes a direct prehensile relationship between the tool and the hand, ignoring the evidence for a surprising array of hafting techniques as revealed by microwear (Beyries 1987, 1988; Anderson-Gerfault 1990). The intermediary of a haft, and the alteration of the size, shape and possibly kinetic actions of a flake that it brings about, would presumably 'blur' any direct prehensile limitations (by this argument microliths may be said to be below a 'minimum prehensile width' and therefore useless in a direct hand-flake relationship, but they are of course perfectly usable when set in hafts). Thus, it is illogical to assume a major prehensile end-point to the reductive scheme. A simpler explanation could relate differences to various primary flaking strategies geared towards working relatively small, irregular nodules, whilst further integration of the effects of hafting into hypotheses of toolkit variability may have much to reveal about differential transport of material and some cyclical patterning (e.g. that the absence of the biface in many Mousterian assemblages may relate to the reproduction of the kinetic actions it has to offer by other tool types set in specific hafts: one might suggest convergent scrapers or points in hafts which replicate the form and functional template of a biface). Further work, then, must escape the limitations of simple 'hand-flake' functional arguments.

Table 2 presents the retouch intensity of scraper forms along with Kuhn’s 'index of reduction’ (199). Despite the ubiquitously high deviation, it is clear that retouch intensity is higher for single and double forms than for either offset or transverse forms, the opposite of what one would expect from the reduction models: only convergent forms fulfil such predictions. The 'index of reduction', which measures retouch intensity relative to maximum thickness, may indicate advanced reduction, although this depends on blank morphology and retouch type (Ashton pers. comm.). According to this method, convergent forms were the most rejuvenated and transverse forms the least, with offsets similar to single and double forms: the picture in no way presents a clear increase of the index along the suggested sequence.

To Dibble and Rolland, most Mousterian variability relates to differing frequencies of scrapers and denticulates (Dibble and Rolland 1992, 12). They suggest that the generally lower edge angle of scrapers as opposed to denticulates might cause scrapers to dull more quickly and, therefore, require more intensive resharpening. Thus, over time a denticulate dominated assemblage (Denticulate Mousterian) might become dominated by scrapers.

<table>
<thead>
<tr>
<th>Scaper type</th>
<th>Borders no.</th>
<th>Length Mean St. dev</th>
<th>Width Mean St. dev</th>
<th>Thickness Mean St. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>6-17</td>
<td>44.2</td>
<td>13.8</td>
<td>31.1</td>
</tr>
<tr>
<td>Double</td>
<td>18-20</td>
<td>40</td>
<td>20.5</td>
<td>35</td>
</tr>
<tr>
<td>Offset</td>
<td>23</td>
<td>47.4</td>
<td>10.6</td>
<td>35.9</td>
</tr>
<tr>
<td>Transverse</td>
<td>22-24</td>
<td>35</td>
<td>6.74</td>
<td>51.8</td>
</tr>
</tbody>
</table>

Table 1. Combe Grenal levels 14, 20, 23, 26: Scraper length, width and thickness.
simply because more of these are being produced: a continuum towards the Charentian Mousterian is implied. Figure 1 compares denticulate and scraper edge angles at Combe Grenal. It can be seen that the means and ranges of the two forms are similar: the higher angles in Quina assemblages are probably due to thicker blanks and heavier ‘Quina’ retouch. Thus, edge angles cannot be used to explain variation here: differential wear could only relate to possible differences in raw materials on which the tools were used, yet given the apparently generalised nature of tool function as revealed by microwear (Beyries 1988; Anderson-Gerfaud 1990) this does not seem to hold either. The conclusion that attributional rates bring about major assemblage change is therefore difficult to accept.

Dibble’s predictions are clearly not supported by these preliminary results. The high variability of attributes would not be expected in situations of lithic parsimony, and simpler explanations relating to primary flaking probably come closer to explaining mass differences in scraper morphology.

Reduction in Context: Assemblage Variability

A database of the most informative Mousterian cave and rock-shelter sites was used to test the predictions of Dibble and Rolland regarding occupational intensity and assemblage composition. Table 3 presents the database by site, noting the variants present at each. The dominance of the Quina Mousterian is not surprising, as it is predominantly an enclosed-site phenomenon, rare (but not unknown) on open sites (Bordes 1981).

Core frequencies were computed as follows:

\[
\text{Cores} \times 100 = \frac{1}{63 + \text{bifaces} + \text{cores}}
\]

Table 4 presents core frequencies for the total sample of Mousterian sites. It can be seen that Quina Mousterian assemblages have low core frequencies as one might expect. The highly variable frequencies in Ferrassie Mousterian assemblages may be due in part to the flexibility of Levallois strategies, although one would not expect such variation in a situation of intense lithic parsimony. Interestingly, Ferrassie Mousterian assemblages have a higher upper range than the supposedly lightly reduced Denticulate Mousterian. The high ratio of cores in MTA assemblages due in part to an increased reliance on curated technology, in a situation where cores (and bifaces) were selectively transported.

Implement frequencies were computed as follows:

**Total of types 6-35, 40-43, 51, 53-60, Bifaces x 100**

Total 1-63, bifaces, unretouched flakes

This differs from the method of Rolland (1977) in that Tayac points (type 51) are included here. Table 4 presents the frequencies for the sample. Despite high deviations again, the Charentian assemblages do have generally higher frequencies of implements at around 30-40% of the assemblage, with consistently low frequencies in the Le Moustier group. These observations do fit with the predictions of lithic parsimony, although one has again to address the amounts of variation within the specific Mousterian variants.

Increasing implement frequencies generally correlated well with increasing scraper frequencies in the Quina, Ferrassie and Typical Mousterian.

### Table 3. Mousterian assemblages used in analysis (MQ = Quina, MF = Ferrassie, MD = Denticulate, MT = Typical, MTA = Mousterian of Acheulian Tradition)

<table>
<thead>
<tr>
<th>Site</th>
<th>Variant/s</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combe Grenal</td>
<td>MQ, MF, MD, MT, MTA</td>
<td>Bordes unpublished</td>
</tr>
<tr>
<td>Abric Cannade Est</td>
<td>MQ, MF, MT</td>
<td>Bordeaux-Bordes 1989</td>
</tr>
<tr>
<td>Abric Chaudorne</td>
<td>MQ, MF, MD</td>
<td>Bordes, Fite and Blanc 1954</td>
</tr>
<tr>
<td>L'Ermitage</td>
<td>MQ</td>
<td>Bordes 1954b, Pradel 1954</td>
</tr>
<tr>
<td>Hautevorg</td>
<td>MQ, MD</td>
<td>Pradel 1957, Bordes 1957</td>
</tr>
<tr>
<td>Petit-Puymonen</td>
<td>MQ</td>
<td>Deport and Vandermeersch 1962</td>
</tr>
<tr>
<td>Mas-Viel</td>
<td>MQ</td>
<td>Niederleender et al 1956</td>
</tr>
<tr>
<td>La Vanzelle</td>
<td>MQ</td>
<td>Debeneditt 1968</td>
</tr>
<tr>
<td>Peche de l'Aze I, II, IV</td>
<td>MD, MT, MTA</td>
<td>Bordes and Bourdon 1950, 1951</td>
</tr>
<tr>
<td>Curbiac</td>
<td>MTA</td>
<td>Bordes 1954c, 1955, 1975, 1976</td>
</tr>
<tr>
<td>Grose Marcel Clozet</td>
<td>MTA</td>
<td>Bordes unpublished</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Debeneditt 1974</td>
</tr>
</tbody>
</table>
although they varied independently in the Denticulate Mousterian (as one would expect in a variant where scraper frequencies are low and are never more than denticulates) and in the MTA (data not presented) where hardly any correlation was possible. This independence is observable within assemblage variability. The reduction models have not paid sufficient attention to production. The reduction models have not paid sufficient attention to the role of other tool forms and unretouched flakes in inter- and intra-assemblage variability.

A final expectation is that one might expect greater occupational intensity to produce more occupational debris; in this case, one would expect larger overall quantities of raw material in the Charentian variants. One can control for sampling error to some extent on multi-layered sites where depositional history is understood and methodical excavation has taken place (e.g. Combe Grenal). Figure 2 presents the overall bulk of assemblages as the total of all lithic material from tools to debris. It can be seen that means

<table>
<thead>
<tr>
<th>Variant</th>
<th>Core Frequency</th>
<th>Implement Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQ</td>
<td>Mean 2.5</td>
<td>Stddev 0.9</td>
</tr>
<tr>
<td>MF</td>
<td>Mean 4.2</td>
<td>Stddev 3.2</td>
</tr>
<tr>
<td>MD</td>
<td>Mean 4.8</td>
<td>Stddev 3.1</td>
</tr>
<tr>
<td>MT</td>
<td>Mean 4.1</td>
<td>Stddev 3.9</td>
</tr>
<tr>
<td>MTA</td>
<td>Mean 6.07</td>
<td>Stddev 3.9</td>
</tr>
</tbody>
</table>

Table 4. Mousterian sites: Core and implement frequencies.

and ranges are generally similar, although the Charentian means are consistently lower than other variants. One would not expect this if the Charentian represents fairly intense seasonal use of enclosed sites and the Denticulate relatively sporadic use in a highly mobile context (Dibble and Rolland 1992). The high upper range of the MTA reflects the abundance of material at Corbiac M1, which is probably an extraction site and, therefore, sitting on the raw material source (Mellars forthcoming). Once again, clear patterns which one would expect from the reduction models are absent.

Discussion

It has been noted above that reduction models have been surprisingly well-received as a major factor of Middle Palaeolithic assemblage variability, despite having been tested against a relatively small database to date. The preliminary results presented here form part of a wider, ongoing enquiry into the effects of blank reduction on Middle Palaeolithic assemblage patterning, following the predictions raised by these models. The implications of tool reduction as a relatively unconscious process for archaic cognitive structures and pre-modern adaptations make such a critical enquiry a crucial factor in our understanding of Neanderthal behaviour and of the Middle to Upper Palaeolithic transition.

Data has been presented to test the predictions of the reduction models. Results generally did not support the predictions, or were open to simpler explanations. Some aspects of the models, notably the assumption of different attritional rates between distinct tool forms and the suggestion of a minimum prehensile limit to the reductive process fail to take the wider database into account and are, therefore, difficult to accept. Other predictions are either contradicted by the data or fail to be supported in any clear way. Thus, it follows that the reduction models simply do not account for major aspects of variation within and between assemblages. Perhaps the most relevant observation is that metrical differences between the various scraper forms tend to be fairly small, and that deviations from the mean tend to be high. This probably relates to the constraints of using relatively general flaking strategies as a response to small, irregular nodules of raw material. One might, therefore, expect the predictions of the reduction models to be masked to some extent by these mechanical constraints; if this is so, then aspects of the reduction models are inherently untestable. Our acceptance of tool reduction as a major factor of assemblage variability is premature for three reasons: the models are logically inconsistent; aspects of the predictions raised by the models fail to account for other data bearing on technological behaviour; and major predictions were either contradicted or failed to be supported in any clear way by the data presented here.

Interpretations of assemblage variation in terms of core and implement
frequencies remain provisional due to the currently poor understanding of sampling as a factor of variability. It has been shown that tool reduction cannot account for major aspects of such variability, and a more profitable means of enquiry could relate differing morphometric attributes of tool forms to the effects of primary flaking strategies. Such strategies, as noted above, seem to undergo cyclical change from the late Riss onwards, and may relate to conscious adaptation to raw material in the landscape and the overlying mobility strategies. It is therefore argued that interpretation at this more general level will provide more useful insights into Mousterian variability, and that the reduction models, concentrating as they do on the final phases of a chaîne opératoire are too narrow a concept from which to account for major aspects of variation. It follows that we should be cautious about placing too much emphasis on tool reduction and begin to understand the effects of conscious decision making from the onset of the chaîne opératoire, as an integral part of the Neanderthal adaptive system. We generally give credit to the success of the Neanderthal technological adaptation, now let us give them their consciousness.

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References


Farizy, C. 1990. Paléolithique Moyen Recent et Paléolithique Supérieur Ancien en Europe (Mémoires de Musée de Préhistoire d’Ille de France No. 3).


A New Variant on the Creswellian Angle-backed Blade

R. Jacobi, and A. Roberts

During recent excavations by the British Museum at Three Holes Cave in South Devon (Roberts 1992) a curved backed blade with a distal oblique truncation (Fig 1) was found stratified in an in situ Late Upper Palaeolithic hearth deposit located just outside the cave entrance. The object forms part of a small undisturbed lithic assemblage of Creswellian-type which appears to date to the early part of the Last Glacial Interstadial c. 12,500-12,000 BP on the basis of a series of unpublished AMS dates by the Oxford radiocarbon accelerator on humanly modified faunal remains.

The object is distinct from the large curved backed pieces of Azilian affinities found at several British Late Upper Palaeolithic sites, and tends to a pseudo-trapeziform outline. Since then other examples of similar curved and angle-backed pieces have been identified from several Creswellian sites in Britain (Table 1). We will argue that this tool-type is part of a continuum of forms of obliquely truncated and backed blades, including both Creswell and Cheddar points (sensu Bohmers 1956, 11), which are characteristic of the British Creswellian.

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Figure 1: Curved and angle-backed point from Three Holes Cave, Devon. Illustration by Karen Hughes.