
1. Behaviour and cognition in the Lower and Middle Palaeolithic: introduction

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Background

Behaviour and cognition have had variable attention and priority for Palaeolithic researchers since the origins of the discipline in the late 19th century. Although early work was dominated by the construction of evolutionary cultural frameworks based on lithic artefacts (de Mortillet 1872), pioneers such as Evans (1872), Spurrell (1883) and Worthington Smith (1894) were always keen to flesh out these cultural frameworks with behavioural details, and the refitting work of the latter two pre-empted the much later 20th century interest in this approach. Following the freshness and diversity of the early years of Palaeolithic research, came a long 'Dark Age', lasting until at least the 1960s in Europe, dominated by further refinement of culture-historical frameworks based on the typological and technological analysis of lithic material, with behaviour usually not addressed at all. This was the heyday of workers such as Breuil (1926; 1932) and Bordes (1950a; 1950b), culminating in publication of Bordes' typology (1961). At this early stage of Palaeolithic research, cognition was not an issue. Having recognized lithic artefacts such as handaxes as made objects, it was assumed that this made their makers essentially human, albeit technologically unadvanced.

The increasing sterility of this culture-historical approach to the European Lower and Middle Palaeolithic was shaken up in the 1960s by L. and S. Binford (1966; 1969) with their emphasis on the need to understand the dynamic processes, both hominid behavioural and natural depositional, behind the creation of the archaeological record as a prelude to interpretation of the static excavated evidence. The Binfords' interpretation of Mousterian variability as representing the habitual patterning within the landscape of different activities, reflected in different toolkits, did not merely emphasize the essential, but general, fact that artefacts were the product of behaviour. It drew attention to the significance of what the details of behaviour were. By presenting a model of Mousterian behaviour, this work put behavioural interpretation on the agenda as an archaeological goal of both interpretive significance for existing typological patterning, and

furthermore of more general interest and accessibility in its own right than typological counts and technological description.

The Binfords were also the first to emphasize the significance of whether it was justified to assume essentially modern human mental capabilities for early hominids, in the contexts of interpretation of both the earliest hominid sites in Africa (Isaac 1978; Binford 1981) and later Middle Pleistocene European sites. This is of course a fundamental issue for interpretive strategies, as favoured by the Binfords and subsequently L. Binford in particular (1978; 1983a; 1983b), based on ethnographic and anthropological studies in the present day as providing a useful model or frame of reference for the interpretation of archaeological remains of extinct hominids. All present day human populations share a package of cognitive capabilities that affects the patterns of their behaviour and their adaptations in different environments. Abilities to learn, to remember, to communicate and to plan ahead are essential in organizing the patterns of activity and mobility that underpin the continual acquisition of sufficient resources for survival, not to mention the equally important aspect of maintaining the social cohesion of a group. Activities take place within a matrix of purpose, and even if repeated patterns of behaviour become routine (cf. Gosden 1994), there remains an intelligent cognitive relationship with activities that allows sensible and flexible responses if the routine is interrupted by unexpected events. The truly routinized funnel-web spider will follow its innate web-building routine in a glass, and hence starve; whereas a human will not grimly sit behind the wheel of a car futilely pressing the accelerator when it runs out of petrol on the way to work, but will take intelligent actions to rectify the situation, despite its unfamiliar intrusion into the almost unconscious routine of the daily commute.

When it comes to the behavioural interpretation of the archaeological evidence of extinct hominid species, one needs to be wary of incorporating it into patterns of behaviour that presume, and require, modern human cognitive capabilities. Thus the behavioural interpretation

of any Lower/Middle Palaeolithic archaeological evidence is contingent upon a perspective upon cognitive capabilities and the consequent potential style of adaptation. Binford (1987) characterized this issue as a dichotomy between niche and cultural geographies of adaptation. Cultural geographies are symptomatic of a more cognitively advanced, modern human style of adaptation, with long-term planning, artefact curation and logistic organization of movement around the landscape. Niche geographies in contrast represented a more cognitively restricted style of adaptation, situationally driven, determined by, rather than mapped onto landscape, and limited to expedient *ad hoc* tool-manufacture, use and discard, and Binford emphasized that pre-modern hominids may be restricted to niche adaptations, lacking the capacities to plan ahead and communicate which underpin cultural geographic styles of adaptation.

Having recognized this as an issue in the interpretation of early archaeological evidence, it becomes necessary to confront the question of the trajectory of development of the modern human cognitive package, from its African origins in early hominines, through to the Old World expansion and settlement by a range of hominids and ultimately global colonization by anatomically modern populations. In Africa, site of the evolution of the hominid lineage, there was already longstanding debate on recognition of the origin of humanity, focused on the interpretation and nomenclature of fossil physical remains with criteria such as brain-size and tool-using taken as indicative of crossing a cognitive threshold (Leakey *et al.* 1964). Once this threshold had been crossed, workers such as Isaac (1978) felt comfortable, until the challenge of Binford, with applying essentially modern human cultural geographic concepts such as home-bases to the archaeological evidence. After the Binfordian bombshell, there had to be a wholesale rethinking of the formation processes of the earliest sites, the potential nature of early hominid behaviour and the development and nature of cognitive capabilities in the earliest African hominids, as well as subsequent species up to the development of anatomically modern forms early in the Late Pleistocene. Therefore, apart from their interest and significance in their own right, research into the mental abilities of early hominids and the evolution of intelligence (e.g. Gowlett 1984; Wynn 1985) also has fundamental relevance to the behavioural interpretation of archaeological evidence – research which, incidentally, identifies relatively advanced capabilities in Middle Pleistocene hominids, contradicting the perspective of Binford (1985; 1989), who emphasized their likely cognitive limitations.

In Europe, where the earliest archaeological evidence post-dates the early African evidence by at least 1–2 million years, and with a greater body of evidence from the Middle and Late Pleistocene, it was also initially taken for granted that even the earliest tool-using could be equated with modern human capabilities and interpreted on those terms. As knowledge of the European archae-

ological and fossil record increased, debate became focused upon the contrasts or otherwise between Archaic hominids (Neanderthals and their evolutionary predecessors *Homo heidelbergensis*), and anatomically modern humans who suddenly supplant them in the archaeological record. One of the great ironies of L. Binford's more recent views (1985; 1989) suggesting a major contrast in cognitive capability between Neanderthals and modern humans, is that his and S. Binford's demolition of Bordes' interpretation of contemporary Mousterian tribes was based on the presumption that 'the behavioural capacities of Neanderthal man were not markedly different from our own' (Binford and Binford 1969), contrary to L. Binford's more recent stance (1985; 1989).

This brief review of some of the historical background to the investigation of behaviour and cognition illustrates the fundamental inter-connectedness of these concepts and their essential relevance to a range of Lower and Middle Palaeolithic archaeological questions, raised in the context of African Pliocene/Lower Pleistocene and European Middle/Late Pleistocene studies but of wider general significance. This work has provided the foundations for subsequent approaches.

Current directions

In the African context, there is continuing focus on the development in the Pliocene or Lower Pleistocene of the advanced cognitive capabilities that distinguish the hominid line, and on the subsequent evolution of these abilities, and their relationship with skeletal evolution, material cultural development and climatic change (e.g. Wynn 1991; papers in Mellars and Gibson 1996). In Europe, debate continues to be structured by the intense history of artefact investigation. Typological and technological studies since the 19th century have provided a reasonably well-documented record of material cultural variability and change since the initial occupation of Europe early in the Middle Pleistocene. There is now increasing emphasis on behavioural interpretations of the Lower and Middle Palaeolithic archaeological record (e.g. Ashton 1998; White 1998; Wenban-Smith 2000), alongside continuing debate on the nature and extent of behavioural and cognitive contrasts between the Archaic hominid Lower/Middle Palaeolithic record and the anatomically modern human Upper Palaeolithic record (e.g. Hayden 1993; Mellars 1996).

This work has highlighted the enduring significance of the fundamental interdependence of cognitive capability and behavioural practices. In addition, it has brought out several other issues, many of which are addressed in the papers in this section. First, there is the fundamental conundrum of distinguishing between a *capacity for* more advanced cognitive capabilities and the *practice of* such abilities. Because certain archaeological evidence does not require more advanced

capabilities, it does not necessarily mean that such abilities were not present. Conversely, even if much archaeological evidence suggests limited abilities, expressed capabilities in some areas may reflect a latent capacity in others (although cf. Mithen 1996).

Second, there is a requirement for joined-up theorizing when it comes to modelling Archaic behaviour. There needs to be consistency in the powers we give our hominids as actors in their landscape. For instance if their artefact manufacture is restricted to blank-conditioned forms made expediently, they are unlikely to hold a detailed mental map of their landscape and its resource distribution. Conversely, if one accepts that their typological and technological prowess reflects relatively advanced cognitive capabilities, then their style of adaptation is more likely to reflect a cultural geographic relationship with their landscape, and need not be restricted to a wide geographic adaptation.

Third, when it comes to reconstructing behaviour, we can make a distinction between site-based narratives of place, and regionally integrated narratives of landscape. The former concern the dynamics of site use at specific locations; the latter concern how these are integrated into a wider model of behaviour across the landscape, and what style of adaptation is involved – a modern human cultural geographic, or a more cognitively restricted niche geographic. The former represent interpretation of those classic ‘moments in remote time’ (Roe 1980) and can be reconstructed from the relatively rare occurrences (at least in Britain) of undisturbed material, whether by refitting (e.g. Vallin and Masson, Chapter 2; Hallos, Chapter 3) or organizational approaches (e.g. Wenban-Smith 2000 and Chapter 5). A more challenging task is integrating these pinpoints of undisturbed activity into wider regional behavioural patterns and finding theoretical and methodological approaches to address, and incorporate in behavioural models, the much more prolific disturbed resource contained in contexts such as fluvial gravels.

Finally, both in the African and European contexts, we need to recognize that reconstructing past behaviours, cognitive capabilities and styles of adaptation is more complex than coming down on one side or other of a modern/Archaic human or an ape/Archaic dichotomy. At each major evolutionary stage, from the earliest hominids to the earliest anatomically modern forms, we are uncertain of the nature and extent of the changes in behaviour and cognitive capabilities accompanying these developments, and of any changes during periods of comparative stasis in skeletal evolution. In the north-west European context for instance, Wymer (1999) regards Archaic behavioural adaptations as having been essentially constant throughout the British Lower and Middle Palaeolithic, despite the climatic fluctuations of the period, the development of Neanderthal physiognomy and the accompanying development of flake- and core-based lithic technological strategies with a range of specialized Levalloisian and blade production techniques. As em-

phasized by Gamble (1996) it is time to move our focus from comparisons with modern capabilities at presumed thresholds at the beginning and end of the Archaic dynasty to exploring the nature of behaviour and adaptation, and the texture of its change, during this long and climatically varying period, when Archaic hominids successfully colonized much of the Old World from Wales to South Africa, and from Gibraltar to Beijing.

Arrangement of papers

The six papers in this section are united in their concentration on lithic evidence. This was not a deliberate policy, but merely reflects responses to the initial call for papers. Thus this section represents a predominantly lithic-oriented approach to the theme, without recourse to alternative avenues such as physical anthropology or comparative primatology (cf. Mellars and Gibson 1996). Under the umbrella of the topic, five of the papers share a deeper common theme, being concerned with the study and interpretation of undisturbed sites, whereas the sixth takes a more general theoretical angle, linking the investigation of debitage characteristics with a cognitive capacity for innovation.

The papers by Vallin and Masson (Chapter 2) and Hallos (Chapter 3) focus on individual undisturbed sites, in northern France and East Anglia respectively, concentrating on refitting sequences of reduction to investigate the intra-site behavioural dynamics and organization of the *chaîne opératoire*. The spectacular refitting results of Vallin and Masson’s work also highlight the puzzle of why the Lower and Middle Palaeolithic archaeological resource is so much richer in northern France than southern England. Is this merely a function of preservation, associated with the northern French loessic belt, or is there some real information here concerning population density, dispersal across the Channel or the impact of the (relatively minor) climatic and environmental differences between the two regions? Although not addressed in this section, this is clearly something to pursue in future work.

The papers by Pope (Chapter 4) and Wenban-Smith (Chapter 5) also focus on undisturbed sites – Boxgrove and Red Barns respectively, both in south-east England. Pope uses both refitting and handaxe distribution data from across the Boxgrove landscape to model the site formation processes, introducing the concept of intensity and longevity of site occupation as a key factor in site formation. Wenban-Smith also investigates the organization of the *chaîne opératoire* at Red Barns, but, in contrast to the other approaches to such sites applied in this section, relies on artefact attributes rather than refitted sequences as the key to identifying the stages of production present. This is not in any sense a rejection of refitting, but an alternative more economic approach to the recovery of gross organizational data. Such an approach may mask some dynamic complexity, but it can also reveal the broad organizational structure of on-site

production in sites less suitable for refitting, besides being less vulnerable to random factors of recovery that may disproportionately distort results relying solely on refitted sequences.

Ashton's paper (Chapter 6), rather than addressing a specific site, concentrates on the more general issue of the value of lithic refitting as an investigative method, a contribution stimulated by Mithen's (1998) challenge that refitting has to move beyond its 'gee-whizz' phase to exploring what can be learnt about past behaviour and cognition that is otherwise unavailable. As Ashton convincingly establishes, besides contributing to on-site behavioural studies (exemplified in the papers of Vallin and Masson, Hallos and Pope), refitting can provide significant information in the quite distinct areas of taphonomic integrity and technological reconstruction, with its implications for cognitive capabilities as applied to lithic artefact production. It is also worth considering whether the 'gee-whizz' issue is such a problem anyway. Ultimately archaeology is about engagement with the past and its evidence, particularly for the wider non-academic community in whose name so much archaeology is carried out, so one could suggest that anything with an intrinsic 'gee-whizz' factor should be gratefully received, and more academic benefits welcomed as a bonus.

The sixth paper by Cochrane (Chapter 7) comes from a different direction altogether, constituting a more general, ecologically-based consideration of the nature of, and influences on, behaviour as part of human adaptation. In many ways acting as a metaphor for itself, Cochrane's paper explores the role of diversity as a facilitator of productive innovation, outlining the theoretical justification for investigating variability in debitage production as indicative of a deeper capacity for innovation. This is situated within the context of the southern African Middle Stone Age, contemporary with the appearance of anatomically modern humans, and thus is squarely aimed at confronting the problematic issue of identifying the *capacity* for the development of typical modern human behavioural packages (or parts of) rather than their *actual presence* or practice.

Overall, the papers represent merely a part of the range of methods and agendas that can be addressed through the study of the lithic evidence, which is, it should be remembered, the most prolific, and often the only, source of information for 99% of human prehistory. There is an emphasis on the interpretation of undisturbed, or at least little disturbed, palimpsest horizons. Perhaps the key contribution such studies make is that, besides providing fascinating and accessible insights to narratives of place, they also provide a direct route to on-site dynamics and patterns of Archaic mobility across their landscape. This allows present day workers a chance to address Archaic behaviour, at least as reflected in lithic artefact manufacture and distribution, directly in its own terms, without having to presume a similarity to a pattern derived from, for instance, primatological or ethnographic studies.

Finally, although the emphasis here is, with the exception of Cochrane, on undisturbed horizons, this should not be taken as an indication that the more abundant evidence from transported contexts such as fluvial gravels has no potential for a significant contribution to Palaeolithic research. Disturbed material has often been implicitly, or explicitly (e.g. Wilkinson 2001), dismissed as of little significance, to the extent of being regarded as having no contribution to make. However, besides avoiding the risk of writing off large quantities of the finite Palaeolithic resource just because we don't yet know what to do with it (cf. Chippindale 1989), it is becoming clear that the study of such material in fact complements the evidence from undisturbed sites by bringing a different chronological and spatial perspective to bear. Collections of transported artefacts represent a time and space-averaged sample (cf. Stern 1993), giving a different, more representative, view of lithic production and diversity than the evidence from a few square metres representing one afternoon in the distant past. Such evidence may in fact be of more value in documenting and explaining general patterns of material cultural change, and understanding behaviour at more regional levels, since it is less vulnerable to local heterogeneity caused by, for instance, specific tasks or raw material availability. A key area for further research must be, therefore, to refine understanding of the spatial and chronological integrity of more disturbed deposits and to develop theoretical and methodological approaches to unlock the interpretive potential of their contained artefacts.

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