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Leiden**
The Netherlands

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Roebroeks, J.W.M.; Gamble, C.

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THE MIDDLE PALAEOLITHIC OCCUPATION OF EUROPE

edited by
Wil Roebroeks and
Clive Gamble



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1 The Middle Palaeolithic: a point of inflection

"So far we have only been able to follow the trail of Palaeolithic man, extracting what information we could from the implements dropped along the way; now...we enter a clearing, where we make acquaintance with the man himself, witness his feasts around his hearth, and contemplate the last ceremonies which attended him to the grave"

(Sollas 1911: 130 The Middle Palaeolithic).

1. Introduction

Archaeologists generally like to think in threes; Thomsen's three ages of stone, bronze and iron (1836), Morgan's ethnical periods savagery, barbarism and civilisation (1877), Childe's three revolutions Neolithic, urban and industrial (1935) and even Flannery's three combatants the Sceptical Graduate Student, the Real Mesoamerican Archaeologist and the Great Synthesiser (1976). Then of course there are the myriad divisions of periods and cultures into early, middle and late phases, for instance Lubbock (1865) and Westropp's (1872) Palaeo-, Meso- and Neo-lithic stages, or more recently the *sistema lógico-analítico* which divides the Palaeolithic into the bio-functional, the bio-morphotechnical and the bio-potential periods (Carbonell *et al.* 1995a; Vaquero 1992).

Three smacks of a job well done. Three also appeals to a higher authority. The anthropologist Ernest Gellner (1986: 78) whimsically labelled this the doctrine of Trinitarianism, which states that mankind passes through three and only three fundamental stages in its development. It is to be preferred to those who, misguidedly in his opinion, favour five. Grahame Clark's five technological modes (1961) would in our opinion be a good Palaeolithic example of two-too-many, since technology is more than just stone tools however well these survive.

The way we approach the whole sweep of human social development therefore colours the way we organise its internal investigation. But however right three may feel it is another matter entirely, as Gellner observed, if the three stages have been correctly identified.

2. 'The Palaeolithic occupation of Europe'

Palaeolithic archaeologists will instantly recognise familiar territory. The Lower, Middle and Upper Palaeolithic and the Early, Middle and Late Stone Age together with the Lower, Middle and Upper Pleistocene are essential building blocks

to understand the period. The pulling power of trinitarianism was obvious when we planned the three workshops in the European Science Foundation network 'The Palaeolithic occupation of Europe'. But our decision from the outset was to examine issues within each of the three periods rather than to discuss transitions.

Our first workshop at Tautavel in 1993 (Roebroeks and Van Kolfschoten 1995) dealt with the Lower Palaeolithic and took as its theme the earliest colonisation of Europe. The second, which forms the basis of this volume, was held a year later in Arras.¹ The focus was the Middle Palaeolithic and concentrated on biotopes and settlement patterns. Our aim was to establish the environmental tolerance of hominines during the period and to examine the variable pattern of settlement, both local and regional across the continent. The third workshop held in October 1995 at Pavlov examined the period from 30,000-20,000 years ago in the Upper Palaeolithic (Mussi and Roebroeks 1996; Mussi *et al.*, in press). The issues were cultural innovation, the distribution of population and the impact, if any, of a deteriorating climate on societies.

We also returned to many of the questions raised at the first two ESF meetings at a joint meeting, sponsored by the Römisch-Germanisches Zentralmuseum Mainz and the European Science Foundation, held at Schloss Monrepos, Neuwied. The conference examined the role of early humans in the accumulation of European Lower and Middle Palaeolithic bone assemblages (Gaudzinski and Turner 1996; Gaudzinski and Turner, in press). Gaudzinski's paper in this volume reports on some of those discussions.

3. Forget modern humans for a moment

The great interest in the origins of modern humans (for example Mellars and Stringer 1989; Trinkaus 1989; Mellars 1990; Aitken *et al.*, 1993) has relied heavily on Palaeolithic data from Europe. This important debate concerning continuity or replacement among regional populations polarised opinions about the respective capabilities – physical and cultural – of archaic and modern humans. Indeed we can see now that by focusing so strongly on the appearance and definition of modern humans our appreciation of the Lower and Middle Palaeolithic was

entirely coloured by the interest in characterising the event, and the process, summarised in such phrases as "the human revolution".

Our intention in the ESF network was to step back from this great question and re-examine the three periods on their own merits and for other issues. Once the teleology that modern humans will arrive in Europe is removed, and the comparative judgement that the Upper Palaeolithic will always look more complex than what went before is also suspended, then we can begin to deal with other issues that might, at a later stage, re-inform the main debate. This was our strategy in the Tautavel workshop. The contentious 'facts' concerning earliest dates and the human manufacture of disputed artefacts served to raise more interesting issues concerning the colonising abilities and environmental tolerances of Middle Pleistocene hominines (Gamble 1995a; Dennell and Roebroeks 1996) by contrasting the behavioural implications of accepting either a short or long chronology for Europe. However, subsequent discoveries seem to have returned the discussion to a national and regional auction for the oldest European (Roberts *et al.* 1994; Carbonell *et al.* 1995b; Roe 1995; Bermúdez de Castro *et al.* 1997; Pitts and Roberts 1997; Gibert *et al.* 1998) even though the maker of one of these early collections at Venta Micena is now identified by some as a horse rather than a hominid (Moyà-Solà and Köhler 1997; Palmqvist 1997).

Of course we have nothing against reliable new data and welcome clarification of chronological patterns. Where we are disappointed is that the use to which such data are put represents a poor return on the effort required to obtain them if they represent nothing more than a timetable (for example Bonifay and Vandermeersch 1991). The same could happen with the Middle Palaeolithic if the only reason for collecting data is to compare it either favourably against the Lower or unfavourably with the Upper Palaeolithic. All that would demonstrate is the fundamental fallacy of trinitarianism – where the inevitability of human progress is the sole lesson that archaeology, and particularly the Palaeolithic, can illuminate. That may be the reason why trinitarianism has appealed so much to anthropologists, historians, sociologists and archaeologists. Three steps to the present, three steps to modern humans, keeps the process simple and the progress palpable.

4. How many Palaeolithic periods?

But for the Palaeolithic archaeologist there is one small problem in this simple scheme of things; does the Middle Palaeolithic actually exist? Without a middle stage to the appearance of modern humans the inevitability of evolutionary progress collapses. We would be governed less by the classificatory structures we inherit and use and rather more by the issues we wanted to investigate.

For example, one of us (Gamble 1986: table 4.8) previously favoured a two stage Palaeolithic based on technology, Earlier and Upper, divided into four chronological periods. Here our interest was in tackling themes such as space and subsistence demography and style, society and settlement. We now see this differently (Gamble, in press). The tripartite division, Lower, Middle and Upper makes a good deal of analytical sense when it comes to tracing a single issue, Palaeolithic societies, and is easily supported by the rich, well-dated artefactual evidence that is now available.

Similar shifts in opinion about either two or three stages has typified the classification of the Palaeolithic. Indeed, the history of the term Middle Palaeolithic is very interesting as it also tells us something about the way this period – which is somehow 'betwixt and between' as well as 'take it or leave it' – has been addressed. As Mussi (this volume) comments it seems to be a difficult period just because it is in the middle. Our own, by no means exhaustive, survey of the literature shows Anglo American archaeologists adopted it much earlier than their continental colleagues. Sollas (1911) devoted an entire chapter to the period in the first edition of *Ancient hunters*. The Middle Palaeolithic is the time when the place of the handaxe is taken by the Levallois flake. By contrast Osborn, in *Men of the old stone age* (1915), was a supporter of a two period Palaeolithic, Lower and Upper. Perhaps such a magisterial conclusion swayed Sollas because in the second edition of *Ancient hunters* (1924) he dropped the Middle Palaeolithic as both a chapter title and as a period.² But on both sides of the Atlantic first Macalister (1921) and then MacCurdy (1924) followed his 1911 lead in their textbooks and stressed the importance of caves and Neanderthals for the Middle Palaeolithic period.

In Europe the term became *en vogue* from around 1950 onwards, and is associated with the increasing influence of François Bordes.³ There were earlier but informal uses of the term. For instance G. and A. de Mortillet in *Le Préhistorique* write about

"Le Moustérien ou partie moyenne du paléolithique"

which began

"avec la dégeneration du coup de poing et sa disparition progressive" (1900: 234).

The first formal and explicit proposal that we have uncovered comes from the German archaeologist F. Wieggers who considered the old division into two periods superseded. He proposed that a "Mittleres Paläolithikum" should be inserted between the Lower and the Upper Palaeolithic (Wieggers 1920: 89). However, even in Germany this division, though occasionally used (Schuster 1928: 48-50), did not become very popular (cf. Andree 1939: 142).

Three decades later Bordes provided a formal definition in his important paper on the ramifying character of industries in western Europe (Bordes 1950). He mentions typological and technological differences between Lower and Middle Palaeolithic industries and goes out of his way to show that Middle Palaeolithic industries – i.e. those with Levallois – are all post Rissian⁴. To do so he even develops an ingenious scenario to discredit the Saalian age of the German site Markkleeberg, with its abundant Levallois elements.

Grahmann, who exhaustively studied the Markkleeberg site (1955), was the first person to use the term Middle Palaeolithic in a way which goes beyond typology and technology to resemble, in many ways, the 'modern' usage of the term. In his *Urgeschichte der Menschheit* (1952) Grahmann characterises the Middle Palaeolithic by a focus on (Levallois) flake products rather than on handaxes, and chronologically covering the Rissian up until the middle of the last glaciation. In this period new habitats were occupied for the first time, for example mountainous areas and caves and significantly regional 'cultures' develop.

Nonetheless, some authors still preferred the twofold division, notably Breuil and Lantier in the 1959 edition of *Les hommes de la pierre ancienne*, and Müller-Beck, who, in the third edition of Grahmann's *Urgeschichte der Menschheit* states that developments in the Upper Pleistocene are a continuation of Lower Palaeolithic variability. He therefore considers the use of the term Middle Palaeolithic unnecessary and confusing (Grahmann and Müller-Beck 1967: 232). By then however the Binfords had entered the mousterian debate (1966) and the Middle Palaeolithic, defined in Bordes' famous *typologie* (1961), became an internationally hot research topic.

The modern usage can be conveniently traced to a volume examining Dorothy Garrod's contribution to the period (Ronen 1982). In particular the paper by Bosinski (1982), stemming from his major survey of the *Formengruppen* of the German Middle Palaeolithic (Bosinski 1967), identified the period as the first appearance of recognisable space-time groupings or cultures.

"The subdivision of our finds into different groups of industries starts with the Middle Palaeolithic. In our region [Germany] these are the Lebenstedt group and the Rheindahlen-type assemblage. This indicates the development of distinct areas of tradition and communication, which characterises the human way of life ever since" (1982: 167).

As recently put by Mellars in his exhaustive study of this phenomenon in France

"the only plausible explanation for these patterns lies in the notion of separate technological traditions – i.e. separate patterns of technological development, fostered by the variable degrees of social distance maintained between the human populations involved.

In this sense, the existence of a real element of 'cultural' patterning in the character of technological variation within the Middle Palaeolithic seems difficult, if not impossible, to deny" (1996: 355).

At the same time the Binfords' tool kits have also been updated (Kuhn 1995) while a lively debate revolves around the dietary habits of the Neanderthals (Stiner 1994; Marean 1998).

5. The Middle Palaeolithic: core properties, timing and development

Throughout this volume the term Middle Palaeolithic is used in the sense employed by the authors in Ronen (1982). It is a stage anterior to the Upper Palaeolithic where lithic assemblages are characterised by a high proportion of standardised flake-supports and flake-tools. These are based on débitage which generally, but not always, involves the Levallois technique. In general terms the period is characterised by long-term technological stability. At a synchronous level, however, considerable technological variability can be found. As noted above the geographical recurrence of tool forms provides, for the first time, cultural groupings at a regional rather than continental scale (Clark 1982, 1988). Regional variability exists in the choice of *chaîne opératoire*, either *débitage*, *façonnage* or *trifacial* (Turq, this volume), the use of secant and migrating plane technology (White and Pettit 1995), and within Levallois the selection of linear or recurrent sequences (Boëda *et al.* 1990; Boëda 1993). Moreover, the repeated presence of blade forms at a small number of sites in Africa and Europe provides another instance of such regionalisation (McBurney 1967; Singer and Wymer 1982; Conard 1992; Révillion and Tuffreau 1994).

The appearance in southern England of Levallois technique in terrace deposits dated to OIS 8, c. 300,000 years ago (Bridgland 1994), indicates a chronological span of some 250,000 years. This places the Early Middle Palaeolithic at the beginning of the continental Saalian complex cold stage as seen at Mesvin IV (Cahen and Haesearts 1984; Cahen and Michel 1986).⁵ Good agreement can be found in many of the papers in this volume. Svoboda (Central Europe) and Vega Toscano *et al.* (Iberia) both give time ranges of 300 Kyr to 30 Kyr bp. Turq (Aquitaine) agrees, even though in lithic terms the beginning of the early Middle Palaeolithic is blurred in this region by the southern Acheulean.

From the next warm temperate phase, OIS 7, a number of well-dated Middle Palaeolithic industries are known, e.g. Ehringsdorf in Germany, Maastricht-Belvédère in the Netherlands and Biache-Saint-Vaast in northern France (Roebroeks and Tuffreau, this volume). This pattern continues through OIS 6 and OIS 5.

There is a qualitative and quantitative change in the archaeology of the period after 70,000 years ago, the division

marked by OIS 4 and the onset of severe Pleniglacial conditions. This is also the beginning of the Late Middle Palaeolithic whose start date has recently received greater significance with the volcanic winter model (Ambrose 1998). The largest Pleistocene volcanic eruption occurred at Toba, in Sumatra, at 71 Kyr bp and may have affected regional archaic populations in Southeast Asia, South China and India. The eruption influenced global climate by exacerbating the shift to glacial conditions. Taken together these events might have produced a bottleneck effect for African populations of *Homo sapiens sapiens* surviving in the largest areas of tropical refugia. It is noticeable that the expansion out of Africa of modern humans at 100 Kyr currently does not reach much further than the Middle East. It is the expansion post-Toba at about 50 Kyr which might be much more significant for re-colonising parts of the Old World and expanding into territories previously uninhabited by hominines.

Europe escaped Toba's thick ash deposits which covered parts of Asia but not the impact of this volcanic event on global climate. Refugia in southern and Mediterranean Europe become important between 70 and 50 Kyr bp. Since these refugia are in limestone regions the places where material survives now changes dramatically. Even so it is apparent that the contexts from which we retrieve the archaeology of these Neanderthal refugia often represent only very short pulses of sedimentation, and thus only stand for short periods of Pleistocene time, most of which is represented by sedimentary hiatuses rather than by gradual sedimentation as previously supposed (Laville *et al.* 1980). This is exemplified by Turq's paper (this volume); in particular the new interpretation of the profile of La Micoque and the sequence at the lower abri of Le Moustier. Rather than representing gradual sedimentation over quite long periods of time, the sediment build-up is seen at both sites as fast, intermittent and episodic. This of course has implications for our view of the archaeology of such sites and the inferences this allows concerning mobility and settlement (see below).

The Late Middle Palaeolithic, often synonymous with the Mousterian, still has the Levallois and all of Bordes' five tribes (1968: 98), some of which can be found in the previous 200,000 years. But added to this are novel aspects at the site and regional level. At the site level we find burials, as at Le Moustier, La Chapelle-aux-Saints, and La Ferrassie in France (Smirnov 1991; Defleur 1993) and less certainly at Saint-Césaire (Vandermeersch 1993) and Altamura in Italy (Ventura 1993) although complete skeletons are present. There are also well-constructed fire places as at Vilas Ruivas in Portugal (Vega Toscano *et al.*, this volume). At a regional level there is greater movement of raw materials over longer distances (Féblot-Augustins, this volume). There is also first

time occupation on the Russian plain extending as far as the Urals (Praslov, pers. comm. 1994). Absolute dating is still tricky for this period but a recent calibration curve suggests that the majority of our information probably falls in the interstadials that punctuated the period between 60-40 Kyr (Van Andel 1998).

6. Biotopes

One of the purposes of the Arras meeting was to explore the geographical limits of Middle Palaeolithic foraging and its environmental constraints. The 'beginning' of the Early Middle Palaeolithic roughly coincides with the first unambiguous presence in western Eurasia of a biotope that has become known as the Mammoth-steppe (Guthrie 1984, 1990). This was a highly productive habitat which supported a very diverse grazing community with the mammoth as its characteristic species. The mammoth steppe stretched from Cantabria to Alaska.

According to Van Kolfschoten (1990) the fauna from the German site Ariendorf 8 which includes *Dicrostonyx*, *Lemmus lemmus*, *Mammuthus*, *Coelodonta antiquitatis* and *?Rangifer tarandus* (Turner 1990, 1991) is one of the first cold stage faunas in Europe with a composition indicative for a mammoth-steppe environment (cf. Kahlke 1994). The Ariendorf I fauna ties in well with the first appearance of *Mammuthus primigenius* during OIS 8 and the contemporaneous immigration of *Coelodonta antiquitatis* into western parts of Eurasia. This timing probably represents the earliest extension of the mammoth steppe this far to the west (cf. also Roebroeks and Van Kolfschoten 1995: 309, note 8). The key property of the mammoth steppe, as explained by Guthrie at the workshop, was the 'plaid' structure of the vegetation which supported both the megafauna and large herds of mixed ungulates. Using a wide array of data, Jaubert (this volume) characterises the result as a geoclimatic mosaic. This structure resulted in environmental resilience to short-term fluctuations in climate. In particular the animal populations, while subject to cycles of population expansion and decline, were able to weather perturbations by adjusting the combination of grazers and browsers, single and multiple stomach ruminants, odd and even toed ungulates, as well as stature and size of taxa in the *Mammuthus/Coelodonta* community. These changes reflect varied selective factors such as snow cover, precipitation, length of season, herb layer, rodent numbers, temperature and wind strength.

Within the monolithic concept of the mammoth steppe we can uncover a good deal of variation relating to a model of settlement ebb and flow. This can be translated into phases of refugia and expansion. Contraction of population into refugia must have been a feature of the glacial climates in OIS 4, 6 and 8. However, while interstadial conditions prevailed in these stages and during the two very different interglacials,

OIS 7 and 5e, population most probably expanded into previously abandoned territory. In this regard Turq's refuge hypothesis developed for the Aquitaine basin (this volume) makes two important predictions for further examination; cold periods should see an increase in both the number of sites and very rich assemblages. This represents an important start in turning archaeological data into long-term demographic estimates. What we need are more accurate estimates of the amplitude and duration of climatic oscillations within these rather monolithic cold and warm deep-sea stages.

Mussi (this volume) also uses the rich Italian palaeontological record, dated OIS 5 to OIS 3, to provide an assessment of hominine ecology. From her sample of 119 sites, 17% with lithics, she found that more carnivores were invariably matched by more human presence. This supports earlier studies by Miracle (1991) and Gamble (1995b) where increased carnivore presence is indicative of resource rich areas. Late Middle Palaeolithic hominines preferred to be in the thick of the action. They were not relegated to marginal zones but competed with other social carnivores and omnivores for the optimum habitats.

But if ebb and flow describes Neanderthal occupation patterns at a regional and continental scale (Gamble 1986) then the limits need to be explored. Exactly what the environmental limits of Middle Palaeolithic hominines were is debated, and in particular their ability to cope with climax-interglacial forested environments (Gamble 1986; Roebroeks *et al.* 1992). This debate has more productively turned into questioning the nature of our environmental reconstructions (Van Andel and Tzedakis 1996). How, for example, do we turn the various data from pollen, small mammals etc. into archaeologically useful data on the structure and productivity of former environments?

The problem is highlighted by the two Middle Palaeolithic interglacials; OIS 7, which probably correlates with an intra-Saalian warm-temperate phase and the Eemian, OIS 5e, the last interglacial. These have been described as a low- and a high-sea level interglacial respectively, both on the basis of oxygen isotope data (Shackleton 1987) and palynological data, with *Abies* present north of the Alps during interglacials with a marine ingression in the coastal areas of Western Europe (see Roebroeks *et al.* 1992 for a discussion of the differences and their archaeological visibility; Zagwijn 1992).

OIS 7 has been subdivided into three major sub-stages with substage 7b representing a short ice age lasting 15 Kyr and commencing at 230 Kyr bp (Andrews 1983). The end of OIS 7b is dated by the single grain $^{40}\text{Ar}/^{39}\text{Ar}$ technique and has been applied to the Ariendorf 8 site in the east Eifel volcanic field. The technique has dated the Hüttenberg (H) tephra to 215 ± 4 Kyr bp (Van den Bogaard *et al.* 1989).

This tephra is found in the transition between a loess and a palaeosol indicating a transition from cool to temperate conditions. The full OIS 7 lasted from 242-194 Kyr and further sub-stages are indicated which mirror the fivefold pattern in OIS 5 (Bassinot *et al.* 1994).

Assigning archaeological sites to these three sub-stages is proving difficult. Most sites are simply 'interglacial in character' with floral and faunal remains very reminiscent of earlier travertine sites in Germany such as Bilzingsleben (Mania 1995). But what is surprising is that for such an isotopically 'weak' interglacial (Shackleton 1987) the faunal and floral evidence is either equivalent to, or greater than, temperatures and tolerances in both the present and the last interglacial which have a very 'strong' isotopic signature.

For example, at the lakeside site of Neumark-Nord in eastern Germany the vegetation was dominated by oak, hazel, hornbeam, yew, lime, box and holly. Pond tortoise (*Emys orbicularis*), regarded as a good indicator of full interglacial conditions (Mania *et al.* 1990; Mania 1991), is also present which is one reason why most Quaternary scientists would prefer to see this site as OIS 5e (Vandenberghe *et al.* 1993). But pond tortoise has also been found at another OIS 7 locale, Maastricht-Belvédère (Van Kolfschoten and Roebroeks 1985). If its eggs are to hatch it requires a mean July temperature of 17-18°C, combined with a considerable amount of sunshine with few damp, cloudy or rainy days. These temperatures are in excess of today's (Stuart 1982). The travertines at Stuttgart-Bad Cannstatt (Reiff 1986) also contain this taxon along with leaves and fruits of box (*Buxus sempervirens*) and other oak mixed forest elements. These tree taxa are also present in the lower travertine at Ehringsdorf (Steiner and Wagenbreth 1971). Remains of macaque monkeys (*Macaca* sp.), indicative of forested conditions have been found in the oceanic interglacials OIS 11 and OIS 9 in northern sites such as Bilzingsleben and Swanscombe. But this species is also found in the more continental interglacial of OIS 7 at Hunas, a collapsed cave in Bavaria, where an upper molar of *Macaca* cf. *florentina* occurs in levels above a stalagmite floor with a Thorium/Uranium date of 260 Kyr (Carls *et al.* 1988; Groiss *et al.* 1995). Curren (1989) lists macaque in English faunas which may be of similar age to Hunas.⁶

High resolution evidence from the Greenland Ice Core project (GRIP 1993) has enabled a detailed sub-division of the 10 Kyr of OIS 5e in the Summit ice-core. Climate in Greenland during the last interglacial was characterised by a series of severe cold periods, which began extremely rapidly and lasted from decades to centuries. For its last 2 Kyr the Eemian was interrupted by a series of oscillations apparently reflecting reversals to a mid-glacial like climate. Importantly, Dansgaard *et al.* (1993) suggest that apart from the Holocene, instability has dominated the North Atlantic

climate over the last 230,000 years, i.e. during the Middle Palaeolithic.

What all this tells us is that interglacial climates fluctuated with rapid internal shifts of temperature. These changes happened within the lifetime of individuals. One event at the end of OIS 5e1 lasted only an estimated 70 years but saw the oxygen isotope values plunge to mid-glacial levels (GRIP 1993: 206). Hominine adaptation to several millennia of constant climate, sea level and presumably plant cover is looking less and less likely as a scenario for the period 300-60 Kyr bp.⁷

Therefore the two factors which characterised Middle Palaeolithic biotopes were resilience and instability. Some indication of their impact on Neanderthal societies can be seen in a north south transect provided by the papers in this volume. In the north, Roebroeks and Tuffreau for France and Svoboda for the Czech Republic reconstruct occupation as mainly interstadial or temperate in character. Moreover what was favoured were the mosaic conditions that increased ecological productivity. In the Czech Republic this was assisted by topographic diversity as suggested elsewhere in Europe and the Ukraine by Soffer (1989: 724, 1994)

Continuing the transect to the south are the papers by Jaubert and Turq for Aquitaine. Here Soffer's model is well supported by the density of find spots. Interestingly the preserved deposits come from caves, abris and *avens*. Their survival emphasises that occupation took place in cooler conditions. The number of interglacial occupations is very small by comparison. In our opinion this emphasises the refuge status of this oceanic moderated corner of Europe.

The third leg of the transect is Iberia (Vega Toscano *et al.*) and Italy (Mussi). Here the biotopes also formed refugia, for plants and animals, during northern and Alpine glaciations (Tzedakis 1993; Tzedakis and Bennett 1995). In Iberia the recovery of open sites as well as caves and abris is particularly striking when compared to southern France. In Italy, as Mussi has argued previously (1995), the topographic diversity of the peninsula encouraged resilience in the occupation of hominine populations by imposing a mosaic of possibilities.

7. Settlement patterns

At Arras the reconstruction of biotopes raised, as expected, more questions than answers. We suspect that this is partly due to the lack of precision in reconstructions but also to the concepts which archaeologists bring to the analysis of hominine/environment interaction. The dominant view is very much one of external selection where at best (and usually not before the Upper Palaeolithic) hominines played a game against the environment. This is most strongly seen in the attempts to analyse settlement patterns and landscape use in terms of decisions based on reproductive success linked to

feeding strategies (Bettinger 1991). The results strike us as curiously data free since the models from evolutionary ecology are so strong that testing them with the taphonomically-riddled samples of prehistoric hunters and gatherers almost seems superfluous. Alternatively, and Mussi (this volume) takes one of these approaches to task, the decisions are reduced to such basic subsistence needs in order to address taphonomic issues (Stiner 1994) that often all we seem to learn is that people ate, which is hardly very revealing about the hominine condition. Especially when, as Mussi points out, the choices by pioneering archaeologists about what bones to keep unintentionally produced a dismal picture of Neanderthal dietary success for the archaeozoologists of the 1990's.

Rather than games-against-nature we would suggest a change in focus and view the environment in a mutual relationship to the hominines we study. Such an approach stems from the work of J.J. Gibson and in particular his last book *The ecological approach to visual perception* (1979). Instead of treating the hominine and the environment as separate, Gibson asks us to acknowledge what our visual sense tells us; that the one does not exist without the other. Instead they exist in a mutual relationship acting *on* and acting *with* each other. In perceptual terms the animal touches and is surrounded by its environment. We are in contact with our environment because that is how we see it, as occlusal edges and surfaces. Quite simply, our understanding of the world is based on what we see, what we can become involved with. For example, Gibson is not interested in the laws of physics which tell us in good cartesian fashion that matter cannot be destroyed, only its state altered. An example is someone eating an apple. In perceptual terms that apple *has* disappeared. What was a persistent surface has vanished (Reed 1988: 285). We do not need to explain its disappearance since it happened before our eyes.

Such elision does not mean that we need to abandon the quest for decision rules (Mithen 1990) but rather that the Palaeolithic hominine is no longer just playing catch-up to adapt to a changing climate. Rather they changed *with* rather than *because* of such shifts. This rather different view of ecological processes also suggests that the perception of environments by hominines was probably more important than their cognitive appreciation of them. What is appealing for Palaeolithic archaeologists about this approach is that perception is another of those intellectual anchors (Binford 1983) which allow us to make strong inferences about the past based on uniformitarian assumptions. The hominine mode of perception, as Gibson pointed out, is ambulatory. We are bipedal with forward facing eyes and a head that can swivel to change the optical array. This is how we see the world and how all European hominines have seen the world.

To walk between the rock shelters of the Dordogne or around the excavations of Maastricht-Belvédère is to perceive an environment in the same way as any Middle Palaeolithic hominine. As Reed puts it, observers have a *path* not a *point* of view. Because these paths intersect the environment of one animal becomes the environment of all animals (Reed 1988: 297).

Of course any landscape will have changed, especially over 250,000 years. But the process of direct perception, whereby we pick up the affordances, or use values, the landscape possesses, has not. Direct perception is one of Gibson's most important but controversial ideas. Basically he argued that the information contained in an animal's environment, be they either 'natural' or 'cultural' items, does not need a prior mental model for their meaning to be decoded. We do not need a mental plan to guide our actions because perception is a process of action determined by our mobility. We perceive the world as we go about our daily lives of living in it. Therefore,

"the structures and meanings that we find in the world are *already there* in the information that we extract in the act of perception; their source lies in the objects we perceive, they are not added on by the perceiver. Therefore perceiving is, *ipso facto*, knowing" (Ingold 1992: 46).

By contrast a cognitive approach to the past can make no such uniformitarian assumption and is difficult to test (Mithen 1997).

In the same way Ingold has drawn attention to the taskscape where people attend to each other as they go about their daily routines (Ingold 1993). Here the emphasis is on sound, an aspect of perception not covered by Gibson. The sounds of flint knapping, children playing and animals calling are all part of the audible rhythms which establish the taskscape and which result from action and movement.

Kolen's discussion (this volume) of Middle Palaeolithic settlement evidence provides another example of such mutual involvement between an organism and its environment. Rather than looking for deliberate, planned structures that meet our criteria of architecture or camp-sites he instead proposes that what patterning we do find in caves and open sites is best interpreted as *centrifugal living structures* where spatial patterning resulted from moving materials outwards in the context of carrying our tasks. He concludes that such Middle Palaeolithic structures were never really finished because they were never planned. Rather they changed continuously due to repeated use and the mutual interplay between the individuals and their environment. The patterns provided their own affordances for subsequent action. In that regard they are different to the notion of primate nests created as individual sleeping or resting places because those Middle Palaeolithic actions were social as well as technical.

This in turn suggests that descriptions of Neanderthals as 'tool assisted hominids' (Binford 1989) may be conceptually limiting for our understanding of their spatial data. However, the intermediary character of these centrifugal living structures remains. They have more complicated life histories than a chimp's bed but yet do not carry that symbolic sense of 'home', with its connotation of dwelling, that distinguishes our use of place and space from the nest of a bird or the hive of a bee (Ingold 1992).

Beyond the level of the site, ambulatory perception and the mutual environment suggests a model of settlement location and landscape use which is linked to animal tracks and hominine paths. Here for example is a route out of the debate concerning the occupation of interglacial forests, reviewed above, as well as a way round the pitfall of 'common sense' approaches to Palaeolithic land use as discussed by Roebroeks and Tuffreau (this volume). When the debate began about the habitat tolerances of archaic hominines (Gamble 1984) the model of landscape use was still one based on the principles of site catchment analysis (Vita-Finzi and Higgs 1970; Bailey and Davidson 1983). Time and distance provided a prism (Carlstein 1982) through which palaeoenvironments around sites could be investigated, typically as a set of concentric resource zones. While these exploitation territories were internally assessed in terms of the zonation of food resources, the model necessarily stressed the central functions of sites (but see Sturdy 1975). This had the result of making the pattern of land use seem like that of agriculturists with its optimising approach to continuous parcels of land.

However, among foragers these mutual environments are not surface-area territories, as traditionally conceived, but rather paths between locales (Ingold 1986: 152; Gamble 1998). Tenure in such societies "is not of surface-area, but of sites and paths within a landscape" (Ingold 1986: 153).

Leroi-Gourhan foreshadowed this argument in *Le geste et la parole*, (first published in 1966), with a discussion comparable to Gibson's ambulatory perception,

"We perceive the surrounding world in two ways, a dynamic one whereby we travel through space to take cognisance of it and a static one that enables us, while remaining immobile, to reconstitute circles around ourselves extending to the limits of the unknown. The first offers an image of the world linked to an itinerary; the second integrates the image within the two opposing surfaces of sky and earth meeting at the horizon" (Leroi-Gourhan 1993: 325-6).

As the result he concluded that, "the nomad hunter-gatherer visualised the surface of a territory by crossing it; the settled farmer constructed the world in concentric circles around a granary" (*ibid.*: 327).

From this perspective the occupation, or not, of the interglacial forests can be re-examined. The question has less to

do with overall prey density, aggregation and mobility, crucial to assessing how hominines played the game against the environment (Jochim 1976), than with the frequency with which their tracks crossed the paths of hominines.

Environmental reconstructions do not need to specify precisely the type of forest but rather the length of the path and the affordances it encounters. As Roebroeks and Tuffreau (this volume) conclude "these open corridors through forested areas must have acted as a kind of highway for Pleistocene hunter-gatherers". The rest of the forest remains unvisited and uninhabited. The path is the territory (Bahuchet 1992) and will be abandoned, lengthened, shortened or redirected depending on the frequency of the tracks which cross it. Neither does the lack of trees matter. Seeing a wider vista does not affect the way mobile peoples move across a landscape. They still construct an itinerary (Brody 1981) because of ambulatory perception. They will always do so irrespective of such cognitive measures as planning depth and memory.

The papers in this volume present abundant evidence to support a path rather than a catchment model. In particular the overview provided by Féblot-Augustins and the regional syntheses of Turq, Jaubert and Svoboda point to the potential with their studies of raw material transfers. When allied with other seminal work by Geneste (1988a, b), Floss (1994) and Roebroeks *et al.* (1988), we can move rapidly away from such 'common sense' models of Palaeolithic land use as catchment analysis. Mussi's final comment (this volume) that the Middle Palaeolithic hominines were more wolf than ape in their use of shelter is borne out by range sizes reconstructed from raw material transfer data (Gamble and Steele 1997). Within such large ranges we now expect well-trodden highways (Roebroeks and Tuffreau, this volume). Lake (pers. comm. 1994) has used a computer based simulation approach to examine how information is acquired and used in such habitats. His results emphasise the importance of the social context for sharing knowledge about itineraries constructed by individual hominines.

At the Arras workshop the problem of Middle Palaeolithic settlement was presented by Roebroeks as a dichotomy between walking stomachs and talking heads. In the former the emphasis is on proteins, exploitation and landscapes filled with resources. With the latter the accent changes to meaning, ritual landscapes and the giving environment (Bird-David 1991). We believe that a move to path models allows us to capitalise on the many excellent studies which have focused until now on the walking stomachs part of the dichotomy (eg. Gaudzinski, this volume). In particular this shift in emphasis allows us to see the mutual relationship between hominines and their environments as discussed above. We therefore move from a cartesian separation of the mind from the world to a more inclusive view of human

action as in, of and with the world rather than separate from it (Gamble 1998). The prospect is for a more interesting set of Middle Palaeolithic hominines than we previously have from our detailed reconstructions.

8. The Middle Palaeolithic and the qualities of primeness and protection

We now illustrate this approach with two qualities which, from our reading of these papers, characterise the Middle Palaeolithic. These are *primeness* and *protection*. Such qualities are expressed through skills which leave residues. But first we have to be reminded about our scales of analysis and resolution.

At Arras we discussed how to make use of the different chronological envelopes in which our data comes. For example, in the Late Middle Palaeolithic of Iberia (Vega Toscano *et al.*, this volume), Aquitaine and Italy there are comparatively few well-preserved activities which can be measured in the minutes it took to perform them. Instead it is the northern region in our transect which due to sedimentation in open sites preserves such fine-grained, precisely timed events; for example flint knapping at Wallertheim (Conard and Adler 1997) and Maastricht-Belvédère (Roebroeks and Tuffreau, this volume) or aurochs butchery at Neumark-Nord (Mania *et al.* 1990). The link between the data which took minutes and the evidence which represents an accumulated thousand years is provided by the scatters. As Svoboda (this volume) points out those travertine sites of Central and eastern Europe are very useful for making the bridge within a single depositional environment. Such variation between regions in Europe has to be borne in mind when assessing hominine capabilities just as the different environmental selection pressures operating between the regions of Palaeolithic Europe (see above) resulted in different adaptations.

But what have we learnt from these varied samples about Middle Palaeolithic capabilities, what we prefer to call skills rather than adaptive strategies? Skills have to be learnt and practised. They provide individuals with a means of creating an identity through performance and repetition. For present purposes we distinguish two skills, *generic*, or transferable, and *specific* which are relevant to this discussion.

Generic skills can be employed in very different environmental settings. Examples would include searching for food, co-operating in its acquisition and sharing the results. The manufacture and use of stone tools was embedded in such generic skills in the form of a social technology (Gamble, in press). Creating and following paths in the landscape would be another skill that was dependent upon knowledge and the transmission of information via social networks. Variation in scale is expected but as we have seen (Féblot-Augustins; Svoboda, this volume) can also be explained in terms of ecology.

By contrast, specific skills are historically developed at particular places and in distinctive contexts. These are ways of doing things which are very local in performance, application and transmission. Such specific skills may be created many times in different places; the Middle Palaeolithic blades, discussed above, would be one such example. These specific skills are what makes the ethnographic record such a cultural kaleidoscope or the world of the last glacial maximum so polyphonous (Gamble and Soffer 1990). The papers in this volume identify specific skills in the Late Middle Palaeolithic of Europe, particularly in the discussion of settlement by Jaubert, Vega Toscano *et al.* and Mussi. Specific skills, but employing different forms of performance and transmission, are a feature of the Upper Palaeolithic. They are less apparent in the Early Middle Palaeolithic (Roebroeks and Tuffreau, this volume) and apparently absent in the Lower Palaeolithic, where a transect over a huge ecological gradient from Olduvai to Swanscombe reveals very little that can be classified in this way (Gamble 1997).

The papers in this volume allow us to elaborate on these skills. Firstly, there is a quality in the Middle Palaeolithic of primeness which expresses aspects of the generic skills which these hominines transferred within Europe. Primeness can be seen in the choice and selection of animals and raw materials; an appreciation of resources that now involves repeated methods of acquisition (Gaudzinski, this volume) and distribution (Féblot-Augustins, this volume) throughout the continent. These data allow us to recognise such generic skills. They make it possible to infer the quality of primeness which is the affordance, or use value, of the hominines' environment which they directly perceived. We would also cite the link between Levallois and the transport of tools around the landscape as another example of a generic skill where primeness is being stressed. In his study of raw materials in Aquitaine, Geneste (1989: 83) shows that the most mobile elements of any mousterian technology, as judged by the use of distant raw materials, involve Levallois elements. While the wider importance of Levallois has often been seen as indicative of linguistic capabilities, based on assumptions about the pre-planned intentions of the knappers (Noble and Davidson 1996: 200-1), it now seems more fruitful to examine the technique in terms of the skills individuals learnt as they trod their habitual paths. The link between technology and resources is well made. The choice of prime aged animals, often taken in large numbers or on many occasions is well made by Gaudzinski (this volume) and illustrated by Jaubert's discussion of locales such as La Borde where 93% of the bones are aurochs with an MNI of 40. The age profile points to a selection of prime aged animals between 2 to 6 years old. Primeness could further be tested by sex and condition.

Protection is the other quality we identify. It is thoroughly examined by Mussi who contrasts concepts of home and mobility now tethered to the needs of the Neanderthals' young. Such specific skills allied to locales differentiated the local regions created by hominines as they trod their paths. While these places remain undecorated, some of them were marked in distinctive ways. In the Late Middle Palaeolithic the creation of place and the embodiment of this quality can be traced through the burials. In contrast to the Upper Palaeolithic the burials of the Late Middle Palaeolithic are all found in caves and abris. No open air graves with elaborate structures and grave goods have yet been found before 30 Kyr bp and none with Middle Palaeolithic associations. The lack of overt symboling is a distinctive feature of the Middle Palaeolithic. What symbols existed were embodied rather than externalised. This pattern reflects the importance to Middle Palaeolithic hominines of intimate and effective networks where the resources used to create and reproduce such societies are emotional and material rather than symbolic (Gamble 1998). However, as they were almost certainly equipped with language to express and create these intimate and effective networks, we must expect highly varied personal histories and identity among the stones, bones and apparently limited spatial patterning which we investigate. Just because there are no huts, art or triple burials does not mean that they were without a social life or that it was not complex. Protection is merely a summary of the skills which we need to be reminded about and which we need to devise ways of investigating. One such example is provided by Kolen's model (this volume) of centrifugal living structures which judges the evidence on its own terms rather than imposing a set of criteria which, as we pointed out at the beginning of this introduction, make the Middle Palaeolithic nothing more than a yardstick for measuring the arrival and sophistication of modern humans.

On the contrary, these specific skills may well point to an internal dynamism in the Middle Palaeolithic that is currently only accorded to the Upper Palaeolithic. This is reflected in the historical development of these societies, not necessarily from outside influences and contacts, as suggested for Arcy-sur-Cure (Hublin *et al.* 1996) although these were undoubtedly important, but from *within* as Kolen suggests. As Farizy noted at this important site there are major differences between the mousterian and châtelperronian levels.

"The changes seem to relate rather to a different quality of life, in which the immediate surroundings of the human groups – the habitation zone – was perceived in a totally different way. Analogous changes can be seen in the character of the lithic industries, in which the forms of the tools appear to have a new, exclusive significance" (Farizy 1990: 325).

Her lead in recognising the Middle Palaeolithic as a point of inflection in hominine prehistory now needs to be pursued. Where this inflection falls, at the beginning of the late Middle Palaeolithic rather than at the Middle/Upper Palaeolithic transition, or even the fuzzy boundary of the Lower/Middle Palaeolithic, is not so important as recognising the task we are now setting ourselves to investigate the Middle Palaeolithic on its own terms. Trinitarianism, thinking in threes, will still serve us well in pursuing fresh questions with Palaeolithic data.

notes

1 The Arras meeting (18-20 November 1994) was hosted by Alain Tuffreau, assisted by Agnes Lamotte and Jean-Luc Marcy. A post-conference excursion visited the palaeolithic sites at Cagny and Abbeville, while Tuffreau and his colleagues enabled the participants to study the excavated material from Biache-Saint-Vaast, Cagny, Seclin and Riencourt-lès-Bapaume. Participants were, in alphabetical order: G. Bosinski, V. Cabrera-Valdes, J. Féblot-Augustins, C.S. Gamble, R.D. Guthrie, J. Jaubert, M. Lake, L. Larsson, M. Mussi, N. Praslov, L. Raposo, W. Roebroeks, M. Santonja, M. Sparreboom (ESF), J. Svoboda, A. Tuffreau, A. Turq, and G. Vega Toscano. (Invited, but unable to attend: G. Bailey, M. Cremaschi, C. Farizy, S. Mithen).

2 His change of mind probably also owed much to the work of Victor Commont in the Somme who is heavily cited in both editions.

3 By contrast, McBurney's (1950) geographical paper finds the Middle Palaeolithic uncontroversial.

4 In a paper written for the Darwinian centennial Bordes reveals his full trinitarian credentials inherited directly from Lubbock, "Can we distinguish any particular direction or tendencies in the general evolution of prehistoric cultures? I believe so. It seems possible to distinguish three great cycles which developed in parallel fashion...the Lower and Middle Palaeolithic...the Upper Palaeolithic-Mesolithic...the Neolithic" (1959: 109).

5 Bosinski (1982: 165) divided the Middle Palaeolithic as follows: Early Middle Palaeolithic of the Riss (Saale), Middle Middle Palaeolithic of the Riss/Würm (Eem), Late Middle Palaeolithic of the Würm (Weichsel). The Saale complex is now recognised as more than just the penultimate (Riss) glaciation and comprises OIS 8, 7 and 6.

6 Macaques are interesting because after hominines they are the most successful colonising primate. Their appearance across a wide range of latitudes contrasts markedly with other tropically based primates in both the New and Old Worlds. It is very possible that their social temperament has much to do with this expansion and as such they may serve as a better analogue for early human societies than previously believed (Y. Marshall pers. comm.).

7 It needs stressing that such short-term oscillations have not been reported from terrestrial records. Indeed, subsequent research of climate fluctuations and other records accounts for the discrepancy between the terrestrial and ice core records through the movement of the warm Norwegian current during the Eemian, possibly caused by the input of large amounts of fresh water from the North Pacific. This created cold water masses near Greenland and so affected the oxygen isotope composition of the source region for precipitation in the Summit area (Larsen *et al.* 1995; Johnsen *et al.* 1995). But these oscillations had little effect on the climate of the European mainland (Litt *et al.* 1996).

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Clive Gamble
Department of Archaeology
University of Southampton
Highfield
SO17 1BJ Southampton
United Kingdom

Wil Roebroeks
Faculty of Archaeology
Leiden University
P.O. Box 9515
2300 RA Leiden
The Netherlands