UNIVERSITY OF SOUTHAMPTON
SCHOOL OF HUMANITIES
ARCHAEOLOGY

Transitions, Change and Identity: the Middle and Upper Palaeolithic of Vasco-Cantabrian Spain.

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Thesis submitted for the degree of Doctor of Philosophy

September 2004

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF ARTS

SCHOOL OF HUMANITIES

Doctor of Philosophy

TRANSITIONS, CHANGE AND IDENTITY: THE MIDDLE AND UPPER PALAEOLITHIC OF VASCO-CANTABRIAN SPAIN.

By Fiona Susan Coward

Current thinking in the Palaeolithic divides the archaeological record into a succession of discrete 'cultures' defined in terms of lithic industries, thus creating 'points' of 'transition'. At the infamous 'Middle-Upper Palaeolithic transition' the problems of this approach are exacerbated because the transition being debated is central to our own identity and thus has a long history which strongly influences our current thinking about the 'nature' of humanity. As the 'transition' from animal to human, Neanderthal to 'modern' is seen as being both behavioural and biological, differences in the archaeological record have been explained away as being caused by 'evolution', applied in a simplistic *post hoc*, accommodative way.

This 'top-down' perspective assumes qualitative differences between Neanderthals and 'modern' humans, particularly in terms of their mental abilities regarding abstract thought and the ability to structure or 'design' activities that occur at some 'distance' in time and/or space. Such assumptions are dangerous in the limitations that they place on the interpretation of the record – hominids, sites, industries, etc., can only ever be 'modern' or 'non-modern', with both categories pre-defined and pre-'explained'. In this thesis I argue that, rather than assuming such differences, 'bottom-up' approaches need to be developed to reconsider the archaeological record of the 'transition' in terms of people, movement and activity.

I argue that both hominid and human populations were inevitably immersed within a four-dimensional world as a fundamental fact of their existence and that, crucially, these ecosystems are not individual and discrete but are inescapably shared with other 'persons', whether these are hominid or human, animal, mineral or vegetable, with whom we interact on a daily basis. Thus the archaeological record represents four-dimensional structures of peoples' habitual, daily activities, comprised of movement and interaction within a four-dimensional ecosystem: the constitutive parts of identity and personhood.

The faunal assemblages from individual sites can therefore be seen as demonstrating the signatures of certain kinds of interaction, providing clues to the 'place' and 'time' at which they occurred and therefore to the kinds of movement and interaction that constituted the identities and personhoods of the people who deposited material there.

In this thesis I present a methodology for considering some of the potential paths of movement and activity centred on some of the Palaeolithic sites from Vasco-Cantabrian Spain, along with something of the flavour of the qualities of interactions that occurred between the populations who lived there and other persons and types of person in that ecosystem. The results demonstrate the way in which fragments of the narratives of the lives of persons in prehistory can be re-presented, and highlight the potential of this methodology for reconsidering the lives of past populations and the similarities and differences of Neanderthals and 'modern' humans.

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DECLARATION OF AUTHORSHIP

I, Fiona Susan Coward, declare that the thesis entitled 'Transitions, Change and Identity: The Middle and Upper Palaeolithic of Vasco-Cantabrian Spain' and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University;
- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- Where I have consulted the published work of others, this is always clearly attributed;
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- None of this work has been published before submission.

Signed: [redacted]

Date: 4th February 2005

ACKNOWLEDGEMENTS

This thesis was funded through a studentship awarded by the Arts and Humanities Research Board. Fieldwork was also supported by small awards from the Department of Archaeology, University of Southampton.

I owe a huge debt to my supervisor Prof. C. Gamble, without whom this would never have happened, and my advisors Dr J. Weinstock and especially Dr R. Hosfield for GIS hand-holding above and beyond the call of duty. Members of the archaeology department, CAHO and the postgraduate office too numerous to mention have assisted with various aspects – thanks to all of you. Sterling proof reading work was done by Dr N. Sykes and Dr J. Chambers (although obviously all errors remain my own!). In particular I would like to thank Dr J. Chambers who read the whole thing from start to finish and kept me more or less sane and extremely well fed throughout, ably aided and abetted by Dr A. Field and E. Gittins as well as the rest of Study Room 1 and the Crown team.

The final mention of course goes to my family for their rather bemused but invaluable support and encouragement throughout – this thesis is dedicated to them.

"In Ersilia, to establish the relationships that sustain the city's life, the inhabitants stretch strings from the corners of the houses, white or black or grey or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency. When the strings become so numerous that you can no longer pass among them, the inhabitants leave: the houses are dismantled; only the strings and their supports remain

... Thus, when travelling in the territory of Ersilia, you come upon the ruins of the abandoned cities without the walls which do not last, without the bones of the dead which the wind rolls away: spiderwebs of intricate relationships seeking a form"

Italo Calvino, 1974: *Invisible Cities*, Picador: London, pp. 62.

"*Field* deals with the world both as made up of things, of objects and bodies, and of space, physical space and the space of consciousness, the limitlessness of the human imagination"

Adrian Searle, 2004. In *Anthony Gormley, Field for the British Isles*. Arts Council Collection.

CHAPTER ONE: THE CONCEPT OF CHANGE IN PALAEOLITHIC ARCHAEOLOGY

The notion of change is central to archaeology. Yet despite this, explicit consideration of the concept itself and of the mechanisms behind it remains rare within the discipline. This thesis was originally intended to contribute to the study of the transition from the Middle to the Upper Palaeolithic. However, it rapidly became apparent that without an explicit theory of change, the notion of 'transitions' was at least highly problematic.

Change in the Palaeolithic is still mostly 'explained' either by traditional culture-history approaches, in terms of changing 'social' and 'ethnic' groups or 'cultures', or by evolutionary and Processualist theories, in terms of continuing adaptation to changing environments. In this chapter I argue that in Palaeolithic archaeology, a largely tacit consideration of change in these overly narrow terms has reified the notion of 'transitions' as 'events' requiring special explanation. It is argued that normative, typological chronological systems create – or at least exaggerate – 'transitions' in prehistory.

Such a paradigm is unhelpful in many cases, and particularly as a way of investigating the replacement of Neanderthals by modern humans. This thesis considers other ways of thinking about change in the archaeological record and particularly the Palaeolithic and their implications for the concept of archaeological 'transitions'

1.1. EXPLANATIONS OF CHANGE IN ARCHAEOLOGY

A history of archaeology is a history of how archaeologists deal with change: the concept of 'change' has been central to archaeological thought since the very beginning of the discipline. As Preucel and Hodder have stated, 'Archaeology obtains much of its disciplinary identity from the study of how and why cultures change'

(1996: 205; see also Shanks & Tilley, 1987a: 137; Gamble, 1999). However, explicit discussion of the concept of 'change' and its use in archaeology remains rare – although this situation is now beginning to change (see for example Field, 2002; Gittins, 2002; Jones, C. 2002).

1.1.1. The 'culture-history' paradigm

Traditional archaeological explanations of change were provided by culture-history approaches, relying on the identification of formal variation and particularly - for the Palaeolithic – lithic variation in the archaeological record as a convenient way of establishing a chronology. This established the role of archaeology as the documentation (rather than explanation) of sequential (rather than changing) 'cultures' identified by material culture patterning combining recurrence in time with distribution in space.

In this paradigm, normative groupings of material culture were identified as 'cultures' in the archaeological record and explicitly assigned to self-aware social groups (e.g. Childe, 1929; v-vi). The concept of 'change' is limited to the explanation of the replacement of one such group with another – usually by diffusion of people (see e.g. Schumann, 1997: 260). Archaeology was thus a particular instance of taxonomic study revealing 'natural order' – linked with the pervasive idea of 'progress' (Binford, 1983: 81): the goal of archaeology was thus the documentation of the actual sequence of progressive change (*ibid.*: 83), often linking the discipline with racist ideas about the relative 'achievement' of various 'cultures' in the present as well as the past. Sollas' *Ancient Hunters* (1911), for example, draws elaborate parallels between contemporary hunting societies and their prehistoric counterparts, equating Tasmanians with Acheuleans, Australian Aborigines with Mousterians, African Bushmen with Aurignacians, and the (superior) Inuit with Magdalenians.

In a cautionary tale for archaeology, when approached from the progressive culture-history paradigm 'the empirical materials seemed to be in tune with the older evolutionary ideas' (Binford, 1983: 86), and the earliest typological systematics (e.g.

de Mortillet, 1883), were based on the concept of *fossils directeurs*, with one industry succeeding another in a logical, linear and 'evolutionary' procession (Schumann, 1997). However, work by a new generation of - primarily Palaeolithic - archaeologists including Breuil and Bordes began to demonstrate that 'the stratigraphic sequence of changes in the forms of stone tool assemblages was not necessarily directional, nor did it appear to represent either gradual or transformational patterns of change' (Binford, 1983: 91; see also Schumann, 1997). Their recognition of parallel 'phyla' in Palaeolithic lithic industries was hugely significant: as Dorothy Garrod put it, 'New knowledge has given a twist to the kaleidoscope, and the pieces are still falling about before our bewildered eyes' (1938, quoted Binford, 1983: 86). However, despite her insistence that the divisions should not be considered as rigid and independent (*ibid.*), archaeologists continued to treat these new 'cultures' in much the same way as the previous concepts of 'peoples' or 'species' (*ibid.*: 87), and Binford's rejection of Bordes' Mousterian tribes was perhaps the real beginning of an explicit rejection of culture history and 'social' explanation in the Palaeolithic (Gamble, 1999: 3).

1.1.2. The 'New' Archaeology and Processualism

The 'new' and Processual archaeologies of the 1960s thus developed in opposition to these culture-history approaches, making an explicit commitment to study prehistoric change. Rather than being seen as a 'complex of associated traits' (Childe, 1929: v-vi), 'cultures' came to be regarded as a 'system' that could be broken down into a number of separate subsystems - ecology, technology, society etc. and considered in functional terms as a means of adaptation to the natural environment. In short, 'behaviour is adaptive in the Darwinian sense and to be related ultimately to genetic fitness' (Jochim, 1998: 13). Cultural change thus becomes the by-product of continuing adaptation (Preucel & Hodder, 1996: 206), and the notion of 'change' as an archaeological concept remains unchallenged.

Such a paradigm underpinned the work of anthropologists in the 60's and 70's measuring the various costs and benefits of particular 'cultural' activities such as subsistence, and the formal economic principles derived from these were applied cross-culturally in archaeology to explain particular cultural strategies from the assumption that, in the long term, behavioural strategies attempt to optimise rates of return as a proxy for reproductive success (see e.g. Lee, 1968; Yellen, 1991a, 1991b): in evolutionary terms, the ultimate benefit is survival to pass on one's genes, and the ultimate cost extinction. In archaeological terms, it is assumed that only successful behaviours/social systems survive to be visible in the archaeological record, and that there is no archaeological record of failure.

General concerns with the inadequacy of data and with the definitions of 'success' and 'adaptiveness' motivated the development of more sophisticated theories of economic formalism and evolutionary ecology including optimal foraging theory (e.g. Winterhalder & Smith, 1981) and sociobiology (e.g. Standen & Foley, 1989; see e.g. Ellen, 1996 for discussion). However, it was not until the post-processualist critique of the 1980s and 90s that the basis of these formalist paradigms, and of objectivist theory and methodology in general, was questioned.

The major focus of the critique was the assumption that social functions are always secondary to ecological necessity. However, critique also came from *within* the objectivist fold, as models based on formal economic assumptions failed to predict empirical ethnographic patterns (Ellen, 1996: 98). By itself, the concept of 'efficiency' is not a sufficient 'explanation' for behaviour (see e.g. Allen, 1989, 275-6).

1.1.3. Post-processual theory

'Post-processual' theory, rather than being a cohesive movement in the same mould as, for example, the earlier 'New' Archaeology, is probably best described in the plural as a loose collection of approaches linked by a general agreement that change is 'best evaluated with regard to changes in social and political organization' (Preucel & Hodder, 1996: 206). These approaches, now widespread in archaeology, draw more from the theory of the 'social' disciplines such as sociology and social anthropology than from the natural sciences which provide the basis for processual and evolutionary paradigms to argue that economic and evolutionary theory deny the 'agency' of essentially active, intelligent individual at the heart of the decision-making process in prehistory (as today) in favour of a heavy emphasis on 'process' and 'systems' as the prime movers of human history. In emphasising the embeddedness of western science in modern society and power relations, these criticisms also took the more general form of a virulent polemic against all things 'scientific', and some of the more extreme critics dismissed 'scientific' paradigms in archaeology as distorting the past for ideological and/or political ends (e.g. Shanks & Tilley, 1987b; see Renfrew, 1994: 9 for discussion).

It has been suggested that the historical, post-processual and the evolutionary, processual paradigms could be reconciled by regarding them as complementary and relating to different scales, 'since social evolution addresses short-term social dynamics and cultural evolution, particularly with its focus on selection (either natural or cultural), deals with the long-term persistence of cultural forms' (Preucel & Hodder, 1996: 217; see also Bailey, 1983). However, the continuing stand-off between these strands of thought relates to fundamentally different ideas about the kinds of questions that archaeologists should be asking of the archaeological record.

For the 'historical' post-processualists, the discipline's subject is 'human experience' (Shanks & Tilley, 1987a) – in contrast, 'scientific' processualism 'necessarily sacrifices concern for the individual human' (Straus, 1991: 67) to address the long-term processes of change patterning the archaeological record (*ibid.*): 'evolutionary explanation', rather than 'cultural interpretation' (Miracle, 2002, 65). While such paradigmatic gulfs remain, it seems unlikely that there will be any rapprochement of the two 'sides' - see for example Wobst's (2000) discussion of the arguments surrounding the use of the word 'behaviour'. Because of its particular interpretation by Processualists, the word became a 'red flag' for an overly mechanistic treatment of past humans, but has since been re-appropriated by agency and action theorists, following Giddens, and is now widely used to mean very different things by both sides of the debate.

1.2. WHY IS THERE NO SOCIAL ARCHAEOLOGY OF THE PALAEOLITHIC?

The development over the last 20 years of a 'social' archaeology has, however, largely been restricted to later periods of prehistory and historical archaeology. Agency theories and 'social' explanations of change have not been a significant part of Palaeolithic research (Wobst, 2000: 43) until very recently - some examples include Charles' work considering 'ethnic signatures' as enacted through butchery practices (2000) and Dobres' on the social relations of hunting and butchery (2000), both in the Magdalenian. There is also a new concern with scales (see e.g. Pike-Tay, 2000), sequences and chaîne opératoires (Dobres, 2000; Jones, M. 2002 – see also other papers from the same volume).

It is, however, notable that virtually all of these examples are from the Upper Palaeolithic (see Gamble, 1999: 1). In addition, a significant number of these examples are zooarchaeological in nature; despite Rowley-Conwy's protestations that zooarchaeology is inevitably empirical (and thus Processual) rather than 'impressionistic' (and thus post-processual) in nature (e.g. 2000: ix), a number of zooarchaeologists have recently begun to make inroads into traditionally post-processual territory, addressing 'social' questions through the study of animal bones (see e.g. Murray, 2000; Politis & Saunders, 2002; Serjeantson, 2000; and papers in Miracle & Milner, 2002).

With the exception of studies of Palaeolithic art (e.g. Conkey, 1982; Leroi-Gourhan, e.g. 1968), the only notable non-zooarchaeological 'social' archaeology of the Palaeolithic is that of Sinclair (2000; again, dealing with the Upper Palaeolithic), Gamble (1999; see also 1996; dealing partly with the Upper Palaeolithic, but also extending back to the Middle and Lower Palaeolithic of Europe), and Field (2002), whose work deals with the lithic record of the Middle Pleistocene of Africa and Europe.

So why is there no social archaeology of the Palaeolithic? Part of the explanation often given for this 'obvious unease with alternative interpretations among

Palaeolithic archaeologists' (Gamble, 1995: 87) is the nature of Palaeolithic data, 'those mere fragments of stones and bones' (Wobst, 2000: 43). According to this 'scraps of data' argument (Gamble, 1999: 5; see also 1998), Palaeolithic archaeologists need more, and 'better', data before those questions considered important in the post-processual paradigm, such as issues of agency, can be addressed (e.g. Legge, Payne and Rowley-Conwy, 1998: 92; see also Wobst, 2000: 43; Clark, 2001a: 139). As long ago as 1951 Childe wrote that

> The archaeological record is found to be regrettably but not surprisingly deficient in indications of the social organisation or lack of it in lower palaeolithic hordes. From the scraps available no generalizations are possible (1951: 85).

Twenty-two years later, Leach was continuing the theme, arguing that although archaeologists were aware of

> the paucity of their evidence and … take legitimate pride in the ingenuity with which they apply scientific procedures so as to make the most of such evidence as they have. … all the ingenuity in the world will not replace the evidence that is lost and gone for ever, and you need to be on your guard against persuading yourselves that you have discovered more than is actually discoverable (1973: 769).

Such considerations have been argued to justify the fact that 'investigating society in the Palaeolithic has never achieved the same research prominence as studies of the subsistence economy, the spatial analysis of settlements, cave art or lithic typology and technology' (Gamble, 1999: 1), the more archaeologically 'achievable' rungs of Hawkes' 'ladder of inference' (1954). However, a number of researchers are now beginning to argue that 'empirical insufficiency is only part of the problem' (Clark, 2001a: 139; see also Miracle, 2002: 85).

In addition to the perceived taphonomic issue, Gamble argues that the Palaeolithic is commonly considered as somehow less *active* than later periods, with the goal of research implicitly seen as the uncovering of the foundations of the 'civilising' process which leads to a more active later prehistory (1999: 5; also Gittins, 2002). This division of the past into 'active' and 'passive' periods creates what Gamble refers to as a 'moving interpretive curtain' (*ibid.*). Until recently, this was located between the Mesolithic and the Neolithic, but as first the Mesolithic and then the Upper Palaeolithic were reclaimed as peopled by active agents, the 'curtain' has settled at the Middle/Upper Palaeolithic boundary, for reasons which will be discussed more thoroughly in Chapter 2. On the passive 'origins' side of this boundary, agency and 'social' explanations of change are seen as less persuasive than economic and evolutionary ones.

In short, then, despite the success of the relativist post-processualist critiques since the 1980s, the Palaeolithic has remained dominated by the objectivist Processual agenda, and a continuing sterile opposition between 'impressionistic' post-processual concerns, attempting to address meaning, and 'empirical' Palaeolithic data, used to elucidate behaviour, has resulted in a marginalisation among Palaeolithic researchers of the theoretical debates current among researchers in other periods.

1.3. WHY A PROCESSUAL PALAEOLITHIC IS NO LONGER SUFFICIENT

Explanations of change in Palaeolithic archaeology thus remain largely uninfluenced by the post-processual critique, and are dominated by those drawn from culture-history and evolutionary paradigms, whereby 'cultural' change is seen as a by-product of continuing adaptation to maintain efficiency in the face of changing environments. Such a view, post-processualists argue, has encouraged an overridingly deterministic view of humans - and especially pre-humans.

1.3.1. Criticisms of the formal economic approach

However, as discussed above, criticisms of formal economic and evolutionary approaches came from inside as well as outside Processualism (e.g. O'Brien & Holland, 1992) to question the archaeological application of formal economic models based on an assumption of 'efficiency' as a major determinant of behaviour. What, exactly, is being optimised? Certainly the 'calorific obsession' (Jochim, 1998: 20) has been broadened to consider a detailed composition of the diet (e.g. in terms of protein and fat percentages), and other currencies in which to measure 'costs' and 'benefits' have been proposed (energy, time, risk, reliability, security etc., e.g. Speth, 1983; Jochim, 1998; Cachel, 2000). As noted above, these are proxies for reproductive success, and when used archaeologically, are themselves studied via further proxies (e.g. prey weight, population density, non-food benefits, pursuit and processing costs etc.; Jochim, 1976; Mithen 1990), and in recognition of this and the complexity of ethnographically documented subsistence strategies, a rigid focus on measuring subsistence along a single dimension of efficiency to achieve 'optimization' been replaced – or at least supplemented – with the concepts of 'meliorisation' (Mithen, 1990: 32) and so-called 'satisficer' solutions (Simon, 1976) – that hominids and humans in prehistory simply aim to do 'as well as they can'.

However, even these approaches remain tied to western economics, and although certainly such analyses have provided much useful data, in fact these explicitly economic models seem to represent a confusion of cause and effect. The patterns apparent in archaeological data may *look* economical and efficient, but this is largely a function of archaeologists' collapsing of temporal and spatial variation into typological units (Conkey, 1987; see also section 2.5.). Processual models, operating on grand temporal and spatial scales, do not account for small-scale variation (*ibid.*: 72). When the starting point is an assumption that the behaviours apparent in the archaeological record are 'efficient', there is really nothing further to investigate in the past; while formal economic approaches to Palaeolithic research and particularly to Palaeolithic subsistence have certainly provided valuable data on the energetic demands of particular behaviours and the ways in which individuals and societies deal with limited temporal and energetic 'budgets' to meet their goals, however defined, they all too frequently result only in sterile descriptions of the activities pursued – doubtless highly efficiently - at various sites.

It is certainly true that the individuals in hunting and gathering societies are keenly aware of the 'best' ways to go about acquiring 'necessary' resources, and that this information forms part of folk knowledge about the world and influences the ways in which aspects of the world are thought about (Berlin *et al*, 1973; Dupré, 1981; Hunn, 1982; Clark, 1988). However, more recent work has drawn from ethnographies that have moved away from traditional functional analyses of behaviour, and as regards subsistence behaviour, for example, has begun to document some of the ways in which peoples' attitudes to and perception of animals affects their interactions with other species. Such information has considerable significance for the ways in which faunal material enters and is recovered from the archaeological record. For example, anthropologists have repeatedly documented how hunting and animal processing behaviours are affected by factors such as gender, status and prestige negotiations and culturally-specific notions of 'correct' behaviour (e.g. Tambiah, 1969; Berlin, 1973; Berlin *et al.*, 1973; Douglas, 1975, 1990; Bulmer, 1976; Dupré, 1981; Riches, 1982; Sharp, 1991; Ridington, 1999). Of course, it is not possible, or even necessarily a valid goal, to divorce subsistence behaviours entirely from economic factors. However, given the ethnographically documented importance of 'social' factors in subsistence behaviours, there seem to be more questions to ask of the archaeological record than just how many calories were consumed. The rational and calculating *Homo economicus*, 'subjecting his decision-making to rational calculation ... performing roles or acting in conformity with models' (Bourdieu, 1977: 30) is thus little more than a straw man.

So while formal economic approaches to the Palaeolithic have a great deal to tell us, it is apparent that they do not necessarily address the factors perceived as important by the creators of the archaeological record. Archaeologists are missing out on a number of important issues if they cling to strictly economic approaches to the past, and such an emphasis has led to a 'very narrow view of what the data can tell us about' (Gamble, 1999: 8). Recent attempts to incorporate such data into archaeological analyses of subsistence includes emphases on the social aspects of, for example, the butchery and division of carcasses (e.g. Enloe, 1992; Boyd, 1999; Charles, 2000; Murray, 2000) and disposal of remains (e.g. Wilson, 1996, 1999; Whittle, Pollard & Grigson, 1999) to provide a much fuller account of prehistory.

1.3.2. Criticisms of the evolutionary paradigm

Perhaps more fundamentally, many critics (again, both Processual and post-processual) have also identified more fundamental flaws in the evolutionary paradigm as used by Palaeolithic researchers to justify this focus on economic efficiency.

As an 'explanation', adaptational and evolutionary rhetoric can be teleological in the extreme; the assumption is all too often that 'if a particular strategy exists, it must be adaptive in some way' (Preucel & Hodder, 1996: 207; see also Shanks & Tilley, 1987a: 153), and evolutionary theory is used as little more than a justification for 'just-so stories' (O'Brien & Holland, 1992: 36-7) about the course of human history.

The assumption that 'culture' *is* the adaptive system in question - one promulgated by the New Archaeologists following Binford's comment that culture is humanity's extrasomatic means of adaptation to the environment' (1962) - has led to a paradigm in which the concepts of adaptation and evolution become 'an ex-post-facto argument aiding "explanation" of change among prehistoric groups' (O'Brien & Holland, 1992: 35). 'Change' in the archaeological record is tautologically 'explained' away as 'evolution', and evolution reduced to typology. As Shanks and Tilley have argued, although the New Archaeology originally aimed to explain change, 'Paradoxically, as utilized, it is a conservative theory of persistence and stability' (1987a: 139).

In such a paradigm, stasis, or 'equilibrium', is seen as the 'norm' for cultures and for species. 'Change' is thus external to the system, separated from human action (hence the critique of 'agency' theorists, and evolution becomes merely a property of long periods of time (Field, 2002; see also Davidson, 1991: 195). The sterility of the culture-history/evolutionary framework as used in archaeology – which does not necessarily reflect the evolutionary concepts as used in other disciplines (see sections 1.5.1. and Chapter 2) – is a major concern. By its assumption of homeostasis as a preferred 'natural' state of 'culture', the paradigm implies cognitive or social conservatism and even stagnation, with change only possible when provoked by external mechanisms.

However, archaeologically, stasis is perhaps more of a problem than change (Shennan, 1996: 284). As Allen argues, 'The real message of the new concepts in science is that change and disequilibria are probably more 'natural' than equilibrium and stasis' (1989: 276), and in fact, as his work demonstrates, equilibrium models are in fact far from satisfactory in practice (*ibid.*: 260).

In the current Processual/evolutionary paradigm, ' culture' is seen as static, and change is equated with evolution - either as punctuated equilibrium, with 'transitions' representing a static 'jump' from the 'stasis' of one 'culture'/species to another, or as gradual evolution, with the first form phasing or morphing into the succeeding one (Field, 2002). However, to view the archaeological record in this way is to accept the monolithic and homogenous analytic divisions of the archaeological record, to accept the equation of the fuzzy taxonomy of archaeological 'industries' and 'cultures', with 'the material remains of identity-conscious social units of some kind' (Clark, 2001b: 43), and this is highly problematic.

1.4. CULTURES, CHANGE AND 'TRANSITIONS'

The equation of evolution and culture which has shaped the framework in which we understand the Palaeolithic reflects a particular conceptualisation of change and variation in material culture whereby 'the Palaeolithic' is divided up by formal variation in lithic technology into a series of discrete industries, static segments of time and space that are considered to represent homeostatic 'cultures'.

The assumption of cultural homeostasis allows Palaeolithic archaeologists to generate chronological 'time-slices' on the basis of shared form and lack of variation in artefacts. However, as discussed above, stasis is more difficult to explain than change; Wobst argues that the laws of thermodynamics imply proportionate variation in other aspects of Palaeolithic lives which is not being sampled and which is thus ignored in analyses of Palaeolithic societies. Alternatively, he suggests, the artefact/element of analysis may in fact be analogous to a 'neutral gene'; lack of variation or change may in fact be 'simply due to the fact that they did not interact significantly with anything of importance' (Wobst, 1983: 225). The logocentic, essentialist typological units thus created act to 'collapse time and/or space, and are all too often reified: we do not refer to Magdalenians but to "the Magdalenian"' (Conkey, 1987: 69).

In this way a great chunks of prehistory are reduced into discrete blocks of time and space, distracting archaeologists from questions about variation, discontinuities and process, and 'how we – much less *they* – get from one pattern or "system" to another' (Conkey, 1987: 69). Such periodisations are created by our classificatory practices, an attempt to 'order the confusingly large amount of historical data and developments into more or less digestible time-slices' (Roebroeks & Corbey, 2001: 67): our divisions of the archaeological record are never neutral or objective.

> How scholars draw these boundaries reflects the various paradigms within which they work ... Paradigms, therefore, have a strong effect on how boundaries between objects (tool types, cultures, etc.) and individuals (species, subspecies, races, etc.) are constructed (Schumann, 1997: 254).

Perhaps archaeological 'periodisations' are indeed best described as 'fossilized expectations' or 'working hypotheses' (Roebroeks & Corbey, 2001: 67), being 'really only gross abstractions and temporary expedients' (Wobst, 1983: 224). As Schumann concludes, 'Classifications, once thought to be 'neutral' devices and independent of theory, have now become as paradigmatic as the interpretations themselves' (1997: 261).

The debate is of more than just semantic concern. With the Palaeolithic divided up into 'boxes' of succeeding, static, 'cultures', '[e]xplanation consequently focuses on the transformation of one such "box" into another. Change is compressed into the lines separating units' (O'Brien & Holland, 1992: 38). If 'cultures' are defined as stases in the archaeological record, encompassing variation *on a theme*, 'transitions' are the moments of change between them, 'points' at which variation exceeds the norm for the period. And as one apparently discrete 'culture' is succeeded by another, a linear boundary of 'transition' separating the two is created. Change thus represents a boundary or 'origin point' between archaeological stages.

'Transitions' in Palaeolithic prehistory, then, are perhaps little more than 'our inadequate, categorical way of trying to deal with processes of evolutionary change in the record' (Straus, 1991: 72). But change *is* apparent in the archaeological record, and Palaeolithic material culture *does* demonstrate patterning in space and time, and this must be dealt with. As Straus argues, whatever their 'meaning' *per se*, 'some of the larger formal typological groupings of the Upper Palaeolithic do seem to have consistency and practical analytical utility ... [and] ... serve as useful shorthands for talking about broad patterns' (1991: 77; see also Schumann, 1997: 254; Field, 2002).

As he concludes,

> Assemblage typologies are indeed sterile, when they are the "be-all and end-all" of archaeological research (usually of a normative, phylogenetic nature). But *as tools*, they are useful, descriptive instruments – just as are artefact typologies. What is important is the questions asked, the reasons for classification (Straus, 1991: 77-8).

Such classifications and periodisations are merely tools for us to use; the danger lies not in their definition or use, but in Palaeolithic archaeologists' and modern human origins researchers' epistemological naïvety (Clark & Willermet, 1997).

Although useful, then, our periodisation schemes should be regarded as purely analytic devices and as based in our paradigms rather than objective: they should be continually tested and re-assessed (Schumann, 1997: 264-5; Roebroeks & Corbey, 2001), and should not be treated as 'real' units capable of acting in their own right (Wobst, 1983: 222). It would be naïve to believe that we are 'discovering, via retouched stone artifact typology, something very like the remains of identity-conscious social units analogous to the tribes, peoples and nations of history' (Clark, 2001b: 43).

In short, while Palaeolithic archaeology has paid lip service to the evolutionary paradigm, the equation of archaeological change and 'evolution'
creates a tautological 'explanation' for change by reducing all change in the archaeological record to a series of self-explanatory adaptive and evolutionary

‘transitions’ between static ‘evolutionary’ states. The perception of the past is thus that of a series of discrete ‘cultures’, reified (more or less explicitly) to be viewed as a series of static developmental stages, each one an ‘essential’ social form (Shanks & Tilley, 1987a: 147). Although formal typologies of social evolution such as those of Service (1971) have been explicitly rejected by archaeology, it is all too apparent that they are still used as a mental shorthand (Gamble, 1999: 16). Perhaps to a certain degree this is inevitable, a product of the human need for narrative (see section 2.1. below). However, as Clark cautions, we should resist their ‘tendency to become “fossilized”’ (2001a: 141).

1.4.1. An a-personal Palaeolithic

The equation of change and evolution problematised above has led to the establishment of an a-personal Palaeolithic, and this has been focus of much of the criticism aimed at Palaeolithic research by post-processual theorists. With the ‘process’ of evolution purely a factor of time, change is conditional only on time passing, and thus (particularly given the kinds of timescales the Palaeolithic deals with) is virtually unrelated to humans and their activities (Field, 2002; see also Davidson, 1991: 195). With evolution seen as an ‘optimising’ force and (pre)history the product of a ‘natural justice’ of evolutionary progress (Allen, 1989: 260), each ‘essential’ stage of culture/evolution would be determined by ‘Panglossian hyperselectionism’, whereby ‘each nuance of form must have a specific selective reason for its existence’ (Brace, 1997: 20; see also Gould & Lewontin, 1979). In this view, all aspects of culture are the products of adaptation to the environment, and individual creativity is entirely superfluous. The argument is circular; if the behaviour is present, it must be adaptive. If it is adaptive, it will be present.

In addition, the conceptualisation of ‘culture’ as a system seeking homeostasis means that change requires external causality – usually, in the Palaeolithic, the environment. In such a paradigm, people are consigned to an essentially passive role driven by processes beyond their control, and the individual in evolutionary theories has been characterised, with some justification, as merely a plastic, malleable, cultural dope incapable of altering the conditions of his or her existence and always subject to the vagaries of external non-social forces beyond mediation or any realistic form of active intervention (Shanks & Tilley, 1987b: 56).

The result is that, as Sassaman writes, 'Hunter-gatherer prehistory has a disturbing anonymity about it' (2000: 148); as early as 1973, Leach criticised the strong behaviourist ethos, virtually unilinear theory of social development and use of direct ethnographic analogy characteristic of much of Binford's work as akin to that of Malinowski, conducted some twenty years previously, concluding that 'Archaeology must be concerned with people rather than with things' (1973: 768).

Processual approaches to the Palaeolithic have a great deal to tell us about the past – but such information remains limited in its interest and application, and the reluctance of Palaeolithic researchers to countenance any form of 'social' theory or theory of agency is limiting its scope. I am certainly not arguing for the complete abandonment of scientific principles and methods; nor would I reject the evolutionary framework, despite the abuse it has been subjected to (contra Shanks & Tilley, 1987a: 75), for reasons which will be discussed in more detail in Chapter 4. What I am seeking to avoid is a contribution to the ongoing and ultimately sterile debate 'between "evolutionary explanation" versus "cultural interpretation"' (Miracle, 2002: 65). It is simply that, like Wobst, 'I find it increasingly difficult to make sense of the past or of the present without reference to the folk who had produced them' (2000: 41).

The recent awakening of Palaeolithic interest in individuals and change within a social framework is an encouraging development. However, it remains nascent and there is no consensus on how post-processual theories of agency can be integrated into Palaeolithic research. The following section is an attempt to do simply this; proffer a way in which the Palaeolithic record could be re-populated with agents while maintaining a certain amount of 'humility in the face of our ignorance' (Jochim, 1998: 28).

1.5. RETHINKING CHANGE IN THE PALAEOLITHIC: PEOPLING EVOLUTION

The criticisms of Processualism by post-processualist theorists have crystallised around the charge that the Processual, scientific, evolutionary approaches currently dominant in Palaeolithic research consign the individual to an essentially passive role, driven by processes beyond his or her control, with social actors irrelevant, 'mere components of the system' (Shanks & Tilley, 1987a: 139).

However, while there is some justification for such a characterisation, the fault lies with the application in archaeology of evolutionary theory, rather than with the approach itself: neo-evolutionary theory in fact conceptualises 'adaptation as an active process of becoming, rather than a static state of being' (Mithen, 1989: 486). Speciation is regarded as epiphenomenal, effect rather than cause, and hominids/humans as essentially active and creative in their behaviour, learning, making decisions and acting creatively to adapt to their dynamic environments (e.g. Allen, 1989: 277; Mithen, 1989: 487). Despite its use in archaeology to provide a teleological, tautological description of and 'explanation' for change in the archaeological record, evolutionary theory is in fact a genuine theory of agency.

Individuals (the unit of selection in neo-evolutionary theory) and their behavioural decisions are the driving force of adaptation, selection and speciation (e.g. Mithen, 1989: 488 and *passim*; Quinney, 2000: 12). Even the 'system' or super-individual structure is properly viewed 'as a continually changing entity, composed of dynamic, creative and interacting individuals' (Mithen, 1989: 488).

Nor does the evolutionary framework inevitably impose a teleological, unilinear developmental path. Social change is certainly contingent; 'it has no predetermined teleological essence and there is no deterministic necessity to the working through of the historical process – history could have happened otherwise' (Shanks, 1987a: 176), and the evolutionary framework more than allows for contingency: it demands it. 'Evolution is by its very nature entirely contextual and contingent; organisms do not and cannot plan for the future but must act in the present context to ensure their survival' (Graves-Brown, 1993: 76).

'Optimising' models, rather than 'describing' or 'explaining' behaviour, provide templates 'against which to compare observed behaviour' (Mithen, 1989: 488), and the ecological emphases so derided by post-processual theorists (although admittedly often abused in Palaeolithic research) are 'an analytical tool, not a mirror of reality, and they do not deny a role for individual agency, as long as it is examined within its environmental context' (Jochim, 1998: 26). But recognition and examination of the environment and its relationship to human behaviour does not have to be deterministic; as Allen puts it, 'Adaptability and change come from the interplay of internal variability, system structure, and environmental conditions' (1989: 273).

1.5.1. Peopling the ecosystem

In fact, ecological theory allows us to visualise the much-maligned 'environment' in a more holistic fashion, as an 'ecosystem' (Tansley, 1935) - 'a continuum of physical features, other species and conspecifics' (Foley, 1984: 5). The emphasis is on 'synecology', interacting communities of plants and animals exercising considerable influence upon each other, rather than a model of individual species acting in isolation (van Valen, 1973; Jochim, 1998). Individuals can thus be considered as *part of* an ecosystem in its fullest sense, adapting through the formation and adjustment of 'niches', the sum total of the adaptations of an organism, or all of the ways in which it 'fits' into its particular environment.

The concept of the ecosystem was first studied in a systemic paradigm, in terms of energy flow, nutrient cycling and information feedback (Preucel & Hodder, 1996: 35), and its use in archaeology has thus been criticised (see e.g. Ingold, 1992: 41). However, in ecological theory the relationship between the individual and its environment is by no means one-way. While 'there is no organism without an environment', it is equally true that there is 'no environment without an organism' (Lewontin, 1982: 160), and the ecological concept of the 'niche' includes the ways in which an organism actually perceives and uses its environment. As Ingold puts it,

> Far from fitting into a given corner of the world (a niche), it is the organism that fits the world to itself, by ascribing functions to the objects it encounters, and thereby integrating them into a coherent system of its own (1989: 504).

Thus, the concepts of the 'niche' and the 'ecosystem' should be considered essentially creative and reflexive, rather than something imposed upon its members. Ecological theory, seen in this light, takes a far more complex view of human/environment interaction than the simplistic 'environmental determinism' set up as a straw 'person' by some of the more polemical relativist critics (e.g. Hodder, 1985; Shanks & Tilley, 1987).

It is true that archaeologists, perhaps of necessity, do tend to have a 'god's eye view' of the past. However, the idea that time and space cannot unproblematically be separated from their experience is one that has been growing increasingly in archaeology, and has recently begun to be applied to the Palaeolithic (see e.g. Gamble, 1996). We need to place ourselves firmly *within* the map and the chronology, not 'making a view *of* the world but … taking up a view *within* it' (Ingold, 1996a: 121), as other societies see the world; indeed, as we ourselves do in everyday life. The culture/nature dichotomy of western capitalism is not reproduced everywhere; in most traditional societies, a person is seen as 'a being immersed from the start, like other creatures, in an active, practical and perceptual engagement with constituents of the dwelt-in world' (Ingold, 1996a: 120-1).

Where former models of ecology in prehistory treated humans and hominids as 'mapping on' to their environment, a truly ecological viewpoint considers them to be *part of* that environment in its fullest sense. Instead of economic 'resources' we must therefore consider 'affordances' (Gibson, 1979) and the way in which humans and hominids would have become aware of and thought about them. As Gibson writes,

> an affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subject-object and helps us to understand its inadequacies. It is equally a fact of the environment and a fact of behaviour. It is both physical and psychical yet

neither. An affordance points both ways, to the environment and to the observer (Gibson, 1979: 129).

In this way we can avoid a simplistic human/environment, subject/object dichotomy: the concept of affordances includes the abiotic, biotic and conspecific members of the community of which any individual hominid is a part. Of course these different aspects of the environment are recognised by its inhabitants (as discussed by Gibson, 1979), as they are associated with different kinds of affordances - 'whereas inanimate objects afford actions ... animate objects afford *interaction*, and socialized objects afford *proper* interaction' (Reed, 1986: 5), a point with interesting consequences for the ways in which individuals construct their identities (see Chapter 5).

The solution to the Palaeolithic problem, therefore, is not to throw the baby out with the bathwater and reject the evolutionary framework outright, contra Shanks and Tilley (1987: 175). In fact, the evolutionary framework, with its emphasis on ecological (rather than 'environmental') context, can in fact help us approach the Palaeolithic in ways which admit the active individual.

The vast majority of palaeolithic research to date has produced a rather 'quiet, faceless account of an ancient past without subplots, contrary characters, or unpredictable endings' (Sassaman, 2000: 148). This appeal to narrative is an interesting point: Haraway has suggested that facts are only meaningful when organised into stories (1989), but as Gamble comments, 'Palaeolithic research, as it stands, produces mainly facts; currently there are very few stories. Those which exist deal mostly with origins and the inception of change' (1999: 8). This, as discussed in the following chapters, is another significant problem for the discipline. To make sense of the Palaeolithic in human terms, we need to create a narrative within which our facts can flourish.

1.6. SUMMARY AND CONCLUSIONS

In this Chapter I have argued that current archaeological approaches in the Palaeolithic, operating largely within the Processual paradigm and focusing on purely 'economic' aspects of prehistory, have unduly restricted the questions that we can ask of the archaeological record. Some Palaeolithic archaeologists are now beginning to demonstrate the potential of the discipline for addressing more 'holistic' questions about past individuals and societies – questions that may lead us to a fuller understanding of prehistory.

The equation of change and evolution in the processual/evolutionary paradigm current in Palaeolithic research uses formal variation in lithic technology to divide Palaeolithic time and space into a series of discrete 'boxes' in a linear succession of homeostatic industries or 'cultures', separated by boundaries or lines which represent 'change'. As one apparently discrete 'culture' is succeeded by another, there is a perceived 'transition', a linear boundary separating the two. In this framework, any notion of 'change' is compressed into the lines separating units, which become a boundary or 'origin point' between archaeological stages.

However, even the ways in which we divide up the archaeological record are heavily influenced by our paradigmatic biases, and the ways in which archaeology (and particularly Palaeolithic archaeology) currently deals with change unnecessarily restricts our interpretations of the archaeological record, leading to sterile, teleological interpretations of Pleistocene hominid and human evolution.

The view of a continuum of interacting biotic and abiotic aspects of the 'ecosystem' allows for a very different conceptualisation of hominid and human behaviour. In ecological terms, an organism constructs its niche by perceiving and acting on the affordances of the abiotic, biotic and conspecific environment. Instead of 'resources' we must consider 'affordances', the terms in which individuals perceive other organisms in their ecosystem (Gibson, 1979), and instead of 'cultures', we should address the ways in which identities and purposes were perceived and constructed.

This view of the individual in prehistory suggests a new way of addressing change in the archaeological record which will be discussed further in Chapter 2.

CHAPTER TWO: THE MIDDLE-UPPER PALAEOLITHIC TRANSITION, A DISCOURSE IN IDENTITY

In the previous chapter I argued that the ways in which archaeology (and particularly Palaeolithic archaeology) currently deals with change unnecessarily restricts our interpretations of the archaeological record.

The ways in which we divide up the archaeological record are also heavily influenced by our paradigmatic biases, and it is salutary to remember that research does not take place within a cultural vacuum. In this chapter I will discuss the influence of our western cultural milieu on modern human origins research and particularly on the topic of the Middle-Upper Palaeolithic 'transition' and the replacement of Neanderthals by so-called 'modern' humans. I argue that many of our assumptions and biases regarding the nature of both of these kinds of hominid are not supported by the palaeontological and archaeological records, and that we need to reconsider the kinds of behavioural change that might be represented in the archaeological record.

2.1. THE NARRATIVE OF HUMAN ORIGINS

Interest in the question of the origins of modern humans dates back centuries, and although the terms of the debate have certainly changed, the questions – and some of the answers – have not fundamentally altered (Alexandri, 1995: 57).

Perhaps, then, it is not surprising that such research 'derives from and constitutes a methodology of narration' (Conkey & Williams, 1991: 104; see also Landau, 1992; Alexandri, 1995; Moore, 1995). Long term continuities are apparent in the kinds of narratives that are told about human origins, whether scientific accounts of human evolution, Biblical origin myths, classical philosophy, or folktales (van Reybrouck, 2001: 77-8 and *passim*). Despite our belief that we, as 'scientists' and 'experts', determine which stories about human origins are told, both in terms of both the subject-matter and the designation of the 'point of origin', we are unavoidably enmeshed in wider social realities (Alexandri, 1995: 60), and our originary narratives, although presented as accounts of our beginnings, are really about our present (Moore, 1995: 51; see also Conkey & Williams, 1991; Alexandri, 1995: 57).

However, the importance of narrative in our originary accounts is not necessarily a wholly negative phenomenon. Although our western, 'scientific' perspective, from which 'myths' are relegated to the un- (or even anti-) scientific 'anthropological' world, means that we tend to categorise myths, stories and narratives as 'unreal' or 'untrue' (or, at the very least, as 'unscientific'), facts, as Haraway has pointed out, are only meaningful when they form part of wider 'stories' (1989), and as Alexandri writes, 'The connection between the search for origins and the making of myths is not necessarily a comment on the objectivity or reality of such stories' (Alexandri, 1995: 60).

'Origins' stories – whether those of 'traditional' societies or our own - are *real* and *objective*, referring to objectively real and significant issues and having real and objective effects in the world, and a refusal to engage in debate on these terms 'loses sight of the durability and general public appeal of this question and its role in shaping our identity as humans; in so doing, we may distance ourselves from an important ongoing discourse' (Alexandri, 1995: 60; see also Maienschein, 1997: 421).

But a postmodern rejection of the past is not a valid response:

> A past which is co-extensive with our present, as well as constructed in our own image, is a passive past. Whatever the motivations and actions of individuals and groups in the past, they merely come to serve our present needs, and are not treated as if they had any independent existence. There may be no way of knowing anything about their existence except through the prism of our own, but it seems unduly cavalier simply to erase all differences between the present and the past (Moore, 1995: 53).

Having recognised our biases, it is our responsibility to work within them to produce the *best* stories that we can - but without a grasp of the epistemological issues involved, we can only continue to reproduce the same sterile debates.

In terms of the Middle-Upper Palaeolithic 'transition', the apparent association of the Upper Palaeolithic and 'modern humans' and the Middle Palaeolithic with Neanderthals, has conflated debates about the nature and significance of the archaeological record of the 'transition' with those concerning the nature of 'modern humans' and its distinction from the animal 'other'.

A focus on 'modern human origins' and 'the Middle to Upper Palaeolithic transition' aims to pinpoint with ever-greater accuracy the date and/or place of 'origin', rather than considering the *explanation* for change (easily provided by the use of evolutionary models as *post-hoc* accommodative arguments). However, the identification of an origins point in fact merely provides us with a false beginning, implying by its narrative form linear, coherent, directional causality in the archaeological record (Field, 2002).

<u>2.2. THE ANIMAL-HUMAN DIVIDE</u>

The location of an origins point for humanity necessarily entails the definition of ourselves as humans from the animal 'other' (Chazan, 1995: 235). This debate has a long history – the appropriate classification of humans and animals is the subject of some of the earliest philosophical discussion (see e.g. Pellegrin, 1986; Serjeantson, 2000: 179, for discussion). Following the publication of Darwin's *Origin of Species*, western society has again found it necessary to reconsider our definitions of ourselves vis-à-vis our 'neighbouring' species, primate, hominoid and hominid, and, inevitably, long term continuities in the debate are clearly apparent. For example, van Reybrouck's comparison of Victorian anthropology (in the form of Lubbock's *Prehistoric Times*, 1865) and postwar primatology (McGrew's *Chimpanzee Material Culture*, 1991) demonstrates that both writers see their work as 'skirting along the same human-animal frontier' (van Reybrouck, 2001: 5). Such loaded words as 'gap', 'hiatus' and 'bridging' are common to both.

Hominid research is thus unavoidably a discourse of our own human identity situated in the present. Archaeological and palaeoanthropological interpretations of hominid prehistory have also been affected by social and cultural factors (e.g. Graves, 1991; Chazan, 1995; Roebroeks, 1995; Drell, 2000; Cartmill, 2001), and debates have significant social and political ramifications; for example, the discipline has been implicated in racist thought (in its denigration of non-white populations as more 'primitive'; see e.g. McBrearty & Brooks, 2000 and Proctor, 2003 for debate about continued racism in archaeology).

2.2.1. The politics of human taxonomics

For archaeologists, the identification of human origins begs the question, 'By what criteria do we adjudge ourselves and others to be human?' (Graves, 1991: 513), and it is clear that there is more than just objective science going on in the far from value-neutral field of human taxonomics:

> In human systematics the classifier and the classified are alike; the classical distinction between subject and object becomes indistinct. As a consequence, living in a matrix of power, social relations, and cultural values, human systematists must invariably carry greater baggage about their subjects that angleworm systematists (Marks, 1997: 46).

Linnaeus himself described formal subdivisions within what we today call *Homo sapiens*, (cited Marks, 1997) and Coon's *The Origin of Races* (1962) famously described five subspecies of human derived from *Homo erectus*[1], and in fact Marks has recently argued cogently for the taxonomic identification of Neanderthals as a

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[1] He argued that the obvious superiority of white races was the logical result of their having been 'modern' longest (Coon, 1962: 47); such work gained credibility from its apparent 'scientific' basis – Coon, like others with similar theories, always maintained the value-neutrality of his work (*ibid.*: 48). Nor is this a purely historical debate, with the publication of Herrnstein & Murray's *Bell Curve* as recently as 1996.

subspecies of humans explicitly *because* of the political ramifications such a categorisation may have in the present, potentially hampering any inclination to consider extant (inferior) subspecies (1997: 55). Indeed, the notion of a single-species *Homo sapiens sapiens* was itself invented and popularised at least partly in response to Nazi atrocities (Chazan, 1995: 235; Proctor, 2003). The issue is far from just academic: as Marks argues, 'we need to appreciate that *human* science is *humanistic* science, and its consequences far outreach the classroom' (*ibid.*: 57; see also Proctor, 2003).

The drive to maintain a clear divide between ourselves as humans and the animal 'other' has strongly influenced palaeontological taxonomies. The success of Piltdown was largely due to the fact that it met researchers' expectations, its big brain rendering it far more acceptable as an ancestor than other apparently comparatively primitive fossils such as the Taung child. With the discrediting of Piltdown in 1952, australopithecines were grudgingly accepted as hominoids, and as more and more data appeared to challenge the definition of the animal-human boundary by identifying in other species abilities analogous to those considered human-specific (e.g. Gardner & Gardner, 1969; Goodall, 1986), the 'goalposts' were moved and new characters found to define the 'essence' of 'humanity' and maintain the animal/human divide, a process that has been described as 'policing the boundaries' (Cartmill, 2001). In the case of language, for example, '...what we mean by "language" is whatever substantiates the judgement that nonhuman animals are unable to talk' (Roebroeks, 1995: 73).

Nor have new techniques providing alternative bases for classificatory systems solved the problem. Although from the point of view of DNA and haemoglobin structure, humans and great apes appear so closely related that Dawkins has stated that in fact 'we *are* great apes' (1994: 82; see also Zuckerlandl, 1963: 247), these kinds of statements have been characterised as 'The Great Overstatement of Molecular Anthropology' (Marks, 1997: 49; see also Simpson 1964: 1536), and it seems that what the apparently extreme similarities indicate is simply that DNA and haemoglobin have little to tell us, *per se*, about species affinities. After all, as Marks points out, great apes have long arms, short legs, large canine teeth, copious body hair, prehensile feet, small brains, high degrees of sexual dimorphism, and a large suite of other anatomical features that are simply not found in humans (1997: 49).

2.2.2. Biological and palaeontological taxonomy

Such difficulties in drawing a line between humans and other animal species reflect more general issues in biological systematics. Early systems of classification were explicitly essentialist in origin, aiming to discover/describe the 'true nature' of species (Mayr, 1969), which were considered to have been 'instituted by the Divine Intelligence as the categories of his mode of thinking' (Agassiz, 1962 [1857]; quoted Gould, 1980). Even Linnaeus, now viewed as a father of modern systematics, conducted his classificatory work with the aim of understanding the Lord's plan of creation: some of his classifications not widely publicised today include the unlikely-sounding *iumenta*, or beasts of burden (1758 [1735]; cited Oldroyd, 1980: 15).

However, the advent of Darwinism instituted a new basis for classification: the theory of evolution is inconsistent with the idea of static, divinely ordained 'natural kinds', promoting instead the notion of virtually ceaseless evolutionary change. Darwin himself wrote that 'we shall have to treat species as … merely artificial combinations made for convenience' (1959; quoted Gould, 1980). Today, while one group considers all classificatory groups, classes and categories to be simply products of the human mind - Haldane, for example, has argued that the concept of a species is a concession to our linguistic habits and neurological mechanisms (1956; quoted Gould, 1980) - another argues the polar opposite, that 'In fact, the existence of discrete species is one of the most striking and least disputable of biological data' (Dupré, 1981: 89; see also Mayr, 1969; Gould, 1980 for further discussion).

Taxonomic classification, therefore, is by no means a straightforward or objective endeavour, a point parodied by Borges when he described a system of classification whereby,

> ...animals are divided into a) those that belong to the emperor, b) embalmed ones, c) those that are trained, d) suckling pigs, e) mermaids, f) fabulous ones, g) stray dogs, h) those that are included in this classification, i) those that tremble as if they were mad, j) innumerable ones, k) those drawn with a very fine camel's hair brush, l) others, m) those that have just broken a flowervase, n) those that resemble flies from a distance (quoted Foucault, 1970: xv).

In fact, the notion of 'taxonomic realism' – the notion that there is only one unambiguously correct taxonomy – has largely been rejected (Dupré, 1981: 73); Dupré calls for an acceptance of 'promiscuous realism', a recognition that many systems of classification may be simultaneously valid but simply used for different purposes (1981: 82). This, of course, entails an acceptance of the fact the classifications are primarily *useful* rather than real *per se* (Mayr 1969: 98; see also Dupré, 1981; Clark, 1988)[2].

Seen in these terms, the endeavour of the identifying the origin of 'humans' becomes highly problematic; in fact, Darwin himself wrote that

> In a series of forms graduating insensibly from some ape-like creature to man as he now exists, it would be impossible to fix on any definite point when the term 'man' ought to be used. But this is a matter of very little importance (1871, chapter 7).

However, significant though this debate is among taxonomists, a casual reader would gain no hint of it from the palaeontological literature. Palaeontologists remain happy to identify with confidence the species equivalents of archaeological 'cultures', 'boxes' of limited variation separated by lines of 'transition' (speciation). In fact, however, such practices are implicitly based on the idea of the '*scala naturae*' or 'natural' hierarchy of animal species and the process – and result – is thus intrinsically

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[2] Thus, for example, although there is in fact no such a biological group as 'fish' (*Chrondichthyes, osteichthyes* and *agnatha* are all popularly called 'fish', but in fact constitute distinct taxonomic groups whose members resemble each other through convergent evolution; Dupré, 1981: 75; Clark, 1988: 18) or 'tree' (Daisies, cacti and oak trees are angiosperms, related more closely than any are to pine trees, which are gymnosperms; Clark, 1988: 18; see also e.g. Dupré, 1981), such categories do nevertheless refer to groups of plants and animals which share many significant characteristics.

narrative (Cartmill, 2001). Human evolution is seen 'as a corridor, where chimpanzees enter at one end and modern hunter-gatherers exit at the other' (Tooby & DeVore, 1987: 95). For many purposes evolutionary alteration may perhaps be considered slow enough that the present configuration can be considered static (Gould, 1980); however, such a simplification can hardly be acceptable for a science which explicitly sets out to investigate the process by which evolutionary change occurs! (see Allen, 1989).

2.3. THE NEANDERTHAL-HUMAN DIVIDE

The debate regarding humans' relationship to our extant primate relatives continues: but still more emotive is the debate concerning our extinct (closer) relatives the Neanderthals.

As Clark and Willermet argue,

> Because of their proximity in time, and because they have become part of western popular culture, it has never been possible, either in science or in the popular mind, to be quite as objective about Neanderthals as it is about more remote human ancestors (1997: 1-2).

Perception of Neanderthals and their contemporaries, and interpretation of the archaeology associated with them, has also changed over the years in response to social and cultural factors (Drell, 2000), and their portrayal both for popular[3] and academic audiences, from the very first fossil discoveries, has tacked wildly between 'primitive' and 'modern' (while often claiming to be 'scientifically accurate'), closely tracked by taxonomic designation.

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[3] Burian, Boule's and Keith's depictions, for example, and literary representations from Rosny (*Quest for Fire*; 1911) and Wells (*The Grisly Folk*; 1927) through to Golding (*The Inheritors*; 1955), Auel (*The Clan of the Cave Bear*; 1980 and further *Earth's Children* volumes) and Sawyer (*Hominids*; 2002 and subsequent books in the *Neanderthal Parallax* trilogy – see Drell, 2000 for further discussion).

Until relatively recently, only one hominid species, *Homo sapiens* (divided informally into 'archaic' and 'anatomically modern' variants; see section 2.4.), was recognised after *Homo erectus*, although Neanderthals were sometimes distinguished at the sub-species level (a significant level of acceptance given that until relatively recently not all extant populations were accepted into the fold of 'modern humans'; e.g. McBrearty & Brooks, 2000).

The general consensus at the moment appears to be that the weight of the evidence suggests that Neanderthals were a separate species *Homo neanderthalensis* (see e.g. McBrearty & Brooks, 2000; Proctor, 2003). But the changes in species designation highlight the fact that zoological and palaeontological taxonomies, like archaeological ones, are not simply the result of the application of 'pure science' – and nor is the debate purely semantic.

In fact, the archaeological perception and treatment of the archaeological record can be hugely affected by the side of the 'boundary' from which it derives. As Roebroeks and Corbey comment about a workshop on the Palaeolithic occupation of Europe:

> In dealing with the Lower and Middle Palaeolithic, a highly critical attitude prevailed in which, for instance, hearths and dwelling structures were concepts to be applied only after a careful scrutiny of the archaeological data. Similarly, there was also a double standard with regard to the association of faunal remains and stone artefacts: at earlier sites, the actual degree and type of interaction between humans and animals had to be convincingly demonstrated time and time again, whereas in the context of modern humans, such critical examinations seemed less important and interpretations of stones and bone flowed more freely in terms of hunters and their prey (2001: 68).

A number of biases and double standards are thus apparent in the ways that archaeologists deal with the record on either side of the 'transition'. The assumption, simply stated, is that modern humans and their associated Upper Palaeolithic assemblages were more 'advanced' than the Neanderthals and the Middle Palaeolithic record (Simek, 2001: 199), a prophecy which has all too easily become self-fulfilling for many archaeologists (see e.g. Clark, 2001a: especially 141; Roebroeks & Corbey, 2001: 69 and *passim* for examples). In summary, 'the "Moderns" are capable until proven incapable, whereas the "Ancients" can be summarized as incapable, until proven capable' (Roebroeks & Corbey: 72). It can often seem that the Middle Palaeolithic and Neanderthals are used only to emphasise the sophistication of modern humans (Clark, 2001a).

2.3.1. ARCHAEOLOGY AND PALAEONTOLOGY

However, the unquestioning acceptance of a straightforward linkage between the palaeontological and archaeological records also needs to be questioned. There is an uneasy relationship between modern human origins researchers and archaeologists, despite the assumption that, since the archaeological record and hominid morphology are both considered to be monitoring hominid behaviour (at some level), the two lines of evidence should agree (Harrold, 1992; Churchill, 1997: 212) - this 'functional-morphological' paradigm is implicit in many of our phylogenetic arguments.

Certainly we cannot escape a behavioural element to our palaeontological taxonomies:

> the ideological and historical bases of current phylogenies are intimately tied to notions of human behavioral evolution. Because behavioural models are *implicit* in phylogenetic models of the origins of modern humans, a clear separation of research realms is not only infeasible, it is impossible (Churchill, 1997: 204).

Because Neanderthals appear very closely biologically related to ourselves, balanced on the contested boundaries between human and animal, the behavioural interpretation of the archaeological record becomes hugely important in determining which side of the boundary they can be considered to belong.

In the biologically deterministic paradigm of the Palaeolithic, 'cultural' practices such as lithic technology are considered to be largely determined by morphotype and particularly 'cognition'. Archaeologists simply list the differences between preceding and succeeding periods/cultures/species before explaining them away with the 'specious and tautological' argument of morphotypic change (Churchill, 1997: 202; see also González Echegaray, 1997: 169; Field, 2002).

However, this biological determinism can be turned on its head. Biology and behaviour are certainly linked, but behaviour, rather than simply a phenotypic *effect* of genotype, is also a potential driving force for morphotypic change, as adaptive behavioural responses lead to the divergence, modification and transformation of morphological characteristics, and ultimately to speciation (e.g. Quinney, 2000). Species distinctions are therefore often underlain, whether overtly or covertly, by (supposed) behavioural distinctions (McBrearty & Brooks, 2000).

The role of the biologically determinist 'morphotype controls phenotype' arguments is clearly seen in the concept of the 'Human Revolution'. The apparent dramatic alteration in behaviour at the Middle-Upper Palaeolithic 'transition' at around 40,000 years ago has often been 'explained' in the literature by 'flick of a switch' metaphors (Jones, C. 2002), such as a single sudden 'mutation' resulting in a fully 'modern human' brain and behaviour (e.g. Klein, 2001; see also e.g. Mellars, 1991; Mithen, 1996).

However, such models were developed by European archaeologists to deal with the European archaeological record of (arguable) discontinuity[4]. But the earliest identifiable *Homo sapiens* pre-date the arrival of 'modern' humans in Europe by some time, and '[i]n terms of developments in world prehistory … western Europe is a remote *cul de sac* with a somewhat anomalous prehistoric record' (McBrearty & Brooks, 2000: 254). The 'revolutionary' nature of the European Upper Palaeolithic record, it is argued, is exactly that: a discontinuity in the record rather than a rapid cultural and/or biological transformation (*ibid.*: 454).

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[4] It has been argued that this Eurocentric bias might also stem at least partly from a desire to link western, white people, rather than anyone else, with the ancestors of humankind (Conkey, 1987; McBrearty & Brooks, 2000).

The Eurocentric bias in human origins research is perhaps understandable because of the length of research history and richness of material (*ibid.*). However, the European record of the Middle and Upper Palaeolithic, it is argued,

> is not inherently any more compelling or central than any others ... We have both expected and made too much of this particular regional archaeological record; on the other hand, we have done so with a limited arsenal of method and theory (Conkey, 1987: 64).

With the discrediting of the European 'Human Revolution' model, the assumption of a straightforward linkage between biology and behaviour (Chazan, 1995: 234) has redirected research for the origins of modern humans to the point of speciation of the first *Homo sapiens*. However, it has become apparent that even here biological and archaeological changes do *not* actually coincide.

In fact, even just the biological evidence is problematic. Genetic data has been making an increasing contribution to the modern human origins debate over the last decade, and early work on molecular DNA appeared to support an African origin for 'modern' humans (Cann *et al.* 1987, 1988). However, some of the assumptions on which the conclusions are based have since been challenged (e.g. Hall & Muralidharan, 1989; Barinaga, 1992; Goldman & Barton, 1992; Hagelberg, 2003), and more recent work on early Australian fossils from Lake Mungo has apparently demonstrated a genetic lineage older than and distinct from modern humans (Adcock *et al.*, 2001), although this too is now disputed (e.g. Cooper *et al.*, 2001).

The fossil evidence also remains problematic. 'Anatomically modern' skulls from East Africa date from around 150,000 years ago, although these retain some 'archaic' traits. There are, in fact, very few hominid fossil remains, apparently representing a variety of different species (the number of which may in fact have been underestimated; McBrearty & Brooks, 2000), which makes any firm conclusions difficult. This is not the place for a full exposition of the genetic and fossil evidence; this is detailed elsewhere (e.g. McBrearty & Brooks, 2000; Klein, 1999). However, the current evidence does seem to favour the 'Out of Africa' scenario, whereby *Homo sapiens*, defined anatomically and genetically, first evolved in Africa over 60,000 years *before* the 'Human Revolution' at the Middle-Upper Palaeolithic transition in Europe around 40,000 years ago.

This apparent division of genetics, morphology and behaviour has obviously caused problems for biological determinists arguing for a sudden appearance of 'cultural' abilities following a revolutionary mutation separating *Homo sapiens* from our ancestors (e.g. Mellars, 1991, 1996; Mithen, 1996; Tattersall, 1998; Klein, 2001). Perhaps, as Churchill has suggested, 'The perceived pattern of coupled morphological and behavioural transitions may owe more to historical coincidence than to causal relationships' (1997: 202).

2.3.2. Biological change at the Middle-Upper Palaeolithic transition?

However, the situation in Europe is still, undeniably, that where there is fossil evidence it does appear to support such associations. The earliest – and most securely documented – 'modern' specimens in Europe are clearly associated with the Aurignacian (Mellars, 1996), while the skeletal evidence from St. Césaire and from Arcy-sur-Cure does argue for the Châtelperronian as a Neanderthal technology (see e.g. d'Errico *et al.*, 1998 for discussion). However, there are of course exceptions to the rule. At Vindija cave, Croatia, Neanderthals skeletal remains are arguably associated with fully Aurignacian bone points, one split-base (Karavanic, 1995, see d'Errico *et al.*: S2, for arguments contra), and there are examples of modern humans associated with Middle Palaeolithic assemblages in the Middle East, at Skhūl and Qafzeh (Stringer & Gamble, 1993).

The existence of the so-called 'transitional' lithic industries documented throughout Europe, of which the most well-known is of course the Châtelperronian (see e.g. papers in Hays & Thacker, 2001), complicates the issue further. Whether such industries are in fact 'transitional' or whether they reflect processes of interaction or acculturation, or even merit their own taxonomic status, remains a hotly debated topic. Despite the problems relating to the association of lithic industries with cultural or biological groups, lithic evidence underpins the arguments regarding the nature and timing of the arrival of modern humans in Europe. There are currently three major models:

a) The 'population dispersal hypothesis'
b) The 'indigenist' hypothesis
c) The 'continuity' hypothesis.

These competing hypotheses all draw on the same evidence: technological and typological systems, radiometric chronologies and climatostratigraphic chronologies (Harrold & Otte, 2001): nevertheless, there is a huge disjunction in interpretation.

2.3.2.1. The population dispersal hypothesis

In this model, the Aurignacian is seen as a major break in both the biological and archaeological records, representing the totally new set of technological practices and behaviours of a new species, *Homo sapiens*.

Certainly, as discussed above, the evidence supports a link between the Aurignacian and modern humans in Europe. In addition, in contrast to the diversity of the immediately preceding Middle Palaeolithic industries across Europe, the Aurignacian is remarkably uniform over a considerable geographic distance, and adherents such as Paul Mellars, Marcel Otte and Randall White (see Clark, 2001b for references) point to a general lack of evidence for true 'transitional' industries developing into the Aurignacian in most regions of Europe (Mellars, 1996), although the Cantabrian site of El Castillo has been cited as a possibility (Bernaldo de Quirós & Cabrera Valdés, 1993; see section 2.3.2. below). They maintain that convincing origins for the Aurignacian occur only in the Middle East, where it is preceded by a long succession of demonstrably earlier Upper Palaeolithic technologies e.g. at Ksar Akil in the Lebanon (Mellars, 1996).

The other major strand of evidence used to support the population dispersal hypothesis is the radiocarbon dating: although this is problematic in this time period (e.g. Pettitt, 2000), there does appear to be a general trend whereby dates of the earliest Aurignacian industries are successively younger across the continent from eastern/south eastern Europe at around 43-45,000bp to c40,000bp in Central Europe, Northern Spain and the Mediterranean coast and c35,000bp in south western France (Mellars, 1996; Davies, 2001).

In this argument, the Châtelperronian, as a Neanderthal industry based on Upper Palaeolithic technology, is regarded as contemporary with Aurignacian and resulting from a process of 'acculturation' on the part of Neanderthals living alongside modern human populations, as attested to by the occasional inter-stratification of deposits containing the two industries (Mellars, 1996).

2.3.2.2. *The 'indigenist' model*

The two major adherents of the so-called 'indigenist' model, João Zilhão and Francesco d'Errico, argue for a Middle-Upper Palaeolithic transition pre-dating the Aurignacian, and thus occurring independently of the arrival of modern humans in Europe (Clark, 2001b). Although they agree that the Aurignacian and Châtelperronian were produced by modern humans and Neanderthals respectively, they maintain that Neanderthals underwent a separate, earlier and independent Middle-Upper Palaeolithic transition, uninfluenced by Aurignacian-producing moderns (Harrold & Otte, 2001).

Their argument centres on the stratigraphic and chronometric relationship of the Châtelperronian and Aurignacian. The former, they argue, pre-dates the latter in all cases where the two occur together, with no convincing evidence for inter-stratification (d'Errico *et al.*, 1998; Zilhão, 2001; see also Clark, 2001b). If the Châtelperronian really *is* apparent in Western Europe prior to the Aurignacian, it would be a strong argument for an independent, autochthonous development of many aspects of supposedly Upper Palaeolithic technology[5]. However, arguments rage about their re-interpretation of the generally-accepted dating; Mellars has commented,

> They have to dismiss not only virtually all of the current radiocarbon dates for Chatelperronian sites, but also all of the claimed evidence for the

[5] blade/prismatic core technology, bone and antler tools and convincing evidence of symbolic behaviours (see Chapter 3).

> interstratification of Aurignacian and Châtelperronian industries at Roc-de-Combe, Le Piage and El Pendo and all of the arguments for the relative climatic positions of the Châtelperronian and Aurignacian advanced by Leroi-Gourhan, Leroyer and others ... - a sweeping dismissal of the large amount of mutually reinforcing data and a virtual rejection of the radiocarbon method for this age-range (1998; S25, comments on d'Errico *et al.*, 1998).

The argument has also been attacked on the grounds of parsimony; an independent development of the Châtelperronian, occurring so soon before the arrival of modern humans with their own very similar Upper Palaeolithic 'package', seems unconvincing:

> On the face of it this would seem to imply an extraordinary level of historical coincidence. Why, after over 200,000 years of lacking these behavioural features, should Neanderthals suddenly – and independently – have *invented* these features at almost precisely the point when anatomically modern populations were expanding across Europe (Mellars, 1998; S25, comments on d'Errico *et al.*, 1998; see also Mellars, 1996: 415-6; Vega Toscano, 1998; Harrold & Otte, 2001).

2.3.2.3. The continuity hypothesis

The 'continuity' hypothesis (although perhaps better considered a range of largely sympathetic views than a single hypothesis) is supported particularly by researchers working in Cantabrian Spain such as Lawrence Straus, Geoffrey Clark and Victoria Cabrera Valdés (see Clark, 2001b). They argue, essentially, that 'the [Middle-Upper Palaeolithic] transition is best modelled as a mosaic of changing human adaptation that cannot be reconciled with any construal of biological replacement' (*ibid.*, 39). They have attempted to problematise the monolithic divisions (Middle and Upper Palaeolithic, Mousterian and Aurignacian, even Neanderthal and modern human) and are particularly critical of basing 'cultural' interpretations on lithic evidence: Clark states explicitly that 'There is no correlation whatsoever between particular "kinds" of hominids and particular "kinds" of archaeological assemblages – anywhere' (*ibid.*, 45). Others are less radical, but emphasise the continuities between the Middle and

Upper Palaeolithic discussed above; Straus concludes his review of the evidence from Cantabrian Spain thus:

> In sum, the whole EUP in Cantabrian Spain constituted a long, irregular, and in many domains, gradual transition from Middle Palaeolithic adaptations to the "classic Upper Palaeolithic" adaptations of the better known LUP of this region. Underway since at least 40,000 years ago, the changes in the EUP were a mosaic (1992; 89).

Such arguments stress a role in the Middle-Upper Palaeolithic transition for processes of mosaic cultural change, and also potentially for some biological continuity (Harrold & Otte, 2001: 4).

2.3.3. Contact, interaction and replacement

These differing hypotheses necessarily entail very different views about the existence and nature of processes of contact, interaction and replacement of Neanderthals and modern humans. The population dispersal hypothesis is of course largely based on the out-of-Africa model of modern human origins, and argues for an influx of modern humans into Europe from the Middle East who co-existed with Neanderthals for some 4-5,000 years, if current radiocarbon evidence is to be believed (Mellars, 1996).

However, the 'indigenists' have argued that the explanations provided by this hypothesis for the phenomenon of the Châtelperronian, that of imitation or acculturation, trade, or the simple gathering of abandoned objects, denigrates Neanderthals' intellectual capacities. As they do not believe that there was any substantial co-existence between the two species, the 'indigenist' hypothesis explicitly sets out to demonstrate that Neanderthals were capable of the same kinds of behaviours as modern humans (d'Errico *et al.*, 1998: S3).

Certainly the presence of manufacturing waste in the Châtelperronian levels of Arcy-sur-Cure suggests that the industry is not solely explicable as the product of trade between the species. D'Errico's work has also demonstrated that, despite superficial similarities between the Châtelperronian and Aurignacian items, production techniques appear to be distinctive in each (see references in d'Errico *et al.*, 1998: S13-4). This

> seems to indicate that there was no adoption or absorption of Aurignacian bone technology by the Neanderthals. But rather the invention of different ways of solving similar technological problems and satisfying possibly different functional and non-functional needs (*ibid.*, S15).

However, as the population-dispersal group has responded, it was never a tenet of the argument that 'acculturation' was a passive or even a one-way process (e.g. Conard, 1998; Hublin, 1998; Mellars, 1998).

Another significant point in considering models of interaction and replacement is that a model of invasion and replacement of 'inferior species' seems suspiciously apt for an era of colonialism and imperialism, naturalising the displacement of 'inferior' species by triumphant whites (Graves, 1991; Drell, 2000: 12). However, other work, such as that by Zubrow (1991) has demonstrated that replacement could have occurred without dramatic confrontation or mass genocide; more recent work on the population dispersal hypothesis has taken this on board, and the consensus view is now that

> the process of eventual population replacement of the Châtelperronian by the Aurignacian groups was a relatively gradual and progressive phenomenon, probably reflecting more of a gradual shift in population numbers and the occupation of specific territories rather than any outright confrontation between the two groups (Mellars, 1996: 416).

In fact, if the radiocarbon evidence for several millennia of co-existence of Neanderthals and modern humans is accepted, this would argue against large-scale 'invasion' or genocide[6] – raising the question of if and how the two species interacted.

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[6] As comparison, the Spanish conquest of central America took about 40 years from initial contact in 1492 to Pizarro's sacking of Cuzco in 1533, with only a few remnants of the indigenous cultures surviving today (Graves, 1991: 521).

The 'indigenists' have argued that immigration of a new population does not necessarily imply contact, and certainly, given the problems of our current radiometric chronologies, contact cannot necessarily be assumed (see e.g. Pettitt, 1999). They argue that any coexistence was on a continental rather than local scale, and that far from demonstrating long-term contact or acculturation, the evidence supports rather a model of mutual avoidance by the two species - although as Zilhão says:

> Given the size of hunter-gatherer territorial ranges, and the length of time involved, this does not imply that each group ignored the existence of the other: chance encounters and cross-border exchange must have occurred, even if separate biocultural identities were maintained for several millennia (Zilhão 2001: 13).

Interaction on a local and regional scale, however, is seen as largely restricted to the peripheries of Europe, to which Neanderthals retreated as modern humans advanced (*ibid.*). Although the indigenists argue for minimal cultural exchange, they do suggest that interaction may have included biological mixing, as evidenced by the Lagar Velho child, a supposed late Neanderthal-modern hybrid (*ibid.*).

In any case, although we remain sadly ignorant of many other aspects of Châtelperronian life (Mellars, 1996), lithic evidence is not necessarily the best way of looking at potential forms of interaction (Zilhão, 2001: 18). Perhaps, as Graves has suggested, we need to consider instead potential mechanisms of interaction and recognition (Graves, 1991). How would social differences have affected interaction? Does the possible 'acculturation' of final Neanderthal populations also indicate identification (social and biological recognition), integration (merging of social structures) or even amalgamation? (biological hybridisation; Yinger, 1981; cited Graves, 1991). Sadly, the characteristics on which most species and mating recognition are made, such as scent, hair, skin colour and body decoration, do not survive directly in the archaeological record. But evidence for the social structures of both populations exists, although it is undoubtedly difficult to interpret, and it is surely these questions which we should be approaching in the archaeological record.

However, although we cannot, from current evidence, be sure that interaction took place between Neanderthals and modern humans, we can be sure of the final outcome of their co-existence, and this raises its own problems. How and why did Neanderthals become extinct and our own species survive and prosper?

It is clear from the case of the Neanderthal/modern human 'transition', therefore, that biological and archaeological strands of evidence are at best problematically integrated. Until recently, biological change has been emphasised, with the implicit assumption that the behavioural changes represented in the archaeological record at apparently around the same time were simply explicable in terms of the effects of speciation. As we have seen, however, the assumptions underlying this approach are inherently flawed: as González Echegaray argues,

> The beginnings of the Mesolithic, the so-called Neolithic Revolution, etc., obviously do not correspond to the appearance of new human morphotypes, so there is the problem of limited generalizability to this explanatory framework (1997: 169).

Recent years have thus seen a shift in emphasis from the palaeontological (biological) evidence to the behavioural (archaeological; e.g. Carbonell & Vaquero, 1996: 12). Rather than looking for 'anatomically modern' humans, researchers are now looking for 'behaviourally modern' humans.

2.4. THE ORIGINS OF 'MODERNITY'

The net result of this confusion about the nature and processes of archaeological, behavioural and morphological change in the late Pleistocene (Churchill, 1997: 202) is a general confusion about what, exactly, constitutes *Homo sapiens*, and what we are looking for the origins *of*. Archaeologists have become reluctant to use the taxonomic category (Chazan, 1995), and the resulting terminological lacuna has been filled by the curious taxonomic device of the 'anatomically modern human': not a taxon with any clear, formal definition, 'but simply a scientific-sounding way of evading the fact that there is no agreement on the ... defining autapomorphies of the human species' (Cartmill, 2001: 104; see also Roebroeks & Corbey, 2001: 72).

The category of 'anatomically modern', in practice, allows palaeontologists and archaeologists to have their cake and eat it, providing 'an alternative sense in which people can be "modern", only to place it out of bounds' (Ingold, 1995a: 253) as required - the boundary can thus still be made to separate 'people like us' from those who may have resembled us morphologically or genetically, but who are considered, on the basis of archaeological evidence, to lack our 'culture'.

However, the (r)evolutionary explanations for the 'origins of modernity' that underpin the notion of the 'anatomically modern human' generally rely on modern humans being

> biologically endowed not only with bipedalism but also with a host of other attributes from language to advanced cognitive and manipulative abilities, all of which are lumped together under the general rubric of the "capacity for culture" (*ibid.*: 247),

although there is of course no agreement on the form such a 'capacity' might take or exactly what characteristic(s) of the archaeological record it might be detected in.

The idea is attractive archaeologically as it implies that any aspect of the archaeological record can be taken and cognition 'measured' against a scale of 'humanness'; borrowing enthusiastically from other disciplines, such research has looked for evidence of such apparently self-evidently 'human' abilities as 'self and other awareness', 'abstraction', 'generalization', 'classification', 'symmetry' and 'symbol use'. Such vague working definitions of 'modern humans' inevitably begin not 'with the precept of what modern *is*, but rather what it is *not*' (Wolpoff & Caspari, 1997: 43, italics in original). While the purpose of the term remains exclusionary, 'Not only do we lack an operational definition for diagnosing modernity in the fossil record, but we must question whether such a definition is even possible' (*ibid.*).

This mythical 'capacity for culture' also sets 'modern humans' apart from other animal species in another way, apparently functioning as a 'dual system' of inheritance allowing us to inherit memes as well as - or instead of, in some more extreme cases - genes (Graves-Brown, 1993), thus distancing us from the sordid business of mere 'biological evolution'.

> Anatomically modern humans, 'people like us', are supposed to possess all the characteristics essential to our species, with the capacity for a complex symbolic language being a major attribute. What makes the Gravettians different from us westerners nowadays is not a matter of innate capacities, that is, biological endowment, but simply some 25,000 years of history and cultural development. The differences between *Australopithecines, Homo erectus*, and the Neanderthals, however, concern manipulative abilities, structure of the brain, etc. In short, they fall in the domain of biological evolution (Roebroeks & Corbey, 2001: 72).

However, some researchers are now beginning to question the idea of 'modernity' existing in the Pleistocene archaeological record. In what sense were 'anatomically modern' populations *actually* 'modern'? To recognise 'modern' humans 100,000 years ago 'is to forget that the anatomy of a modern human is the product of medicine, culture, education, nutrition' (Graves-Brown, 1993: 75). The concept serves merely to provide an ante-room to 'humanness': all 'modern' fossils represent 'people like us', a kind of 'in-group' who possess all essentially human capacities – but only some of these ('behaviourally modern humans') demonstrate these archaeologically. The 'out-group', meanwhile, is left in the cold, defined negatively as incapable (Roebroeks & Corbey, 2001: 72). As Ingold argues,

> If Cro-Magnon Man, had he been brought up in the twentieth century, could have mastered the skills of literacy, why should not *Homo erectus*, had he been brought up in the Upper Palaeolithic, have mastered language? (1995a: 245-6).

The former is considered a matter of sociocultural *milieu*, the latter a biological ability. For 'modern', cultural humans, 'biological' evolution has been replaced by 'cultural' mechanisms. If the first 'anatomically modern' humans were separated from Neanderthals and earlier hominids and hominoids by biology, *we* are separated from *them* by history: the point of intersection of these two continua becomes our origin point (*ibid.*: 255).

Such a conceptualisation places dangerous constraints on archaeological thought. If 'human origins' research is directed towards searching for 'modernity' in the archaeological record, then any given population can only be 'modern' or 'non-modern' (Field, 2002; Brace, 1997). The notion that some species and populations were 'modern' and others pre- or proto-modern is teleological, erroneously assuming directionality in the archaeological and palaeontological record, and labelling species or populations 'modern' allows us to assume, rather than demonstrate, their abilities and behaviours.

2.4.1. Paradigm crisis?

The growth of a critical epistemological examination of the assumptions and biases underpinning 'modern human' origins research has thus demonstrated clearly that there are serious flaws in the discipline. Representatives of the various models are in fact often simply 'outlining their preconceptions or biases about what they believe the course of human evolution was "like"' (Willermet & Clark, 1995: 487): such subjective paradigmatic formulations (e.g. the 'replacement' or 'continuity' positions regarding the evolution of *Homo sapiens*) are worldviews (Kuhn, 1970; Willermet & Clark, 1995: 488; Clark, 1997: 66),

> grounded in different sets of preconceptions and biases about evolutionary process which result in different construals of what the human past was like. Each comprises a polythetic set of assumptions that privileges some suites of variables at the expense of others, and that weights variables held in common differently (Clark, 1997: 66).

The result, unsurprisingly, is that protagonists in the debate are often merely talking past one another: Willermet and Clark's review of some of the evidence for the opposing 'replacement' and 'continuity' positions: of the 680 craniometric data points collected by researchers from both camps, only 11% were common to both paradigms (1995: 488; see also Clark, 1997: 1). The implications are clear: with no foundation from which to evaluate competing models (Churchill, 1997: 202), 'simply acquiring more data will not help us choose between opposing paradigms' (Willermet & Clark, 1995: 489). Shreeve's experience of trying to find some consensus is perhaps typical: after interviewing more than 150 scientists, he found he had

> come away with one hundred and fifty points of view. Early modern humans appear first in Africa. No, they don't. Or it depends on what you call early. Or how you define modern. Or what you really mean by human. I indexed my notes, and indexed the indices. A city of Post-it notes grew on my office wall, each with a revelation scribbled on it. Arrows of blue chalk sprang up to link brainstorm to brainstorm. But the arrows sprouted question marks. The Post-it notes lost their sticking power and fell to the floor (1995: 252).

In summary, the demonstration of different timings of morphological, genetic and (apparent) behavioural change in the palaeontological and archaeological records has resulted in the virtual collapse of the previously self-explanatory linkage between them. Nor can the concept of cultural and/or cognitive 'modernity' explain away the lack of a neat coincidence between these forms of evidence at a hypothetical modern human origins point. Instead, it is increasingly being argued that this situation may not, in fact, require 'explanation'. Why *should* we expect all these lines of evidence to match exactly? As Simek concludes,

> Biological determinism in examining the Middle/Upper Palaeolithic transition has led to simplistic formulations, taxonomic approaches to diachronic processes, and monolithic rather than mosaic views of change. None of these have produced useful or satisfying explanations for the complex patterns of evolutionary change that we know occurred during this time period (2001: 201).

2.5. RETHINKING THE MIDDE-UPPER PALAEOLITHIC 'TRANSITION'

The evidence, therefore, seems to suggest that rather than evolving in an uncomplicatedly linear fashion, various dimensions of past behaviours changed along distinctive trajectories and at different tempos in a complex, mosaic fashion. McBrearty & Brooks' exhaustive review of the evidence from both the Middle-Late Stone Age transition in Africa and the Middle East and the Middle-Upper Palaeolithic transition in Europe concludes that, *contra* those who identify morphological, genetic and/or behavioural 'revolutions' at either (or both) point(s), the evidence supports a gradual constellation of changes:

> the new behaviors do not appear suddenly together, but rather are found at points separated by sometimes great geographical and temporal distances. It seems inappropriate to label changes accumulating over a period of 200,000 years either a revolution or a punctuated event (2000: 259; figure 13).

The 'modern' human cultural 'package' is thus disassembled and taxonomically-based approaches to culture change undermined (Simek, 2001: 199): the issue becomes one of 'scheduling' or 'sequencing' rather than 'before and after' (e.g. Gowlett, 1996; McBrearty & Brooks, 2000; Stettler, 2000; Clark, 2001b). In this paradigm, we can no longer expect behavioural (and archaeological) 'revolutions' to coincide with the arrival of 'modern' humans in Europe. The fact that there *is* such a coincidence of biological and behavioural change should not be seen as *providing* a neat 'explanation' for the differences observed between the Middle and Upper Palaeolithic, but as *requiring* one.

And to address this question, we need to dispose of the teleological 'top-down' approach which starts with an assumption of complexity among 'modern' humans and a comparative simplicity in the Neanderthal archaeological record (e.g. Gamble & Roebroeks, 1999; Roebroeks & Corbey, 2001). Instead archaeologists need to take a 'bottom-up' approach, 'observing and documenting what Palaeolithic hominids actually did and how their behaviour changed over time, not just whether or not they could do what modern humans did' (Roebroeks & Corbey, 2001: 75).

We need to look again at the 'transition' with an open mind; not 'dehumanising' Neanderthals and so-called 'pre-modern' populations, ticking boxes in our 'trait-list' of archaeological characteristics of 'modernity' and labelling differences as 'failures' on the part of the preceding populations, but accepting the validity of their behavioural repertoires. As Alexandri puts it, 'The notion of difference must be divorced from a framework that devalues it' (1995: 65). With biological and cultural change decoupled, we can move beyond a sterile biological determinism (e.g. Simek, 2001), and rather than seeing changes 'arrive' in a single package of 'modernity', models should be 'mosaic' in nature, emphasising the variations and changes in different spheres of behaviour at different times, in different places and over different timescales. They should not focus purely on the much-vaunted 'Middle-Upper Palaeolithic transition' or a 'human revolution'. Change – or otherwise – in the archaeological record at this 'point' needs to be placed in context. As Brace argues,

> it should be categorically denied that there was anything in their genome that compelled Neanderthals to produce Mousterian tools or that dictated that their early mdern successors were genetically predisposed to produce Upper Palaeolithic ones. Likewise, the production of Mousterian tools does not be that mere fact consign the makers to Neanderthal status, nor does the manufacture of Upper Palaeolithic tools automatically confer modernity on their producers. The tools that an individual constructs, like the language he speaks, are aspects of learned behavior that are shaped by the sociocultural context within which that individual matures (Brace, 1997: 11)

But how do we address the social and cultural context of the archaeological record? If the identification of biological 'units' ('Neanderthal', 'modern human') has little to tell us about behaviour *per se*, does the definition of archaeological 'units'?

2.5.1. What are archaeological periodisations?

As discussed in Chapter 1, there has been a rejection of the traditional, thinly-veiled essentialism of claims for the straightforward 'cultural' or 'ethnic' associations of the standard 'units' of archaeological classification as defined by lithic typology, which 'treats pattern in retouched stone tools as if it were objectively real and intrinsically meaningful, and … uses pattern to identify the time-space distributions of identity-conscious social units analogous to those known from history' (Clark, 1997: 67). Instead, if we are to use an evolutionary analogy, we should use that of Darwinism. In this paradigm change is a constant (though not necessarily a consistent) process (Field, 2002), rather than an event – although societies may choose to recognise 'definitive' points of realisation or acceptance of change (*ibid.*). And yet stability is a fact; although there are many reasons to expect changes in social life, stability is more difficult to account for (Jones, C. 2002).

In particular, the kinds of (massively long-term) stability that we are to be talking about in the Palaeolithic is difficult to understand. As Clark points out,

> the time-space distributions of prehistorian-defined analytical units (e.g. the Aurignacian) exceed by orders of magnitude the space-time distributions of any real or imaginable social entity that might have produced them … Social identity is a fleeting, transient thing, constantly changing, constantly being renegotiated. It simply does not persist for millennia, nor across vast reaches of space. So whatever the Aurignacian is, it is manifestly not a "culture" (Clark, 2001b: 43-4).

What, then, are we documenting when we document change in lithic technologies, in subsistence practices, in spatial behaviour? How and why should variation in one such aspect relate to that in others, or to the people responsible for them? Why should we expect all of these aspects of change to coincide in a 'transition'? *Why should* changes in the shapes of pieces of stone, changes in the ways people found their food, changes in the ways they moved around, really have anything to do with each other, or with any kind of biological change? As discussed above, once again we need take a 'bottom-up' approach to archaeological record rather than imposing a 'top-down' structure upon it, and re-assess the kinds of change that actually occurred in a wider context:

2.5.2. A wider definition of technology

The key, I think, lies in the recognition that lithic technologies, like all other aspects of the archaeological record, were produced by people. It is past time to re-populate the Palaeolithic. The relevance of our analytical units lies in the fact that they link individuals across time and space (Wobst, 1983). Such links are temporal and spatial; they occur within the context of the ecosystem – a concept which, as outlined in section 1.5.1., encompasses the totality of the world of the individual manufacturer of lithics, both 'environmental' and social.

Recent archaeological approaches to technology have de-emphasised the traditional focus on the artefact in favour of a return to the root of the word '*techné*', meaning 'technique' or 'performance' (e.g. Ridington, 1999; Dobres, 2000). Recognition of the 'embeddedness' of technological practices in experience and social behaviour has led to a conceptualisation of technology as a particular structure of knowledge communicated between people primarily through oral and practical traditions (Ridington, 1999). The implications are far reaching, implying 'an archaeology of human practice, rather than of material objects' (Boyd, 1999).

Experimentation with these ideas has begun among lithics researchers: *chaîne opératoire* and object biography approaches emphasise creative, problem-solving technologies over typology, addressing the ways in which lithic technologies interact with other kinds of behaviours such as, for example, hunting and use of the landscape (e.g. Churchill, 1993; Kuhn, 1993; Stiner, 1994; Stiner *et al.*, 2000).

But the notion of a narrative technology or *techné* can be extended beyond this. As Gosden and Head point out,

> Every action we perform is contained within a network of actions stretching across time and space. For instance, the act of flint knapping has implicit within it the purposes for which the finished tools will be used. These purposes exist in the future and may involve activities which will be carried out in another location. Flint tools may be used for scraping skins or shaping woods; both skin and wood are destined for other purposes, part of further chains of action. Consequently, every act contains within it implicit links to other acts separated in space and time. These future acts orientate and shape the present one and it is the flow of life as a whole which gives each act point and purpose. These chains of action knit together to form a network. We can think of this network as a system of reference, because every act implicitly refers to many others (1994: 114).

'Technology' thus encompasses many, if not all, aspects of life and behaviour, linking them together: 'a corpus of culturally transmitted knowledge, expressed in manufacture and use' (Ingold, 1981: 125). Complexity of technology can be seen as residing in stories, narratives and constellations of use-behaviours rather than simply in artefacts *per se*.

While the focus thus far has been on lithic technologies, the implications of such a conceptualisation for the study of other aspects of behaviour are also huge. In the case of subsistence practices, for example, the notion of a 'narrative technology' suggests a way of placing these squarely within the individual hunters' experience of the four-dimensional ecosystem. The technological know-how of hunting practices forms a dynamic web of understanding regarding, for example, the monitoring of the ecosystem and gathering of information about plant and animal 'behaviour', the planning and organisation of the hunt deciding on and locating prey, and its slaughter as well as butchery practices, distribution of meat and disposal of remains - the 'who, what, where, when, how and why of a hunting technology' (Dobres, 2000: 106; see also Gifford-Gonzalez 1993).

2.5.3. Narrative technology and the theory of practice

A view of subsistence practices as part of an overall *techné* argues against any separation of lithics, subsistence and other aspect of behaviour; all form part of the daily experience of past individuals and groups.

But how does all of this relate to our familiar analytical divisions of the Palaeolithic? Such units link people and technologies by virtue of being 'modalities' (Clark, 1997: 68), constituting 'a range of options very broadly distributed in time and space, held in common by all contemporary hominids, and invoked differently according to context' (*ibid.*). Such a concept could sound like the familiar Processual hominid making rational and efficient choices in the Palaeolithic 'supermarket': the challenge is to place these wider technological practices in context. What we need is an archaeology of 'narrative technology' – a theory of *practice*, such as that of Bourdieu (1977). The emphasis of Bourdieu's theory of practice on the relationships between people and their material world is one of its major advantages for archaeology, and will be returned to in the following chapters. Bourdieu's other important contribution is the concept of *habitus*, which is seen as 'integrating past experiences, [it] functions at every moment as a *matrix of perceptions, appreciations, and actions* and makes possible the achievement of infinitely diversified tasks' (Bourdieu, 1977: 82-3). Put more simply, the components of the *habitus*

> are strategy-generating principles enabling agents to cope with unforeseen situations. Rather than seeing *habitus* as abstract sets of mechanistic rules in a filing cabinet in the mind, Bourdieu emphasizes the importance of practical logic and knowledge … the *habitus* is unconscious, a linguistic and cultural competence. In day-to-day activities, there is a practical mastery involving tact, dexterity, and *savoir faire* which cannot be reduced to rules. It is transmitted from generation to generation without going through discourse or consciousness (Preucel & Hodder, 1996: 215-6).

Perhaps the most important thing about the concept of the *habitus* is that it is a theory of practice. A theory of engagement in the world, making explicit a link between the individual person and their *milieu*, showing us a way of overcoming the sterile dualism of agent vs. 'unit' of adaptation and selection. The *habitus* is no vague, amorphous phenomenon but is always *situated* in the world, not transmitted so much as understood through a process of 'enskillment' rather than of enculturation (Gibson, 1979: 254):

> 'Learning to see, then, is a matter not of acquiring schemata for mentally *constructing* the environment but of acquiring the skills for direct perceptual *engagement* with its constituents, human and non-human, animate and inanimate' (Ingold, 1996a: 141-2; Chapter 5).

Such knowledge is not so much unconscious as *non-discursive*; rather than being able to list behavioural 'rules', people simply know how to get on with their lives (Shennan, 1996: 284).

2.6. SUMMARY AND CONCLUSIONS

This chapter has argued that current explanations of the Middle-Upper Palaeolithic transition and of the replacement of Neanderthals by modern humans are firmly embedded in contemporary social and political discourse. They are based on (largely unwarranted) assumptions and biases concerning the kinds of behaviours that we can expect 'humans' and 'others' to practice, and the ways in which these might have 'evolved'. The Palaeolithic needs a new framework for conceptualising archaeological (and biological) change, and it is argued that this is best provided by a consideration of the archaeological record in terms of narrative, performed 'technologies'.

The archaeological study of 'technology' should not be limited to typological analysis of the form of stone (or bone, or wood) tools, or to the mechanics of subsistence behaviours. A more holistic approach to technology, conceptualising it as a form of narrative performance which both underpins and structures the *habitus*, a practical *savoir faire* and mastery of the skills involved in experiencing the world, enables us to use the archaeological record to ask questions about prehistoric lifeways. As Ingold argues, 'the activities we conventionally call hunting and gathering are forms of skilled, attentive 'coping' in the world' (1996a: 149).

This 'dynamic approach to technology as social practice' (Gowlett, 1996: 135-5), sees the kinds of behaviours apparent in the archaeological record not as separate sub-systems of a 'culture', but as part of an holistic constellation of everyday life. In such a way we can re-think change in the Palaeolithic in terms of the changing *habitus* and identity rather than as a series of transitions between static 'cultures'. As Gamble argues,

> we need to broaden explanation to consider that lifestyles have a 'becoming' (i.e. are constantly originating) rather than an origin in time and space. Such a becoming is a continuous process of creativity, not something that is fixed in time, pinned like a butterfly in a case (Gamble, 2001: 172).

The following chapter goes on to discuss some of the ways in which the Middle-Upper Palaeolithic transition of western Europe has been conceptualised, and to suggest new ways of thinking about the period from the perspective introduced here.

CHAPTER THREE: DESIGN AND DISTANCE IN THE MIDDLE AND UPPER PALAEOLITHIC OF VASCO-CANTABRIAN SPAIN

In this chapter I argue that just two basic concepts – 'distance' and 'design' – underlie current thinking about the nature of the behavioural 'transition' from the Middle to the Upper Palaeolithic in Europe, and particularly in Vasco-Cantabrian Spain.

Rather than merely produce yet another exhaustive review of the arguments for and against continuity or rupture, this chapter attempts 'set limits to archaeological speculation and sketch a basic outline of the social organization of these hominids' (Roebroeks, 2001: 438; Aiello, 1998). Only when we have set out what changes *did* actually occur can we begin to consider how these might relate to biological, 'cultural' or behavioural change.

As Enloe writes, however, 'Every adaptation is local. A culture does not merely copy itself onto a new territory; it must meet the problems posed by the physical and social environments' (2000: 118). Any attempt at synthesis must thus focus on a particular region, and my focus here is on the northern regions of Spain and Vasco-Cantabria, although where appropriate I also draw from the archaeological record of other parts of southwest Europe.

3.1. THE IBERIAN PENINSULA AND VASCO-CANTABRIAN SPAIN

The Palaeolithic archaeology of the Iberian peninsula has been overshadowed by that of neighbouring France for some time (Straus *et al.*, 2000: 9). However, recently there has been something of a revival of interest, partly a result to political and social change in the country following the devolution of jurisdiction and funding of archaeology to the post-Franco autonomous regions of the country (Estévez & Vila, 1999; Straus *et al.*, 2000: 8), and partly because of a series of new discoveries, including the paintings of the Côa Valley and intriguing new data regarding the Middle – Upper Palaeolithic transition, particularly Bischoff *et al.*'s new dates (e.g. 1989, 1992, 1994).

New dates for the earliest Aurignacian in the north of the country – at l'Arbreda, El Castillo and Abric Romaní – centre around 40,000 B.P. (Straus, 1996), posing a problem for the generally accepted East-West 'trend' of the earliest dated Aurignacian assemblages (Rigaud, 1997). In addition, in the south of the peninsula, evidence has come to light of the very late survival (to around 30,000 B.P.) of Mousterian assemblages and of Neanderthals, at sites including Cova Negra, Cova Beneito, Cariguela, Figuiera Brava and Zafarraya (Straus, 1996: Table 3; Rigaud, 1997).

On the basis of these dates, the potential 'overlap' between Neanderthals and modern humans more than doubles from previous estimates, with Neanderthals apparently surviving some 10,000 years after the appearance of the Aurignacian and Châtelperronian in the North of the peninsula, sandwiched between both Neanderthal and modern human populations in southwest France, and modern human Aterians in Morocco (Straus, 1996). The discovery of the Lagar Velho 'hybrid' has also fuelled debate about the existence and nature of interaction between the two groups. Thus

> The role played by the Iberian Peninsula in the debates over the origins and diversity of 'modern' humans and of Upper Palaeolithic culture has now become *central*, rather than peripheral which arguably it had been perceived to be in the archeological literature of decades past (*ibid.*: 8).

The Vasco-Cantabrian region has also provided a focus for both indigenists and continuists. As discussed in Chapter 2, the conflation of the Middle-Upper Palaeolithic transition with the replacement of Neanderthals by 'anatomically modern humans' means that archaeologists look for evidence of 'humanness' or 'modernity' in the archaeological record using a 'checklist' approach, whereby elements of the archaeological record are related to behavioural traits.

It is not my intention in the following section to discuss in any more than very general terms the efficacy of these checklists at describing or explaining the changes - such work has been done in detail elsewhere (see e.g. White, 1982; Chase & Dibble, 1987; Hayden, 1993; Gaudzinski, 1999; McBrearty & Brooks, 2000 generally, and Straus, 1983, 1996, 1997; Cabrera Valdés & Bernaldo de Quirós, 1996; Cabrera *et al.*, 2000, for northern Spain). Instead, I will illustrate how all of these aspects can be related to just two interconnected concepts – 'design' and 'distance' - which describe archaeologists' approach to the Middle-Upper Palaeolithic 'transition' in Vasco-Cantabrian Spain. These concepts are perhaps best demonstrated archaeologically in Binford's fundamental division between specialised, logistic 'collectors' and generalised 'foragers' (1996 [1980]), and I will use this to approach – and challenge – the idea of a transition to modernity.

3.2. TECHNOLOGICAL CHANGE IN THE MIDDLE AND UPPER PALAEOLITHIC

1.	New technologies: new tool categories and forms, including hafted and composite tools and tools in novel materials such as bone, ivory and wood.
2.	Standardisation within formal tool categories, with specialised tool types.
3.	Increased variation of formal tool categories over time and across space.

Table 3.1. The Major technological components of the Middle-Upper Palaeolithic transition

The Upper Palaeolithic/Aurignacian 'package' includes blades produced from prismatic cores - rather than flakes, as was the case for most Middle Palaeolithic industries - and new types of stone tools (discussed more fully in Mellars, 1989, 1996). The major tool types associated with industries of the Middle and Upper Palaeolithic in Vasco-Cantabria are listed in Appendix 2; see also Straus (1992); Bernaldo de Quirós & Cabrera Valdés (1993); Cabrera Valdés & Bernaldo de Quirós (1996); Cabrera Valdés *et al.* (1997) and Cabrera *et al.* (2000).

The changes in technology between the Middle and Upper Palaeolithic have been linked, more or less explicitly, to the 'collector/forager' debate. The interpretation of

Neanderthals as generalised, opportunistic foragers is linked to that of their lithic technologies as representing generalised 'sharp edges', an opportunistic, expedient, spur-of-the-moment technology (Binford, 1973). Middle Palaeolithic assemblages, it is argued, seem to represent largely on-the-spot, *ad hoc* decisions made on the basis of short-term requirements (Binford, 1989: 33) - *maintainable*, rather than *reliable* technologies. Ethnographically such technologies are portable and modular, designed to be easily repaired as and when required and ideal for use in unpredictable yet plentiful environments and situations where the cost of failure is not ruinous, and are thus related to opportunistic, 'foraging' food-getting strategies.

In contrast, Upper Palaeolithic populations' 'specialised' technology, in this model, is pre-designed for particular subsistence strategies – over-designed, with parallel, redundant components too complex to be easily repaired by the user. They are usually manufactured and maintained by specialists in anticipation of specific tasks, and thus are favoured when these tasks can be anticipated and when the cost of failure is high – they tend to be related to logistical 'collecting' subsistence strategies (Pike-Tay, 1993: 88; Peterkin, 2000: 126-7), and are seen as strong indicators of 'curation, foresight and mental templates of tool designs employing different materials shaped to predetermined specific functions' (Hayden, 1993: 115; see also Binford, 1989).

However, despite these oft-cited differences between them, it is increasingly being argued (particularly for Vasco-Cantabrian Spain), that in many respects the Upper Palaeolithic Aurignacian is not very different from the preceding Middle Palaeolithic Mousterian. Even without consideration of the nature and significance of the Châtelperronian[7], significant continuity has been demonstrated in lithic manufacture (Straus, 1992, 1996: 206; Bernaldo de Quirós & Cabrera Valdés, 1993; Clark, 1997; Cabrera *et al.*, 2000: 90 and *passim*) and raw material use (Straus, 1996: 206; Cabrera *et al.*, 2000), although - by definition - type-fossils remain discrete (Straus, 1996: 206) and other differences are also identifiable; for example, a general reduction in sidescrapers and increase in endscrapers and burins (Cabrera Valdés & Bernaldo de Quirós, 1996; Cabrera *et al.*, 2000).

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[7] Identified in Northern Spain at El Castillo level 18, Cueva Morín, level 10, and at El Pendo level VIII (with isolated Châtelperron points recovered from other sites, including Labeko Koba and Ekain).

3.2.1. Hafting and composite tools and tools in novel materials

The traditional association of the Mousterian with the production of flakes (Levallois or non-Levallois) and of the Aurignacian with the volumetric production of blades from prismatic cores has been explained in terms of the Upper Palaeolithic production of hafted and composite tools, involving of necessity a more complicated 'mental template' because of the need to hold more than one scheme, object or relationship in the mind simultaneously (e.g. Gibson, 1993: 265). However, it is now apparent that this was not a simple 'all or nothing' change (e.g. Mellars, 1989: 364; Rigaud, 1997; Cabrera *et al.*, 2000: 90) but a more gradual process.

In addition, although at least occasional use by Neanderthals of bone and wood is now well-documented (e.g. Gaudzinski, 1999: 216-7; McBrearty & Brooks, 2000; Henshilwood *et al.*, 2001), arguing against any 'inability' on the part of Neanderthals to work such materials (Cabrera *et al.*, 2000; Mithen, 1996), the Upper Palaeolithic does seem to be characterised by a number of new, specialised, techniques (Cabrera *et al*, 2000). The widespread use of these new materials - more suitable than stone for certain 'special-purpose' tools such as the diagnostic harpoons of the Magdalenian - has been linked to the development of 'designs' and 'mental templates'. However, bone and wood technology is hardly common in comparison with stone tools, and the early Aurignacian Level 18 at El Castillo is unusual in having yielded a rich assemblage of many antler points many (Straus, 1996). Such materials, it seems, are only in common use after the LGM, and in fact the most significant changes date to between the Solutrean and Lower Magdalenian (Stettler, 2000).

3.2.2. Special purpose tools, standardisation and variation in formal tool categories

The identification of 'special purpose tools' in the Upper Palaeolithic record and their apparent lack in the Middle Palaeolithic has also been used to argue for the development of 'designs' or 'mental templates' only by modern humans. An consequence of the pre-'designed' nature of these tools, it is assumed, was standardisation. However, 'standardisation' (proof of 'design' ability) in the Upper Palaeolithic becomes 'uniformity' (lack of creativity) in earlier populations, while Upper Palaeolithic 'variation' (evidence of flexibility and adaptiveness) becomes opportunistic, *ad hoc* behaviour in the Middle Palaeolithic (Roebroeks & Corbey, 2001). Thus 'virtually continuous' Middle Palaeolithic tool variation is used to argue that tools 'do not appear to have been produced with clearly defined preconceived "mental templates" about the final, overall form of the finished tools' (Mellars, 1991: 66), and Middle Palaeolithic tools are considered to be generalised rather than designed for a specific function, while the deliberate 'imposed form' of the Upper Palaeolithic is argued to reflect growing conceptual normalisation, clear (linguistic?) categories and/or some form of 'stylistic' social communication (*ibid.*: 67; Rigaud, 1997). This, of course, ignores the fact that contemporary Australian/New Guinean aboriginal populations have minimal taxa for stone tools, and types are even less 'standardised' than those of the Middle Palaeolithic (Hayden, 1993).

Such standardisation, almost by definition, allows the identification of formal variation in space and time. It is therefore no surprise to find increased or accelerated lithic variation listed as a defining characteristic of the Upper Palaeolithic in contrast to the Middle Palaeolithic. Certainly, in the Middle Palaeolithic of Cantabria some Mousterian facies span 25-50,000 years in contrast with the series of distinctive Upper Palaeolithic industries, each spanning only a few millennia, occurring over the course of 25,500 years (Butzer, 1981). Most researchers thus conclude that the Mousterian represents 'the flexible technology of a single population, maintaining an adaptive steady state despite repeated environmental changes' (*ibid.* 113), in contrast to the bewildering rapidity of Upper Palaeolithic technologies, which are characterised as more 'sensitive' to changing affordances of the environment (Hopkinson, 2001).

Lithic technology functioning as 'the set of extrasomatical adaptations employed to defend against the environment' (Cabrera *et al.*, 2000: 85) is thus seen as a major defining characteristic of 'modern' humans; pre-'modern' populations, in contrast, did not 'adapt' technologically – instead, 'technology was an aid to adaptations organized in other terms' (Binford, 1989: 25).

3.2.3. Technology, design and distance

Hominid Type	Technologies
Early hominids	Tool-kit represents expedient tools knapped on the spot and discarded after use, the goal being the production of multipurpose sharp edges.
Upper Pleistocene Neanderthals	Artefactual assemblages more varied and diverse but still very immediate in nature, some multipurpose, some specialised but still a 'direct' or 'tool-assisted' lifestyle.
Earliest modern humans	Tool-kit demonstrates use of new raw materials, assemblages 'curated', direct and indirect (e.g. hafted and composite tools), standardisation and specialisation.

Table 3.2. Hominid 'types' and design and distance in lithic technology (after Enamorado, 1997: 54-6)

The 'time depth' (measured by the amount of design, planning, forethought and maintenance involved) of technological behaviours is thus seen as gradually increasing over the course of the Pleistocene (Table 3.2., see also Binford, 1989), and this neat, cumulative and directional scheme highlights the extent to which the perceived changes in lithic technology rely on the concept of the increasing cognitive abilities of *design* and *distance* between Middle and Upper Palaeolithic populations.

3.2.3.1. Design

The concept of *design* relates to the apparent increase in standardisation and variation of Upper Palaeolithic industries and its perceived basis in the 'mental template', linked to the idea of *distance*: the production of specialised, designed tool types including composite and hafted tools (containing more components, linkages etc.) is related to increased planning depth and abstraction (McBrearty & Brooks, 2000: 492).

However, the purely typological approach to lithics is highly problematic (section 2.5.2.). The system used in Vasco-Cantabria is a slightly modified form of the de Sonneville-Bordes-Perrot system: this tends to amplify assemblage differentiation, being extremely (overly?) fine-grained (e.g. Clark, 1987), and its application of the system outside of south-west France (and even simply beyond its type-sites) has been questioned (e.g. Straus, 1992: 71). It has been argued that the Vasco-Cantabrian lithic record, rather than falling into neat, discrete 'industrial' categories, is in fact virtually continuous: Straus recognises only three major technological divisions of the Middle and Upper Palaeolithic, and bases these not solely on typology, but on 'significant perceived differences in technology, environments and adaptations'[8] (Straus, 1992: 124).

The apparent obsession with lithic variation and tool 'types', and celebration of standardisation in the Upper Palaeolithic has been criticised (e.g. McNabb, 2001, comments on Gosden, 2001) by those who argue that it denigrates creative, less constrained Middle Palaeolithic technologies, centred on performance and action rather than design (Gosden, 2001), than essentially rather 'boring' and 'mass-manufactured' Upper Palaeolithic tool types, and the focus can thus be moved away from typological debate to address the wider project of living in the world. More interesting - and potentially more fruitful - than typological debate is a consideration rather of the ways in which lithics 'designs' might have been generated and used, including the wider behaviours and practices in which technology is embedded and the kinds of social ties that would influence the generation, transmission and variation of designs. These issues are as relevant in the apparent stability of Middle Palaeolithic industries as they are in the bewildering array of Upper Palaeolithic 'tool types' and industries. As Gibson argues, 'the intellectual level of our ancestors is more likely to have been reflected by the ways tools were used and by the complexity of the social-

[8] A distinct Middle Palaeolithic tradition and an Upper Palaeolithic divided between early technologies (prior to the LGM, comprising the Châtelperronian, Aurignacian and Gravettian as traditionally defined), and late technologies (younger than the LGM - the Solutrean, Magdalenian and Azilian).

technological networks of which they were a part' (Gibson, 1993: 263-4). What do technological differences have to say about the forms of social behaviour in which these patterns are embedded?

3.2.3.2. Distance

The question of 'distance' is more problematic. It is all too often related purely to 'abstract' or 'logical' thought, and to linguistic and symbolic competence, in addition to its more prosaic uses in archaeology as evidence for 'logistic' or 'collector', as opposed to 'foraging', strategies of subsistence (Binford, 1996 [1980]).

The notion of 'distance' or displacement can instead be looked at in terms of *personhood* and *skill*. It has been suggested that 'distance' in lithic technologies may reflect 'distance' in social relations; the forming of relations and linkages between an increasing number of 'components' in the creation of increasingly dense, diffuse, distributed networks of personhood (Gamble, 1996, 1998; Gosden, 2001), although Gosden characterises all pre-humans as 'individuals' relating with other individuals, rather than creating the kinds of diffuse, distributed personhoods that he ascribes to modern humans (thus arguing for a qualitative rather than quantitative difference between Middle and Upper Palaeolithic 'networks'; 2001a; see section 5.2.1.). Although I would take issue with such a bald, punctuated division, I agree with his wider point that such technological differences relate to the ways in which people interact with their worlds, rather than simply the sudden evolution of new cognitive abilities.

The concept of 'skill' - 'generic' and 'specific' - also allows us to reconsider 'design' by linking technological changes in the archaeological record with the wider lifeways of hominid and human populations:

> 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. Creating and following paths in the landscape would be another skill that was dependent upon

knowledge and the transmission of information via social networks … By contrast, specific skills are historically developed at particular places and in distinctive contexts. There 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 … 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 & Roebroeks, 1999: 11).

Although specific skills are considered a feature of the Upper Palaeolithic, manifesting in the huge variety of industries of the Upper Palaeolithic, and less apparent in the early Middle Palaeolithic, Gamble and Roebroeks are careful not to identify what would simply be a differently-worded transition between the Middle and Upper Palaeolithic. The notion of 'skill', coupled with that of 'personhood', forces us to take a more holistic view of the archaeological record than the language of design, types, templates, logistics and planning. This is true not just when considering lithic technologies, but other aspects of the record.

3.3. SUBSISTENCE CHANGE IN THE MIDDLE AND UPPER PALAEOLITHIC

Subsistence practices, and particularly hunting, have traditionally seen as a central aspect of the transition from archaic to modern *Homo sapiens* (3.3.; see also Cartmill, 1993).

1.	Increased intensification in resource use, planning depth and seasonal scheduling of hunting and fishing.
2.	Regular hunting of dangerous species, and specialisation on prime age adults of a single species

Table 3.3. Subsistence practices characterising 'modern' populations (after McBrearty, 2000: 492)

3.3.1. Intensification and increased diet breadth

The issue of intensification, in this context, is mainly used to refer to the apparent increase in exploitation of more 'costly' resources such as aquatic, avian and smaller, quicker terrestrial species (Bahn, 1983; Stiner, e.g. 1993; Peterkin, 2001; Richards *et al.*, 2001). This is thus linked to the increased diet breadth also argued to be characteristic of the Upper Palaeolithic in contrast to the Middle Palaeolithic as well as technological developments and particularly the advance design of the weapons and techniques necessary to capture these animals (Richards *et al.*, 2001).

However, evidence from isotopic studies of Neanderthal and AMH populations does not, in fact, support any dramatic subsistence changes at the boundary. Certainly exploitation of such resources appears limited among Neanderthal populations, who appeared to focus almost exclusively on open-environment herbivores (Fizet *et al.*, 1995; Bocherens *et al.*, 2001; Richards *et al.*, 2001). Such a pattern, however, is also evident in the Early Upper Palaeolithic and particularly the Aurignacian (*ibid.*).

The archaeological record of northern Spain – both Vasco-Cantabria and Catalunya - presents very little evidence of the exploitation of species such as molluscs, fish or birds for the Mousterian *or* Aurignacian (Straus, 1996: 206-7). Diversity[9] in the Vasco-Cantabrian Mousterian assemblages thus does appear to be low (Clark, 1987, table 3.4.) – and although other researchers see evidence of a slight increase in diversity during the Aurignacian (Freeman, 1973: 38; Bernaldo de Quirós & Valdés, 1993; Stiner, 2001), much of the data for increasing diversity derives from later Aurignacian contexts, and in fact 'any change is poorly represented by the fairly sparse available data, and is in any case greatly overshadowed by the more striking changes later in the sequence' (Bailey 1983a: 157; Straus, 1996: 206-7). Significant evidence for intensification only becomes apparent in Solutrean assemblages (González Saínz, 1992; Straus, 1992; Pike-Tay, 2000), particularly in terms of the use of marine resources, which become more markedly important in the Magdalenian, best demonstrated by the data from La Riera (Straus, 1986; Bailey 1983a).

[9] Number of different species utilised regardless of their proportional contribution - as opposed to niche width, which takes into account the proportional contribution of different food resources (Clark, 1987).

However, there are numerous ways of measuring diet breadth, and while Clark's work (table 3.4.), demonstrates increases in resource diversity and niche width over the course of the Palaeolithic, other work (e.g. Grayson & Delpech, 2001) finds no variation in 'taxonomic richness' but a change in 'evenness' which reflects a gradual specialisation as assemblages become dominated by a single species.

Period	Resource diversity	Niche width
Mousterian/Châtelperronian	11	2.54
Aurignacian/Perigordian	16	3.12
Solutrean	17	3.10
Lower Magdalenian	14	2.16
Upper Magdalenian	22	3.73
Mesolithic	30	2.72

Table 3.4. Resource diversity and niche width during the Middle and Upper Palaeolithic of Vasco-Cantabrian Spain (after Clark, 1987, tables 1 and 2).

3.3.2. 'Generalised foraging' versus 'specialised collecting '

Therefore, while unspecialised and opportunistic Middle Palaeolithic 'foraging' 'is characterised by the rather indiscriminate encounter hunting of available prey and in relatively small numbers. The resources procured by foraging are intended for more or less immediate consumption (Peterkin, 2001: 171), specialised Upper Palaeolithic faunal assemblages are considered to demonstrate logistical design, being 'characterized by large, systematic, social, and communal hunts resulting in the simultaneous procurement of a large number of animals from a single species; some of the proceeds were set aside in storage facilities for later use' (*ibid.*: 172). The increased planning depth or *distance* of these specialised 'collector' strategies reflect modern humans' 'mental template' of their target prey and hunting strategies designed in advance, which involve a 'temporal extension' of the activity 'beyond the immediate situation of extraction' (Binford, 1996 [1980]). Ingold has proposed a similar division between 'predation' (like foraging, a strategy retained from ancestral primate behaviours) and qualitatively different 'hunting', suggesting that the 'essence of hunting lies in the prior intention that motivates the search for game', while 'the essence of predation lies in the behavioural events of pursuit and capture, sparked off by the presence, in the immediate environment, of a target animal or its signs' (1987a: 31).

Traditionally, of course, the major dietary changes are located at the Middle-Upper Palaeolithic transition (Binford, e.g. 1982; White, e.g. 1982; Mellars, e.g. 1996; Enamorado, 1997: 55). Others, however, do not recognise evidence for a 'collecting' strategy until the Middle or Late Upper Palaeolithic, particularly around the last glacial maximum (Straus, 1992; Shea, e.g. 2001; Pike-Tay, 1993, 2000; Peterkin, e.g. 2001: 171; see Pike-Tay, 1991 for discussion and further references).

The evidence from from Vasco-Cantabrian Spain does seem to suggest non-specialised, unselective and opportunistic exploitation of all, or almost all, existing species in the area during the Mousterian, and in contrast, evidence from the Magdalenian does lend some support to Upper Palaeolithic populations abilities to deal with *distance* (in terms of their ability to anticipate animal species' movements and behaviour in space and time) and *design* (as evidenced by the organisational and technological aspects of subsistence practices) in their subsistence behaviours (Freeman, 1973: 38; Bailey, 1983a; Altuna & Mariezkurrena, 1988; Cabrera Valdés & Bernaldo de Quirós, 1992).

However, age-profile evidence from EUP assemblages in the region (Pike-Tay, 1993: 85), although limited, suggests that these assemblages also demonstrate small numbers of individual animals, a relatively wide spread of season-at-death data and a generalised technology that seems to reflect 'encounter hunting with the immediate consumption of relatively small numbers of prey, which is commensurate with Binford's use of the term foraging' (Pike-Tay, 1991, 1993; Peterkin, 2001: 171), and Aurignacian and even later EUP subsistence behaviours in fact demonstrate little advance in these respects over Mousterian populations (Rigaud, 1997: 163).

In fact, the evidence suggests that populations demonstrated a multiplicity of differing subsistence strategies according to immediate context. Thus among Upper Palaeolithic populations, 'collector'- type faunal patterning ('gourmet' curves and bulk processing) can co-exist with encounter-based hunting ('bulk' curves and evidence of greater carcass processing) of different species (Boyle, 1993) or of the same species at different times of the year (Burke, 1995). In short, however useful a general distinction between 'foraging' and 'collecting' strategies might be analytically, in practice,

> there is no clear dichotomy between Binford's foragers and logistical collectors in the archaeological record of the Upper Palaeolithic, but rather a continuum of variation in the patterned exploitation of faunal resources over time and across space ... The aspects of hunting vary widely through time and across space, with culturally specific choices regulating the choice of appropriate techniques and technology and the definition and selection of suitable prey species (Peterkin, 2001: 172).

3.3.3. Specialisation

This of course leads us to the question of specialisation, also considered to be a trait of the Upper Palaeolithic in contrast to the Middle Palaeolithic. Although usually taken to mean the targeting of a particular animal species, in practice specialisation can be identified on a number of different levels (table 3.5.).

The traditional model sees a shift, at the Middle-Upper Palaeolithic boundary, from subsistence strategies involving considerable scavenging of large body-sized animals to those focused almost solely on hunting (e.g. Binford 1982). However, new data and analyses have conclusively demonstrated that regular hunting even of large game was common during the Middle Palaeolithic and even earlier (Roebroeks, 2001: 445), and Bratlund's work suggests that researchers' scepticism regarding Neanderthals' and earlier hominids' hunting abilities

1.	specialising on hunting alone, rather than hunting and/or scavenging as part of the same subsistence system
2.	A focus on a particular ethological group [Boyle #40;Boyle, 1990 #40]
3.	A focus on a particular species
4.	A focus on prime-aged animals
5.	A focus on particular animals of particular species and at particular times and places
6.	'specialised' hunting practices often involving communal or mass hunting

Table 3.5. Levels of 'specialisation' in subsistence strategies (after Boyle, 1993)

related more to the attitude of earlier European colonial hunters towards large, dangerous animals than to the actual dataset (cited Roebroeks, 2001: 446). Stable-isotope studies on Neanderthal bones in fact suggest that they were top-level carnivores (Fizet *et al.*, 1995; Bocherens *et al.*, 2001; Richards *et al.*, 2001). While scavenging may have remained significant, a shift to more hunting-focused strategies is documented well before the arrival of the Aurignacian (Stiner, 1994; Peterkin, 2001; see also Marean & Spencer, 1991; Marean & Kim, 1998 for discussion of the role of taphonomic effects and analytical bias in scavenging arguments).

However, the most commonly-used interpretation of 'specialisation' in the context of the Middle-Upper Palaeolithic 'transition', is that it involves targeting a particular preferred taxon, producing faunal assemblages dominated by a single species, a pattern identified by Mellars in south-western France and subsumed into the trait-list of characteristic 'Upper Palaeolithic' behaviours (1973). However, revision of this work has virtually reversed his original conclusions (Grayson & Delpech, 2002; see also Enloe, 2000: 116), and the majority of Palaeolithic assemblages 'specialised' on prime-age animals of a single species are dated to the Magdalenian, with low levels recorded for both the Middle and Early Upper Palaeolithic and little sign of a radical change at the Middle-Upper Palaeolithic boundary (Straus, 1996: 206; Gamble & Roebroeks, 1999; Stiner, 1994).

In northern Spain, Mousterian and early Upper Palaeolithic faunal assemblages are generally both small, with roughly even numbers of bovids, horse and red deer represented by few anatomical elements per individual (Straus, 1996: 206). Differences between the two are related more to changing use of forest and alpine biotopes (Altuna, 1989), and in any case are much more marked for later periods.

In fact, it is the Solutrean assemblages which appear to demonstrate the first real faunal specialisation (Altuna & Mariezkurrena, 1988; Clark, 1987), and it is not until the Magdalenian (particularly the Lower Magdalenian) that a single species commonly comprises more than 80% of an assemblage, strictly according to location (lowland = red deer dominant, upland = ibex; Freeman, 1973: 39; Altuna & Mariezkurrena, 1988; González Saínz, 1992), and even here horse and bovines remain important in terms of meat weight (Straus, 1992). Magdalenian assemblages also tend to demonstrate more intensive processing of carcasses, suggesting that animal resources were 'maximally utilised' (e.g. for grease or marrow extraction; Clark & Straus, 1983).

However, biased interpretation of specialised pre-Upper Palaeolithic faunal assemblages often dismisses them as merely representing the limited availability of animal species in the local environs, and despite the lack of evidence for any dramatic change at the Mousterian/Aurignacian boundary, such highly selective foraging is still generally considered an Upper Palaeolithic/modern human characteristic, beyond the capabilities of Middle Palaeolithic hominids (Boyle, 1990). To be 'properly' specialised it is thus also necessary to target a particular age cohort (usually prime-aged) or sex - which usually involves the hunting of the chosen animal at a particular time of year and often in a particular place (particularly in the case of the migratory species which consistently dominate Upper Palaeolithic assemblages; e.g. Pike-Tay, 1993).

The key ability, then, is *distance*: such consistently specialised exploitation requires a detailed understanding of the world and its temporal and spatial variation – which is only possible if one can deal with *distance*. 'Logistic' Upper Palaeolithic populations are thus seen as planning in advance to tailor their movements and hunting and gathering practices to seasonal variation. Neanderthals, in contrast, are opportunistic 'foragers', taking whatever they encounter.

However, work at El Castillo, El Pendo, and Cueva Morín demonstrated that 'None of the caves show dramatic differences between Mousterian and EUP occupants or site use in terms of season of hunt and age of individual prey animals' (Cabrera *et al.*, 2000; see also Pike-Tay, 2000; Bernaldo de Quirós *et al.*, 2001). In all three sites, the age distribution of prey animals remained constant across the Middle – Upper Palaeolithic 'transition', and thus 'In this regard at least, there is no evidence that EUP site occupants were targeting a particular age group of animals any more or less "effectively" than their Mousterian predecessors' (Bernaldo de Quirós *et al.*, 2001: 34].

Specialisation can also be considered in terms of the actual strategies pursued during hunting and/or gathering; the use by Upper Palaeolithic populations of specialised tools and weaponry, *designed* for logistically planned strategies, was discussed in section 3.2.2. Another quintessentially '*designed*' hunting strategy is that of communal hunting, usually linked to mass kills of the target species – although co-operative, rather than communcal hunting, may involve little forward planning (Frison, 1986). Such practices can be difficult to identify in the archaeological record (Binford, 1978; Driver, 1990), and communal hunting is thus usually identified by the 'catastrophic' age-profile of the faunal assemblage, or by carcass processing strategies – the classic 'bulk' versus 'gourmet' curves (Boyle, 1993; Burke, 1995).

Prior to the Upper Palaeolithic, it is argued, even gregarious migratory species such as reindeer were hunted as if they were territorial game (i.e. assemblages demonstrate an attritional or prime-aged age-profile, with seasons-at-death more spread out than those produced by large mass kills; (Binford 1982; see also Pike-Tay & Knecht, 1993). The suggestion is that Neanderthals were unable to organise personnel for communal hunts because of an inability to deal with *distance*. Straus summarises the argument:

> In order to be more successful in collective hunting, these hunters would have required planning and organisational skills well beyond those needed by their

> Neanderthal ancestors, suggesting quantum growths in social organisational complexity, symbolic abilities, calendrical knowledge, information acquisition and exchange, transgenerational transmission of knowledge etc.' (1986: 172).

However, that they were unable to predict the movements and gregarious and migratory herd animals sufficiently well to allow communal hunting and mass kills seems unlikely given the considerable evidence that such behaviours were perfectly possible even earlier in the Middle Palaeolithic, e.g. at La Cotte de St. Brelade (Callow & Cornford, 1986). Roebroeks has also argued that the variable environmental settings of assemblages and large size of prey might suggest co-operative hunting (2001). As he points out, with only limited technologies at their disposal,

> It is obvious that knowledge of animal behaviour must have played a key role in successfully hunting large mammals in the Palaeolithic, especially with the limited technologies at stake here. Even if experiments suggest that the Schöningen throwing spears were superb hunting weapons usable up to a distance of about 25m, the most important 'tool' must have been an extensive knowledge of a wide range of animal behaviour (Roebroeks, 2001: 450).

When the assumptions about Neanderthal and modern human behaviour are stripped away, then, there is evidence of considerable continuity in subsistence behaviours between the Middle and Upper Palaeolithic that undermines the simplistic opposition between specialised, logistical Upper Palaeolithic collectors, cognitively capable of *design* and *distance,* and opportunistic Middle Palaeolithic foragers.

3.4. CHANGE IN SPATIAL BEHAVIOURS IN THE MIDDLE AND UPPER PALAEOLITHIC

A number of different 'traits' relating to spatial behaviour are considered characteristic of 'modern humans' in contrast to Neanderthals (table 3.6).

1.	Range extension to previously unoccupied regions
2.	Long-distance procurement and exchange of raw materials
3.	Curation of exotic raw materials
4.	Site reoccupation
5.	Structured use of domestic space

Table 3.6. Spatial behaviours characteristic of 'modern' human behaviour (after McBrearty & Brooks, 2000).

In the following sections I break these down into two major scalar groups relating to the scales of spatial use:

1. Large-scale use of space, particularly relating to settlement and mobility strategies (inter-site spatial analysis and 'landscape' archaeology), assumed to relate to a broader 'regional' or 'interregional' community network (Mellars, 1989: 358).
2. The use of space *within* and in the immediate surroundings of particular sites (intra-site spatial analysis), assumed to relate to an individual or to a local group/community of groups.

3.4.1. Larger-scale spatial behaviour: settlement and mobility

The argument about the nature of the changes in larger-scale spatial behaviour is generally related to the 'economy', with a strong emphasis on subsistence practices and the procurement and trade of resources over large distances. In these terms, Middle Palaeolithic populations are generally characterised as existing at relatively low densities, with fluid, unstructured social structures unable to deal with the kinds of large-scale social interaction (*distance*) on which large-scale alliance and trading networks are dependent. During the Upper Palaeolithic, however, it is argued that an increase in population density was accompanied by the development more structured and formal (*designed*) relationships between and within other groups, allowing them to deal with *distance* in relationships with other individuals and groups over much greater temporal and spatial scales (e.g. Mellars, 1989; see also Gamble, 1996, 1998).

This extension of relationships over space and time (see Chapter 5 and section 3.4. below), it is hypothesised, allowed populations to share resources and information with other, distant groups, thus 'releasing' hominids into more marginal areas with less predictable resources such as the more northerly and mountainous areas of Eurasia, apparently virtually uninhabited by Neanderthals (e.g. Mellars, 1989; Finlayson, 1999; Enloe, 2000).

Such large-scale networks are attested to by the findings of materials at large distances from their origin, particularly in the Upper Palaeolithic, when high quality resources such as Bergerac flint often moved long distances, and in the case of some marine shells recovered from sites in the Périgord, more than 500km (Mellars, 1996). But while Middle Palaeolithic raw materials generally derive from within 50km (Mellars, 1991), even in the early Middle Palaeolithic (OIS6) some artefacts were moved over linear distances of more than 120km (Roebroeks, 2001: 448), and although some researchers argue for significant, sharp increases in the distances moved by raw materials at the Middle/Upper Palaeolithic boundary (Mellars, 1996: 400; Binford, 1989: 33-4), others (e.g. Gamble 1983a) argue that the major increases are most apparent during the increasingly glacial conditions immediately preceding the LGM, much later in the Upper Palaeolithic.

Population density, group size and mobility strategies are explicitly linked to subsistence in the 'generalised forager/specialised collector' model: 'foraging' is related to higher mobility, as people move between 'patches' of resources, a strategy associated with (or requiring) lower population densities and larger range-sizes, small, fluid social groupings and little formal social organisation; most researchers assume rather than demonstrate such a structure for Neanderthal groups by extrapolation from the divergent subsistence models for the Middle and Upper Palaeolithic discussed in section 3.3. above: as Gamble and Roebroeks lament,

> attempts to analyse settlement patterns and landscape use in terms of decisions based on reproductive success linked to feeding strategies. 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 (Gamble & Roebroeks, 1999: 8).

There is certainly some evidence, from site sizes, that Middle Palaeolithic groups were smaller and that population density was generally less than in the Upper Palaeolithic (Table 3.7.; Clark, 1987: 309; Mellars, 1996: 400).

Period	**Population density**
Acheulian	0.03
Mousterian/Châtelperronian	0.21
Aurignacian/Gravettian	1.2
Solutrean	8.25
Lower Magdalenian	11.67
Upper Magdalenian	12.00
Mesolithic	22.00

Table 3.7. Extrapolated population densities during the Palaeolithic of Vasco-Cantabrian Spain (after Clark, 1987: Table 3. Population density = number of sites/duration of culture-stratigraphic unit)

Although clearly a highly problematic measure, table 3.7. would suggest that population densities in Vasco-Cantabria, at least, were low during the Mousterian. However, there are also relatively few credible Aurignacian – or even EUP - sites in the region[10], and elsewhere in the southwest of Europe, early Aurignacian sites are actually fewer in number than Mousterian/Châtelperronian (Rigaud, 1997). Population densities, it can perhaps be assumed, stayed low. In Vasco-Cantabrian Spain, it is not

[10] In 1992 Straus quoted a figure of 47 levels from 21 sites over the Aurignacian and Gravettian – a timescale of some 20 millennia.

until the Solutrean that there is any substantial increase (Straus 1992; Straus *et al.*, 2002) - it has been suggested that the region may have served as a refuge for human populations at the height of the Last Glacial Maximum (Straus, 1992).

The assumption of small groups and high mobility of Neanderthal populations also generates the expectation that sites themselves will be more ephemeral, smaller, less structured ('designed') and subject to less re-use. They are also expected to be positioned less 'strategically' than those forming part of the 'logistical' system argued to structure Upper Palaeolithic subsistence patterns (Freeman, 1973: 39). However, although during the Early Upper Palaeolithic in Vasco-Cantabrian Spain, although some sites do appear in the mountainous interior - assumed to represent 'specialised' sites focused on the exploitation of alpine ungulates (Straus, 1992) – there is little evidence for any dramatic change, and the majority of sites are still located in sheltered spots in the coastal zone, where a number of biotopes could have been exploited in a 'generalised' fashion: analyses of subsistence economies at Cueva Morín, El Castillo and El Pendo in Santander 'suggest similar use of the sites and their surrounding landscape by both Mousterian and EUP groups' (Cabrera *et al.*, 2000: 90-1; Pike-Tay, 2000; Bernaldo de Quirós *et al.*, 2001). Again, it is not until the Solutrean and particularly the Magdalenian, that there is any substantial evidence for 'special-purpose' or 'logistical' sites (Straus, 1992).

Pre-Upper Palaeolithic populations are thus characterised as having a 'niche', rather than a 'cultural' geography (tabke 3.8.): in short, Neanderthal behaviours are seen to be directly attributable to or determined by the physical environment, while Upper Palaeolithic modern humans are characterised by a cultural geography, dealing with a *designed* environment whose cultural construction encompasses *distance* in both space and time, for example, using physical features of the landscape such as corridors, funnels and chokepoints in hunting strategies (see e.g. Straus, 1993 for comprehensive review).

Niche Geography: Middle Palaeolithic Neanderthals	**Cultural Geography: Upper Palaeolithic 'modern' humans**
Characteristic of animals: do not 'construct' an environment to serve their needs but instead move within their natural environment among the places where they may obtain resources essential to their biological success.	Construct and modify their environments to serve their needs and then exploiting their natural settings in ways that sustain both themselves and their cultural constructs.
Mobility-based rather than technologically aided, not organised around home bases.	Construct technologically aided social landscapes; operate out of camps into an environment.

Table 3.8. 'Niche' and 'Cultural' geographies (after Binford, 1987: 18).

3.4.2. Smaller-scale use of space: domestic space, hearths and structures

These perceived differences between the behaviours characteristic of the Middle and Upper Palaeolithic are also applied to smaller-scale use of space; the sites themselves are argued to be more structured and 'designed' in the Upper Palaeolithic record, supposedly reflecting more sophisticated forms of social organisation and interaction characteristic of the 'cultural' geography described by Binford (1987: 18; table 3.8.).

The 'design' and construction of a living space is held to represent the socialising of space and attachment to place ('topophilia'; Tuan, 1974) considered characteristic of modern human societies: 'the ordering and differentiation of space [*design*] by a recognition of places, including a home, and the use of those places according to specific temporal rhythms and schemes [*distance*]' (Kolen, 1999: 139). Evidence as to whether these particular spatial, social and cosmological notions can be applied to pre-modern living spaces follows two main lines; the analysis of 'structures', and of internal differentiation of space within a site (see Appendix 3 for review of the evidence from Vasco-Cantabrian Spain).

3.4.2.1. Structures

Evidence of 'structures' has been identified on Middle and even Lower Palaeolithic sites (Kolen, 1999: 145; Hayden, 1993), although such evidence is relatively rare and unimpressive in comparison to that from the Upper Palaeolithic, and even if other explanations are ruled out, these structures are not considered to represent the kinds of symbolic homes that modern humans construct, being likened to 'nest areas' (using analogies drawn from primatology): ephemeral, intended for individual rather than shared use close to food and constructed around the body. Kolen's comprehensive review of the evidence (1999) concludes that Middle Palaeolithic 'structures' should be termed instead 'centrifugal living structures'.

> "Centrifugal" because they were generally created by moving materials outwards in the context of carrying out tasks. "Living structure" because they entailed a wide range of day-round activities - not just sleeping or resting - but without evoking notions of dwelling in the modern human sense, "structure" because they were different from the soft primate nests and the constructed 'homes' of modern humans (Kolen, 1999: 155).

These 'centrifugal living structures' seem to reveal 'fluid' life histories, with repeated 'cleaning', use, rearrangement and reuse.

> Middle Palaeolithic living structures were never really "finished", but changed continuously during use .... The structures showed an emphasis on process, continuity and flexibility rather than on goal-oriented construction and well-demarcated episodes of production, use and abandonment. Therefore, they definitely were not 'buildings' in our sense of planned architecture' (*ibid.*, 153).

This clearly fits a perception of Neanderthals as lacking 'design' and 'distance' skills, being highly opportunistic and generalised in their mode of dwelling: Kolen refers to Middle Palaeolithic structures as 'undesigned', produced by basic biomechanical principles arising from the 'embodied' state of the individual rather than from abstract 'design' concepts (*ibid.*, 162), although they do seem to demonstrate at least a rudimentary form of spatial differentiation, and their continued re-use suggests their conceptualisation as 'fixed places' in the world.

3.4.2.2. Intra-site spatial differentiation

Similarly, it is argued of the changes in intra-site spatial differentiation between the Middle and Upper Palaeolithic that, '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' (Farizy, 1990: 325). Mousterian sites are characterised as demonstrating little or any internal differentiation, with artefacts and bones distributed randomly and relatively evenly across 'living floors' with no discernible patterning: 'refuse accumulation was not disturbed by systematic human intervention ... Thus humans seem to have lived in the midst of their garbage' (Farizy, 1990: 307). Neanderthals thus lived amidst 'des carcasses de son gibier, qu'il repoussait pour se ménager un espace où vivre'[11] (Leroi-Gourhan, 1965, 149 quoted Kolen, 1999).

The only major type of internal differentiation recognized for Middle Palaeolithic sites are hearths and their associated accumulations (Vaquero & Pasto, 2001) - and these are apparently made by simply removing sediment, using natural depressions or by pushing the undifferentiated accumulations of bone and stone aside (Kolen, 1999). Any activity residues are 'structured' in ways characteristic of Binford's drop-and-toss zone model - i.e. un-'designed' and a by-product of simple biomechanics (Vaquero & Pasto, 2001). 'Structured' and 'designed' hearths, it is argued, are a feature solely of the Upper Palaeolithic.

However, evidence of structured 'dwelling' *is*, perhaps, apparent at Châtelperronian sites, notably the 'huts' and well-built hearths at Arcy-sur-Cure X-IX. Here,

> the cave is no more than just a dump of middens. The huts are cleaned, and there is now a distinct outside as opposed to an inside; the fire is constructed, and domestic activities are around the hearth, which seems for the first time to

[11] 'the carcasses of their prey, which they push out of the way to clear themselves a living space' (own translation).

be the heart of group life (Farizy, 1990: 99; although see Kolen, 1999, for contrasting argument).

If the Châtelperronian really is, as seems likely, associated with Neanderthals rather than modern humans, such 'designed' structure was apparently not beyond their capabilities. Nor is early Upper Palaeolithic behaviour in this regard a quantum leap from that of the preceding populations (Rigaud, 1997: 164; Kolen, 1999): obvious structures are absent for the first 10,000 years of modern human presence (*ibid.*: 162).

3.4.3. Spatial behaviour, design and distance

Neanderthal living space is thus commonly characterised as 'situational' in character (Kolen, 1999); what structure *is* demonstrated is considered to represent the immediate biomechanical demands of embodied existence, rather than the planned, 'designed' construction of 'dwelling' space of modern humans.

On a larger scale, the perception is that Neanderthal behaviours reflect a 'niche' geography, with no indication that they reflected about other places or environmental conditions when elsewhere or at other times (Kolen, 1999: 161). This, it is argued, is in sharp contrast to the 'cultural geography' of Upper Palaeolithic 'modern' humans, whose spatial organisation 'is goal and place oriented and spatial concepts are referential, that is, they frequently refer to situations beyond the here-and-now and therefore presuppose acts of cognitive and linguistic "displacement"' (*ibid.*: 162).

3.5. TIME AND IDENTITY IN THE MIDDLE AND UPPER PALAEOLITHIC

The twin concepts of 'distance' and 'design' presented as fundamental to the Middle-Upper Palaeolithic are related, respectively, to concepts of time and identity. 'Distance' concerns the ability to deal with displacement in time - and in space - to anticipate regular or cyclical occurrences, such as animal movements, behaviour and changing 'affordances': the 'mental capacity to simulate events remote in time from immediate experience, and of the temporal horizons incorporated in their social relations and economic activities' (Bailey, 1983b: 186-7). 'Distance' is also, I would argue, partly what allows hominids to empathise and identify, and enter into relationships with, other individuals, species and entities, through a displacement or distribution of personhood (Chapter 5; see also Gamble, 1996, 1998). The structure and 'design' of these relationships is both created and structured by the *habitus*, an holistic conception of identity: simultaneously who one is and what one does in all aspects of daily life (see Chapter 5 for further discussion).

However, while such a linkage of 'design' and 'distance' may be characteristic of humans today, as Gamble has pointed out, 'The challenge that the Palaeolithic presents … is that the basic assumptions of the elements of social life which underpin so much of social archaeology cannot be taken for granted' (1999: 9). Does this form of created 'identity' also characterise Pleistocene populations, whether Neanderthal or modern human?

As we have seen, the vast majority of the points comprising the 'checklist' of modern behaviour are implicitly underlain by these two notions; Neanderthals are considered to lack both 'design' and 'distance', and thus are qualitatively different from modern humans,

> Incompetent at language and symbolic thought; incompetent hunters; expedient, incapable of anticipation; having no future tenses or clauses (so no alliances, families etc), incapable of forming ethnic identities, lacking aggregation sites or even home bases, incapable of abstract or realistic artistic

expression; lacking ability to inter dead or have religions; lacking motor and mental capacities for lithic technologies (Hayden, 1993: 113).

Although Hayden exaggerates the case slightly, the suggestion that the ability to think and plan ahead may have been the major distinction between Neanderthals and modern humans has a long history of use as an explanatory modern of 'humanity', first mooted by Kroeber as early as 1923 (Binford, 1989) before being taken up – tangentially - by Bailey (1983b) and by Binford in the eighties (especially Binford, 1989). It has also been elaborated more recently by Pettitt and Schumann (1993), Gamble (Gamble, 1996, 1998) and Roebroeks (2001), among others.

3.5.1. Time and 'distance'

It seems, then, that 'An expanded temporal horizon is by common consensus a fundamental distinguishing characteristic of human behaviour', underlying 'The development of distinctively human attributes, such as language, conceptual thought, and the co-ordination of social activities in time and space' (Bailey, 1983b: 167). This increase in 'temporal envelopes' - 'the conceptual distance to which organisms can stretch back into the past (memory) and toward the future (expectation/prediction)' (Pettitt & Schumann, 1993: 27) is not considered evident in the archaeological record until the Upper Palaeolithic - Neanderthals are compared to extant non-human primates who can only extend conceptually into past and future in a very general way. The complexity apparent in the Middle Palaeolithic record, it is argued, is reflective of a highly developed sense of space rather than of time (which characterises the Upper Palaeolithic; *ibid.*).

Perhaps the ultimate archaeological indicator of the ability to deal conceptually with 'distance' is evidence of 'symbolic' behaviour and 'art', generally agreed to be an almost wholly Upper Palaeolithic and 'modern' human phenomenon. 'Symbolic' objects are indeed largely absent from Vasco-Cantabrian Spain in the Mousterian and Châtelperronian. However, this is also the case for the early

Aurignacian[12] (Straus, 1992, 1996): in this region, at least, 'There was no "explosion" of "artistic" or "ornamental" activity with the onset of the Upper Paleolithic' (Straus, 1992: 88).

The classic examples of bone and antler artefacts and parietal art in fact mainly date to the Magdalenian which, in Vasco-Cantabrian Spain, is among the richest in the Palaeolithic world. Over 1,200 pieces of mobiliary art were known from the region in 1992 (Straus, 1992), and perforated and engraved teeth and shells are common in Magdalenian levels. The morphology and decoration of bone and antler artefacts also underwent its most significant changes between the Solutrean and Magdalenian (Stettler, 2000).

Although it is a truism to repeat the adage that absence of evidence is not evidence of absence, 'Evidence for a reduced time horizon in the activities of Lower and Middle Palaeolithic groups might mean either that they were incapable of the required mental operations or that they had the ability but lacked the incentive to apply it' (Bailey, 1983: 188). Certainly more or less credible items of 'art', as well as ochre (assumed to indicate some decorative practices) have certainly been recovered from pre-Upper Palaeolithic contexts (Hayden, 1993; Cabrera *et al.*, 2000) – although many of these are still controversial. In any case, it does not seem that such practices formed part of the behavioural repertoires of the Upper Palaeolithic populations of southwest Europe to a substantially greater degree than those of earlier Neanderthal populations.

3.5.2. Identity and 'design'

This ability to conceive of 'distance' is crucial in the construction and maintenance of 'identity'. An understanding and appreciation of 'time' in a linear fashion is clearly essential for the recognition of the 'self' in a historical sense (Pettitt & Schumann,

[12] Evidence for an increase in such items in the later Aurignacian and Gravettian is limited to engraved stones from the Gravettian levels of El Castillo and Cueva Morín, and a small number of perforated teeth and shells from the latter, and at Bolinkoba and Amalda (Straus, 1992). EUP mobiliary art is also extremely scarce, with only two notable finds: the Altamira red deer scapula engraved with hinds and the cave bear canine bird pendant from El Buxú. However, parietal art (though notoriously difficult to date), does seem to increase at this time (Straus, 1992), although naturalistic art in general may be much younger than the Aurignacian (e.g. Cabrera *et al.*, 2000).

1993: 27). Identity *is* memory; with an increase in the time-depth of available information, individual and group identities can be extended significantly beyond individual lifespans (Bailey, 1983b) – with huge implications for the ways in which the world is conceptualised (see Chapter 5).

This is performed by the *externalisation* of memory and of identity, the distribution of personhood via other entities, material culture, other species, places and technologies which link them in space and time and are both individual and shared. 'The "stretching" of social relations across time and space' (Giddens, 1984: 35) is thus achieved through the externalisation of memory, transferring properties of people to objects, allowing simplification of individual acts of social interaction and thus more complicated forms of social interaction (Gamble, 1993, 1996, 1998, 2001).

The 'design' inherent in this process may be both conscious (for example, through style in clothing and ornamentation) and unconscious (or pre-discursive), through learned techniques and 'ways of doing', forming part of a 'language' of identity (e.g. Charles, 2000). These are – indirectly – monitored by aspects of the 'modern' checklist traits as 'regional differentiation' and the appearance of items of 'self adornment'. The crossing of a 'cognitive threshold' (e.g. Pettitt & Schumann, 1993: 27) is seen as allowing the conception of 'distance' and thus the construction and maintenance of 'designs' for living. Such a difference, perhaps, relates to the distinction between the 'local hominid network', experienced via direct perception and mediated by interaction between individuals (cf Gosden, 2001), and the 'social landscape', with its hugely expanded networks negotiated through external entities (Gamble, 1996).

3.5.3. Time and identity, 'distance' and 'design'

The current consensus on the nature of the differences between Neanderthals and modern humans - the causes of the variation in archaeological evidence apparent between the Middle and Upper Palaeolithic – is thus that, with a restricted 'temporal envelope' and unstructured social life, they did not draw material objects and other entities into extended networks of identity and memory. Rather, 'it is the body itself and its interaction with other bodies within intimate and extended social networks which acts as the main vehicle of signal transmission' (Pettitt, 2000; 360).

Despite this lack of symbolically based social networks, they are (occasionally) credited with complex and highly creative social strategies and identities. Even Pettit and Schumann, who explicitly link a clear Middle/Upper Palaeolithic distinction in this respect to the replacement of Neanderthals by 'modern' humans, agree that 'it is undeniable that Neanderthals were creative, individual social actors' (1993: 362), and Gamble has characterised Neanderthal social life as inherently *more* creative that modern humans', lacking the structuring design principles which make it more *complex* than *complicated* (Gamble, 2001, comment on Gosden, 2001). Nevertheless, Neanderthals' abilities in this respect are firmly located on the purely local and intimate levels and based solely around their bodies.

3.6. SUMMARY AND CONCLUSIONS: BODIES, DESIGN AND DISTANCE IN THE MIDDLE AND UPPER PALAEOLITHIC OF VASCO-CANTABRIAN SPAIN

The assumption behind most of the explanations commonly offered for the replacement of Neanderthals by modern humans is generally that there was something about the Upper Palaeolithic 'package' that conferred an adaptive advantage (Klein, 2001: 8), whether this is seen as a genetic or biological change in cognitive capacities, reproductive rates, or changes in social and cultural spheres of life, including technological developments. As Mellars has argued,

> very few contributors to the Neanderthal/modern-human debate have assumed that the documented behavioural differences between Neanderthals and modern humans *must* reflect innate, genetic differences in the cognitive capacities of the two populations. But as long as we have evidence that the evolutionary trajectories of Neanderthal and anatomically modern populations are likely to have been separate over a period of around half a million years, then the possibility of such genetically based divergences in brain structure,

neurology, and cognitive capacities can in no way be ruled out (Mellars, 1996: S26).

In this chapter I have illustrated the ways in which the current characterisation of the differences between the Middle and Upper Palaeolithic is based on a model of increased evidence of (and therefore, simplistically, cognitive abilities for) 'design' and 'distance' among Upper Palaeolithic populations.

The concept of 'design', stated simply, is that Upper Palaeolithic hominids, unlike Neanderthals, are capable of holding a clear 'mental template' of designs for material culture (whether tools or living structures) – and for patterns of behaviour such as subsistence practices and social interaction – in abstraction, *before* their production or enactment. Although Neanderthal behaviours are recognised as extremely complex they are, however, considered expedient and opportunistic, enacted on an *ad-hoc* basis and taking account only of the short-term or immediate context. Thus lithics production techniques, although complex, are considered to be primarily directed mainly towards the production of multi-purpose sharp edges. Subsistence is opportunistic, focusing on animals encountered in the immediate vicinity. Space-use is unstructured, *ad-hoc*, with any intra-site patterning simply a by-product of simple biomechanics, and symbolic behaviour minimal, with social interactions performed on an individual, direct and unmediated basis.

The difference, then, is 'distance'; the ability to 'displace' activities in space and time, allowing time depth in the planning of behaviour. The abstract 'designs' of modern humans can be separated from their material representation or enactment by a considerable amount of time and/or distance. This increase in 'distance' among modern human populations is used to explain the more highly 'designed' tool types and techniques and the rapidity of their change over time, reflecting the planned and organised subsistence practices of Upper Palaeolithic populations. Space-use is seen as generated by symbolic as well as purely functional concerns, and the appearance of representational art and clearly 'symbolic' objects is perhaps the clinching argument.

However, as we have seen, while there certainly are significant differences between the Middle and Upper Palaeolithic, there is also evidence for considerable continuity in some aspects, and there is now a fairly clear division between those researchers who would argue for a clear break in the evidence between these periods (and, not coincidentally, between hominid species), and those who see instead a series of gradual changes over the course of the Middle and Upper Palaeolithic, or who would place any such 'break' later in the sequence (Simek, 2001: 200). As Straus has argued,

> The transition from Mousterian to Upper Paleolithic and from Neandertal to Cro-Magnon, would seem to have been more complex and less monolithic than often imagined, not so much a total replacement as a varying situation of exchanges and resistances, more of a mosaic in time, space and aspect, sometimes abrupt, at other times more gradual. Both independent invention and diffusion (as well as gene flow) were probably involved. And this transition we paleoanthropologists so fixate upon, was perhaps only an inflection point in on-going processes of adaptation to the changing resources and environment (physical, as well as demographic and social) of the Last Glacial. These processes continued apace, often at different rates and with sometimes differing manifestations on a region-by-region basis, throughout the course of what we call the Upper Palaeolithic. All was not settled at 40, 30 or even 20 kya' (1996: 212).

The argument continues; what are becoming clearer are the concepts underlying archaeologists' expectations of the 'transition'. These, as I have demonstrated above, can be reduced to the twin concepts of 'design' and 'distance'. 'Modern' humans have the cognitive capacity for these; Neanderthals do not. The divide between animal and human, nature and culture, non-modern and modern, is clear: humans may be animals, but they are animals 'plus …' (Ingold, 2000a). And it is this separation that forces us to find a transition point between the two discrete states; 'this argument implies some kind of threshold in human evolution, beyond which our ancestors were able to author their own projects. This idea has motivated the search for a point of origin for humanity in general' (Ingold, 2000b: 181; cf Ingold, 1995). As we saw in Chapter 2, such strong cultural paradigms can act as attractors for our narratives of prehistoric change, casting them in its image. The narrative may, in fact, be accurate: but it should be proven rather than assumed.

By abandoning a top-down, teleological approach which tells us that there are only two ways to be in the Middle and Upper Palaeolithic; modern and non-modern, and that the only change that mattered was the transition between the two, we can look instead at what changes did actually occur and how the Middle and Upper Palaeolithic look if we take away this big division, avoiding a sterile biological determinism.

To do this, we need to look again at the heart of the current conceptions of the Middle-Upper Palaeolithic transitions; the 'design' and 'distance' and the distinction between a generalised, 'foraging' and a logistical, 'collecting' lifestyle, and what it means in terms of the daily lives of both Middle and Upper Palaeolithic populations.

CHAPTER FOUR: SPACE, PLACE AND TIME AND THE FOUR-DIMENSIONAL ECOSYSTEM

In this chapter I discuss the context for change: the world in which our Palaeolithic forebears lived. I begin with a review of recent critiques of traditional archaeological approaches to 'space', arguing that its treatment as an objective and geometric 'backdrop' to action is not an appropriate way to address past behaviours. New approaches to 'space' consider geography and the ecosystem in terms of its experience and perception and the ways in which this structures and is structured by the nature of the individual person as embodied, as flesh and bone and muscle, and I argue that in this way we can reconsider the potential significance of the changing behaviours of past populations, as evidenced by the changes apparent in the archaeological record, in terms of changing forms of interaction with the world and its constituents.

4.1. CRITICISMS OF PAST ARCHAEOLOGICAL APPROACHES TO SPACE

Perhaps the most significant impact of the relativist critique occurred in so-called 'landscape archaeology'. Traditionally, and in Processual and New Archaeology's approaches, the discipline looked firstly to geography for its methodology vis-à-vis the study of 'landscape', focusing on the more functional aspects of spatial behaviour: demography, technology, resources and land use, 'on what people did to the land and how it aided or constrained them, rather than what they thought or felt about it' (Knapp, 1999: 7). 'Space' was just that, abstract and characterless, a 'container' for human activity (Tilley, 1994: 9; see also Gamble, 2001), considered primarily in Euclidean, geometric terms, 'an extended surface for the distribution of things' (Relph, 2000 [1985]: 25), giving rise to the functional concept of the 'environment' as a determinant background or occasionally as a social resource, separated out from and merely providing a 2-dimensional backdrop for objectively measuring human movement and activity.

Certainly human populations were seen to share their environments with other animal species. But New Archaeology tended to 'envisage the environment as a vast container filled with objects, living and non-living, mobile and stationary, like a room or stage-set cluttered with furniture and decorations' (Ingold, 1992: 41), and animals are thus simply envisaged as properties of abstract space, calories on legs, presenting by their essential nature a set of rules which must be adhered to and challenges that must be met.

Such an approach is, however, symptomatic of a very particular view of the relationship between the human individual and the world around them which can be traced back to the Galilean doctrine that nature is composed of matter residing in physical space and time, which in turn directly influenced the development of the Cartesian paradigm of the essential separation of the mental and physical (Gordon, 1989: 149).

However, the strict behavioural model initially adopted by archaeology and anthropology, which assumes that 'perception is based on discrete bodily sensations touched off by external stimuli, and that action is based on the corresponding bodily responses' (Ingold, 2000c, 165), directly linking stimulus and response in the way exemplified most famously by Pavlov's dog (Rodaway, 1994: 16), proved insufficient in the case of humans (or perhaps simply did not allow for the 'obviousness' of the human/animal distinction; section 2.2). Cognitive science 'thus added a mental processing device that would convert the stimulus input into knowledge, and generate plans for the delivery of meaningful responses' (Ingold, 2000c: 165; see also Rodaway, 1994: 17-18).

The individual is thus separated from the world, 'constructing' it through *indirect* awareness, by constructing sensory inputs into models or schemata which represent the 'real' world (Gordon, 1989: 149; Ingold, 2000c: 162), effectively dividing human experience of the world:

> One part, fully immersed in the sensate, physical world, is continually bombarded by stimuli which are registered in consciousness as a "chaos of shifting impressions". The other part, however, stands aside from this engagement, and is untouched by it (Ingold, 2000c: 159).

It is this mental *distance* from the world that is seen as the hallmark of modern humanity (Chapter 3); 'our very humanity is seen to exist, in essence, in the transcendence of physical nature' (Ingold, 2000d: 214), a neat parallel of the infamous culture/nature division. In this distinction between sensation and perception, sensation is seen as inferior, as primary raw data, and perception (representing interpretation and knowledge) prioritised (Rodaway, 1994: 6) – a value distinction with obvious echoes for the negotiation of human/animal/Neanderthal boundaries (Chapter 2). The first part of the process is biological; 'natural', and the second, involving the 'ordering' of sensation, is 'cultural'. It is inevitably this part of the process that is seen as particular to (modern) humans, organisms 'plus ...' (Ingold, 2000a: 89).

With the 'cultural' (and distinctively 'human') separated as distinct from the 'natural' or 'physical', the physical world becomes meaningless and neutral in and of itself (Reed, 1987; cited Gordon 1989: 150). Thus consideration of pure, neutral 'space', and even of 'landscapes' in archaeology has remained at the level of consideration of things *done to* the land by humans and hominids (Bender, 1992: 737; Knapp & Ashmore, 1999: 9). The world is 'a preformed surface *waiting to be occupied*' – a viewpoint Ingold links to a colonial outlook (2000d: 214), as this kind of conceptualisation allows 'space' to become an object of appropriation.

The pre-existing objects, features and locations of this space are known by being represented, either mentally or on paper, in the form of a map (Ingold, 2000e: 155, 2000f: 375), and it is in these terms that human (and hominid) activity in the environment is traditionally conceptualised in archaeology. The abilities of people (and other animal species) to 'find their way' have been traditionally explained by cognitive sciences in terms of their 'cognitive maps', through which geographical information is 'stored' (whether internally –mentally - or externally) independently of the bodily location of the subject (Widlok, 1997: 320) i.e. at a *distance*. It is thus, in Gell's terms, *non-indexical* (Gell, 1985; cited Ingold 2000f), allowing for the establishment of novel paths and shortcuts (*ibid.*; Tolman, 1948; cited Bennett, 1996: 220). In contrast, navigation by movement between sequential memorised 'landmarks' is denigrated as mere 'route-finding' (O'Keefe & Nadel, 1978; cited Bennett, 1996: 220).

However, more recently the assumption that any map can be independent of any particular point of view has been challenged: 'maps' are not necessarily the exercise in pure Cartesianism that is often supposed (Turnbull, 1989). More fundamentally Hayes has criticised 'diagrammatic reasoning'; 'that people find diagrams useful does not imply that they use "mental maps" to reason with' (quoted Mark et al., 1997; see also Bennett, 1996: 220) – although, equally, it does not mean that they do not (Wheatley, 2003)! However, Bennett's comprehensive review of the psychology associated with the concept of the 'cognitive map' has led him to suggest that it 'is no longer a useful hypothesis for elucidating the spatial behaviour of animals, and that use of the term should be avoided' (Bennett, 1996: 223).

Unlike medieval maps, 'memoranda of itineraries', relating fragments of stories, directions and advice rather than providing independent representations of topography (de Certeau, 1984: 120; see also Ingold 2000f: 233), modern maps have succumbed to what Ingold calls the 'cartographic illusion': 'The world - as it is represented in the map – appears deserted, devoid of life. No one is there; nothing is going on' (*ibid.*: 234)..

It is this process of removing 'human actor-perceivers', their direct, sensory experience and narratives of movement and travel that lies at the heart of the current critiques of archaeological (and anthropological) conceptualisations of 'space' and landscapes (Ingold, 2000f: 235).

4.2. NEW APPROACHES

Towards the end of the 1960s, however, the development of a 'human geography' signalled a disillusionment with the 'quantitative revolution' and the methods of positivist science (Rodaway, 1994: 6). During the 1970s, strands of Marxist social geography (which drew heavily from the social sciences, including sociology and political economy) and humanistic geography (tending rather to the arts and humanities) competed for primacy in the discipline (*ibid.*). Although initially the Marxist strand seemed more robust, since the 1980s there has been a strong revival of humanistic ideas, partly due to the increasing influence of postmodern thinking.

This process was reflected in archaeology and anthropology by the rise of the post-processual critiques, which have had perhaps their strongest successes in the discipline in the field of 'spatial' and 'landscape' studies. Previous approaches to geographical behaviour focused on developing context-independent models of perception (whether these are mechanisms of stimulus-response or of information processing and the development of mental constructs; Rodaway, 1994: 15); in contrast, the so-called 'humanistic' approaches outlined below provide an alternative by emphasising the perspective of the individual person.

In this paradigm, archaeology (and geography) becomes a consideration of the *experience* of the environment rather than of the problem-solving, strategic computation of neutral, abstract 'space':

> Geometric space is homogeneous, uniform, neutral. Geographical space is differentiated into that of the prairies, the mountains, the oceans, the equatorial forest … Geographical space is unique; it has its own name: Paris, Champagne, the Sahara … it has a horizon, a surface form, a color and density (Dardel, 1952: 2; quoted Relph, 2000 [1985]: 25).

In short, geography has identity. For people, 'space' is never experienced in abstraction. The concept of geographical experience 'refers to the entire realm of feelings, acts and experiences of individuals in which they apprehend themselves in a distinct relationship with their environment' (Relph, 2000 [1985]: 20).

This particular conceptualisation concerns itself with the landscape as it is dwelt in (e.g. Preucel & Hodder, 1996: 33). However, there is no one single 'post-processual' approach to space, geography and/or landscape, but rather a multiplicity of approaches which develop similar themes with different emphases; some of these are discussed below in an attempt to develop a practical, workable way forward in the archaeology of (Palaeolithic) geographical behaviour.

4.2.1. Direct perception

Currently one of the most popular theories in archaeology is J.J. Gibson's theory of direct perception, or ecological perception (1979). In this paradigm, the environment does not merely provide a stream of raw data sensations from which 'cultural' representations of the world are constructed; rather, the environment itself structures the kinds of 'stimulation' perceived by the organism - what reaches our senses is not neutral but has already been structured by the environment itself, into 'a complex of surfaces, edges, textures and, importantly, movements' (Rodaway, 1994: 2). The world is thus perceived *directly*, actively: '...perceiving is an act, not a response, an act of attention, not a triggered impression, an achievement not a reflex' (Gibson, 1979: 149).

Several important implications follow. Firstly, because 'the environment' provides 'information' rather than just 'stimuli' (Rodaway, 1994: 2), the difference between the 'real' and the 'perceived' environment dissolves: according to cognitive science, we can never 'see' the real world, only our perceived representation of it. 'Yet from a Gibsonian perspective, it is apparent that the world becomes a meaningful place for people through being *lived in*, rather than through having been constructed along the lines of some formal design' (Ingold, 2000c: 168).

Secondly, if the environment is directly perceived, it must be *shared* with others who perceive in similar ways (e.g. Mackie, 2001: 23-4). Gibson himself paid little attention to the specifically social and cultural dimensions of human life, restricting himself to the observation that 'other persons and animals' in the perceiver's environment, uniquely, are able to 'act back' and literally 'interact' with the perceiver (1979: 135; see also Ingold, 2000c: 167). However, Reed has developed this further, pointing out that in this paradigm, the environment must be considered as a *shared* world, because 'Attuned through prior training and experience to attending to similar invariants [in light], and moving in the same environment in the pursuit of joint activities, they will pick up the same information' (Reed, 1986: 119-20). In short, sensory data is not experienced privately, then shared according to a social/cultural/collective system of representation; rather sociality arises from 'the direct, perceptual involvement of fellow participants in a shared environment' (Ingold, 1993a: 222-3).

Thirdly, information is not passively 'received' from the environment but is actively *produced* by the perceivers themselves; 'Perception is an experience of the whole body and an activity in a dynamic world' (Rodaway, 1994: 2). Ambulatory or moving perception takes place along what Gibson termed a 'path of observation'; not a series of discrete points, occupied at successive instants, but a continuous itinerary of movement. The obvious corollary of this has been emphasised by Ingold:

> if perception is a mode of action, then what we perceive must be a direct function of how we act ... The knowledge obtained through direct perception is thus *practical*, it is knowledge about what an environment offers for the pursuance of the action in which the perceiver is currently engaged (2000c: 166-7).

And the actions and activities we engage in and the behaviours we practice within our shared worlds are *learned*: thus what we perceive, or what is emphasised out of the many direct perceptual clues afforded by the environment, depends on our *learned* and practised ability to attend and respond to the relevant aspects of the environment (*ibid.*). Although it may be taken for granted in everyday life, operating on a pre-conscious, non-discursive level, perception is thus a learn behaviour, a skill, and 'not just a physical reflex' (Rodaway, 1994: 20).

4.2.2. Practice theory

This last point serves to highlight some of the correspondences between Gibson's psychological theory of direct perception, and Bourdieu's anthropological/sociological 'theory of practice' (section 2.5.3.). As Ingold summarises:

> … Both Gibson's ecological psychology and Bourdieu's theory of practice set out to re-embed perception and cognition within the practical contexts of people's ongoing engagement with their environments in the ordinary course of life. And both seek to escape from the sterile Cartesian dualisms of mind and nature, subject and object, intellection and sensation (2000c: 167).

Rather than envisioning the individual as possessed of a mind which applies learnt, 'cultural' patterns of behaviour into contexts of experience, Bourdieu's theory of practice instead sees behaviour as *generated by* those very contexts. Geographic 'space', rather than surrounding an individual and providing cues for actions and behaviour, is both constituted by and acts to structure the individual's behaviour in that particular context of experience.

Bourdieu's challenge, then, is that in their interactions with others in the practical pursuance of their lives, people acquire the 'cultural knowledge' that structures how they orient themselves within and understand their environment in the particular ways that they do: in short, it is activity that provides the basis of 'cultural knowledge' through 'hands-on' training in everyday activities (Ingold, 2000c: 167): and it is this understanding that comprises what Bourdieu calls the *habitus* (1977: 82-3).

The theory of practice thus makes explicit a dialectical link between the individual person and their *milieu*, suggesting a way in which we can overcome the pervasive dualisms of relativism vs. objectivism, agent vs. 'unit' of adaptation and selection; by presenting 'the subject as responding to spatial situations in an unreflective, socially patterned way' (Widlok, 1997: 319).

4.2.3. Phenomenology

For Gibson and Bourdieu, then, the point of departure is the perceiver in his/her environment (social and physical) – for phenomenologists such as Heidegger and Merleau-Ponty, it is the being-in-the-world. However, while Gibson assumed that the environment is relatively fixed and 'out there' to be perceived, for phenomenologists, the world comes into being at the same time as its perceiver (Ingold, 2000c: 168). For Heidegger, the 'availableness' of things is evident in our everyday uses of the world around us, and is opposed to 'occurrentness', the way that things appear to an observer who self-consciously 'stands back' to reflect on it (*ibid.*). Thus the world is constructed anew through habitual, daily activity.

In Cartesian theories, occurrentness has to come before availableness, but in phenomenological theory, a being in the world initially encounters things as 'available', already integrated into their everyday activities and tasks in the world: 'self' and 'world' cannot be separated but merge in the practice of 'dwelling', a term which Ingold uses to describe Gibson's linking of perception and action (2000e). And if the 'self' is present, is active, is perceiving, then the self must also be *embodied* (Ingold, 2000c: 169): it is this sense of embodiment in the world as the basis for existence that is perhaps the key to phenomenological approaches (e.g. Rodaway, 1994: 8).

Any 'objective', physical knowledge of the 'occurrentness' of our bodies comes only *after* a more fundamental, existential awareness of our embodied immersion ('availableness') in the world (Ingold, 2000c: 169).

> Close your eyes for a while, and then open them again. Do you have the impression that you are staring out upon the world through a hole (or perhaps two holes) in the front of your head? ... Far from it (Ingold, 2000c: 263; comment on Merleau-Ponty, 1964).

We don't 'live in' our bodies: rather, the body is an aspect of the self that we 'live through' (Thomas, 1996: 19; see Chapter 5). If the landscape is lived in, it is inhabited by an individual, a person, a body.

Therefore, while for Processual Archaeologists the 'landscape' is a technical, analytic phenomenon to be analysed geometrically, and for others (for example, post-structuralist archaeologists) a text or book that can be read and interpreted, for the embodied individual, landscapes are always specific. There is no 'landscape', only *this* landscape, here and now (Relph, 2000 [1985]: 23). Although perceived in immediacy, 'landscapes' are indeterminate phenomena, a 'lived-moment' (Dardel, 1952: 41; cited Relph 2000 [1985]), a collection of disparate sensual and emotional experiences united by one thing: human presence and concern.

Phenomenological approaches are thus

> grounded in the realisation that we are already within and part of the world we study. It is not possible to sustain an objective and detached view of the world. Geographical understanding always begins from or is relative to a given location in space, the space which is being studied (Rodaway, 1994: 12).

There can be no 'mental map' with its fixed reference point; the Cartesian separation of the constructing human from the pre-existing world is replaced by a world understood though the individual's activities, in which 'Distance and dimension are perceived as near or far, this way or that way, moving along one track or another' (Tilley, 1994: 16).

4.2.4. Geographical experience

Geographical experience, then, is part of our existence, part of the *habitus* of our daily lives. The world is understood via *géographicité*, a non-discursive, taken-for-granted involvement of the individual in the world (Dardel, 1952: 47; quoted Relph 2000 [1985]: 21); and there is no non-situated form of being, no existence separate from the world. And the world is also a *shared* world, also experienced by other beings that are embodied in similar ways and thus experience things in similar – but also subtly different – ways:

> Home territory may be treated analytically as a local environment of resources, but in terms of the lived experience that is social practice it may be as well thought as something like the Welsh concept of *y filltir sqwar* - the square mile of intimate landscape of childhood, the patch we know in detail, a web of favourite places, others to avoid; neighbours and their stories; the beginnings of geography, history and society, difference and similitude (Shanks, 1997: iii).

However, the notion of pre-conscious, unreflective 'practical mastery' does not account for the fact that humans can and do use orientation skills 'which are centred, not on direct experiences of the subject but, for instance, on maps or extensive topographical gossip' (Widlok, 1997: 319), allowing the finding (or creation) of new routes using non-indexical techniques such as dead reckoning, for example. The major criticism of phenomenological approaches is that the emphasis on 'potential commonalities of experience' overgeneralises bodily experience and so-called 'innate' human characteristics of capacities and perception. 'There is a tendency to write in terms of an intensely individual experience outwards, so that the subject in question is usually based on the sensibilities of a modern academic' (Hamilakis *et al.*, 2002: 9). The result is the creation of yet another dualism to be layered on to archaeological theory, that of lived experience vs. objective knowledge.

Approaches to spatial behaviours which emphasise geographical experience need to take into account not only *individual* experience, but also *social* knowledge communicated between individuals in a variety of ways - including, potentially, maps and plans. The division often drawn between the 'western', Cartesian map and a more experiential experience by 'native' peoples is perhaps, then, largely artificial; people in traditional societies are of course entirely capable of producing external representations of spatial relationships. A Cartesian/Euclidean perspective on space, then, is not necessarily *wrong*; however, it is certainly not *sufficient*.

4.2.5. Naïve geography

But how do we address spatial behaviours in archaeology without being accused of overgeneralisation and the projection of Western-specific concepts? One recent set of methodologies in the field which has thus far been little noted by archaeologists is the ongoing development of a 'naïve geography', which aims to study 'the body of knowledge that people have about the surrounding geographic world' (Egenhofer & Mark, 1995; Mark & Egenhofer, 1996). 'Naïve' here stands for 'instinctive or spontaneous' (*ibid.*: 4), and naïve geography 'is not based on Euclidean geometry or correct physics, but is based on a high level expert understanding of how the world works' (Smith, 1997, quoted Mark *et al.*, 1997). Exponents of naïve geography, like the other experience-based approaches, consider the interaction between the person and the geographical world of paramount importance:

> the contextual linkages that make our concepts mean what they mean derive not so much from interconnections between concepts inside the head as from

> interconnections between the cognitive agent and the common-sense world in which he finds himself (*ibid.*).

When considered alongside the other approaches discussed above we can begin to see some of the elements that a properly 'narrative' archaeology of spatial behaviour would have:

- It would break down the division between the individual and the environment (and between culture and nature): the two cannot be separated from one another as each is immediately implicated by and acts to constitute the other.
- It would be less concerned with two-dimensional, Cartesian representation than with considering spatial narratives of movement and action.
- It would concern itself with social as well as individual forms of knowledge about and understanding of the world, and would see these as arising out of practical, everyday behaviour involving activities – and interactions - in the world.

So, from a model of pathfinding and 'space-use' which relies on the metaphor of a 'complex-structure' model (the 'cognitive map'), we have moved instead to one which invokes rather a 'complex-process' conceptualisation (Rubin, 1988). Far from *distance* allowing *design*, immersion and embodied experience is inseparable from understanding and action.

> With a complex-process metaphor ... little or no pre-structured content is imputed to the mind. Instead, wayfinding is understood as a skilled performance in which the traveller, whose powers of perception and action have been fine-tuned through previous experience, "feels his way" towards his goal, continually adjusting his movements in response to an ongoing perceptual monitoring of his surroundings (Ingold, 2000c: 220).

Archaeological approaches to peoples' spatial behaviour in the past should thus start from the premise of their practical engagement with a dwelt-in world, rather than that of an objective assessment of an occupied environment (Ingold, 2000d: 216). The world is not perceived as a neutral, value-free 'stage' littered with props, by ourselves or by people in the past, but rather as something that surrounds and enfolds us entirely within itself, perceived directly in terms which reflect our wants, needs and activities as embodied people, moving in particular directions, experiencing particular paths of sensation while engaged in particular activities:

> The space of human action is not a geometrical entity to be represented easily on a piece of paper, but rather room-for-manoeuvre, a space in which skills can be deployed. Our skills are created to fit the spaces in which they are used and the spaces of human life are the result of past skilled action (Gosden, 1994: 344).

4.3. TEMPORALITY AND ARCHAEOLOGY

Thus far we have focused on *space* – but the world is also *temporal*, and if embodied experience occurs at *locales,* it also occurs at *tempos* (Barrett, 1991: 8): 'Practical daily involvement with the world is temporal to its core' (Gosden, 1994: 6). However, despite the fundamental nature of the concept to the discipline, archaeology's consideration of time has been minimal. A notable exception is Bailey's 1983 paper 'Concepts of Time in Quaternary Prehistory', where two interrelated concepts of time are discussed which cross-cut the theoretical dichotomy of environmentalists/Processualists and 'internalists'/post-processualists - 'time as process', and 'time as representation'.

In the first, different sorts of processes such as, for example, climatic, geological, biological and physiological, serve as forms of measurement as well as terms of definition, and so can be considered not such much to 'occur over time', but rather as *constituting* time (Parkes and Thrift, 1980: 37; cited Bailey, 1983b). The linear chronologies of the Palaeolithic draw strongly on this notion (Carlstein, 1982; Preucel & Hodder, 1996; see also Chapter 2).

However, it has been suggested that this conceptualisation of time as process is in fact highly specific to western society (and to capitalism; see Shanks & Tilley, 1987a; Ingold, 1995b). In many other societies, it is social action, rather than physical processes, that is seen to comprise time (Gosden, 1994). Time is 'immanent in the passage of events', found in the experience of people (Ingold, 1993).

Gell (1992) has drawn a similar distinction between experiential or 'A-series' time, and universal 'B-series' time, characterised by linear progression and sequential logic; both he and Bailey conclude, however, that their divisions overlap to some degree, being simultaneous rather than opposed, and that a single division between objective, 'western' time and traditional temporality is over-simplistic. Even in capitalist western societies 'task-orientation' rather than 'clock-time' remains significant (Ingold, 2000g: 289). In fact, a simultaneous strand of thought in western society going back to Aristotle (Pettitt & Schumann, 1993) and validated by the theory of relativity, recognises time as a 'construction' on several different levels (Chapman, 1997; Gosden, 1994: 5) - although our society continues to organise itself around what Bailey terms 'planetary time' (Bailey, 1983b; see Gosden, 1994 for discussion).

These forms of time coexist, and one should not be prioritised above the other: the juxtaposition of the notion of 'temporality', as recognition of experiential time, with that of 'chronology' or 'history', recognises the fact that temporality arises from *practice* (Bourdieu, 1977). Everyday life is composed of habitual actions and practices, no matter what calendar or clock is imposed on them (Mackie, 2001). Time arises from our own involvement in the habitual patterns and actions which comprise our lives (Ingold, 1993b), both structured by and acting to structure societies. Thus the marking of 'times' via periodic recurrence of rites, feasts and public ceremonies is influenced strongly by our human and social perceptions of the cycles of environmental change (including animal behaviour) through which we experience and by which we measure time (table 4.1.).

The apparent linearity of (B-series) time is thus both created by our experience of the succession and duration of events outside ourselves, as well as by the way we think about these events (Kant, for example, considered both time and space to be an ordering device of the human mind produced from the way the human mind works; Gosden, 1994). It has also recently been suggested that the linear 'stream of consciousness' that is our conscious experience of time is a problem-solving illusion created by the neocortex from a multiplicity of forms of bodily experience (Greenfield, 2000).

1	*hourly* variation in light, temperature and tides, 'so fundamental that it cannot be ignored, even at the risk of appearing banal'
2	*daily* phases of moon (influence on tides and nocturnal activities), day-to-day weather, intersection of daylight and tides and the related behaviour of plants and animals
3	*Annual* seasonality of weather and solar cycle and obvious related changes in plants and animals e.g. reproduction, mortality, migration, hibernation etc.
4	*inter-annual* variation, changes in degree and proportion of all above, physical and biological components which arrive in a different mixture each year. Sometimes it is predictable e.g. some game and fish cycles, but often not.

Table 4.1. Scales of time (after Mackie, 2001: 13-4)

The question, then, is what timescales are appropriate in archaeology? Processual archaeology tends to 'totalise' human activity in the past into broad-scale, homogenised concepts such as resource maps (space) and the organisation of the annual round (time; Mackie, 2001; Pike-Tay, 2000). We have a relatively well-developed large-scale framework for Palaeolithic chronologies, but there is little to link long-term process such as climatic change and processes on the human scale, although Pike-Tay has argued that seasonality studies can mitigate between the homogenising long-term perspective, and the high-resolution, individual events (such as flake scatters) visible in the archaeological record (*ibid.*).

What archaeologists need is more flexibility in our temporal frame of reference and the units we use. In fact there has recently been a new interest in problems of temporality in the Palaeolithic, and for example Pike-Tay (2000) and Hopkinson (2001) have both argued for the necessity of a multiscalar approach, and the adoption of a perspective based around embodied perception allows us to bring the experience of time into archaeological analyses. If the object of our study is geographical experience, then it is also the experience of time (or its creation *through* experience, to follow Kant), as the one inevitably entails the other.

4.4. ADDING THE FOURTH DIMENSION

4.4.1. Time Geography

Time and space have of course been linked through a consideration of the embodied individual before, most notably in Time Geography, developed from the philosophy of Hägerstrand (Carlstein, 1982). The approach takes as its starting point some basic conditions governing human spatial and temporal activity (table 4.2.).

By virtue of the fact that movement takes time, in Time Geography the fourth dimension is 'bolted on' to fundamentally spatial models, and both time and space are seen as distributed carefully via 'budgeting' (Gamble, 1987: 238), for example through systems of alliance and social storage, scheduling and logistic planning:

> Different units of action in society (individuals, groups and organisations) are … placed in an environment where resources are *accessible* only in certain temporal

situations ... Moreover, the problem is not simply one of gaining spatial access to resources through movement but is further complicated by getting a hold of them as they become available in time, for instance at certain seasons or times of the day (Carlstein, 1982: 38; compare with Binford's 'logistical' subsistence models, 1996 [1980]).

The approach assumes a Cartesian division between the hominid/human and the environment whereby scheduling and budgeting becomes a kind of 'game' played against nature (Gamble & Roebroeks, 1999): as Mackie argues, 'people do not live in such a rectilinear world or through such linear time ... Whether time-geography can accommodate a more humanistic vision is uncertain' (2001, 20).

1	The indivisibility of the human being (and many other entities, living and non-living)
2	The limited length of each human life (and many other entities, living and non-living)
3	The limited ability of the human being (and many other indivisible entities) to take part in more than one task or activity at a time
4	The fact that every activity (and project) has a duration
5	The fact that movement between points in space consumes time
6	The limited packing capacity of space
7	The limited outer size of terrestrial and territorial space (whether we look at a farm, a city, a country, or the Earth as a whole)
8	The fact that every situation is inevitably rooted in past situations (because the trajectories or paths of people, objects and organisms must come from somewhere and go somewhere)

Table 4.2. Basic conditions governing human spatial and temporal activity in Time Geography (after Carlstein, 1982: 25).

Nevertheless, the definition of time as a dimension of activity rather than something abstract and external (although it remains, in this paradigm, linear and singular) is a positive development, as is the explicit linkage of time and space with the motion of an embodied individual performing (and *experiencing*) these activities: individuals are seen to 'describe a continuous path starting at birth and ending at death, on various scales (day-path, year-path, life-path)' (Carlstein, 1982: 43). The list of 'human conditions' given above, although phrased awkwardly as 'capability constraints', does at least acknowledge the fact that individuals are embodied, and that this entails certain consequences for movement, for perception and for interaction. In addition, it is recognised that humans must interact with others - a population forms a *web of paths* which connect to form 'bundles' – and that these are not only fellow humans but also animal and even inanimate entities, and that the properties and capabilities of these 'entities' will vary and affect the quality, duration and timing of interaction. These paths and bundles of paths are envisaged as flowing through a set of time-space locations, which may be structured in certain ways, for example by the existence of 'stations' such as dwellings, workplaces etc which act to structure spaces of interaction in time-space over longer time periods than individual human paths, or by 'channels' such as transport or communication systems or paths.

In its totality, this web of paths is seen as forming a time-space region which both

> contains the social system and is the setting of every-day life. As time flows, organisms and objects of different life-span describe paths which together form a large and complex web, where paths are born, move around (some more, some less) and die, combining all the time into different constellations' (Carlstein, 1982: 40).

It is this linking of human, non-human and inanimate entities within a 'Society-cum-habitat', thus acknowledging the biotic, ecological, environmental and technological aspects of embodied experience which may prove most useful in archaeology.

4.4.2. The four-dimensional ecosystem

These developments in the ways that space and time are regarded in archaeology have however thus far failed to rescue the much-maligned concept of the 'environment' - mainly, perhaps, because of its perceived link to formal economic approaches. However, the demonisation of the notion of ecology is unjustified; while current scientific ecology 'sets up organism and environment as mutually exclusive entities' (e.g. Ingold, 2000h: 19), this is so only if the 'environment' is defined in narrow, purely physical terms. But in fact no narrow definition of environment as the simple geological and biological properties of a person's immediate surroundings will do (Foley, 1984), and ecological theory actually allows us to visualise the much-maligned 'environment' in a much more holistic fashion, as an 'ecosystem' (Tansley, 1935; section 1.5.).

Such a 'dwelling perspective' assumes from the start the immersion of the organism-person in its world (Ingold, 2000e: 153). In this approach, 'organism plus environment' denotes 'not a compound of two things, but one indivisible totality' (Ingold, 2000h: 19).

The 'environment' of any individual, then, is comprised of their activities and interactions, both structuring and being structured by them, experienced in embodied movement. This four-dimensional ecosystem of experience is thus always specific rather than general. It is also never 'complete' or bounded, but rather the indivisible totality of 'organism-plus-environment', not an entity *per se* but a *process* of growth and development in real, experiential time. And thus it should not be confused with an objective, physical backdrop to action (e.g. *ibid.*: 20).

By an ecological or ecosystemic approach, like Ingold,

> I do not simply mean a perspective that would incorporate external environmental variables as part of the explanation for behaviour. An approach that is genuinely ecological, in my view, is one that would ground human intention and action

within the context of an ongoing and mutually constitute engagement between people and their environments (2000i: 27).

However, one aspect on which I disagree with Ingold is his oft-stated certainty that such an approach is incompatible with the neo-Darwinian evolutionary paradigm (e.g. 2000i: 28). As he himself has noted, biological and ecological science is increasingly considering the interactions and mutualism between organisms and their environments (see for example Ingold's review of ecology's acceptance of recent advances in developmental biology, 1995; also section 1.5. and work by e.g. van Valen, 1973; Foley, 1984; Mithen, 1989).

4.5. SUMMARY AND CONCLUSIONS

The model of the 'evolution' of 'modern' humanity discussed in Chapters 2 and 3 emphasises the cognitive abilities of 'distance' and 'design', and Palaeolithic archaeology (and archaeology in general) has prioritised Cartesian conceptualisations of space and time as maps and linear chronologies. But humans perceive their world in terms of sensual, bodily experience, and space and time arise out of their direct experience of the four-dimensional ecological medium, which is understood in terms of a matrix of activities, places and ways of movement between them and their ordering in four dimensions, together constituting an habitual 'taskscape' (Ingold, 1993b).

Because perception of one's surroundings is *direct*, it is also *shared* and people interact on an habitual, daily basis with others who experience the world via similar mechanisms (because of a shared body plan) and in similar ways. However, because of individual differences in our embodied natures, our expectations, desires, goals and projects, our experiences of the world also differ, and these similarities and differences and the ways in which they structure and are structured by interactions, I contend in the following Chapter, are the basis for identity – individual *and* group.

However, we do not just share the world with other humans. Other species also inhabit the world and are perceived by us – species which, as I shall discuss further in the following chapter, we also enter into interactions with; as predators (e.g. red deer) or prey (e.g. large carnivores), as admirers or worshippers (e.g. eagles), as symbiotes (whether reluctantly – e.g. rats – or deliberately – e.g. dogs) and in a myriad of other ways. These interactions with other-than-humans are also part of our lifeworld and our experience. And our ecosystemic interactions also extent past the obviously 'animate' species to vegetation and types of flowers or plants that we might eat, make things from, avoid or use as medicines, and to geological and physical features of the particular ecosystem in which we live – hills, mountains, lakes, rivers, forests and cliffs and well as material objects created by ourselves or by the people we live with.

All of these entities and the varying experiences which surround them form a significant part of our experience of the world and the activities and interactions that comprise it, and can be only artificially separated out for archaeological investigation. The ecosystem, then, is a *process*, created through action and movement;

> And these movements, of the sun in the heavens, of trees in the wind, or animals and human beings as they go about their everyday tasks, do not take place against the backdrop of a nature that is fixed, with its locations and distances all laid out in advance. For they are part and parcel of that total life process, of continuous generation, through which the world is forever coming into being. In short, living beings do not move upon the world, but move along with it (Ingold, 2000a: 98).

While most approaches to prehistoric behaviour tend to emphasise either the physical or the social 'environments' (Ingold, 1996b: 183), we need to accept that we cannot separate the two; they are (as we are) inevitably embedded as a very condition of our existence in a four-dimensional ecosystem. This perspective goes some way towards re-informing our understandings of change in prehistory. Rather than visualising aspects of the archaeological record ('subsistence'; 'lithic technology'; 'symbolic behaviour') as separate and discrete, all are implicated in a 'technology' (section 2.5), an everyday *habitus* or understanding of the ways in which life can be lived within a real, four-dimensional world. Change in the archaeological record is nothing more or less than a change in identity.

CHAPTER FIVE: BODILY IDENTITY, INDIVIDUALITY AND PERSONHOOD

In this chapter I consider the implications of the recognition the archaeological record is produced by the embodied person embedded within a four-dimensional world - a *shared* world - and that our practical day-to-day experience is composed of constellations of habitual interaction with our co-denizens, including humans but also other animal and plant species and 'inanimate' entities such as artefacts of material culture and geographical elements of the landscape. These interactions act to 'distribute' personhood spatially and temporally through a complex of relationships between 'entities' in the world, challenging the modern western notion of 'the individual': 'identity' is seen as arising out of the entirety of the four-dimensional matrix of movement and activity formed by 'timed' and 'placed' interactions.

5.1. BODIES AND PERSONHOOD

Day to day experience of the world is fundamentally structured by the nature of the human person as embodied. Archaeology has dealt with the body in a number of different ways (see e.g. Hamilakis *et al.*, 2002: 1; and other papers in the same volume), all too often, rather than challenging the Cartesian separation of mind and body, 'the body' has been considered a stable, universal, biological given in opposition to the varied cultural 'mind' (Ingold, 1996c: 178-9; Connoller, 2002; Fowler, 2002: 47; Thomas, 2002). Humanist thought privileged this rational 'mind' above the physical 'body' (Thomas, 2002: 29; see also Ingold, 1996:c 179; Hamilakis *et al.*, 2002: 6), and thus 'the body' was treat as little more than the physical container for the mind.

However, as noted in Chapter 4, this Cartesian separation of mind and body is challenged by the recognition that we don't live *in* our bodies but *through* them (Thomas, 1996: 19), experiencing the world directly (e.g. Grange, 2000 [1985]: 82) by virtue of that fact. In the ecological theory of perception the whole body acts as a perception system: 'the eye swivels in the orbit, which is in a swivelling head, which is supported by feet and moves through the environment' (Gibson, 1979: 23) – as Ingold concludes, 'In short, the whole animal (whether human or otherwise) perceives, not its mind alone, and the outcome is not a percept but a new state of the perceived' (1992: 45).

The process of perception in its entirety can thus be considered as 'comprehension'; an holistic experience[13] that is always singular and unique but that is also continuous and continually changing (Grange, 2000 [1985]), and is inseparable from our own awareness of our flesh in a preconscious perceptual way, an awareness termed *body-subject* (Merleau-Ponty, 1962):

> the innate ability of the body to perform movements with neither conscious awareness nor effort, thus leading to the completion of routine activities. The hand knows how to grasp a pencil or the feet know how to climb the typical staircase (Hill, 2000 [1985]: 105).

This awareness of *body-subject* is manifest at various levels of complexity, from single movements such as lifting a fork to your mouth to walking across a crowded room, both activities accomplished many times a day without conscious awareness. Body-subject thus becomes 'body-ballet'; '*a set of integrated behaviors which sustain a particular task or aim*' (Seamon, 1980: 157, italics in original).

Such body-ballets occur through time and also through space, interacting with the lived-space in which a person dwells to compose what Seamon terms *place-ballet* (1980: 159), and thus:

[13] Comprehension stems from the interaction of *all* senses (Rodaway, 1994: 1), despite a general analytic obsession with the visual system (Hamilakis *et al.*, 2002; although see e.g. Watson, 2001 for an example of work on acoustics).

> Space is first of all grounded in the body. Through body-subject, the person knows where he is in relation to familiar objects, places and environments which in sum constitute his everyday geographical world (Seamon, 1980: 161-2).

Our embodied nature thus inevitably structures our experience (Grange, 2000 [985]: 82). We experience the world in a universally human way because of our shared body-plan: because of individual variation in this plan, our experiences also vary. However, this is not a deterministic process. A potential commonality of experience has been used as the basis for both work such as Binford's on intra-site spatial patterning such as 'drop' and 'toss' zones, whereby through a knowledge of biomechanics, 'The relationship between the human body and the spatial patterns would act as an "eternal object" ... because it could be assumed to be uniform between the past and the present' (Binford, 1983c: 145), as well as by phenomenological work emphasising individual sensory experience – which also involves the assumption of certain 'biological' universals (Hamilakis *et al.*, 2002: 8-9). However, such an assumption has been dismissed as a 'romantic fantasy' in which 'the body' is reduced to a 'template for sameness' used 'to sketch prehistoric lives' (Fowler, 2002: 47).

But if 'the body' is not universal and stable, then in what terms *can* we think about it? In Chapter 4 I introduced the notion of the four-dimensional ecosystem; in such a context a focus on 'the body' is replaced by one emphasising embodied persons, forming part of and directly experiencing their ecosystem rather than separated out from it by virtue of being a cultural 'mind' which just happens to be situated in a biological 'body'. Rather than being a pre-existing constraint or determinant of experience, our embodied personhood both structures and is structured by that experience (Fowler, 2002 : 64). People literally embody notions of time, space and human relations; Robb's work in the Italian Neolithic, for example, argues that our temporally changing bodies are a means of structuring the narrative of our lives (2002: 155; see e.g. Pettitt for debate re Neanderthals).

Our skills, our ways of doing or making things, even of moving, are thus not determined for us by the physical construction of our bodies, but are acquired during growth and during action; rather than learning such skill through formal instruction, it is unconsciously acquired by attention to others' habitual bodily gestures of manufacture and doing (bodily *hexis*; Bourdieu, 1977; see also Leroi-Gourhan, 1993 [1966]; Ingold, 2000c: 162).

Such skill is emphatically *not* a set of mental rules and representations, a pre-existing cultural template impressed onto our natural bodies by formal teaching. Rather, as Ingold writes, 'What Bourdieu has in mind is the kind of practical mastery that we associate with skill – a mastery that we carry in our bodies' (2000c: 162), an habitual, pre-conscious and often unreflected-upon way of being and doing.

Such a perspective emphasises the embeddedness of persons in their four-dimensional ecosystems, re-incorporating the notion of corporeality into the study of the behaviour of prehistoric persons, avoiding the sterile Cartesian dualisms of mind and nature, thought and sensation (Ingold, 2000c: 167). An active and mobile, preconscious, multimodal awareness of our flesh and our immediate environment is what acts to structure the *habitus*, and, I argue, what allows archaeologists to access experience in the past.

It is true that our experiences may be interpreted consciously in very different ways from those of people in the past (e.g. Fowler, 2002a), but what we do share is the process of perception; the experience of experience. It is of course true that modern western cultural perceptions of the body are culturally specific; that our bodies are particular cultural artefacts (Gosden, 2001). But the recognition of direct perception resolves this issue; it is not so much 'the body' that we are concerned with, as the way that our flesh is part of the holistic experience of dwelling, immersed in the four-dimensional ecosystem. Perception is corporeal, and thus not only is geographical experience 'fundamentally mediated by the human body' (Rodaway, 1994: 31), so is temporal experience (Robb, 2002: 153), and there is no division of this ecosystem into 'body' and 'world' (Fowler, 2002a: 59).

The archaeological record, then, is not a product of 'the individual human body as a thing-in-itself, but of the total system of relations constituted by the presence of the organism-person in a richly structured environment' (Ingold, 1996c: 178). Rather than taking a discrete, isolated and bounded individual as unit of study, we need instead to focus on 'the agent-in-an-environment' (Ingold, 2000c: 171).

5.2. IDENTITY, THE 'DIVIDUAL' AND PERSONHOOD

Such a conclusion obviously has hugely significant ramifications for our view of persons. The dominance of the 'humanist' paradigm in archaeology (Fowler, 2002a: 50; Thomas, 2002) has led to an uncritical acceptance of the centrality and universal significance of the bounded 'rational individual' which both conflates 'body' and 'person' and establishes the body as a passive container for the prioritised (at least in 'modern' humans; Chapter 2) mind or agency (Fowler, 2002: 47), separating nature from culture, body from mind, 'individual' from 'environment'. If the familiar dualisms can no longer be upheld, if a person forms *part of* his or her ecosystem, rather than being 'enclosed within the confines of a body' (Ingold, 2000a: 100), this has serious implications for the standard Western model of individuality and identity.

The notion that conceptions of identity are not necessarily universal but culturally-specific has been around in anthropology since Mauss' work of the 1930's, although it was barely researched until the 1960's (Bird-David, 1999). Perhaps the best known anthropological example of such a 'local person-concept' (*ibid.*: 68) is the notion of the 'dividual', a concept developed through work particularly in south Asia by anthropologists such as Marriott (e.g. 1976) and Strathern (e.g. 1988). This notion stands in direct contrast to the modern western idea of the bounded unit of the 'individual', an irreducible, indivisible unit within a reducible, divisible world (Pálsson, 1999). The 'dividual', rather than a discrete, bounded whole, is divisible, 'a person constituted of relationships' (Strathern, 1988: 68; Thomas, 2002: 34), an emergent identity arising from the total of the relationships he or she engages in with other such persons. 'Identity', in this view, arises out of the everyday practices and interactions which comprise the *habitus* (Gamble, 2001: 206).

The theory of direct perception demonstrates clearly that people dwell not in their own worlds but in a world of shared experience (Section 4.2.); while we each experience the world from our own individual perspective, we are keenly aware that we also figure in the surroundings of other individuals, and that this is a *shared* awareness. Thus 'public knowledge' of the ecology is based not solely on communication, but on shared co-perception (Mackie, 2001). As Gibson points out,

> The whole field of social behaviour ... could be supposed to rest on the perception (or misperception) by the individual of what other individuals afford ... it is only when each child perceives the values of things for others as well as for herself [that] she begin[s] to be socialized (Gibson, 1979: 141).

This does not mean, however, that 'personhood' is universal or homogenised: while all human persons engage in the world in a similar fashion, 'not all of them possess the same skills, competence, stocks of knowledge, goals, control, awareness or foresight about what they are doing' (Dobres, 2000: 137). Thus while the same world is directly perceived by different entities, it is differently known and different affordances are recognised, different relations are entered into - and it is these differences that together compose personhood.

When persons are seen as constituted by their relationships, the boundary between the body and the world becomes permeable, and persons are seen as 'sustained by flows of substances and energy' (Thomas, 2002: 34): thus the boundaries around the human body do not necessarily define the boundaries of the person (Jones, 2003), and 'persons are conceptualised as amalgams or hybrids of relations and substances of different kinds' (Thomas, 2002: 34).

This is not to argue, of course, that the western concept of the 'individual' is simply wrong. It is obviously true to say that human entities are separable from each other and from the other entities they enter into relationships with. However, the current notion of the 'individual', or the 'self' is a relatively recent phenomenon even in western societies; until the Middle Ages the word 'individual' was employed in the sense of 'indivisible from the world' (Pálsson, 1999: 88), and Thomas has argued that the concept was produced in Europe by the Enlightenment (Thomas, 2002: 29; Tarlow, 2002: 24). Nor should the notion of the 'dividual' be considered 'a hard and fast model in contradistinction to the bounded western individual' (Jones, 2003). Dividualism and individualism can and do exist side by side:

> When I individuate a human being I am conscious of her 'in herself' (as a single separate entity), when I dividuate her I am conscious of how she relates with me. This is not to say that I am conscious of the relationship with her 'in itself', as a thing. Rather, I am conscious of the *relatedness with* my interlocutor *as I engage with her*, attentive to what she does in relation to what I do, to how she talks and listens to me as I talk and listen to her, to what happens simultaneously and mutually to me, to her, to *us* (Bird-David, 1999: 72; see also Gosden, 2001; Jones, 2003).

Rather than simply replacing one model with another, then, the importance of the concept of the dividual is that it opens up our understandings of the ways in which identity might be created and maintained. Both the 'dividual' and 'individual' can be considered different notions of 'personhood', bypassing the essentialism of the concepts of 'the Body' and 'the Self' in favour of a paradigm emphasising *action* (Pollock, 1996: 320).

The importance of the notion of the 'dividual' is that it

> focuses our attention on the significance of the relations or connections between things or people. It promotes a framework in which we focus less on the relationship between concrete objects, and more on an analysis of how things and people are composed out of their relations, a framework in which both things/people and the relations between them are constantly in flux (Jones, 2003: 2).

It is this focus on the relations or connections which help to compose people and things, rather than hard-and-fast models of 'the dividual' in contrast to 'the individual', that is stressed in this thesis.

5.2.1. Distributed personhood and the four-dimensional ecosystem

Significantly, the relationships from which personal identities emerge are not solely with other humans. Among the Nayaka of South India, for instance,

> composite personhood is constitutive of sharing relationships not only with fellow Nayaka but with members of other species in the vicinity. They *make* their personhood by producing and reproducing sharing relationships with surrounding beings, humans and others (Bird-David, 1999: 73; see also Ingold, 2000a: 103 for discussion of the relational selves of the North American Ojibwa).

The recognition of the embeddedness of the person within a four-dimensional ecosystem means that 'the relation between humans and nature is no longer one of subject-object division. Instead, both aspects are subjects, active participants in the social process' (Fowler, 2002a : 59). Relational personhood is thus constructed from relationships not just with fellow humans, but also with other 'beings' in the world.

Hunter-gatherer societies do not see the 'natural world' as a discrete domain separate from either social or supernatural realms (Politis & Saunders, 2002: 115). Instead,

> the environment, far from being seen as a passive container for resources that are there in abundance for the taking, is saturated with personal powers of one kind or another. It is alive. And hunter-gatherers, if they are to survive and prosper, have to maintain relationships with these powers, just as they much maintain relationships with other human persons (Ingold, 2000j: 66; see also Hallowell, 1960; Bird-David, 1990: 190).

Such work has served to relativise western ideas about nature and culture (Little, 1999: 270). According to western science '*personhood as a state of being is not open to non-human animal kinds*' (Ingold, 1996a: 130, italics in original). However, while western science perceives a fundamental split between 'human' and 'non-human' (section 2.2), with 'person' a subcategory of 'human', other societies start from an overarching category of 'person', within which 'human person', 'animal person', and even 'wind person', for example, are all valid subcategories (see Hallowell, e.g. 1960).

Thus in many societies other animal species, plant species, aspects of the landscape such as outcrops and lakes, as well as 'natural' phenomena such as the sun and moon are also construed as 'persons', part of the world with which human persons interact during the course of their habitual activities. The human person, then, is just one form of person, and persons

> can also appear in a variety of animal guises, as meterological phenomena such as thunder or the winds, as heavenly bodies such as the sun, and even as tangible objects such as stone that we would have no hesitation in regarding as inanimate (Ingold, 2000a: 91).

Such ways of thought are often considered simply 'wrong', directly opposed to the 'truth' of science and examples of immature or 'savage' thought: at best, they are considered a highly adaptive 'perceptual strategy' (Guthrie, 1993) – still wrong, but at least understandable (Bird-David, 1999). However, when we consider that dwelling in the world is primarily a practical business, a way of getting-on-with-things, it is apparent that conceptualisation of other 'inhabitants' of the world does not constitute a *failed* epistemology, but rather a *practical* one (*ibid.*). Humans do not just behave *as if* they interact with animals, with stones, with the weather – they *do* interact with them.

It is not that such societies fail to differentiate between human and animal, animate and inanimate; simply that while western thought assumes a dichotomy, then looks for homologies and analogies, other societies assume a fundamental similarity, then look for differences (Ingold, 1996a). Thus, while the Nayaka clearly recognize practically and linguistically that other inhabitants of their world have different and various qualities and 'affordances', the fact that the local environment is shared with these beings is held to unite them in another sense (Bird-David, 1999: 73).

That there may be in some sense a continuum between humans, animals and 'inanimate' objects, however, 'does not mean that we should objectify people, or personify things' (Fowler, 2002: 50). Nor is attributing personhood to animals necessarily anthropomorphising them (Ingold, 2000a: 91; Little, 1999: 258). Rather, 'Animals, artefacts and people can share social characteristics which cross these boundaries' (Fowler, 2002: 50). As Ingold writes,

> In truth, there are as many different kinds of relationships as there are beings in the environment of an agent, but the differences are relative, not absolute ... To be sure, each of these relations will be qualitatively different and will call for distinctive skills and sensibilities, but it is quite impossible to determine any final cutoff point, as we move from a person's relationships with humans, animals, plants and apparently inanimate objects, beyond which we can say without doubt that we are no longer dealing with a relation between persons in society, but one between a person and a thing in nature. In every case, whatever we do *to* others is embedded in the context of our relationships *with* them (Ingold, 1996b: 186-7).

If personhood is seen as arising from the relationships that one has with such co-denizens of the ecosystem, then a model of 'distributed personhood' emerges, in which personhood does not reside *per* se in a individual body but rather in a complex web of heterogeneous relationships with other entities, not only humans but also other members of other species and 'inanimate' places and objects. This distribution of personhood via relationships with others allows the 'stretching' of personhoods across time and through space. Nor are these relationships one-way: instead they are dialectical and constantly under negotiation during habitual daily activities which are grounded in – although not determined by - the body.

5.3. PERSONHOOD AND ANIMALS

While 'entities' in the world around us 'afford' us various things, animate entities have particular kinds of affordances – mutual or interactive affordances. In short, animate entities 'act back' or literally *interact* with their perceivers (Gibson, 1979; Ingold, 2000c: 167).

Animals are both the same as us and other, sharing many biological and 'mechanical' characteristics:

> Their otherness derives from their distinctive anatomies, the polytypic heterogeneity, their lack of sentience, symboling and language, and their innocence of the incest taboo and its resultant social patterns. Yet they are also like man, in their basic anatomical plan, and their basic behavioural repertoire (eating, sleeping, mating, fleeing or attacking) and their shared basic patterns of sentience (Guenther, 1991: 195-6).

The Saami, for example, identify closely with bears because of their structural similarity to humans, displaying, they claim, human-like bodily and facial expressions, even weeping when upset. Locomotor postures (sitting, standing upright) resemble those of humans, and in addition they note 'the remarkably human form and proportions of the bear's carcass after it has been skinned, lending credence to the idea that the animal is really a man in disguise' (Ingold, 1987b: 257-8; see also Binford, n.d.).

Whether or not non-human animal species engage in direct perception in quite the same way as we do, *we* perceive *them*, and in addition we see them acting *as if* they do, and often in very similar ways to ourselves. A practical, 'relational' epistemology thus exists alongside the 'scientific' one even in western society[14].

This assignation of personhood to non-human animal species does not require that they be anthropomorphized (Little, 1999: 258) - rather, both 'are related through their mutual embodied inhabitation of the world' (Jones & Richards, 2003: 45) and through their continuing relationships as hunter, as prey, farmer or stock. Among the Mistassini Cree of northern Canada,

> The facts about particular animals are reinterpreted as if they had social relationships between themselves, and between them and anthropomorphised natural forces, and furthermore the animals are thought of as if they had personal relations with the hunter (Tanner, 1979: 136).

In many societies this notion of a relationship between humans and animals is formalised in myth: The San consider present existence a reversal of primal time, 'when animals were humans and humans animals' (Guenther, 1001: 193). Even in their current states, each is thought to carry within themselves some residual traces of their former states; thus some groups forbid eating of certain prey animals as akin to cannibalism. The principal

[14] The issue of animal rights remains emotive, and pets are often 'credited with human feelings and responses, spoken to and expected to understand, given names, put through life-cycle rituals, and sometimes even dressed in clothing' (Ingold, 2000a: 90-1). In short, it is not only children who consider other animate species (and even inanimate objects) as sentient and capable of entering into relationships. Even scientists may enter into relationships with their test animals and begin to regard them as 'persons'! (Kennedy, 1992: 27; quoted Bird-David, 1999: 71).

characters in stories of this older time are enigmatic blends of human and animal: bipedal, tool- and language-using social beings with distinct animalian traits. Similarly, in the world-view of the Nunamiut, all animate beings are seen as partaking of the same pool of 'essence' or 'power', and at birth, the essences are 'mixed and combined anew' (Binford, n.d.).

This essential commonality of human and animal beings is interpreted in terms of kinship, and interactions with various species are conducted in very similar terms to those with other humans. For example, particular bears may be hunted and killed because they are thought to possess characteristics of a person's dead enemy, or as a revenge killing for the death of a relative (*ibid.*).

Life as part of an ecosystem thus involves constant interaction with other animate organisms, and as an individual in a hunter-gatherer society,

> one gets to know the forest, and the plants and animals that dwell therein, in just the same way that one becomes familiar with other people, by spending time with them, investing in one's relations with them the same goals of care, feeling and attention ... at root, the constitutive quality of intimate relations with non-human and human components of the environment is one and the same (Ingold, 1996a: 128-9).

5.3.1. Implications: a technology of hunting

Such a re-conceptualisation of human-animal relations obviously has significant ramifications when considering hunter-gatherer subsistence practices. Far from being an encounter between culture and nature, the wild and the tame (see e.g. Cartmill, 1993) or a form of technological manipulation of the natural world, hunting is seen as a kind of interpersonal dialogue, integral to the total process of social life.

Nor is the kill is an event that ends life but one which sustains it (Ingold, 2000h: 13, 2000k: 114). The Cree, for example, consider that moose present themselves willingly to the hunter as part of their ongoing relationship – however, humans must also play their part in world renewal by means of their butchery, consumption and disposal of the remains (Ingold, 2000l, 143). If a hunter fails in his duty to perform the kill, butchery, consumption or disposal in the respectful fashion, animals will not yield themselves to him (Ingold, 2000j: 66). Thus the process of hunting establishes a particular kind of relationship with other animal species and with the world (Jones, 2003) – which becomes part and parcel of the identity of the hunters.

The 'technology' of hunting, in the sense intended by Dobres (2000; section 2.5.), includes all aspects of 'the hunt', from the gathering of knowledge about the world, through the practices of the hunting and gathering of other animal and plant species, to butchery and processing, sharing, deposition and the re-use and re-interpretation of associated locales. The actual practice of hunting itself thus arises from 'histories of continuing involvement' between human and non-human constituents of an ecosystem (Ingold, 2000m: 9), and the kill itself is simply 'a moment in the infolding of a continuing – even lifelong – relationship between the hunter and the animal kind (of which every particular individual encountered is a specific instance)' (Ingold, 2000j: 71).

These ongoing relationships form part of the practical daily comprehension of one's ecosystem that is very clear in the anthropological literature (e.g. Binford, n.d.; Brody, 1981; Ingold e.g. 1996a; Ridington, 1999), a 'monitoring' or nondiscursive awareness of the environment. Nayaka hunters and gatherers consider time spent in foraging for food to be well spent, even if it results in very little return, as it allows people to 'keep in touch' with the environment 'intimately, in the way one "knows" close relatives with whom one shares intimate day-to-day life' (Bird-David, 1992: 39). As Evans writes,

> interactions were complex and intimate. People and other predators knew where their prey animals were living and breeding, what sort of state they were in and

> how they moved around … the hunt went on all the time in peoples' mind and in their behaviour (1999: 14).

Thus a 'technology' of hunting should address hunting and gathering behaviour as the ongoing, nondiscursive practice of day-to-day skills:

> Hunting (or trapping) cannot be seen simply as the execution of a strategy. It is a social practice which involves long preparation, both technical and ritual, co-operation and organisation between the men and women who are going to be involved, choices as to which animal is to be pursued and so on. In all of these preparatory stages people draw upon historical and practical knowledge, and expectations based upon previous experiences, to guide their procedures, gestures and actions. To reduce all of these aspects to one "strategy" or mode of "behaviour" misunderstands the essentially social and cultural nature of hunting practice (Boyd, 1999: 7).

Some attempt has been made by archaeologists to address these wider issues; Charles' work on butchery practices in the Upper Palaeolithic looks at the ways in which butchery behaviours, being pre-conscious, routine actions 'usually learnt by a combination of example, observation and trial and error until an individual becomes so skilled that conscious thought becomes almost unnecessary' (2000: 52) might reflect an 'ethnicity' or specific mode of practice, and work on the consumption of animal remains is also progressing beyond a purely functional standpoint (see papers in Miracle & Milner, 2002).

Such work is beginning to identify the ways in which the material remains recovered archaeologically might play a part in the construction and negotiation of personhood. The breaking down and reassembling of the bodies of animals – not just meat but teeth, wings, beaks, etc. (perhaps the most distinctive parts of animals' interaction with the environment) allow them to be re-incorporated into human identities (Connoller &

Yarrow, 2002; Fowler, 2002) through being worn as ornaments, worked and/or traded and passed on, potentially carrying with them aspects of the perceived affordances and abilities of the original animal identity to be conveyed onto their owner/wearer – thus animal species can also be considered to have 'distributed' personhoods. Such issues are underrepresented in the Palaeolithic literature – even d'Errico and Vanhaeran's recent work on the perforated teeth from the Upper Palaeolithic site of Aven des Iboussieres (2002), while opening up several important avenues for discussion along these lines, adheres disappointingly to a narrow functional focus. As Jones and Richards comment,

> We have become familiar with the notion of the cultural biography of things. Objects are imbued with histories and personalities by virtue of the relationships they establish between people [section 5.5.]. Yet we have seen little discussion of the cultural lives of things that already have biographies, such as animals (2003: 46).

Their work in the Neolithic considers the ways in which the butchery and deposition of a particular animal articulates particular sets of relationships and the ways in which these impact on or are impacted on by the engagement of people with animals (*ibid.*). As they point out, the biographies of animal species as transformed over their lives may be hugely significant for their hunters - in functional terms, as meat or hide quality or behaviour varies seasonally or with age - but also in terms of the ways they are perceived and treated.

5.4. PERSONHOOD AND 'PLACE'

And all encounters of interaction between human and animal species occur *in the world*, at specific times and in specific places: 'All animals are not equal; rather they evoke quite distinct qualities of place and existence. Animals presence the relationship between people and different places in the landscape' (Jones & Richards, 2003: 50), and this recognition leads me on to consider the role of 'place' in the constitution of personhood.

The experience of 'place' differs qualitatively from that of 'space' (see Tilley, 1994: 14-5; Chapman, 1997 for discussion) because they are embedded in the four-dimensional matrices of distributed identity: places 'are constructed in our memories and affections through repeated encounters and complex associations. Place experiences are necessarily time-deepened and memory-qualified' (Relph, 2000 [1985]: 26), created by the events of interaction of embodied persons (Grange, 2000 (1985): 83), whether human, animal or other[15].

'Places', then, do not so much have locations as histories or biographies (Ingold, 2000f: 219), acquired by virtue of the interactions which occur there. Among the Ongees from Little Andaman in the Bay of Bengal, 'places' are created at the points of intersection of pathways and movement of different entities: humans, animals and spirits (Pandya, 1990), and for hunters and gatherers generally,

> the most significant places are where the paths of different beings intersect, or perhaps merge for a while before diverging again. It is here that exchanges of substance occur, for example in episodes of hunting, where the trails of human and animal cross and from which each leaves bearing something of the substances of the other, or of gathering, where people consume the fruit of a tree once planted by an ancestor (Ingold, 2000l: 145).

Such 'places' do not exist in isolation, but are 'Bound together by the itineraries of their inhabitants ... as nodes in a matrix of movement' (Ingold, 2000f: 219), both historical and potential. The Walbiri of western central Australia, for example, perceive the entire country in terms of networks of places linked by paths of movement (Munn, 1973: 215): for Australian Aboriginals, 'the life of a person is the sum of his tracks, the total

[15] As with animals, continuity is seen between animate and 'inanimate' kinds of persons: the stone parentage of the first humans is a theme in a large number of myths (Bender, 1992: 744). The Nayaka, for example, 'refer to the spirits that inhabit hills, rivers and rock in the forest and to the spirits of their immediate forebears alike as *dod appa* ("big father") and *dod awa* ("big mother")' (Bird-David, 1990: 190).

inscription of his movements, something that can be traced out along the ground ... who one is becomes a kind of record of where one has come from and where one has been' (Wagner, 1986: 21).

Thus inanimate features of the landscape and 'places' in the four-dimensional ecosystem are drawn into webs of relationships and thus become part of the negotiation of personhood and identity. Furthermore, 'places' do not exist in isolation - rather 'it is through insertion into a narrative that a place assumes active meaning and it is through the linking of places in a sequence that a narrative is itself constructed' (Chapman, 1997: 31). Therefore, paths and tracks enact movement between persons as well as between places, and in fact help to *comprise* those persons: 'Every trail, however, erratic and circuitous, is a kind of life-line, a trajectory of growth' (Ingold, 20001: 144).

When viewed in this way, the movements of hunter-gatherers are not a process of 'mapping on' to a landscape, or even of organising to be in the right place at the right time to exploit a resource. Instead they are governed by an appreciation of and identification with affordances arising out of the taskscape, closer to storytelling than map-using (Ingold, 2000: 219), being a non-discursive process arising out of understanding of the structure of the matrices of historical and potential movement embodied in the four-dimensional ecosystem:

> The Athapaskan hunter will move in a direction and at a time that are determined by a sense of weather (to indicate a variable that is easily grasped if all too easily oversimplified by the one word) and by a sense of rightness. He will also have ideas about animal movement, his own and others' patterns of land use ... But already the nature of the hunter's decision making is being misrepresented by this kind of listing. To disconnect the variables, to compartmentalize the thinking, is to fail to acknowledge its sophistication and completeness. He considers variables as a composite, in parallel, and with the help of a blending of the metaphysical and the obviously pragmatic. To make a good, wise, sensible hunting choice is to

accept the interconnection of all possible factors, and avoids the mistake of seeking rationally to focus on any one consideration that is held as primary. What is more, the decision is taken in the doing: there is no step or pause between theory and practice (Brody, 1981: 37).

5.4.1. Implications: Sites as 'places' in the four-dimensional ecosystem.

'Site-based' archaeological approaches have recently given way to 'landscape-based' or 'off-site' archaeologies (see Knapp & Ashmore, 1999: 2, for discussion), reflecting a new concern with the scales relevant to past hominids and societies. However, the fact remains that 'sites', in the sense of concentrations of material in the archaeological record, exist. There thus continues 'a prominent interest in site location, not simply as determined by natural or environmental factors, but within a seamless web of active relationships between people and materials, people and artefacts' (Shanks, 1997: iii), an approach which considers sites as nodes in a network rather than as isolable 'hot spots'.

The nature of many Palaeolithic sites as palimpsests of activity, frequently over large timescales, suggests that we need to view them as (intentionally or unintentionally) created 'significant places within the social landscape, as locales of meanings, intimately tied into narratives and social identities, and embodying a sense of time and belonging' (Pollard, 2000: 124). While collective memory may maintain a 'place' as special, deposition of material may also serve to underpin a sense of identity and location. For example, Pollard's work at Mesolithic shell middens leads him to argue that they were not simply functional constructions or 'steadily accumulating heap of refuse' but 'projects', a concrete statement of occupation and belonging in a constant process of creation for the duration of their use. Not only did deposition create a sense of place, but it also reified human presence in and use of certain locales over varying lengths of time, contributing to memory, continuity and individual and collective identities (Pollard, 2000).

Continued use and re-use of sites, often over thousands of years in the Palaeolithic, would increase identification with the 'place' (e.g. Evans, 1999): such continued use and re-use of sites would also undoubtedly entail recognition of previous inhabitants, whether human/hominid or otherwise. The lithic and bone evidence of previous human occupations may have been subject to re-disturbance and/or re-use, or may have been the focus for storytelling, origin myths or simple curiosity; cave sites may on occasion have been the setting for encounters with other cave-dwelling members of the ecological community, using the site as a resource for feeding, refuge and/or breeding[16]. It is this wider sphere of interactions that we need to consider; such encounters and knowledge would have formed part of the experience of the place, which would have been metonymically significant as part of seasonal, annual and lifetime occupation or settlement ranges of its users (Whittle & Pollard, 1999).

In addition, the nature of the material deposited adds another dimension to the 'project' of the creation of place. The disposal of animal remains has generally been treated very functionally: although there is an extensive literature on the taphonomic effects of methods of disposal practices, this has generally stopped at the level of identification of their associated signatures. Archaeologists have often tacitly considered animal bone to be 'rubbish', a simple by-product of subsistence practices. However, as Moore's work among the Endo Marakwet in northwestern Kenya demonstrated, not all discarded objects fall into the same category, and such discarded items may be organised according to several categories, none of which may be equivalent to the modern western concept of 'rubbish' (1983: 75).

[16] The distinction between anthropogenic and non-anthropogenic assemblages and parts of assemblages obviously needs to be made before the relationship between hominids and other animals can be understood (Serjeantson, 2000). However, this should not be considered as a simple case of developing methodologies for identifying and discounting non-anthropogenically derived faunal material. Rather than dismissing material and data out of hand because it is not (or not wholly) hominid-derived, we should consider the possibility that it has a great deal to tell us about the *relationship* between hominids and animals. The very fact that hominids and other animals 'shared' and competed for living space and resources such as caves is bound to have been a factor in the behaviour of both and informed the ways in which hominid populations thought about and related to these species (see e.g. Gamble, 1983b; Stiner, 1994: table 5.23; Evans, 1999: 14).

There is an extensive literature on the social and symbolic meanings of spatial patterning of faunal remains in later prehistoric and historic periods; this has not, however, been a factor in Palaeolithic archaeology although Evans has recently suggested that it may be a factor for La Cotte de St. Brelade (1999: 8). However, as noted above, the dismemberment and deposition of animal parts is an integral part of interactions with animal prey species. In hunting and gathering societies there are often detailed rules regarding where and how specific animal species' remains may or may not be disposed of: Among the Nunamiut, following ritualised consumption of bear meat, the bones may not be left for dogs or wolves or disposed of casually, but may be buried in anatomically correct arrangements to honour the dead bear's spirit and facilitate encourage its reincarnation (Binford, n.d.). Murray documents similar practices regarding seals among Arctic hunters (2000). Among many societies – including contemporary western societies – mammal bones and especially crania and mandibles of larger animals, may also be retained as trophies (see e.g. Wilson, 1999: 301 for discussion). Whether or not patterned deposition was created formally and explicitly or unintentionally created as part of the daily/seasonal routine, then, 'it was still structured by notions of appropriate and traditionally sanctioned ways of doing things' (Pollard, 2000: 130), and this insight allows us to approach these issues archaeologically; for example, Pollard has identified faunal depositional practices perhaps reflecting hunter-gatherers' respect for prey and perception of the need for proper treatment of animal remains in Mesolithic middens (*ibid.*).

Other ethnographic examples link the patterning of bone deposition to the ways in which societies think about space in general and the areas in which they live in particular; Tambiah's work in Thailand demonstrates clear linkages between the cultural classifications of animal species, areas of the village and/or house, and deposition practices (Tambiah, 1969). Other examples include Bulmer's work among the Kalam of New Guinea (1976), and Hyndeman's among the Wopkaimin (Hyndeman, 1990). In the latter case, Hyndeman discusses how various New Guinea hunting peoples collections and displays of trophies function as 'mental maps' referring to their environment. They:

> use their mental maps for relating resources and making sense out of the world. They connect together and condense the stream of experience to solve spatial problems and the resource use of the past is displayed in the present to solve future problems (*ibid.*: 73).

In short, then, the deposition of material such as animal bones is part and parcel of the matrices of action that constitute identity (e.g. Pollard, 2000: 125). In addition, animal bones in and of themselves are representative of individual, living animals, killed at other 'points' of temporal and spatial intersection between different entities in the four-dimensional narrative of daily life that would have been experienced by the creators of identifiers with the 'place'. They could thus have acted as mnemonic reminders of these encounters and the character of them, the events, times, places and people involved in the interactions, 'evoking connotation and memory, and structuring and being structured by relations with other people and the material world' (*ibid.*: 132-3).

5.5. PERSONHOOD AND MATERIAL CULTURE

If 'inanimate' entities such as elements of the landscape can be considered 'persons', then so too can artefacts of material culture. Post-processual approaches have established that material culture is more than a functional by-product of the process of passive adaptation to the physical environment (Preucel & Hodder, 1996: 301) but actively constitutes that society. Objects of material culture are viewed as having an *effect* in social relations; they are ambiguous in that 'by their sheer physicality and inanimacy [artefacts] are intrinsically thing-like, but in their incorporation into the nexus of social relations they are also personified' (Ingold, 1994: 335).

Objects can thus be considered intentional, living subjects, as in the village of Langda in Indonesian Irian Jaya, where adze makers attribute emotions and names to the stone they work with and the objects produced from them:

> Social relations with stone are an important part of production, and care must be taken to avoid angering pieces through improper practices such as placing finished pieces on the ground in an improper fashion (Stout, 2000: 704).

Whether or not they are considered as 'persons' with agency in and of themselves (compare Gosden & Marshall, 1999 and Ingold, 2002), it is undeniable that objects not only change over time, but that they can also accumulate histories (Gosden & Marshall, 1999: 170), and object-biography archaeological approaches consider the 'life history' of objects of material culture. The point is not whether objects can really be considered social actors *per se* but to consider the ways in which peoples' biographies are tied up in objects – less how objects accumulate biographies than how they are used to create personhood (Hoskins, 1998; Gosden & Marshall, 1999: 174). Working in Sumba, eastern Indonesia, Hoskins got little response when asking people about their life-histories directly, but obtained a wealth of information about people and their lives when she asked instead about significant objects: artefacts of material culture are created by persons, at times and at places, and as such constitute nodes in the matrix of persons and timed places that constitutes personhood. Therefore, in some societies such as those of Melanesia, material objects are seen

> as the detached parts of people circulating through the social body in complex ways. People are not just multiple, they are also distributed. A person is ultimately composed of all the objects they have made and transacted and these objects represent the sum total of their agency (Gosden & Marshall, 1999: 173).

This 'externalising' of identity by a transference of properties of people to objects, allows a 'stretching' of social relationships beyond the immediate proximity of the person, both in space and in time (Gamble, 1998: 440, 2001). The durability of some such objects makes them particularly important in transgenerational communication (Gosden, 2001). However, this is not to reduce artefacts of material culture to a purely functional, adaptive, problem-solving role: relationships and interactions are not *mediated by* material culture but *embodied in* it (Gosden, 2001).

5.5.1. Personhood and skill

The significance of artefacts of material culture in terms of the personhood they represent is thus the technology or skill behind their creation. The recent reconsideration of the notion of 'technology' as *techné*, with its meaning more of performance (Dobres, 2000; section 2.5.), considers technology as based around bodily actions, narrative forms of performance embedded in the nexus of activities that constitutes personhood. The 'technology' or skill behind the construction of artefacts of material culture is thus a significant part of that artefact's meaning or personhood.

In contemporary western society our understanding of technology relates to mass manufacture and machinery, involving 'a removal of the person so that procedures for tool manufacture or use have become standardized and objectified, related to the tools and not their users' (Sinclair, 2000). However, in other societies technology is not a static collection of material objects and technical facts, handed down as an internal, cultural 'programme' of design, but rather 'a dynamic system of skilled and goal-directed action in a social context ... a dynamic property of the organism-in-environment' (Stout, 2002: 694; see also Sinclair, 2000).

As such it is *part of* the ecosystem, encompassing relations with the sources of raw material (elements of the landscape, animals, etc) and/or other humans, living, dead and mythical, during interactions with whom the technical skills were acquired. The adze makers of Irian Jaya studied by Stout were able to recite a list of ancestors who had handed the craft down to them:

> Relations with living individuals are embodied in the learning, cooperation and exchange that are as much a part of the adze-making craft as is knowledge of reduction strategies. Craftsmen must always be aware of their relationships with others and the ways in which they are enacted and modified through adze production. The social, symbolic, and mythic ramifications of the industry are for them in no way external to the central goal of adze making. Knowledge in these spheres is one aspect of an overarching structure of knowledge that is unified by its practical and teleological focus (2002: 702-5).

Such a re-conceptualisation of artefacts of material culture, as embedded in heterogenous networks of personhood and relationships between persons, has significant implications for the ways in which archaeologists interpret assemblages. Artefacts of material culture can be considered as 'external receptacles of memory' (Jones, 2003), mnemonically 'redolent of the network of relationships between kin and others, places and agents in the landscape' (Pollard, 2001: 322) by virtue of their intricate involvement in daily life.

Deposits – even of refuse - draw from routine social life and thus act as a focus for memory:

> at one level memories of specific events such as the breaking of a pot, the killing and butchery of an animal, the sharing of meat, of successful times and difficult seasons; on another level, of the flow and rhythm of social life, and of the ontological and cosmological order of things. Here, the agency of objects resided in their capacity to serve as mnemonic devices (Pollard, 2001: 323).

Objects of material culture thus have a significant role to play in the establishment and negotiation of personhood, helping 'with the organization of experience that constitutes someone's life story' (Gosden & Marshall, 1999: 174).

5.6. PERSONHOOD AND NARRATIVE KNOWLEDGE

Persons, places and objects of material culture, therefore, all form part of a heterogeneous network of active relationships. These relationships are not separable; in the previous sections I have separated out 'animals', 'place' and 'objects of material culture' purely for clarity. In the ongoing experience of dwelling the activities that comprise such relationships are not isolated but linked through paths; the paths of movement of persons through their world:

> Putting together all the trails of all the different beings that have inhabited a country – human, animal and plant, ordinary and extraordinary – the result would be a dense mass of intersecting pathways (Ingold, 2000l: 144).

Such a life-trail or collection of trails is not experienced from outside, in the 'vertical' mode but 'laterally' (Casey, 1996), as constituting practical daily life embedded within a four-dimensional world, not integrating entities in terms of an independent framework of spatial coordinates but rather through their performance of the activities and relationships that constitute the life-trail. Similarly, knowledge is not passed down as an abstract, external 'culture', but rather subsists in the practical activities themselves (Ingold, 2000l: 147) and in their performance for others, in storytelling, dance or song, for example.

Being educated, for hunter-gatherer societies, involves an 'education of attention' and 'enskillment' (Gibson, 1979: 254) absorbed during daily practice of habitual activities (Ingold, 2000l, 145). Thus many societies (most famously those of Aboriginal Australia) have traditions of 'walkabout', when young men are taught the characteristics of the environment. Among the Walbiri of central Australia, a boy being prepared for initiation was 'taken from place to place, learning as he went about the flora, fauna and topography of the country, while being told … of the totemic significance of the various localities visited' (Ingold, 2000h: 20-21, citing Meggitt, 1962: 285).

As a result, persons of hunter-gatherer societies may display an astonishing depth of knowledge about their worlds, and like Atsin, an Athapaskan Indian whom Brody accompanied on hunting trips, persons are 'proud … of the immense work and of the achievement such detailed and extensive knowledge represents' (Brody, 1981: 12) - examples of the sheer depth of understanding of worlds can be found in Hallowell's study of the Ojibwa (1960), Binford's of the Nunamiut (1978), and numerous references in Ingold, (2000n), among others: the daily practices of hunting and gathering and both structured by and create a long-term body of knowledge of and familiarity with the ecosystem of which each person is a part (e.g. Roebroeks, 2001: 450). However, such 'knowledge' is not a formal kind of 'data': as Ingold puts it,

> this is not knowledge in the natural scientific sense, of things and how they work. It is rather as we would speak of it in relation to persons: to "know" someone is to be in a position to approach him directly with a fair expectation of his likely response, to be familiar with that person's past history and sensible to his tastes, moods and idiosyncracies. You get to know other human persons by sharing with them, that is by experiencing their companionship. And if you are a hunter, you get to know animals by hunting … the weapons of the hunter, far from being instruments of control or manipulation, serve this purpose of acquiring knowledge (Ingold, 2000j: 72).

This is not so much, he comments, 'an alternative science of nature but a poetics of dwelling' (Ingold, 2000m: 11). To be a good hunter is not 'just' about being able to detect those clues in the environment that 'tells' him where animals are, but it is also to be able to create narratives of hunting journeys (Ingold, 2000h: 24-5) - not to create 'stories', but to continue to place relationships and activities (with the audience and with animal species, weapons and tools and the land and places where these interactions occurred) into a narrative framework.

The performance of such activities, then, cannot be reduced to a merely functional form of 'information exchange' (Lake, 1999: 118) or 'topographical gossip' (Widlok, 1997), but is a form of establishing personhood – both for individuals and groups, by locating oneself and one's group in the four-dimensional world of activities.

Four-dimensional, because such activities occur in time as well as in space; the world changes over time, and an understanding of this is central to any 'sentient ecology' or 'poetics of dwelling'. Thus the passage of a time in ecosystems is understood both through human activities and 'natural' changes in the world - Brody, for example, describes one particular understanding of seasonality among the Athapaskan indians, whereby fall is equated with dry meat hunting, early and late winter with the hunting and trapping of varying animal species, spring with beaver hunting, and summer with 'slack' time (1981: 191); each of these 'seasonal' activities involves different animal species and also different places and the routes between them. Similarly, Bird Rose's discussion of the numerous 'seasonal' transitions recognised by the Tiwi of Northern Australia includes the 'seasons' of: 'clap sticks; flower/flowing times; tall grass; knock-'em-downs (winds); fire; cold; fog; dry creek bed; hot feet; thunder; breeding mangrove worm and muddy possum tracks' (1996: 59).

The significance of narrative is clear; it is through the embeddedness of interactions with various forms of entity into the narrative experience of dwelling in a four-dimensional ecosystem personhood is created.

5.6.1. Towards a narrative ecology

The problem that archaeology as a whole is slowly beginning to face, and that Palaeolithic archaeology needs to address, is 'the necessity of moving beyond formal analysis to constructing narrative' (Pollard, 1999: 76-7). As Gamble says, 'the problem with the Palaeolithic is that currently there are very few stories' (1999: 8). For example, rather than consider 'information exchange', we could consider that, according to ethnography, evening is an important time for 'performance' (Lake, 1999: 118). The Veddah of Sri Lanka in the early 20th century constructed 'conversation hearths' outside of their caves, where groups from several shelters would congregate in the evenings to converse and tell 'stories' (Binford, 1998). Although I am not advocating direct ethnographic analogy, such small fragments of narrative can perhaps show us a new way forward in the ways in which archaeologists think about and interpret ecological knowledge and subsistence behaviour, the construction of hearths, the deposition of material in 'sites' and social interaction, as part of a single way of life.

A particularly good example of the ways in which aspects of personhood are entangled with ways of life is provided, perhaps ironically, by Binford's work among the Nunamiut. The emphasis he places on the sizes of 'annual ranges' and frequency of settlement change does not entirely obscure a fascinating picture of a group of people and the matrix of movement and interaction that constitutes their identities and social lives. Among the Nunamiut lives begin in a 'home range' of birth, the "birth country", from which they will progress to the "becoming country", the area they would be expected to be living in while learning their adult roles as hunters and gatherers. It is here that they engage fully with the environments of the "lifetime range", or area over which they can expect to live over their lifetime, gathering the depth of understanding of the world that comes from full engagement with their co-denizens. It is from dwelling within this area that one's "group identity" will emerge. A third residential area is known, for boys, as the "courting country", and for girls as the "birthing country"; on marriage a man would leave the "courting country" to perform 'bride service' for his wife's people, after which he would move back to his original band, now in a new area known as "hunter's country". It is here that he will, as Binford puts it, 'achieve his maximum notoriety as a hunter and an expert performing male roles', after which he will move back into the original "birthing country", where he 'becomes a respected elder in the country in which he had been born' (1983b: 383). In this example, personhood can be seen as a constantly changing, growing phenomenon arising from interactions with other humans, animals and plant species and with the landscape.

5.7. SUMMARY AND CONCLUSIONS

In many cultures, therefore, personhood is not something that arises from inside a bounded human 'individual' entirely independently of the surrounding world. Certainly it arises in part from a sense of oneself as an embodied 'organism-person' (Ingold, 1996a), through direct, sensual perception of the world. But *because* the world is experienced in a direct, practical, effective way, it is a *shared* world and people are aware that they figure in the environment of other entities.

These 'others' include not only other humans, but members of other species, artefacts of material culture, and elements of the landscapes; all are drawn into active social relationships performed at points of interaction which occur at intersections in the paths described and created by the movement of persons in space and time. And the whole architecture of this four-dimensional matrix of movement, action and interaction within an ecosystem comprises a *habitus* of day-to-day comprehension of how to act within one's world.

The distribution of personhood via other relationships with other entities allows the 'stretching' of human relations beyond their immediate, embodied presence (Giddens, 1984: 35; Gosden, 2001), and people can have effects at some 'distance' from themselves in both space and time - where 'time' is measured in experience, and 'space' 'is not a geometrical entity to be represented easily on a piece of paper, but rather room-for-manoeuvre, a space in which skills can be deployed' (Gosden & Head, 1994: 114). It is because of this that a way of life can exist over scales larger than a single person, or even immediate group of people: a society.

Our concepts of time, space and human relations are inculcated into our bodily being as we grow up. These notions, which form the basis of all action, are not something which we are necessarily conscious of, they are not something we know, but something we are (*ibid.*).

This holistic comprehension of ourselves and how we fit into our world means that persons are able to draw upon historical and practical knowledge and expectations based upon previous experience to guide their procedures, their gestures and their actions: the result, as Shennan puts it, is that 'individuals know how to take part in their way of life without a great deal of conscious thought and simply get on with it' (1996: 284).

Such a conception clearly has huge implications for the way archaeologists regard archaeological remains. Such remains are inevitably produced and deposited within this four-dimensional structure of relationships; in the case of animal bones, for example, with the animal species they derive from, with the times and places of their appropriation in the landscape, with their association with and patterning within the locale of their use, deposition and recovery. A purely functional approach to faunal remains disregards these extra dimensions of information available. The perspective of ecosystemic personhood, then, perhaps suggests a new way of addressing the (Palaeolithic) archaeological record: not merely as stones and bones and the spaces between them, but as constitutive of personhood.

CHAPTER SIX: THE MIDDLE AND UPPER PALAEOLITHIC OF THE DEBA AND UROLA VALLEYS

6.1. AIMS OF THE STUDY

A number of changes in the archaeological record have been documented over the course of the Middle and Upper Palaeolithic. Opinion is now divided between those who describe a radical break in the record with the transition from the Middle to the Upper Palaeolithic (and, not coincidentally, between Neanderthals and 'anatomically modern humans'; e.g. Mellars, 1991, 1996; Mithen, 1996; Klein, 2001), and those who see some degree of continuity and emphasise instead change over the course of the Middle and Upper Palaeolithic and particularly around the time of the LGM c18,000 years ago (e.g. Straus, 1992; Clark, 2001b; Cabrera Valdés & Bernaldo de Quirós, 1992, 1996; Cabrera Valdés *et al.*, 1997; see Chapters 2 and 3).

Reviewing these debates in Chapter 3, I argued that the current thinking about the nature of such changes is based on two interlinked concepts, *design* and *distance*. The notion of 'design' is linked to the concept of 'mental templates' for behaviour – not simply technical behaviour such as lithic technologies, but also subsistence and spatial behaviours. 'Distance' relates to the concept of 'planning depth' or 'anticipation', the ability of people and populations to use experience and memory to predict phenomena distant from themselves in space and/or in time. Researchers (Chapter 3) have documented increases (whether gradual or punctuated at the Middle-Upper Palaeolithic transition) in abilities in these directions across the course of the Middle and Upper Palaeolithic in Europe and elsewhere – although of course the relationship between the practise of behaviour and the *capability for* such behaviour is far from straightforward.

The particular conceptualisation of the Middle-Upper Palaeolithic 'transition' presented in Chapter 3 is perhaps best summarised by Binford's distinction between 'generalised foragers' and 'specialised collectors' (see section 3.3. for discussion; also Binford, 1996 [1980]). Although in modern humans he argues that these modes of subsistence behaviour are the extreme ends of a continuum, he has consistently argued that Neanderthal subsistence strategies should be characterised as occurring at only the generalised end of the continuum due to their supposed inability to deal cognitively with 'design' and 'distance' (*ibid.*).

However, rather than being seen as essential properties of kinds of hominid, the concepts of 'design' and 'distance' can be related to 'technology' in the fullest sense (Dobres, 2000), structuring and structured by practical experience in a four-dimensional ecosystem. In this paradigm, engaging in hunting and gathering of necessity involves persons in highly social relationships with other entities in their environment - conspecifics, other animal and plant species and particular places in the landscape, and the unfolding of these relations in a four-dimensional ecosystem together form a complex matrix of paths of movement, interactions and events from which arises personhood and identity. Changes in subsistence and hunting practices, therefore, can be used not just to divide the period into problematically-defined 'cultures', but also to explore the implications of change for the people, whether Neanderthal or *Homo sapiens*, who experienced them.

And the faunal record provides a particularly good way for addressing such issues because it provides a signature of peoples' interactions with other animal species, and also because these interactions occur at *places* and at *times*, aspects of information that are recorded in the faunal record itself. Patterns of age-at-death are used to address the 'seasonality' of hunting (Stiner, 1994; Pike-Tay, 2000): clustered ages-at-death reflect a specialisation on prime-aged animals, while 'catastrophic' or 'living structure' profiles are considered characteristic of 'logistic' hunting, because of the anticipation of hunting opportunities and/or organisation and mobilisation of people for communal/mass hunting. Element representation can provide evidence for transport of subsistence resources and, through comparison of 'bulk' or 'gourmet' profiles (e.g. Binford, 1978), potentially for planned ('*distant*') and organised ('*designed*') hunting behaviours.

Zooarchaeological analysis can thus provide a picture of the timing and nature of some of these interactions. In addition, different animal species can be 'located' in the landscape to identify an area within the four-dimensional structure of the ecosystem in which these interactions occurred. Animal species – and particularly ungulates – are strongly associated with particular parts of the landscape by virtue of their ecological 'niche'. Preferred habitats and the patterns of movement over daily and seasonal timescales, have been well studied (at least those still extant or with modern analogues, although there are of course problems with this; Sturdy *et al.*, 1997; Sturdy & Webley, 1988). The locations of the habitats associated with particular animal species within a specific landscape of course reflect its topographic and edaphic characteristics (Section 7.2.), while patterns of seasonal dispersal, aggregation and movement as well as variation in condition and appearance are also closely tied to other ecological factors such as climatic and seasonal regime (see e.g. Boyle, 1990; Jochim, 1976; Mithen, 1990; West, 1997; Winterhalder & Smith, 1981).

From these clues to the locations of different animal species within an ecosystem and their movements in space and time, we can begin to consider the paths described by some of the animal species with which Neanderthal and modern human populations interacted. Combined with the information provided by zooarchaeological analyses of the actual remains recovered from sites within a specific landscape and ecosystem, we can begin to identify some of the specific interactions that occurred at particular points within the four-dimensional architecture of movement described by the inhabitants of these caves, and something of their character.

My focus is, therefore, on the faunal record of the Middle Upper Palaeolithic; but rather than list menus, I will demonstrate that this aspect of the archaeological record can be used to consider the ways in which personhood and identity were constructed by Neanderthals and 'modern' humans. By treating the faunal remains as metonymic of the interactions from which they are derived, 'clues' to the patterns of interaction that their creators described during the course of their everyday lives, we can begin to construct narratives of movement within a specific ecosystem.

Comparison of the forms of interaction attested to by assemblages and sites from the Middle and Upper Palaeolithic will thus inform on the question of whether change was gradual or punctuated (and if the latter, whether it coincided with the replacement of Neanderthals by modern humans), as well as on the related issue of whether the current model of 'design' and 'distance' is appropriate for describing the process.

In this chapter, I begin with a concise summary of the use of Geographical Information Systems (GIS) in archaeology, and some of the criticisms that have been levelled at this form of methodology (Section 6.2.1.). The remaining sections discusses the study region (the Deba and Urola valleys of Guipúzcoa, the Basque country, northern Spain), in terms of its geology, ecology and archaeology, and the sites on which the analysis will focus (particularly Amalda and Labeko Koba; section 6.5.). Chapter 7 then goes on to discuss the specifics of the Pleistocene ecosystems in which the Neanderthal and modern human populations of this region lived.

6.2. GEOGRAPHICAL INFORMATION SYSTEMS AND ARCHAEOLOGY

Geographical Information Systems (GIS) can perhaps best be considered as a 'bricolage' of technologies (many of which existed before the development of GIS *per se* in the 1960 and 70s). Virtually all GIS, however, include components which handle data entry, storage and retrieval (database systems designed to work with spatial data, whether internal or external) as well as the manipulation and analysis of data (data transformation, spatial analysis and modelling), its visualisation and reporting (as graphs, maps etc.) and a particular user interface (Wheatley & Gillings, 2002: 11, following Marble, 1990). GIS thus represent 'a powerful set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world for a particular set of purposes' (Burrough, 1986: 7).

The significant spatial component of much archaeological analysis, particularly given the New Archaeologists' advocacy of such topics as subsistence and settlement 'systems' and the statistical analysis of spatial patterning in the archaeological record (see section 4.1.), meant that cartographic and spatial analysis software was gradually adopted by archaeologists during the 1970s (Wheatley & Gillings, 2002). GIS software systems have been used in the discipline since the 1980s, but it was not until the early 90s that the range of applications of these tools to archaeological problems began to be demonstrated and the use of GIS became widespread (*ibid.*: 19-20).

Essentially, the appeal of GIS to archaeologists lies in the fact that they can provide both a methodological solution to the problems of handling large sets of spatial data *and* (by virtue of their speed and graphical display of results) provide dynamic feedback during analysis. Perhaps the most valuable feature of GIS, however, is its capacity to generate new information from existing data (see Mackie, 2001: 40-1 for a discussion of how the combination of exploratory data analysis and the development of hypotheses strengthens the process of analysis as a whole).

However, a number of criticisms relevant to my own research have been made. These are essentially that the use of GIS in archaeological analyses:

- encourages environmental determinism and is incompatible with a focus on *people* or individuals, i.e. is environmental rather than humanistic (e.g. Wheatley, 2000; Wise, 2000; Mackie, 2001; Wheatley & Gillings, 2002).
- is determined by the technology, rather than by the analyst (Mackie, 2001; Wheatley & Gillings, 2002).

6.2.1. Criticisms of GIS

In many ways, the criticisms levelled at GIS are analogous to those levelled at spatial analysis in archaeology generally, and stem largely from a similar link to the Processual paradigm. Certainly,

> GIS technology tends to privilege the analysis of a particular subset of archaeological themes – ecology, economy and subsistence – over social and ritual analyses; a process which has led to a predominance of settlement studies of a very particular kind. These are either in the form of highly deterministic predictive models … or of site catchment analyses based on optimal foraging theories (Wheatley, 2000: 123-4).

However, like any tool GIS can be used in many different ways, and although the growth of GIS in archaeology has not thus far been accompanied by the development of theory about its use, but this situation is now being rectified (see e.g. Wheatley, 2000; Wise, 2000 for discussion).

The incorporation of 'post-processual' or humanistic approaches to 'space' into a theory of GIS use has become an important area of research (Wheatley, 2000: 126 – 128; Wheatley & Gillings, 2002). Archaeological applications of GIS, it is argued, offer a unique opportunity to pursue and break down traditional units of analysis such as the 'site' – by their nature GIS, particularly those based on raster representations, imply 'offsite' archaeology by mitigating against distinct, bounded sites.

In addition, the use of a GIS allows the analyst to perform spatial analysis using a human scale as the fundamental unit of study. For example, the individual can be the basic unit of visibility in viewshed and cost-surface analysis (Mackie, 2001; Wheatley, 2000; Wise, 2000).

> Theories of place should therefore lead to analytical methods which start at the scale of the individual, and then relate this scale of analysis (the individual viewshed or the individual pathway, for example) to the patterns which become apparent at larger scales of analysis. These larger scale patterns, however, do not have meaning when they are divorced from the individuals who generated them (Wheatley, 2000: 128).

The diachronic, historical analysis of spatial data, however, has proved more difficult to address, and GIS remain rather poor at accounting for temporal variation – perhaps partly accounting for the general perception that it is anti-humanistic. Most GIS deal with temporal variation by the creation of multiple overlays, tenseless 'snapshots' of change. This can have the unfortunate effect of 'crushing' landscape history into two dimensions, and 'makes us forget about the previous history of the landscape and the fact that it is part of the living social system' (Gaffney & van Leusen, 1995: 379; see also Castleford, 1991). Attempts to develop a temporal GIS (TGIS) are reviewed by Wheatley & Gillings (2002: 242-3), but their impact has been limited. This is of course a significant issue for my own analysis, which will involve the production of a series of maps corresponding to different intervals of time.

One possible way around this problem has been suggested by Mackie, who argued that, rather than attempt to reproduce chronological time in a GIS, analysis could '*focus on aspects of the archaeological record which implicitly have a social temporality*' (2001: 42, italics in original). Such an approach, he argues, recognises the inseparability of space and time in the *habitus* and the consequent temporality of the landscape and the archaeological record. A focus on movement and interaction with a four-dimensional is inherently and inescapably temporal to its core; rather than a continuum being 'sliced' into thin sections of time, the patterns revealed for each 'phase' in this analysis can be thought of as being seen from different angles and viewpoints.

The other major criticism levelled at the use of GIS, particularly in the early years of its acceptance in archaeology, is that analyses suffer from a form of *technological determinism*, being designed around the capabilities of GIS rather addressed towards the answering of specific archaeological questions (Mackie, 2001: 42; Wheatley & Gillings, 2002: 237). As Mackie points out, because of monetary and time restrictions, unless archaeologists are also accomplished programmers or able to conduct a specific GIS-based research programme (as opposed to a research programme *using* GIS as a methodology), they are generally obliged to work with available and possibly non-ideal spatial data sets designed for other purposes (2001: 42).

In the case of this analysis, however, it was during, rather than prior to the development of, the research design that GIS was decided on as the means of analysis; the inherently spatial nature of the problem necessitates the use of GIS for methodological reasons rather than the GIS directing the nature of the research (see also Mackie, 2001, 43). In addition, as the discussion of the burgeoning theory of GIS use should have made clear, the use of such systems is by no means incompatible with the more humanistic approach I have taken in articulating my research question. Certainly the data used as a basis for the analysis was downloaded from publicly available sources and not necessarily designed for archaeological use. Nevertheless, the topographic data is highly detailed and accurate and with the modifications described below, is well suited to the analysis.

6.3. REGIONS

A focus on sites as embedded within wider matrices of movement of necessity implies a multiscalar analysis. Ethnography has demonstrated the vast areas which hunter-gatherer groups and individuals may experience over a year or a lifetime (Binford, 1983c: 110). However, a regional scale of analysis was first developed in the 'settlement archaeology' of the 1950s and 1960s, and is particularly associated with the 'new archaeology' (Conkey, 1987), and a 'regional' focus can all too often fall prey to the same kinds of problems as typological approaches, as the analytical device of 'the region' becomes reified by archaeologists. This inevitably makes the consideration of variability difficult, because 'regions' are not merely arbitrary areas of 'space'. As Relph argues,

> A geographical region is defined as a part of the earth that is distinctive from other areas and which extends as far as that distinction extends. It is characterized by internal similarities of landforms, cultural history, settlement forms, climate, or a combination of all of these ... A region is, in short, a particular way of classifying geographical information (2000 [1985]: 21).

The taken-for-granted 'regions' which with we are familiar from Palaeolithic Europe (the Pyrenees, the Perigord, Cantabrian Spain etc) are products of current and historical politics, as much as any objective criteria, and many represent little more than 'accumulated generalizations from site-by-site analysis' (Conkey, 1987: 69), merely composed of 'the sum total of all the sites from a particular time block contained within a manageable geographical area' (Gamble, 1984: 240). Such definitions of region are in stark contrast to those of Heidegger, who argues explicitly that regions do not *contain* things, but rather *arise out of* them: 'the things we use as ready-to-hand have specific places to which they belong, but there are many such places for any one thing ... these places together comprise its region' (Relph, 2000 [1985]: 22; citing Heidegger 1962 [1927]).

This view of 'regions' as practically, multiply-defined entities rather than simple blocks of space raises problems for archaeologists, who have been slow to accept anything other than a basic 'two-scale' model, with 'the site' and 'the region' the only two spatial frames of reference. Palaeolithic studies have rarely even managed to relate these two scales of analysis (Wobst, 1976: 49; Hopkinson, 2001). However, Conkey's call for more flexibility and diversity in the geographical units of archaeological investigation (1987) is being answered as archaeologists are slowly coming to grips with the fact that regional patterning operates at many different levels, necessitating multiple scales of analysis (Gamble, 1984; Burke, 1995; Pike-Tay, 2000; papers in Peterkin & Price, 2000).

However, the very fact of the complexity of 'the region' is what makes it such as useful concept. Certainly individual archaeological sites need to be considered in terms of their positioning with a wider pattern of behaviour; ethnographic data has consistently demonstrated the importance of the wider, 'regional' band as an important entity with real meaning for its members (Ingold, 1980; Burke, 1995). However, regions are more than just 'areas' and 'should be linked with the specifics of given culture-historical trajectories and with a variety of features of the particular geographical (both physical and social) context(s) under consideration' (Conkey, 1987: 71).

So how can we define 'regions' with meaning for the study of the Palaeolithic? If a region is defined at a number of different scales, it also displays correspondingly different boundaries (Pike-Tay, 2000: 1). Gross geographical features may the most obvious, but less obvious features may also be relevant, depending on the practical purposes and capabilities of the entity experiencing the region; boundaries relevant to some species are not relevant to all (Sturdy *et al.*, 1997: 598-9). Areas characterised as 'regions' and as a meaningful unit of analysis, therefore, need to be defined on the basis of multiple factors and, as Conkey states, 'a regional analysis …should be considered as more of a searching technique than as a way of "capturing" some past regional system or processes, as a way to "capture" and "reveal" groups' (1987: 75).

6.4. THE STUDY REGION: VASCO-CANTABRIAN SPAIN, GUIPÚZCOA AND THE DEBA AND UROLA VALLEYS

Nevertheless, the regional level of analysis remains far more appropriate than site-based when looking at subsistence practices and interactions which would have been enacted across a large area. Vasco-Cantabrian Spain, although one of the 'classic' regions Conkey (1987) wished to see problematised, does seem to have a better claim than most of the 'regions' focused on in the Palaeolithic literature to being well-characterised and differentiated from its surrounding environments by multiple factors. As Freeman argues,

> The region is one of broadly uniform bedrock, topography, climate, soil, and biology, and is relatively distinct from other adjacent parts of the European land mass. The distinctness of the Cantabrian region is sufficiently marked so that one would expect to discern in the prehistoric record peculiar regional patterns of ecological interrelationships, including identifiable sets of "cultural orientations" toward specific environmental offerings, and specific extractive strategies (Freeman, 1973: 4).

Vasco-Cantabrian Spain is a narrow, mountainous coastal strip on the northern coastline of the Iberian Peninsula (figure 6.1.), demarcated to the north by the Bay of Biscay/Cantabrian Sea, to the south by the Cantabrian Cordillera, and to the east by

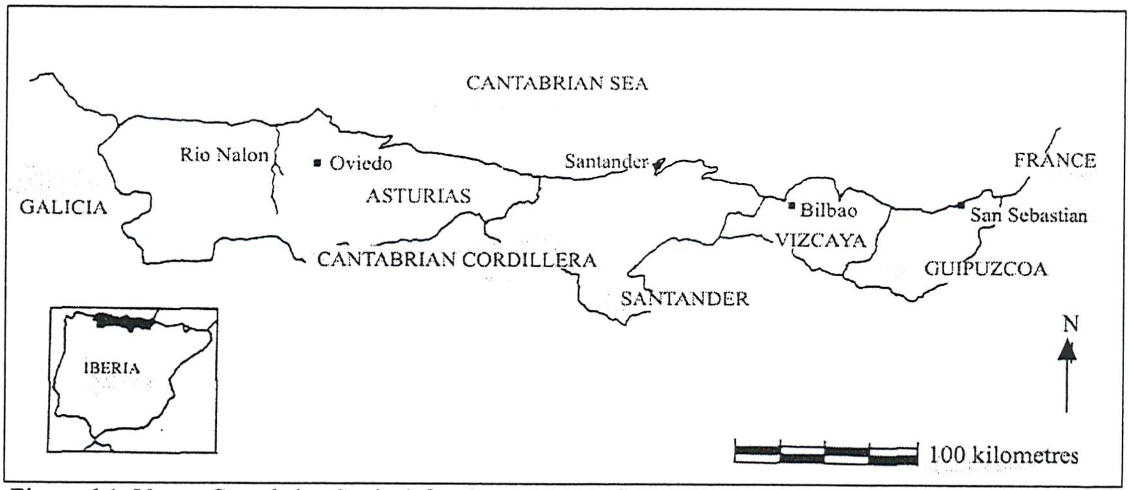

Figure 6.1. Vasco-Cantabrian Spain (after Straus, 1992; figure 1.1).

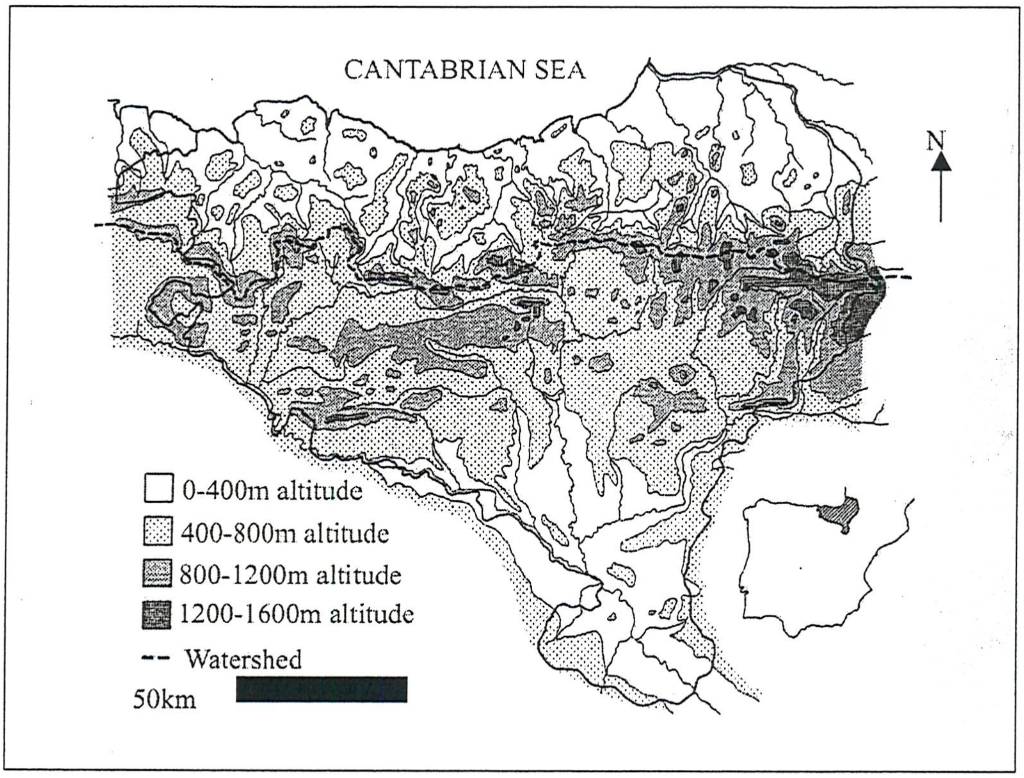

Figure 6.2. The Basque country in simplified relief (after Altuna, 1984: figure 1.1)

the western end of the Pyrenees. Although topographically open to Galicia in the west, the regions are rather different – east of the Río Nalón in central Asturias, the calcareous bedrock of Vasco-Cantabrian Spain meets the shield rock region of northwestern Spain (Straus, 1992). The area involved thus totals about 14,000km^2, and is highly distinct from the neighbouring areas to the south in terms of topography, environment – as well as modern settlement and politics (*ibid.*: 13).

This study will focus on only a small area of this wider Vasco-Cantabrian region. Much of the work on mobility and general subsistence patterns in this area has been in Santander, and particularly in the central part of the region, based around the sites of El Castillo, Cueva Morín and El Pendo (Butzer, 1981, 1986; Cabrera *et al.*, 2000; Pike-Tay, 2000). In contrast, the Basque provinces, while well-studied and published, particularly in terms of their faunal remains (mainly by Jésus Altuna; see section 6.4.3. below) have been less intensely studied in terms of mobility and regional activity.

The Basque provinces are situated between the Cantabrian sea and the Cantabrian Cordillera, comprising the provinces of Guipúzcoa, Vizcaya, Alava, Navarra and Labourd and covering some 1,884km^2 in total (Altuna, 1972: figure 6.2.).

The Cantabrian Cordillera (essentially a western extension of the Pyrenees) forms the Atlantic-Mediterranean watershed, with waters south of the Cordillera draining into the Mediterranean and those North into the Cantabrian Sea, and effectively separates the northern territories from the lower Ebro basin (figure 6.2.). In the Basque country it runs extremely close to the coast, with a distance of only between 30 and 40kmfrom the coastline to mountains of 1,300m altitude (Altuna, 1972; Galán, 1988). It is also relatively low, much of it at elevations of less than 1,000m, with only a few peaks surpassing 1,500m (Straus, 1992).

The topography of the province, with its narrow coastal plain and precipitous mountain chains, creates a relatively simple hydrogeologic profile. Many fast-flowing rivers run essentially South-North to drain into the Cantabrian Sea, forming a series of relatively discrete river valleys, with some east-west trending subsidiary flows draining into the major rivers along smaller valleys (Galán, 2000). Areas delimited by drainage basins are generally considered 'a good bet' (Sturdy & Webley, 1988: 265) for describing meaningful 'regions' for analysis, and the Guipúzcoan river valleys act to constrain and direct mobility, land-use and communication, even today (Bailey, 1983a; Straus, 1992). This suggests that these valleys are likely to have been, at least to some extent, meaningfully bounded areas for their Pleistocene inhabitants as well, and as the Deba and Urola valleys, in the extreme West of the province, provide a good number of sites ranging across the time period in question.

The narrow, deep Deba river (Figure 6.3.a.) rises in the mountain range of Arlabán in the extreme southwest of the province near the town of Escoriaza, where the river is deepest and fastest. From here it flows through Mondragón, where a smaller river, the Aramayona, joins from the east near the site of Lezetxiki. Further downriver it flows through Elgoibar, at the confluence of the Deba and the river Ego, to Deva, where it reaches the sea. The river basin covers c552km^2 (Altuna, 1972).

The Urola (Figure 6.2.b.), immediately to the east of the Deba, flows from the north face of the Sierra de Aizkorri through the towns of Legazpia and Zumárraga to Villarreal, where it becomes extremely narrow in its flow down to Azkoitia. Here it

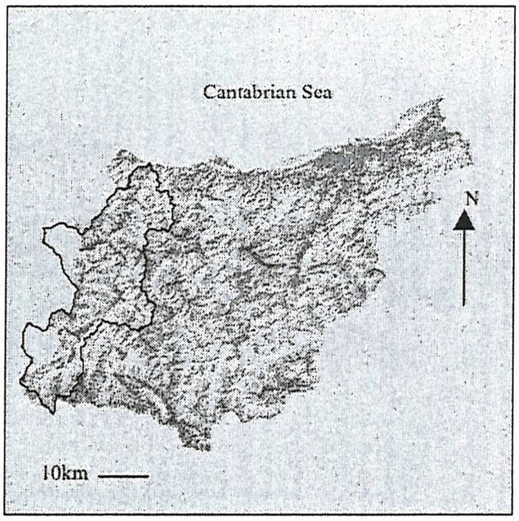

Figure 6.3.a. The Deba river basin

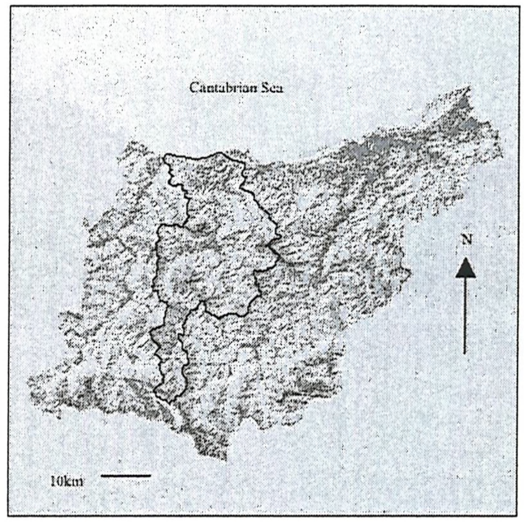

Figure 6.3.b. The Urola river basin

opens out a little through Azpeitia to Cestona (not far from Ekain) to wind down to the sea at Zumaya The Urola is at a higher altitude than the Deba, with most of it above 200m altitude. The basin extends over c328km^2 (*ibid.*).

6.4.1. Geology of the region

The vast majority of the Palaeolithic sites in Cantabria generally, and in Guipúzcoa more specifically, are cave sites. The distribution of these sites is therefore largely constrained by the geology, and particularly by the distribution of karstic areas in the region. Most of the following review is based on Galán's geological and speleological work in the region (1988, 2000).

Nearly a quarter of the surface of the province is karstic areas (around 480km^2), of which the vast majority (72%) correspond to just 4 large massifs, named after the major peak associated with each (Figure 6.4.):

1. Izarraitz (peak of 1,026m)
2. Ernio (peak of 1,076m)

3. Aralar (peak of 1,427m)
4. Aizkorri (peak of 1,551m)

These karstic areas in are spread over two larger structural regions, the northern and southern anticlines of the Folded Basque Arch, part of the French Norpyrenaic Area which runs through the Basque country to the Le Danois bank 150km northwest of Bilbao. These buckled structures are found in two longitudinal strips located in the North (Izarraitz – Ernio) and in the South (Aizkorri – Aralar) of the territory, formed initially from Jurassic and Cretaceous sediments of 200-65 million years ago.

The initial sediments are of European origin, deposited during the formation of the Bay of Biscay, and thus serve to differentiate this region from the Iberian geology south of the Cordillera, and the landscape has been progressively deformed and uplifted by the collision and knitting together of the continental Iberian and European plates at the same time as the surface deposits were eroded to form the relief as seen today, with the limestone massifs surviving as abruptly elevated areas in the landscape. Speleological exploration of the region since 1945 has documented more than 2,000 caves, of which some 850 have been studied in any detail (Galán, 2000).

Of the major massifs, only Izarraitz and Ernio are significant in terms of this study. The former, an Urgonian complex, stretches in a general northwest-southeast anticline between the Deba and Urola rivers, continuing west of the Deba as the Arno massif. Its highest peak is Erlo, at 1,026m high. The Ernio massif, to the east of the Río Urola, is geographically and geologically the most heterogeneous. The northerly parts are mainly Urgonian in origin, but elsewhere the massif is composed of a complex of distinct lithological signatures. Its three major summits are Ernio (1,076m), Gazume (997m) and Pagoeta (714m).

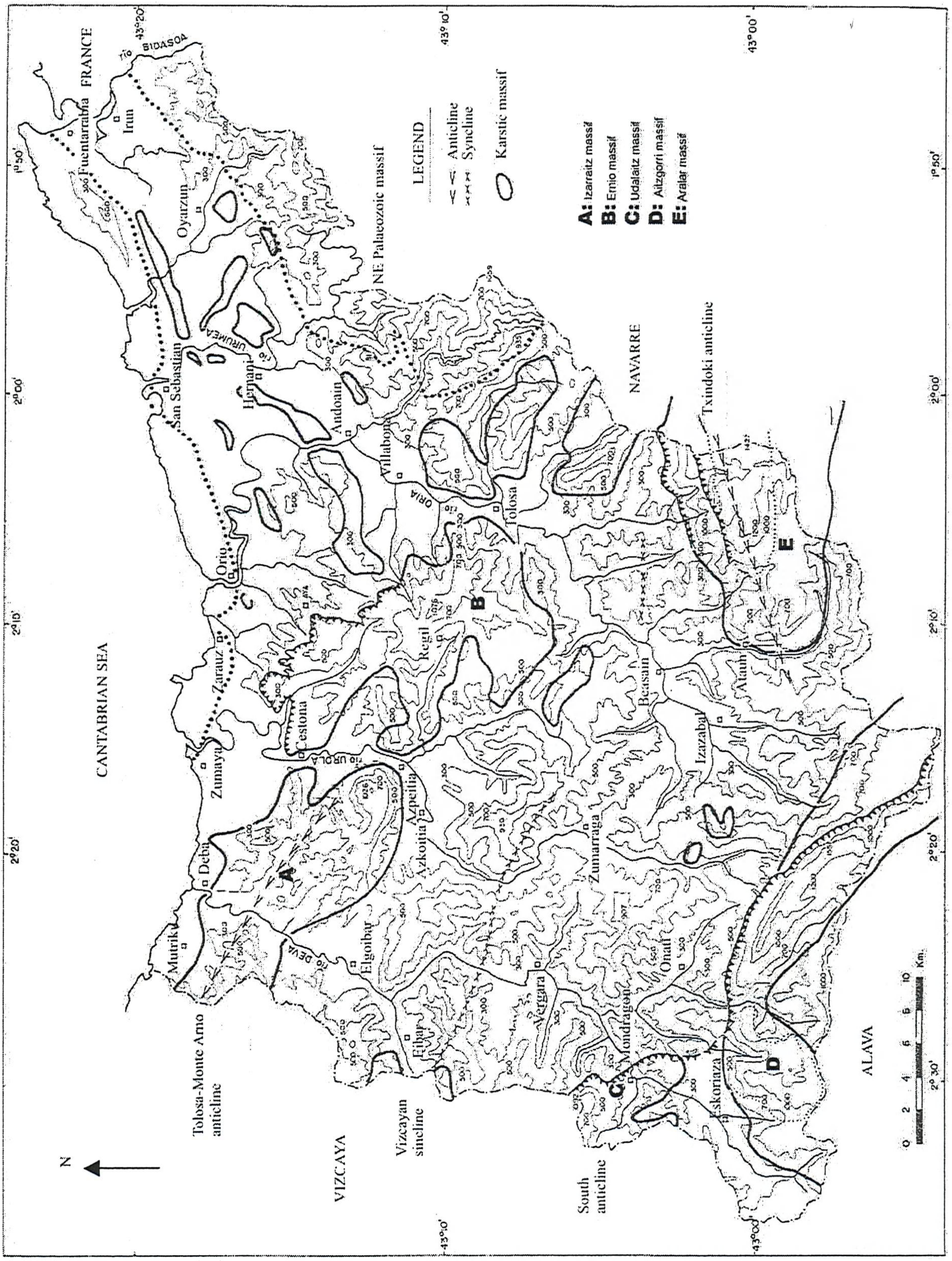

Figure 6.4. Geology of Guipúzcoa (after Galán, 1988).

6.4.2. Ecology of the region

In ecological terms, although the Iberian Peninsula is almost entirely composed of the Mediterranean climatic zone, Guipúzcoa and the rest of Vasco-Cantabrian Spain, north of the Atlantic-Mediterranean watershed, falls instead within the Occidental European climatic zone. Thus, environmentally (and perhaps culturally), it is more similar to modern southwestern France (Vega Toscano *et al.*, 1995) and strikingly different from the remainder of Spain. While the Mediterranean zone today is comprised mainly of warm Mediterranean forest, the Atlantic zone is characterised by deciduous mixed forest with coniferous forest and bushes and pastures above 1,000 - 1,500m altitude (Enamorado, 1997).

The relatively low-altitude coastal plain also experiences the climatic 'oceanic effect' of the Gulf Stream; seasonal equability and high humidity means that the region is one of the most humid in Europe, making the region extremely suitable for karstification (Galán, 1988, 2000). Strong winds and storms are common throughout the year, although winters are generally mild and snow infrequent.

The precipitous topography of the area compresses a variety of biotopes into narrow 'bands' according to varying local factors such as moisture, temperature and distance to watercourses or the sea (Bailey, 1983a). It also renders arable farming difficult, and the major present-day economic mainstay of the region is dairy cattle pastoralism which has distinctly altered the modern-day vegetational make-up of the region.

Reconstructions of early Holocene vegetation suggest that oak woods covered much of the area at lower elevations, with chestnut trees, poplars, hazels, willows, maples, lindens and alders represented mainly along watercourses, although the coastal plains themselves were probably largely covered by ericaceous heathlands and grasslands. Higher elevations would have been largely covered by beech forests, with even the highest mountain slopes covered by alpine meadow plants and probably only cliffs bare (Straus, 1992). Even today the fauna of Vasco-Cantabrian Spain is quite diverse, with native populations of red and roe deer, chamois and ibex (reintroduced), boar, brown bear, wildcat, lynx, genet, wolf, mustelids, hare and rabbit as well as a rich and varied avifauna and aquatic resources (*ibid.*).

6.4.3. Archaeology of the region

The Cantabrian region can perhaps be considered one of the classic Palaeolithic regions, with discoveries here - most notably from Altamira and other cave-art sites - contributing to the acceptance of an ancient past for humankind. However, although prehistoric archaeological research in Cantabrian Spain and Portugal began only a few decades after the earliest serious French excavations, Cantabria has played a much lesser role than the Palaeolithic 'ideal' of southwest France. Publication of the major stratigraphic sequence of El Castillo was prevented by World War II, consigning it to a lesser role than comparable sites in France such as Le Moustier or La Ferrassie (Straus 1992). The civil war exacerbated the problem, effectively halting burgeoning prehistoric research until the mid 1950s, with many prominent archaeologists being forced into or choosing exile, such as H. Obermaier, then Chair of Primitive History at the University of Madrid, and a number of archaeologists working in the Basque country including J. M. Barandiarán (Estévez & Vila, 1999). Spanish archaeologists remained largely isolated from the international community and the Cantabrian sites and data remained less well known than those of its neighbouring region.

Even after the civil war, the recovery of Spanish archaeology was slow. Close intellectual links with the 'phylogenetic' tradition in France and a general attitude towards French archaeologists as 'more advanced and better qualified' than their Spanish colleagues (*ibid.*), encouraged a focus on fitting the regional record as a whole into the 'ideal' model from the French Périgord. It was only really with the major international research programme associated with the excavations at Cueva Morín in the early 1970s that interest in the region began to re-awaken. It was the lithic analysis of this site that really underpinned that realisation that fitting the assemblages from the site into Bordes' framework was 'a meaningless academic exercise' (Freeman, 1994: 47; see also Mouré-Romanillo, 1990). Since then, Cantabria has established itself as one of the 'classic' Palaeolithic archaeological regions, aided by the eagerness of many of the newly autonomous communities, to whom responsibility for archaeology had devolved, to establish themselves an independent 'past' (Mouré-Romanillo, 1990). This is particularly true of the Basque Provinces who consider their continuing demands for independence strongly supported by archaeological evidence for the antiquity and distinctiveness of the region (Estévez & Vila, 1999; Peredo, 2000).

The province of Guipúzcoa also forms a relatively small and intensely surveyed area within the wider Vasco-Cantabrian region. Archaeology in the region is performed by members of the Department of Prehistory of the Ciencias Aranzadi, San Sebástian, and the Palaeolithic sites of the region have been intensively studied, particularly by Dr. Jésus Altuna, director of the department. Dr. Altuna's 1971 PhD, *Fauna de Mamíferos de los Yacimientos Prehistóricos de Guipúzcoa*[17], was published by *Munibe* in 1972 and includes a thorough discussion of the geography of the region, as well as an exhaustive catalogue and analysis of the faunal remains from the major sites then known and palaeontological studies of the species recovered. A further review of sites in the region was published in 1995, the *Carta Arquelogica de Gipuzkoa II: Cuevas*[18]. Although this does not focus specifically on the faunal remains, every cave site known in Guipúzcoa is described exhaustively, with plans, position and situation and history of excavation of each site as well as brief descriptions of the material recovered.

The amount and quality of the data, particularly from the Palaeolithic, is generally high, although many of the best-known sites were excavated some time ago, with all the concomitant problems of standards of excavation, collection and publishing (Freeman, 1973: 4; Vega Toscano *et al.*, 1995). However, these can be considered generic problems of the Palaeolithic, and certainly not restricted to Cantabria; the sites focused on in this analysis were chosen largely because they were excavated relatively recently and have been published in full to modern standards (Altuna *et al.*, 1990; Arrizabalaga & Altuna, 2000). The faunal record of the wider region of Guipúzcoa and Vasco-Cantabrian Spain is well-studied (mostly by one individual,

[17] Mammalian faunal assemblages from the prehistoric sites of Guipúzcoa
[18] Archaeological map of Guipúzcoa II: caves

thus reducing the potential for inter-analyst variation) and published in great detail and to a high standard.

The Vasco-Cantabrian region is thus highly suited to a regional consideration of subsistence practices during the Middle and Upper Palaeolithic, forming a neatly distinct study region with a large amount and range of data which has been well-studied and published. The well-defined topography of the province supports a study focused on particular river valleys, and the Deba and Urola valleys of Guipúzcoa are particularly suitable, with a number of interesting and notable sites with levels dated to all major industries of the Middle and Upper Palaeolithic contained within their river basins. And although questions of regional mobility and large-scale behaviour have been addressed for neighbouring areas, these questions have not been particularly emphasised in Guipúzcoa.

6.5. THE SITES

The complete list of Palaeolithic archaeological sites known from the Deba and Urola valleys as of 1995 is given in table 6.1 below (Altuna, 1995). However, many sites and levels had provided very little diagnostic material, and could thus be 'dated' only as 'Upper Palaeolithic', or even, in a number of cases, just as 'Palaeolithic'. Some (e.g. Langatxo) have not yet been published, and others proved difficult to assign reliably to palaeoenvironmental phases (e.g. Urtiaga): six sites (with a total of 27 levels) were thus selected as suitable for analysis (Table 6.2). All of these are multi-level sites (albeit with varying numbers of levels) with overlapping sequences running from the Mousterian (Lezetxiki and Amalda) through to the Postglacial (Amalda; Ekain; Labeko Koba).

However, the main focus of the analysis will be on just two sites: Amalda and Labeko Koba. Both of these sites are extremely well published with data not just on species representation but also on anatomical representation, ageing, sexing etc. (Altuna, 1990; Altuna & Mariezkurrena, 2000). Located in different river valleys and at virtually the opposite ends of the study region, these two sites between them cover a significant proportion of the temporal and spatial scale of the study.

Site	River	Mousterian	Chatelperronian	Aurignacian	Gravettian	Solutrean	Magdalenian	General Upper Palaeolithic	Azilian	Epipalaeolithic	General Palaeolithic	Postpalaeolithic
Aitzbeltz	Deba							■		■		
Aitzbeltz II	Deba							■		■		
Aitzkoltxo	Deba							■		■		
Aitzorrotz	Urola									▒		■
Aitzorrotz 2	Urola							■		■		■
Amalda	Urola	■	■	■	■	■	■	■		■		■
Arbelaitz II	Urola							■				■
Astigarraga	Urola							▒				■
Astuipeko Estalpea	Urola							■		■		
Ekain	Urola			■			■		■			
Ermittia	Deba					■	■					■
Ermittia II	Deba										■	
Ermittia III	Deba										▒	
Ermittia V	Deba							▒				
Erralla	Urola						■					
Imanolen Arrobia	Deba							■				
Iruroin	Deba							■				■
Iruroin II	Deba							▒		▒		■
Iruroin XI	Deba							▒		▒		
Iruroin XII	Deba							▒		▒		
Iruroin XV	Deba							▒		▒		
Kiputz I	Deba							■		■		
Kobatxo	Deba							■		■		■
Labeko Koba	Deba		■	■								
Langatxo	Deba						■					■
Langatxo II	Deba							■		■		
Latsurregi	Deba							■		■		
Lezetxiki	Deba	■		■	■		■					■
Lezetxikiko Harpea	Deba										■	
Oterreta II	Deba							■				
Pendize	Deba							■				
Praile Aitz I	Deba						■					■
Praile Aitz II	Deba							■				■
Saar Makatza	Deba							▒		▒		■
Santakutz	Deba							▒				
Urtiaga	Urola						■		■			■
Urtiagako Leitzea	Urola							■				

Table 6.1. Sites from the Deba and Urola valleys with levels dated to the Palaeolithic, in alphabetical order. Black boxes indicate a firm assignment; grey boxes doubtful ones.

	Mousterian	Chatelperronian	Aurignacian	Gravettian	Solutrean	Early/Lower Magdalenian	Middle Magdalenian	Final/Late/Upper Magdalenian	Magdalenian
Amalda VII	■								
Amalda VI				■					
Amalda V				░	░	░			
Amalda IV					■				
Ekain Xa		░	░						
Ekain Ixa			░						
Ekain VIII			░						
Ekain VIIf-a						■			
Ekain Via								■	
Ekain VIb								■	
Erralla V						■			
Erralla II/III							■	■	
Ermittia V					■				
Ermittia III							■	■	
Labeko Koba IX		░							
Labeko Koba VII			■						
Labeko Koba VI			■						
Labeko Koba V			■						
Labeko Koba IV			■						
Lezetxiki VII	■								
Lezetxiki VI	■								
Lezetxiki Vb	■								
Lezetxiki IVa	░								
Lezetxiki IIIa			░						
Lezetxiki II				■					
Lezetxiki Ia								■	

Table 6.2. Sites/levels included in the analysis, in alphabetical order. Black boxes indicate a firm assignment; grey boxes more doubtful ones.

In order to position each level in its ecosystemic context, it was first necessary to ensure that the individual levels of the sites were (reasonably) firmly assigned to palaeoenvironmental 'periods' and correlated with one another. In many cases levels were already (more or less) firmly assigned to a single palaeoenvironmental period. In others there was more controversy over their dating, and it was necessary to choose between conflicting arguments – this was most notably the situation in the case of the lower levels of Lezetxiki. The assignment of specific levels to particular palaeoenvironmental periods is detailed in Appendix 4, and the final assignations are shown in Table 6.9. Brief descriptions of the situation of the six cave sites chosen for comparison are given in sections 6.5.1. – 6.5.6. below. The locations of the sites and of notable towns and features of the landscape referred to in this chapter and Chapter 7 are given in figure 6.5.

6.5.1. Amalda

Longitude:	02° 12' 12"	Latitude:	43° 14' 03"
UTM X:	564,689	UTM Y:	4,787,306
Altitude(m)/UTM Z: 205			

Table 6.3. Coordinates of Amalda

The cave of Amalda is situated on the western slope of the Alzolaras Valley, a tributary which enters the main Urola river valley from the east about 8km as the crow flies from the modern coast at Zumaya. The cave itself is about 400m south of the hamlet of Errezabal and about 110m above the valley bottom, immediately below a very steep escarpment. Oriented east, the cave has a large, triangular mouth 12m wide by 7m deep giving onto a large chamber some 50m long, where the main excavation took place

The cave was discovered by J.M. de Barandiarán in 1927 and excavated by Jésus Altuna 1979-84, the excavation (and published by him in 1990) covering $124m^2$ in the outermost 32m of gallery. Six levels were identified, as detailed in table 6.3.

Figure 6.5. The Deba and Urola valleys, Guipúzcoa, País Vasco, Spain. Black lettering indicates mountains/hills, red lettering indicates sites, blue lettering indicates modern towns, turquoise rivers.

Level	Industry	Absolute dates	Palaeoenvironmental phase
VII	Typical Mousterian		St Germain II/Brørup/OIS 5a or St Germain I/Odderade/OIS 5c
VI	Perigordian V	27,400±1,000 B.P. (I-11665) 27,400±1,100 B.P. (I-11664)	Cold phase of Würm III between Kesselt and Tursac warm oscillations
V	Solutrean/ Magdalenian	17,880±390 B.P. (I-11372)	Lascaux interstadial
IV	Upper Solutrean	17,580±440 B.P. (I-11335) 16,200±380 B.P. (I-11428) 16,090±240 B.P. (I-11435)	Dryas Ia
III	Chalcolithic		-
II	Late Roman		-

Table 6.4. Amalda levels and palaeoenvironmental phase assignments (Altuna *et al.*, 1990)

Figure 6.6. View east along the Alzolaras valley towards Amalda (located at the base of the sheer face of limestone to the right of the picture). Photo taken by F. Coward November 2003.

6.5.2. Ekain

Longitude:	02° 16' 29"	Latitude:	43° 14' 10"
UTM X:	558,893	UTM Y:	4,787,485
Altitude(m)/UTM Z: 90			

Table 6.5. Coordinates of Ekain

The cave of Ekain is located at the base of the western slope of Monte Ekain, 200m from the Caserío of Sastarrain, a small tributary stream to the northern part of the main Urola valley.

When first investigated, the cave mouth was 2.3m wide by 1.2m high, giving on an entrance chamber of 2x3m, with a lateral gallery 13m long and nearly 2m wide. The archaeological remains are exclusively found in this zone, although the cave itself is very extensive. Cave paintings were discovered much further into the system.

The cave art was discovered in 1969 by A. Albizuri and R. Rezebal of the Grupo Anxtieta de Azpeitia, and following this, J. M. de Barandiarán and J. Altuna excavated 1969-1972, and J. Altuna in 1973 and 1975. A total of 12 levels were identified, many divided into sublevels (table 6.4.)

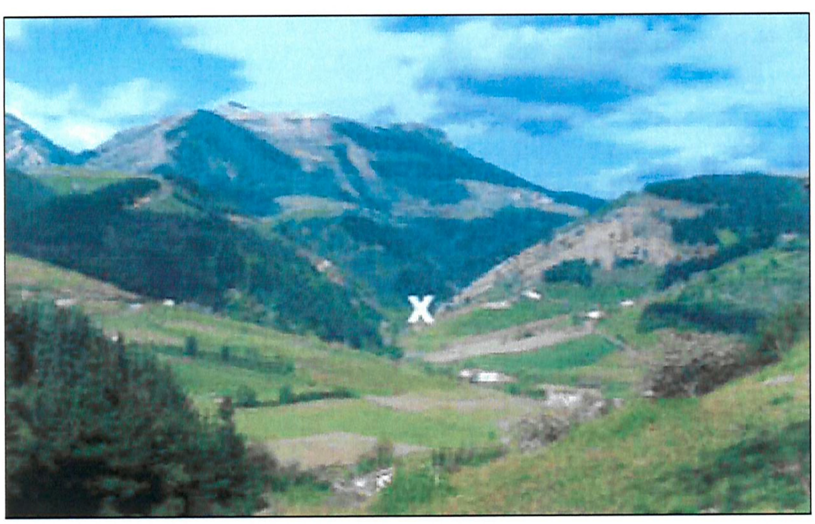

Figure 6.7. View west towards Ekain (marked by white cross, below slopes of Erlo; photo from http://www.euskadi.net)

Level	Industry	Absolute dates	Palaeoenvironmental phase
XII	Sterile		-
XI	Sterile		-
Xb	Non-anthropogenic		-
Xa	Early EUP		Kesselt warm oscillation
IXa	EUP (Aurignacian?)		Kesselt warm oscillation
Ixb	Non-anthropogenic		-
VIII	EUP? Solutrean?	20,900±450 B.P. (I-13005)	Laugerie Insterstadial
VIIf	Nearly sterile	16,250±250 B.P. (I-12566) 13,950±330 B.P. (I-10931)	Lascaux Interstadial
VIIe	Lower Magdalenian		Dryas Ib
VIId	Lower Magdalenian	15,970±240 B.P. (I-12225)	Dryas Ib
VIIc	Lower Magdalenian	15,400±240 B.P. (I-12226)	Dryas Ib
VIIb	Lower Magdalenian	16,030±240 B.P. (I-12224) 16,510±270 B.P. (I-12020) 7,800 B.P. (I-8628: invalid)	Dryas Ic
VIIa	Lower Magdalenian		Dryas Ic
VIa + b	A = Upper Magdalenian b = Final Magdalenian	12,050±190 B.P. (I-9240)	Allerød
V	Azilian		-
IV	Azilian		-
III	Azilian		-
II	Azilian		-

Table 6.6. Ekain levels and palaeoenvironmental phase assignments (Altuna & Merino, 1984)

6.5.3. Erralla

Longitude:	02° 10' 50"	Latitude:	43° 12' 32"
UTM X:	566,527	UTM Y:	4,784,519
Altitude(m)/UTM Z:	230		

Table 6.7. Coordinates of Erralla.

Erralla is situated at the head of the western slope of the Alzolaras valley, approximately at the height of the bridge situated just next to the hamlet of Granada, about 40m above the river. The cave forms a gently sloping tunnel about 18m long and 6m wide on average, open to the outside by two large mouths oriented north and east. It was discovered in 1976 by A. Albizuri, and excavation took place around the eastern entrance in 1977-8, directed by J. Altuna, identifying 5 levels of which only two contained archaeology (table 6.5.).

Level	Industry	Absolute dating	Palaeoenvironmental phase
VII	Sterile		Lascaux Interstadial
VI	Sterile		Lascaux Interstadial
V	Lower Magdalenian	15,740±300 B.P. (I-12540) 16,200±240 B.P. (I-12551) 16,270±240 B.P. (I-12868)	Dryas Ib
IV	Sterile	14,570±300 B.P. (I-10819)	-
III-I	Upper/Final Magdalenian	12,310±190 B.P. (I-13439)	Dryas II

Table 6.8. Erralla levels and palaeoenvironmental phase assignments (Altuna *et al.*, 1985)

6.5.4. Ermittia

Longitude:	02° 21' 45"	Latitude:	43° 16' 36"
UTM X:	551,679	UTM Y:	4,792,066
Altitude(m)/UTM Z: 130			

Table 6.9. Coordinates of Ermittia.

The cave of Ermittia is located on the northwest slope immediately above the tunnel of the Bilbao-Behobia motorway near the town of Sasiola in the northern part of the Deba valley (figure 6.5.). The mouth of the cave is triangular, 2m wide by 2.2m high, and oriented west by north-west. After a small entranceway, where the excavation was located, a thin, downsloping gallery ends in a large chamber which gives off into three separate galleries: one of these (Ermittia II) exits to the exterior.

Ermittia was discovered in 1924 by J.M. De Barandiarán, and with T. de Aranzadi, he excavated between 1924-6. The excavation covered around 15sqm in the entranceway but was destroyed by clandestine excavations in 1960. In 1965, J.M. de Barandiarán and J. Altuna dug a trial trench in the larger chamber 30m from the entrance, but most of the soil from the chamber collapsed during the construction, in the 70s, of the Bilbao-Behobia motorway immediately beneath the site. Five levels were identified, of which only two yielded Palaeolithic finds (table 6.6.).

Level	Industry	Absolute dates	Palaeoenvironmental phase
V	Upper? Solutrean		Dryas Ia
IV	Sterile		-
III	Middle/Upper Magdalenian		Dryas Ic
II	Chalcolithic/Bronze Age		-
I	Chalcolithic/Bronze Age		-

Table 6.10. Ermittia levels and palaeoenvironmental phase assignments (Altuna, 1972)

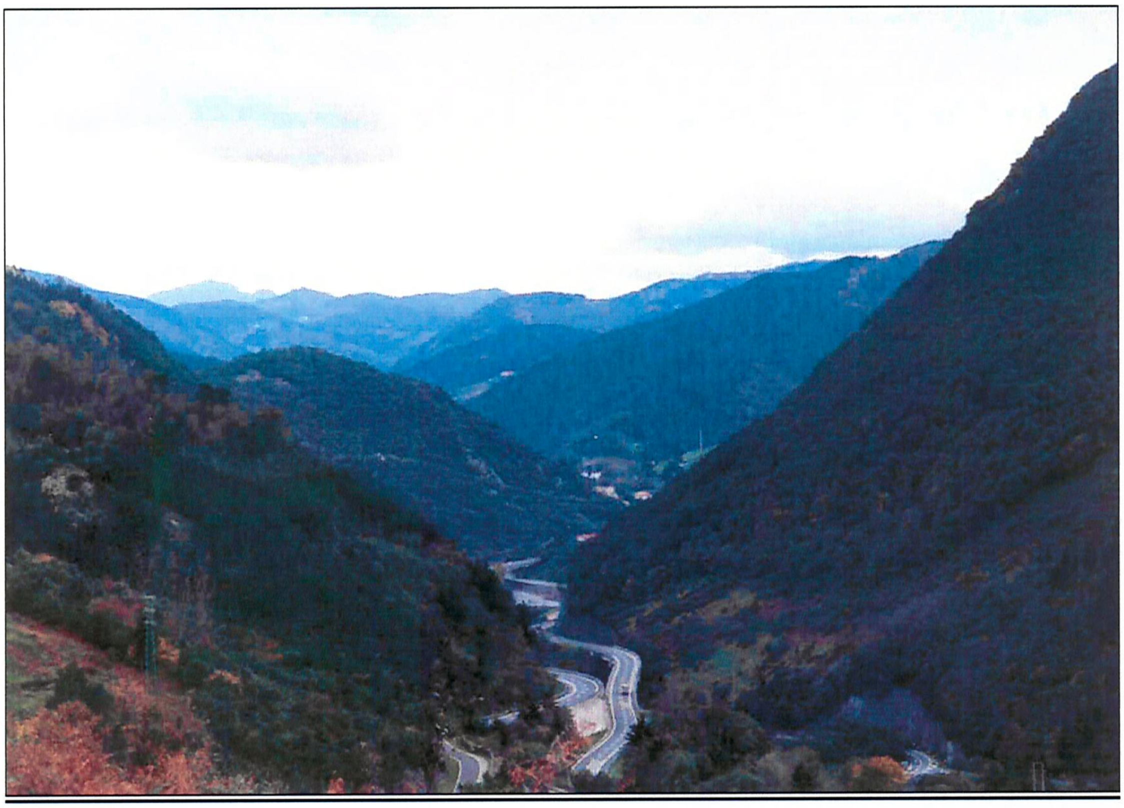

Figure 6.8. View northwards along the Deba valley from above Ermittia. Photo taken by F. Coward November 2003.

6.5.5. Labeko Koba

Longitude:	02° 29’ 22”	Latitude:	43° 03’ 38”
UTM X:	541,538	UTM Y:	4,767,862
Altitude(m)/UTM Z: 235			

Table 6.11. Coordinates of Labeko Koba.

Located on Labeko Koba the western slope of Monte Kurtzetxiki, in the southern part of the Urola valley just outside the modern day town of Arrasate/Mondragón below the peak of Udalaitz (figure 6.5.), Labeko Koba was discovered in 1972 by members of the Speleological Group of Arrasate, who recognised faunal remains in the lower gallery. In 1973 a trial trench produced fauna and some lithics. In 1987, the planned destruction of the cave led to rescue excavations in the old entrance, directed by A. Arrizabalaga between 1987 and 1988. The site report was published by him and J. Altuna in 2000.

The cave comprised a gallery of about 140m long, open to the exterior through three mouths. Until 1987 only two small mouths were known, but a third, almost completely blocked by slope rubble, was discovered during excavation. The site as excavated formed a tunnel oriented southwest, about 10m long and 3m wide. It connected to the major gallery of the cave at a lower level.

Figure 6.9. Udalaitz peak, northwest of Labeko Koba. Photo taken by F. Coward, November 2003.

Level	Industry	Absolute dates	Palaeoenvironmental phase
X	Sterile		-
IX lower	Chatelperronian?	34,215±1,265 B.P. (Ua-3324)	Hengelo
IX Upper	Non-anthropogenic	29,750±740 B.P. (Ua-3325)	-
VIII	Sterile		-
VII	Aurignacian	31,445±915 B.P. (Ua-3321)	Arcy Interstadial
VI	Aurignacian		Initial cold phase of OIS 2
V	Aurignacian	30,615±820 B.P. (Ua-3322)	Initial cold phase of OIS 2
IV	Aurignacian		Kesselt warm oscillation
III	Unassigned		-
II	Sterile		-
I	Sterile		-

Table 6.12. Labeko Koba levels and palaeoenvironmental phase assignments (Arrizabalaga & Altuna, 2000).

6.5.6. Lezetxiki

Longitude:	02° 31' 49"	Latitude:	43° 04' 29"
UTM X:	538,191	UTM Y:	4,769,333
Altitude(m)/UTM Z:	345		

Table 6.13. Coordinates of Lezetxiki.

The cave site of Lezetxiki is situated on the eastern slope of Colina Bostate, 100m from the collado de Kobate, above the quarry.

The cave forms a tunnel 20m long and 3m wide, with two main mouths and a third lesser which opens off the gallery. Excavations took place at the northern end, 6m into and 8m out of the cave. This mouth, before excavation, was 2m high and is now 12m high. The cave opens into a smaller gallery, called Leibar, discovered during excavation of the lower levels of the cave.

The cave was discovered in 1927 by J. Jauregui. Excavations took place in 1956 by J.M. de Barandiarán and D. Fernandez Medrano, by Barandiarán alone from 1957-63, and with J. Altuna 1964-8. The deposits date from the early Mousterian during the last interglacial (OIS 5) to the Final Magdalenian in Dryas II (late OIS 2; table 6.8.).

Level	Industry	Absolute dates	Palaeoenvironmental phase
VII	Sterile		-
VII	Typical Mousterian	309,000±92,000 – 140,000-6,000 B.P. (see table A5.7.)	OIS 5d or b
VI	Typical Mousterian	288,000+34,000-26,000 – 200,000+129,000-58,000 B.P. (see table A5.8.)	OIS 5c or a
Vb	Typical Mousterian	186,000+164,000-61,000 – 57,000-2,000 B.P. (see table A5.9.)	Lower Pleniglacial OIS 4
Va	Sterile		-
IVa	Mousterian/EUP		Lower Pleniglacial OIS 4
IVb	Sterile		-
IVc	Mousterian/EUP		Lower Pleniglacial OIS 4
IIIb	Sterile		-
IIIa	EUP?	19,340±780 B.P. (invalid)	Lower Pleniglacial OIS 4
II	Gravettian		Laugerie Interstadial
I	Final Magdalenian		Dryas II

Table 6.14. Lezetxiki levels and palaeoenvironmental phase assignments (Baldeón, 1993)

6.6. SUMMARY AND CONCLUSIONS

In this chapter I have outlined the aims of the study, discussing the GIS methodology and the criticisms made of it, arguing that far from being a deterministic technology, the use of GIS allows a more experiential, person-centred approach that will be demonstrated in Chapter 8. The following sections 6.4. – 6.5. summarised the geological, ecological and archaeological context of the area under study, focusing on the Deba and Urola valleys of Guipúzcoa in the Spanish Basque Country. Within this area I will focus on two sites, Amalda and Labeko Koba, that offer contrasting and complementary perspectives on the Middle and Upper Palaeolithic of the area. In the following chapter, I outline the methodology of the reconstruction of the ecosystems in which the inhabitants of these sites lived.

No.	Timeslice	Amalda	Ekain	Ermittia	Erralla	Labeko Koba	Lezetxiki
1	OIS 5b/d						VII: Mousterian
2	OIS 5a/c	VII: Mousterian					VI: Mousterian
3	OIS 4						Vb: Mousterian IVa: Mousterian/EUP IVc: Mousterian/EUP IIIa: EUP?
4	Hengelo					IX (inf): Chatelperronian?	
5	Arcy					VII: Aurignacian	
6	?cold?					VI: Aurignacian V: Aurignacian	
7	Kesselt		Xa: Early EUP IXa: EUP/Aurignacian?			IV: Aurignacian	
8	Würm III	VI: Gravettian					
9	Laugerie		VIII: EUP/Solutrean?				II: Gravettian
10	Lascaux	V: Solutrean/ Magdalenian	VIIf: Nearly sterile				
11	Dryas Ia	IV: Upper Solutrean		V: Upper? Solutrean			
12	Dryas Ib		VIIc, d + e: Lower Magdalenian		V: Lower Magdalenian		
13	Dryas Ic		VIIa + b: Lower Magdalenian	III: Middle/Upper Magdalenian			
14	Dryas II		VIb: Upper Magdalenian				Ia: Final Magdalenian
15	Allerød		VIa: Final Magdalenian		III-I:Upper/Final Magdalenian		

Table 6.15. Timeslices for all sites and levels analysed

CHAPTER SEVEN: THE PLEISTOCENE ECOSYSTEMS OF THE DEBA AND UROLA VALLEYS

This chapter focuses on the ecosystemic basis for the analysis, summarising the development of the map used as a basis for the 'timeslice' maps of the various palaeoenvironmental phases outlined in section 6.5. (7.1.) and discussing the ecosystems associated with these phases in more detail in terms of the ways they will be represented in the analysis: as an integral part of the ecosystem in which humans and animals live. (7.2. – 7.4.). Section 7.5. then turns to the second category of data, discussing some of the relevant characteristics of animal behaviour that allow me to outline some of the characteristics of human-animal interaction in the Palaeolithic. Much of the methodology for 'placing' animals in the landscape has been discussed previously by Sturdy *et al.* (Sturdy & Webley; Sturdy *et al.*, 1997) and is therefore only summarised here. The concluding section 7.6. then goes on to discuss the process of the analysis and the specific ways in which the pathways of daily, habitual movement were generated before the patterns from each 'timeslice' are presented and discussed in Chapter 8.

7.1. THE BASE MAP

The topographic data for the analysis was acquired as a digitised version of the Servicio de Información Territorial's 1:5000 series of maps of the province of Guipúzcoa, downloaded in .dxf format from the website of the Diputación Foral de Guipuzko[19]. As initially downloaded the data comprised more than thirty layers, including information on roads, railways and amenities such as swimming pools and playing fields. The number of layers was therefore reduced to 5:

1. 25 metre interval contour lines
2. natural bodies of water
3. rivers

[19] http://www. B5m.gipuzkoa/liz5000

4. streams
5. stream/river beds

This data was then cleaned and georeferenced[20] using AutoCAD Map 2000 and imported into GRASS 5.0.2. as a vector file[21] and the lines reconstructed[22] before labelling[23]. Once contour labelling was complete, contour heights were checked against the original paper maps and found to be highly accurate.

The downloaded data did not, however, include the bathymetric elevation data necessary to model rising and falling Pleistocene sea levels. Bathymetric contour lines were thus digitised by hand from georeferenced .tiff files[24].

Once the bathymetric and terrestrial contour maps were joined[25] and transformed to a raster format[26], a raster mask of 'null' values was layered over the resulting map[27] to maintain its original boundaries[28]. One issue of concern was the difference between the contour intervals in the terrestrial (at regular 25m intervals) and bathymetric data (at uneven intervals: -5, -10, -20, -50, -100 and -200m). As distances between the bathymetric contour lines increase, so the spatial interpolation module produces a 'stepped' effect in the raster map, whereby the interpolated values do not result in a smooth surface (a common problem, see e.g. Wheatley & Gillings, 2002 for discussion of potential solutions). However, the affected regions were only really a factor during periods of maximum sea regression, as for example at the Last Glacial Maximum, and so

[20] UTM (zone 30) projection (ellipsoid: international, datum: ED50)
[21] using the module v.in.dxf
[22] using the module v.build.polylines
[23] using the module v.digit
[24] from the Instituto Geologico y Minero de España's (IGME) 1:25,000 Mapa Topográfico Nacional de España sheets 63-I (Ondarroa) and 63-II (Eibar)
[25] using the GRASS module v.patch
[26] using the module v.surf.rst, which interpolates values between vector contour lines using the 'regularised spline with tension' algorithm (RST). Resolution 20x20 (maintained from source data).
[27] Using the module r.mask
[28] The interpolation process of transformation from vector to raster does not 'stop' at the edges of the map and thus produces an effect whereby raster data extends into adjacent areas of 'null' values.

impact on only a small subset of the analysis, and proved insignificant at the scale of the analysis, as described below.

7.2. PREPARATION OF THE TIMESLICES

7.2.1. Landscape change

The use of modern data obviously raises problems. There is the potential problem of assessing the amount and impact of landscape change since the period being reconstructed. As Sturdy and Webley write, 'Few landscapes will be completely unchanged from Palaeolithic times; some may simply have been affected by climate change; others by complex geomorphological processes as well' (1988: 265-6).

This study necessarily relies heavily on modern topographic data, and there are a number of important processes of topographic change that need to be considered. In particular, the high humidity and precipitous topography of the region point to one significant process of landscape alteration; slope processes acting to redeposit material from higher elevations and steeper slopes in valley bottoms and river channels. However, significant as this process undoubtedly was during the climatic variations of the Pleistocene, radical restructuring of the landscape has not occurred in Vasco-Cantabria or indeed in northern Spain more generally, and a number of other researchers have used the modern topographic structure of the area as the basis for reconstructions of various points of time in the Pleistocene (Butzer, 1981, 1986; Bailey, 1983a; Clark, 1983).

More significant is sea-level change - potentially extremely important in this study due to the expansion and contraction of grazing lands available along the Vasco-Cantabrian coast over the course of the time period covered by the project. Together with changing snowlines, these processes have a significant affect on animal ranges and the accessibility of parts of the landscape (see e.g. Bailey, 1983a; Sturdy & Webley, 1988).

Of more concern is the fact that, while topography and geology remain relatively stable over centuries – even millennia – superficial landscape and vegetational changes occur over much shorter timescales. Such variation is of course significant to the ways in which people constructed their four-dimensional identities. Certainly particular areas of the landscape would appear rather different today than at particular points of the Pleistocene - however, this study is not seeking to reconstruct any *specific* experience of the world, but rather to investigate the processes by which taskscapes might be structured.

While the use of modern topographic data as the basis for 'summer' and 'winter' 'timeslices' corresponding to the major palaeoenvironment phases of the Middle and Upper Palaeolithic inevitably compresses significant variability into a single static 'snapshot' of what is a highly dynamic process of activities, data regarding the shorter-term seasonality of movement and subsistence behaviours in the region has been incorporated as fully as possible into the detailed analyses presented in Chapter 8, emphasising the variability and shifting emphases within the overall pattern.

7.2.2. Classifying the landscape

The first part of the process of 'placing' animals into the landscape involves its classification in terms relevant to the animal species' distributions. A number of systems of classification have been presented in the literature, including Sturdy *et al.*'s comparable work in Epirus, Butzer and Clark's work in Palaeolithic Cantabria (Butzer, 1981, 1986; Clark, 1983), and in the Holocene, van Hove's work in Calabria, Southern Italy (2003) and Hammond's 'classes of land-surface form' for the Holocene USA (1964) as well as other systems designed for non-archaeological uses, such as agricultural potential and land-use maps produced by many agricultural agencies around the world such as the Soil Survey of England and Wales' *Land Use Capability Classification* (Bibby and Mackney, 1977).

The two major axes, corresponding to the major kinds of data required, remain reasonably constant:

1. topographic: data on elevation, with its associated temperature and vegetational variation, as well as slope and drainage systems and what Sturdy *et al.* (1997) call general 'ruggedness' of terrain, which essentially describes the ease of access of parts of the landscape by different animal species.
2. edaphic: 'the underlying soil and subsoil characteristics which make a piece of ground more or less attractive to animal species in terms of their nutritional needs' (*ibid.*: 593)

Topographic factors are of course covered by the downloaded data; edaphic factors, however, are more difficult to examine. Sturdy *et al.* (1997) use a combination of geological and chemical analyses of the major soil types of the area, but although it was originally hoped that a geological element would be incorporated into this reconstruction, geological data for the region proved extremely difficult to source as the 1:25,000 maps produced by the Instituto Geologico y Minero de España (IGME) were unavailable for digitising. IGME's 1:50,000 Mapa Geológico de España sheet 5/12 (Bermeo/Bilbao) and that published by Galán (1988; see figure 6.4.) served to supplement the topographically-based reconstructions as necessary. Chemical analysis is beyond the scope of this project, and no relevant work has been done in the region to date. Modern soil distribution maps are of course available, but modern soils have been subject to various processes of change throughout the course of prehistory and particularly in the modern era with the adoption of intensive farming practices.

However, the development of particular soils is in any case a highly context-specific process dependent on a multiplicity of factors including the duration of development, climatic, chemical and physical characteristics of the immediate environment and particularly the parent material, the local bedrock (Buol *et al.*, 1973: 108-9; Wild, 1993: 49). Thus there are no one-to-one linkages between rock and soil types, and this study draws on geological and edaphic data only in a very general way to supplement the data from palynology and ecology used for reconstruction of the 'timeslices'.

Development of these 'timeslices' maps required 'translation' of the palaeoenvironmental data detailed in section 7.4. into essentially topographically-based categories that would make sense in terms of a GIS model: such descriptive terms as 'sheltered valley bottoms' therefore needed to be broken down in terms of variables handled by the computer model, i.e. altitude, slope, aspect, distance to water. Such variables describe the environment in terms which are hugely significant for the movement of embodied entities through it, as discussed in the following sections 7.2.2.1. – 7.2.2.4. Specific details for individual timeslices (and how they relate to the habitats preferred by various animal species; see section 7.5.) are provided in Appendix 4.

7.2.2.1. Altitude

Changing Pleistocene sea levels are perhaps the most obvious altitudinal consideration. Although it is important to consider the potential roles of marine and littoral species, this analysis focuses mainly on the terrestrial animal species with which hominid populations interacted and thus areas of land below the sea level estimated for each timeslice are simply assigned to the category of 'sea' and treated as functionally impassable (by being assigned a high 'movement' cost; see section 7.6.). At the opposite extreme, areas at altitudes above the snowline can also be considered out of bounds (Bailey, 1983a).

Other altitudinal effects are of course not so binary but nevertheless significant in terms of the experience of the landscape to people moving through it: altitude is associated with differing climatic and geological and thus vegetational regimes and potential views. Perhaps the most obvious example of this is the treeline; in Vasco-Cantabria today beech forests grow at altitudes of around 1600m, and deciduous oaks to 1100m (Butzer, 1986: 212). However, such altitudinal associations are of course hugely affected by climatic regime and would have varied considerably over the course of the Middle and Upper Palaeolithic. Butzer (*ibid.*: 204) used Hammond's synthetic terrain classes to reconstruct the vegetation patterns of a hypothetical full-glacial Cantabria with four major altitudinal categories (which were in practice cross-cut by slope categories): <100m, 100-300m, 300-1,000m and >1,000m. These categories were designed to be directly relevant to the distribution of large herbivore species, and are thus a useful guide for the relevant ('cold') timeslices.

Similarly, Clark's altitudinal and slope categorisation system for early Holocene/Boreal Vasco-Cantabrian Spain (1983: table 9.2.) divides the territory into three categories: <100m (further subdivided by other criteria); 100-200m; and all territory above 200m *or* 100m if it is of a 'steep' gradient ('Alpine'). This system was used as a guide for the modelling of 'warmer' timeslices during which altitudinal effects would have been less pronounced; the lowered snowlines of colder phases would have compressed ecotones, with higher elevations far more subject to exposure and rigorous climatic regimes (Bailey, 1983a).

7.2.2.2. Slope

The gradient of a slope is also highly significant in terms of the way a landscape is perceived and experienced. It has a significant effect on the vegetation able to grow (for example, steeper slopes in the coldest palaeoenvironmental phases are likely to have been highly unstable, with minimal soil development and thus largely bare; e.g. Butzer, 1986) and is therefore indirectly as well as directly (in terms of access) related to the animal species that might be associated with parts of the landscape.

For the purposes of this analysis I have projected that slope gradients would not have changed significantly over the course of the Pleistocene, and have used the same map layer for all timeslices. Of course this is certainly overly simplistic – slope gradients, particularly those of river valleys, will have changed almost constantly and sometimes dramatically throughout the various palaeoenvironmental phases, with changing moisture regimes and drainage patterns in particular altering the landscape through slope movement processes, erosion and the deposition of colluvium and alluvium (see section 7.2.1.). However, such change would be virtually impossible to model within the scope of this analysis, and in any case it seems likely that the overall structure of the landscape has not changed significantly. Provided the influence of slope gradient is not taken as an exact reconstruction of the palaeoenvironmental phase in question, but rather a guide to large-scale landscape patterns, this will not be a significant problem for the analysis.

Although the model can provide a more or less precise measurement of slope in terms of either degree or percentage, for the reasons discussed above, using these raw figures would provide a spurious accuracy to the analysis. In any case, human movement around the landscape is based less on calculation of exact slope gradients than on their mental categorisation of them as perhaps 'steep' or 'gentle'. Exactly how slope gradient may be divided in terms of human judgement is a matter of some debate. Clark, for example, considers any gradient of greater than 40° as 'steep' (1983: table 9.2.), while Hammond (1964) prefers to term any slope of less than 8% or 5° 'gentle'; see also (Butzer, 1986). Van Hove (2003) defines slopes of gradients 0-10% as 'low', 10-90% as 'high', and slopes of 100% 'cliffs'. Münier *et al.* suggest categories of <5°, 5-10°, 10-20° and >20° (2001: table 2), and Vogt *et al.* (2003: table 1) used 5 categories of 0-2%, 3-13%, 14-20%, 21-55% and >56%, while the Scottish Avalanche Information Service's Avalanche Hazard Scale defines 'steep' slopes as being greater than 30% (c25°)[29].

Consideration can also be given, of course, to the energy costs and changing experience of bodily movement over slopes of varying gradients; energy costs of moving uphill appear to increase monotonically with slope much as would be expected, but the energy costs associated with walking downhill decrease until -10% (c5°), and then begin to increase again. When running downhill, the decrease lasts until the slope reaches -20% (c11°; Susta *et al.*, 2000). Working from these examples, I have settled on a figure of 0-10%/0-5° as a 'gentle' slope, 11-30%/6-c25° as 'moderate' and anything greater than 30%/c25° as 'steep'.

[29] http://www.alexski.co.uk/mountainsafety/Avalanche_Hazard_Scale.htm

7.2.2.3. Aspect

Another potentially significant topographic factor is aspect. More 'sheltered' south-facing locations were more likely to provide suitable conditions for acting as refugia for vegetational species which could not survive on more exposed north, coast-facing slopes, and the exposure or shelter of an area to weather or sunlight, for example, would have been a factor in the perception and experience of the landscape.

An aspect map was automatically generated by GRASS at the same time as the slope map[30], and was further reclassified into three categories: Exposed or north-facing[31], 'sheltered' or South/East/West facing[32] and 'flat' (land with a gradient of <5°), given a 'null' value as it cannot sensibly be said to have an 'aspect' (Münier *et al.*, 2001). The resulting map could of course be used for all timeslices, albeit with the same caveats as discussed in section 7.2.2.2. above.

7.2.2.4. Water

The topic of changing sea-levels was considered in section 7.3.2. above; however, proximity to open coastline also has a significant effect on vegetational patterns. Although Butzer defines the 'coastal plain' of full glacial Vasco-Cantabria solely in terms of altitude and slope (1986: 204), Clark prefers to define a category of 'open coastline' <100m from the shoreline, as well as creating an 'estuarine' category defined as the 'First 500m of river flood-plain' (1983: 100). After some experimentation with the modern data, I found that a category of land within 4km of the coastline appeared to correspond well with the modern coastal plain; such a category was created using the GRASS module r.buffer[33] separately for each timeslice.

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[30] using the v.to.rast command

[31] N, NE and NW: 45-135° - aspects are calculated in GRASS in degrees counter-clockwise from East

[32] S, SE and SW (203-248°); West-facing (136-224°) and East-facing (316-44°).

[33] This creates a new raster map layer showing buffer zones around any non-NULL category cells in an existing map layer. As the input map needs to be composed solely of cells with values of 1 and 0, the coastline of each timeslice was extracted as a separate thinned raster file before r.buffer was performed.

Proximity to rivers and streams is also a factor, particularly in 'warmer', more humid palaeoenvironments. Van Hove (2003) used a category of 'river channel', defined as being within 50m of a river and at an altitude of between 15m and 1000m. The maximum width of the modern flood plain around both modern rivers is c200m; in this analysis, therefore, the GRASS module r.buffer was used to create a landscape category of 'watercourse' <200m from each river. This category was used unaltered for all timeslices, subject, of course, to the caveats discussed in sections 7.2.1. and 7.2.2.2.

7.3. PROPERTIES OF THE INDIVIDUAL TIMESLICES

7.3.1. Climate

Perhaps ironically, the Vasco-Cantabrian evidence has often been used to argue against a significant role for 'the environment' in changing behavioural strategies, as climatic and subsistence changes show few correspondences (for example, red deer are the dominant species throughout virtually the whole of the Upper Pleistocene of western Europe, regardless of climatic phase; see Bailey, 1983a). However, as for example Bailey has argued, 'the environment' has been described only in very simple climatic terms[34] (e.g. *ibid.*; Straus, 1992) and vegetation and animal populations would have changed in more subtle ways than simple binary shifts between 'warm-' and 'cold-adapted' populations.

Western Europe during the Pleistocene and particularly during the last *c.* 20,000 years, has probably experienced some of the world's most dramatic climatic and environmental changes (Straus, 1992: 191). However, Vasco-Cantabria was characterised by relative climatic constancy because of its southern location, the ameliorating 'oceanic effect' and

[34] Variation in temperature is only part of the wider processes of environmental variation, affecting ocean currents, storm tracks and sea levels and moderated by such factors as continental versus oceanic and Mediterranean versus Atlantic location. Changes in snowlines and coastlines, for example, would have affected the overall productivity of a region as well as altering animal ranges and thus their accessibility to and interactions with human populations (Bailey, 1983a)

the southeastern deflection of the Gulf Stream by the Labrador current and extension of polar waters into relatively low latitudes[35] (Bailey, 1983a; Enamorado, 1997)

7.3.2. Sea level

In Cantabria, sea level changes would have had an important effect on the extent of the presently narrow coastal plain. Full glacial sea levels would have been between 100m and 130m lower than today (section 7.4.3.), although the narrowness of the continental shelf just off the northern coast of Spain meant that even in full glacial conditions only an extra 4-12km of coastal plain was exposed (figures 6.1. - 2; Straus, 1992).

7.3.3. Snowlines

At the opposite altitudinal extreme, snowlines probably marked the upper limit of human and animal activity:

> Although browsing is possible under all but the heaviest snowfalls, feeding would not be easy above the snowlines, even if there was not much snow. Vegetation would have been ice-encrusted and there would have been relatively little browseable scrub (Turner & Sanchez Goñi, 1997; see also Gilbert and Beckinsale 1941, cited Bailey, 1983a: 150).

In the present climatic conditions there is no permanent snowline in the region (Bailey, 1983a: 150), although further west in the higher Picos de Europa there are some year-round snowfields at heights of *c.* 2400m-2600m, with patchy snow still lying at heights of above 2200m as late as June. Current permanent snowlines in the French Pyrenees are around 2800m, and (theoretical) permanent snowlines in the Sierra de Aralar *c.* 10km to the southeast of the head of the Urola valley are calculated at 2400m (Kopp, 1965: 14).

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[35] During pleniglacial periods the polar front probably extended southwards as low as 45° latitude (during OIS 4; Mellars, 1996: 24), deflecting the Gulf Stream to the south and effectively chilling the northern and western zones of Europe.

Sturdy *et al.* cite a general modern permanent snowline of 2400m, with a pleniglacial snowline depression of around 700m (1997: 591).

Estimates of the permanent snowline during cold phases of the Pleistocene range between 1,650m and 1,025m above sea level (see references in Straus, 1992: 21). At the Last Glacial Maximum (LGM), glaciers existed in the Sierra de Aralar, with terminal moraines found at 825m above (current) sea level, 25km from the coast (*ibid.*) and perhaps even lower, down to 460m on the northeast slopes (Kopp, 1965: 14). Glacier tongues of the Atlantic catchments extended as low as 500m in the west and 900m in the North, while Regional Climatic Snowlines (RCS) appear to have been at 1100-1700m along the Atlantic-Duero watershed, with the higher mountains snowbound year-round (Butzer, 1986: 206).

In the Sierra de Aralar permanent snowlines are calculated at 1050m for the LGM, a depression of 1360m (Kopp, 1965: 14). In the Picos de Europa, Butzer (1973), placed the permanent Pleniglacial snowline around the level of 1400 – 1500m above sea level, and mentioned that some evidence of earlier (Middle Pleistocene) glaciations suggested a level of around 1450m. Winter snowfall in the area today means that much of the terrain at altitudes above c1000m is impassable (Gilbert and Beckinsale 1941, cited Bailey, 1983a), but the estimation of lower limits for winter snowfall in the past is problematic because of uncertainties about relative precipitation and snowfall (see Bailey, 1983a: 151): clearly the 1350m descent in the permanent snowline indicated by Kopp (1965: 14) for the Pleniglacial cannot simply be applied to the line of snowfall; the ameliorating proximity of the sea would have maintained the coastal plain as a relatively favourable winter zone (snow rarely falls on the coastal plain today; Altuna, 1972: 17). Although 4.5 - 5m of snow was probably common in lowland Vasco-Cantabria from early December to late April in pleniglacial phases, the impression is one of a 'moderately thick snow cover that would only occasionally pose a problem for grazing animals or hunting forays' (Butzer, 1986: 216). Sturdy *et al.*, working in Epirus, Greece, give suggested seasonal snowlines detailed in Table 7.1. below, and as the suggested permanent modern snowline of 2400m they give is very close to suggested snowlines for northern Spain, I have used these as the bases for my own estimations detailed in section 7.4. below.

Period	Winter	Spring	Early summer	High summer
18-13kyr	450m	700m	1000m	1700m
13-10kyr	700m	1000m	1300m	2000m

Table 7.1. Suggested Palaeolithic snowlines in Epirus, Greece (after Sturdy *et al.*, 1997: Table 30.2.)

7.3.4. Palaeoenvironments

In terms of vegetational regime, variations between warmer and colder paleoenvironmental phases tend to show up as alternations between open and more forested conditions (van Andel & Tzedakis, 1996: 491; Kukla *et al.*, 2002: 9). Conditions in the north were harsh during the coldest Pleniglacial phases, with areas of almost barren polar desert and open tundra communities.

However, reconstruction of palaeoenvironments is not simply a case of making latitudinal shifts: Guipúzcoa (and Vasco-Cantabrian Spain more generally), represent low-latitude tundra-steppe, at the southern, more productive end of the biome, and reconstructions demonstrate that 'although categorized as equivalent to modern biomes, the simulated paleovegetation is structurally different from the equivalent modern biome' (Huntley *et al.*, 2003: 209). Colder phases here would have been characterised by a more steppic flora than the tundras of further north, with heath and grasslands communities highly conducive to cold-adapted large ungulates. Much of the coastal plain and river valley floors would have been dominated by grasses. During milder glacial phases, although steeper, north-facing slopes were probably denuded of vegetational cover and frequently geomorphically unstable (Straus, 1992: 51), considerable localised patches of hardier tree species such as pine and birch survived on sheltered south-facing slopes and along valley bottoms, with relatively rapid tree expansion during warmer phases.

Warmer phases, in general, were characterised by mixed (although probably mainly coniferous) forest with some thermophile deciduous trees, arriving in familiar succession with birch and pine through the elm, oak, hazel and hornbeam forests, gradually shifting back to pine, spruce and other cold-tolerant species when colder conditions returned. Tree cover, however, was probably always rather open to judge from avian faunas (Adams, 1998) and arboreal pollen (AP) values (Mellars, 1996: 27), although reforestation might have been quite significant during longer or warmer phases – though still not attaining the dense forests recorded in the area at the onset of the Holocene (d'Errico, 2003: 777). Open pinewoods and parkland probably dominated during 'warm' phases, then, with isolated oak, hazel and birch groves in more sheltered spots, and the coastal plain and river valleys providing rich grass pastures.

7.4. THE TIMESLICES

Although the generalised 'warm' and 'cold' phase regimes discussed in section 7.4. form the basis for the reconstruction of palaeoenvironments in this analysis, these large-scale patterns were subject to considerable variation during the different palaeoenvironmental phases of the Vasco-Cantabrian Pleistocene; in the following sections I discuss the specific phases during which material was deposited at Amalda and Labeko Koba (the summary tables at the start of each section also include those levels of the other four sites discussed in Chapter 6 attributable to that phase for context), detailing the evidence regarding climate, sea level, snowline and palaeoenvironmental regime known for each and used in this thesis as the basis for reconstruction: summaries of the topographic and vegetational parameters used in each reconstruction, as well as their relation to animal species' habitats, are detailed in Figure 7.1. (for OIS 5a/c) and Appendix 4.

7.4.1. The Early Glacial – OIS 5a/c – St. Germain I and II

Site	Level	Industry	Dating?	Notes
Amalda	VII	Mousterian	-	
Lezetxiki	VI	Typical Mousterian	Range from 288,000+34,000-26,000 B.P. to 231,000+92,000-49,000 B.P. - see table A5.8. and section A5.6. for discussion.	

Table 7.2. Levels from the Early Glacial/OIS 5a or c/St.German I or II

In many ways, as Mellars has commented,

> the most striking feature of the early glacial period is not the severity of the colder periods but the relative warmth of the intervening "interstadial" periods represented by stages 5c (St. Germain I) and 5a (St. Germain II) of the oxygen-isotope records (Mellars, 1996: 21).

The total volume of global ice sheets during these phases – although still much greater than that during fully interglacial periods – was only around half of that of the cold stages of 5b and 5d.

7.4.1.1. Climate

Both OIS 5c (correlated with the pollen Interstadial St. Germain I) and OIS 5a (correlated with St. Germain II) appear to have been fairly marked and significant warming phases, marked by the shrinking of the Scandinavian ice sheet during OIS 5c (van Andel & Tzedakis, 1996: 490), and the retreat of the North Atlantic polar front[36] (Mellars, 1996). July temperatures are estimated to have ranged from c12°C (approximately 6° below present values) in southern Scandinavia, to 18-20°C (only 1-2°C below present) in the southern parts of France and along the Atlantic coast (Zagwijn, 1990). These estimates are supported by pollen data from Les Echets and La Grande Pile; at the former peak

[36] Several hundred miles from latitude 50°N to above 60°N

warm conditions again appear to have been around 1-2°C cooler than present, and at the latter the pollen demonstrates conditions almost identical to those in the same region today (Mellars, 1996: 23).

7.4.1.2. Sea level

Lambeck *et al.* argue that global sea levels were around 20-30m lower than at present during these two phases (2002). However, European research suggests a figure at the lower end of this estimate, with van Andel and Tzedakis suggesting a 20m drop (1996: 491) and Mellars estimating around 10-20m (1996: 23). It seems likely that OIS5c levels were slightly higher than those of 5a, as the ice volume curve shows a gradual global increase in 5a beyond that of the previous Interstadial (van Andel & Tzedakis, 1996: 491), but this has yet to be quantified satisfactorily and in this analysis I have used the figure of -20m for both phases.

7.4.1.3. Snowline

With temperatures only a little lower than those of today, permanent snowlines during OIS5a and 5c were certainly well above the highest peaks above the study region; the 'summer' timeslice, therefore, does not include a snowline, and for 'winter' I have used Bailey's altitude of 1000m as a functional upper limit for human and animal activity (1983a: 150).

7.4.1.4. Palaeoenvironments

While the climatic oscillations of OIS5, as noted above, appear in the pollen records as alternations between expanding open vegetation during the colder phases and returning forest conditions in the warmer periods (van Andel & Tzedakis, 1996), the exact ways in which the interstadials of 5a and 5c were reflected in the local records varied significantly across Europe (Mellars, 1996: 22). South central Europe and France were apparently rather rapidly covered by a mixed forest of birch and pine, with some elm, oak, hazel and hornbeam during the warmer periods (*ibid.*; van Andel & Tzedakis, 1996), although fossil bird faunas suggest that the Interstadial tree cover was always rather open (Adams, 1998).

Figure 7.1. below shows how these data were combined into a broad-scale reconstruction of the ecosystem of OIS 5a/c, and also the habitats with which various animal species were associated (section 7.5); figure 7.2. shows the result.

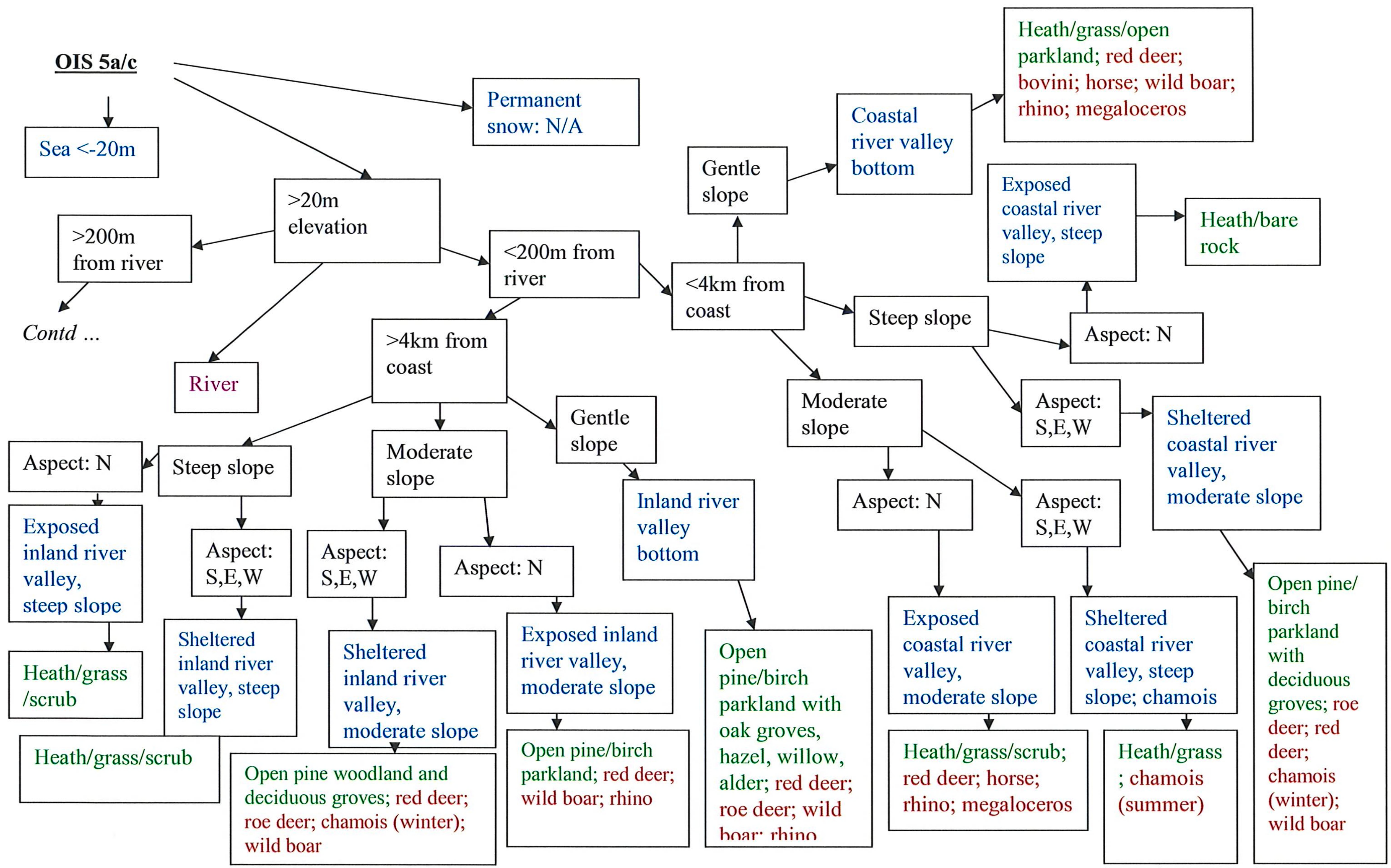

Figure 7.1a. Reconstruction of OIS 5a/c habitats (continued over next two pages).

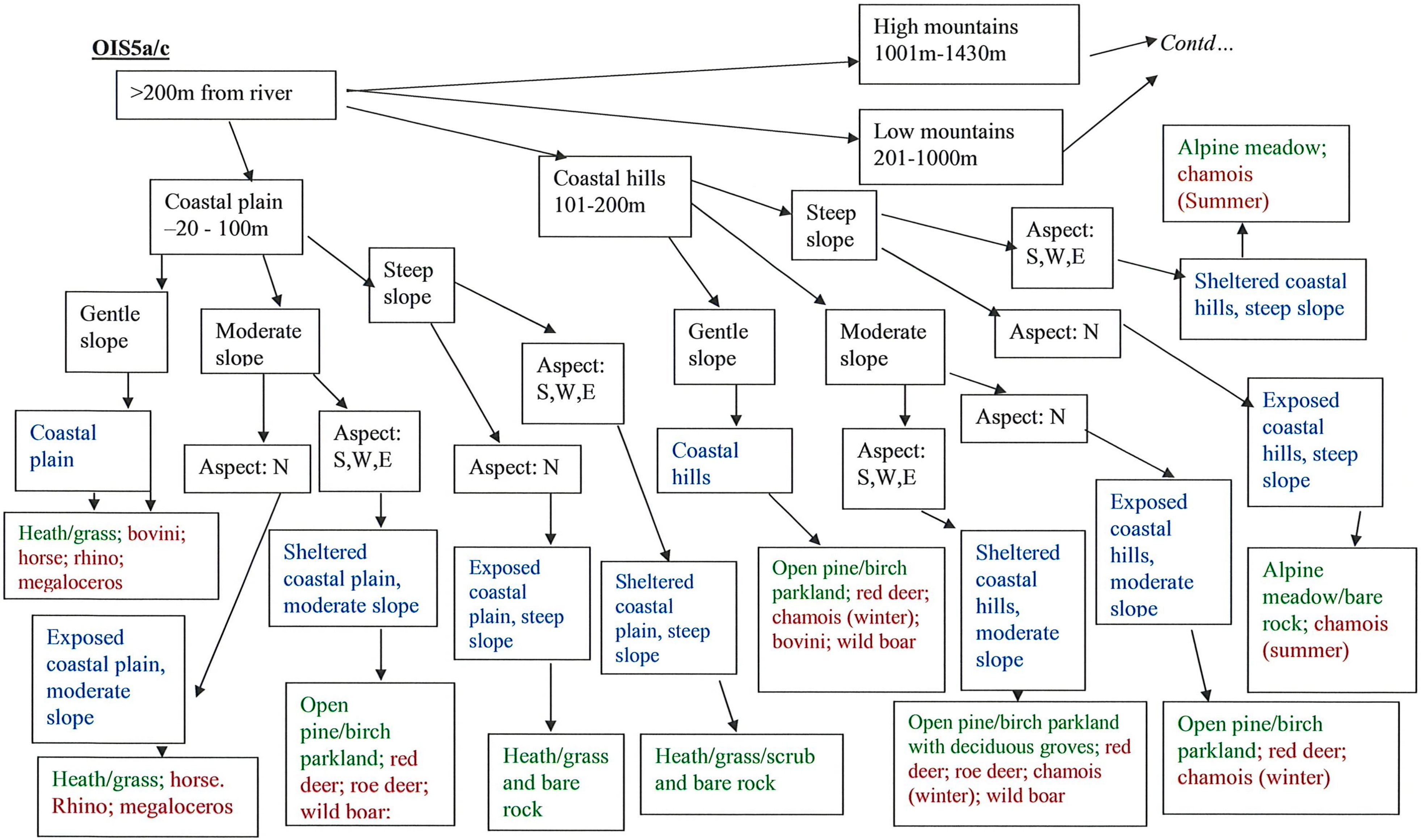

Figure 7.1b: Reconstruction of OIS 5a/c habitats (continued from previous page and onto next page).

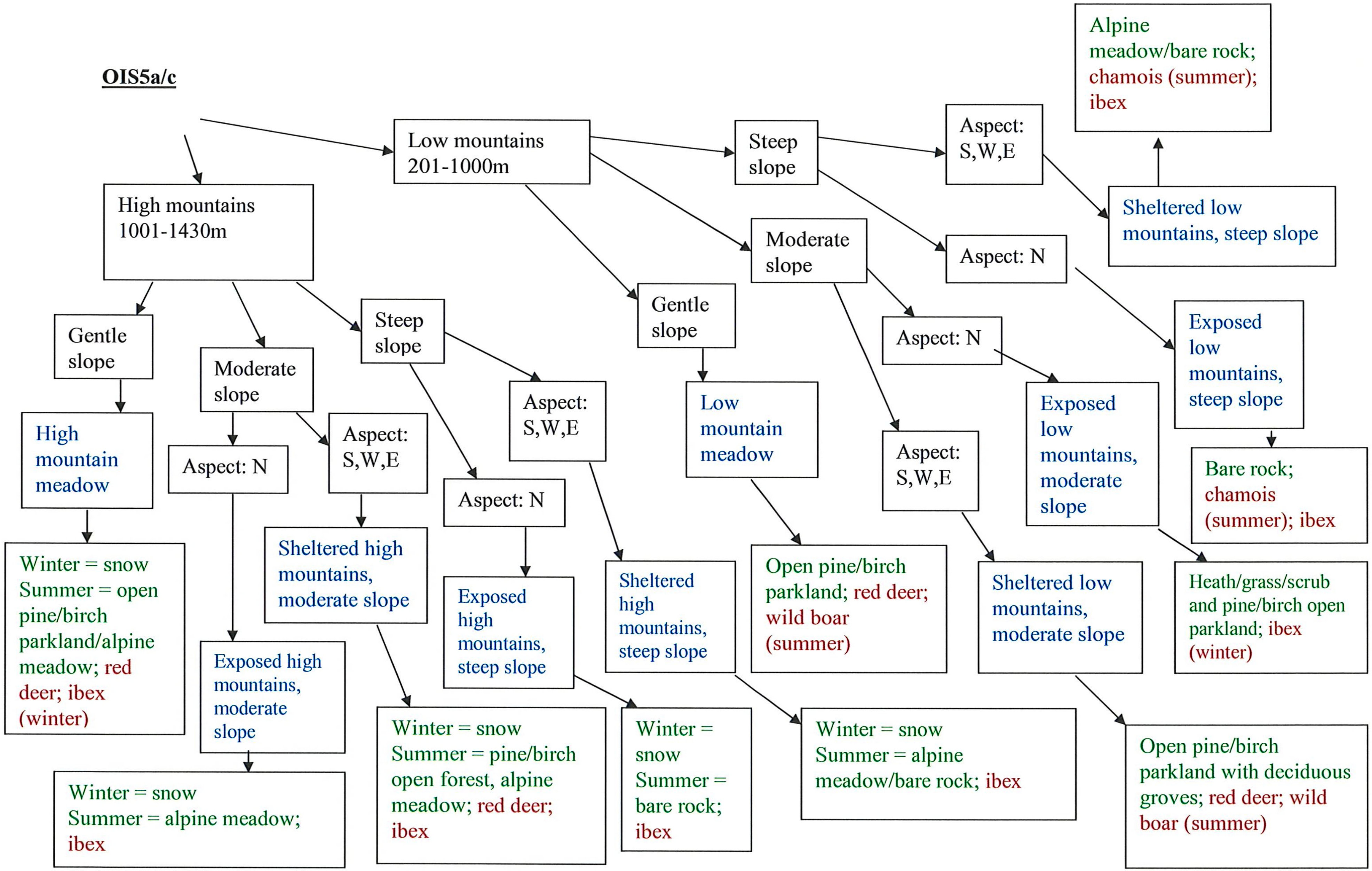

Figure 7.1c. Reconstruction of OIS 5a/c habitats (continued from previous two pages).

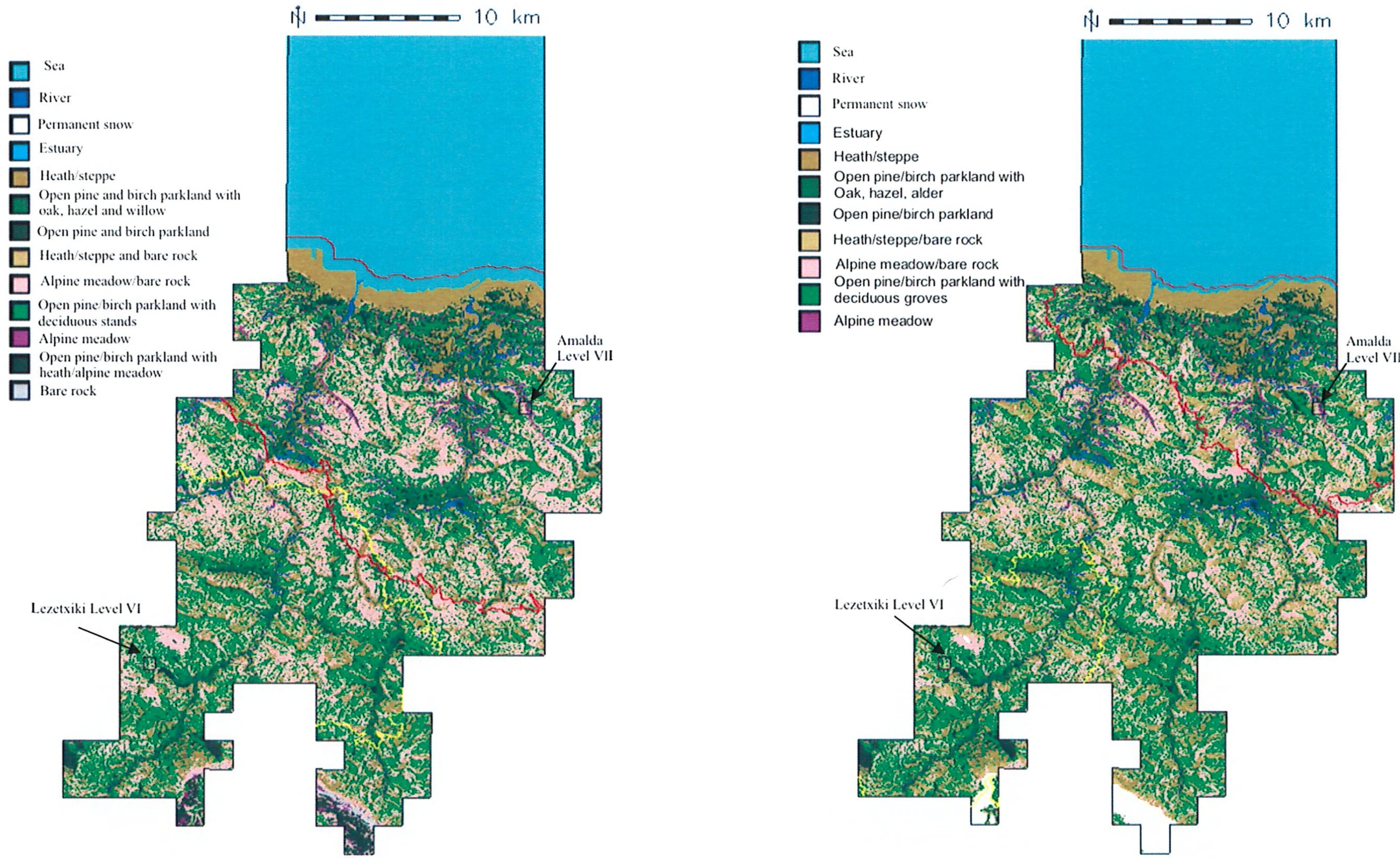

Figure 7.2. OIS5a/c summer (left) and winter (right) vegetation. Red line indicates limits of midsummer/midwinter days' walk out and back from Amalda, yellow from Lezetxiki (see section 7.6.)

7.4.2. The Inter-Pleniglacial – OIS 3 – the Würm Interstadial

Site	Level	Industry	Dating?	Notes
Labeko Koba	IX	Châtelperronian	34,215±1,265 B.P. (Ua-3324)	Possibly non-anthropogenic: Hengelo or Les Cottés Interstadial
Labeko Koba	VII	Aurignacian 0	31,455±915 B.P. (Ua-3321)	Arcy Interstadial

Table 7.3. Levels from the Interpleniglacial/OIS3/Würm Interstadial.

As Mellars writes,

> isotope stage 3, from ca 60,000 to 25,000 BP, is one of the most enigmatic parts of the last glaciation. In broad terms this was a period of predominantly mild climate, in which the extent of global glaciation was substantially reduced … The difficulties of reconstructing climatic and environmental patterns during this interval stem from the sharply *oscillatory* nature of climatic events, which can be seen clearly in all the associated climatic and Palaeoenvironmental records (1996: 25).

While certainly all of the 'periods' discussed here were by no means single, monolithic climatic 'blocks', this fact is perhaps most important in the consideration of OIS 3 (van Andel & Davies, 2003). The Greenland ice cores GRIP and GISP 2 in fact demonstrate

> at least a dozen significant climatic oscillations between ca 25,000 and 60,000 BP, in which temperatures over the area of the ice sheet itself seem to have risen by between 5 and 8°C, often within remarkably short periods of less than 50 years or so (Mellars, 1996: 25-6; see also d'Errico & Sanchez Goñi, 2003: 776; papers in van Andel & Davies, 2003).

Of course, many of these smaller 'interstadials' are unlikely to show up in any other record. In fact ^{14}C age estimates for the five north European interstades of stage 3 revealed that uncertainties in the dates are comparable to the magnitude of the fluctuations recorded in the stable-isotope records; making exact correlations of even the longer and more pronounced individual climatic oscillations virtually impossible (Huntley *et al.*, 2003: 96; Mellars, 1996: 26). However, comparison of pollen analyses from deep-sea cores with terrestrial records does suggest that cold marine and Greenland oscillations were in phase with cold and dry conditions in south-western Europe (d'Errico & Sachez Goñi, 2003: 777).

According to the accepted picture, at the start of OIS 3 global ice volume decreased slightly before increasing slowly and steadily over the subsequent 30,000 years, a pattern interrupted by numerous brief (100-1,000 years) sharp climatic oscillations (van Andel & Tzedakis, 1996; 493; papers in van Andel & Davies, 2003). The climatically 'optimal' period of the Würm Interstadial, tentatively correlated with the 'warm' Hengelo pollen interval has been pushed back slightly to around ~38-34kyr BP (Mellars, 1996) or ~39-36 (van Andel, 2002; Adams, 1998), followed by Heinrich Event 4 at around 35,300-33,900 BP (d'Errico & Sanchez Goñi, 2003). Another 'warm' episode, perhaps correlated with the 'Grand Bois' pollen episode ~32,000 BP (van Andel, 2002) was terminated by Heinrich Event 3, at around 28-26kyrs BP (d'Errico & Sanchez Goñi, 2003).

However, in total some 19-20 climatic phases have been detected in terrestrial signatures, paralleling the Dansgaard-Oeschner stadials and interstadials (*ibid.*; see van Andel, 2003 for summary), and the uncertainties regarding the dating of specific events and their correlation with those known from other sources such as the pollen record[37] led the Stage 3 Project (the source of much of the data used here; van Andel & Davies, 2003) to conclude that,

37 Even the familiar European pollen divisions (as well as more recent 'Interstadials' such as Tursac, Laugerie, Lascaux, Angles-sur-Anglin and the Pre-Bølling) have been attacked more recently by Sanchez Goñi, who argues that their identification in the record is problematic in the extreme (d'Errico & Sanchez Goñi, 2003: 772). Both the Les Cottés and Arcy Interstadials are dismissed in her scheme, and although she accepts Hengelo, she concludes that its identification in the record at around 36-35kyr BP is highly problematic and significantly younger than its true spectra at around 40-37kyr BP (*ibid.*).

> Modeling specific dated events would thus be unrewarding. Instead, one warm and one cold "typical phase," broadly defined and positioned at about 40,000 and 30,000 yr B.P., would be modelled. The models cannot be tied to named European stades and interstades (van Andel, 2002: 4; see also papers in van Andel & Davies, 2003).

Only two levels from the study region are assigned to OIS stage 3 (Labeko Koba levels IX and VII); both in 'warm' phases of the period. Although these are – tentatively – correlated with the Hengelo/Les Cottés and Arcy interstadials respectively, their exact assignment to pollen stages is of less importance than their position as 'warm' phases of OIS stage 3 in general. And thanks to a concerted recent effort to correlate climatic and Palaeoenvironmental data for the period by the Stage 3 Project (van Andel & Davies, 2003), while the exact pattern of climatic oscillation and Palaeoenvironmental variation remains unclear, the conditions that probably prevailed during these phases are relatively well understood.

7.4.2.1. Climate

OIS 3 was thus characterised by an unstable climate that fluctuated greatly on timespans of a few thousands of years. However, it can be generally characterised as temperate – although by no means warm - and relatively humid, with an optimal period c38-34,000 years BP: the 'Würm Interstadial'. In northern Spain, Butzer (1981: 176) has characterised the period as one of cool, frequently wet conditions with slope soil instability and winters not unlike those of Iceland today.

These 'warm' phases were probably characterised by temperatures only a few degrees below Holocene values (Barron & Pollard, 2002: 296; Alfano *et al.*, 2003: 98; papers in van Andel & Davies, 2003). The period chosen to be modelled by the Isotope Stage 3 Project was that of Interstade 12 of the Greenland ice cores, *c.* 45 cal kyr B.P. according to the GISP2 time scale. It has been correlated with the Hengelo Interstade of northern Europe with a calibrated age centring on 44 kyr B.P. (van Andel, 2002: 196; van Andel & Davies, 2003). In northern Spain, temperatures during both winter summer months would have been around 4-7°C below current temperatures (Barron & Pollard 2002, figs. 4 and 7), around 0-4°C in winter and 8-12°C summer (Barron *et al.* 2003: fig. 5.7.). Warm excursions in general ranged from a mere 2°C below the local Holocene mean to 7°C above intervening cold spells (van Andel, 2002: 3). Mean July temperatures based on the record from La Grande Pile are inferred at around 20-22°C based on pollen alone, and 16-18°C based on both pollen and beetles (*ibid.*). Precipitation was around 700-900mm/yr (van Huissteden & Pollard, 2003: fig. 2), some 200-400mm less than today (van Andel & Tzedakis, 1996: 494; see also Barron *et al.*, 2003: fig. 5.8.). The Stage 3 project models suggest between 10-60 days of snow cover over the course of a year with an average depth of less than 5cm (*ibid.*: fig. 5.9.).

These warm phases lasted a few millennia; cold ones only a few centuries, with transitions between them sometimes taking less than a few decades (van Andel & Tzedakis, 1996). However, conditions such as those inferred for warm phases such as that taken as representative by the Stage 3 Project were probably representative for as much as half of the entire isotope stage (*ibid.*: 494).

7.4.2.2. Sea level

OIS 3 was marked by a succession of relatively rapid fluctuations in sea-level. The eustatic sea-level curve (Chappell & Shackleton, 1986; Chappell *et al.*, 1996) gives an OIS 3 value of -80m, with oscillations; Adams argues for a -70m sea-level (1998), while according to van Andel (2002), sea-level fluctuated around the -50m isobath for some time before falling to -80m towards the end of OIS 3 (this latter figure was used by the Stage 3 Project; Barron *et al.* 2003). As this analysis is concerned with two 'warm' phases of the isotope stage, the -50m figure was selected for the GIS model.

7.4.2.3. Snowline

Given temperatures during the warm phases of OIS 3 very little below modern Holocene levels, it is assumed that there was no permanent snowline in the region at this time. Assuming similar precipitation levels to today (section 7.4.5.2.), winter snowfall would have limited movement above *c.* 1000m during the coldest months (Bailey, 1983a: 150).

7.4.2.4. Palaeoenvironments

Warm phase reconstructions from the Stage 3 Project (Huntley & Allen, 2003; Huntley *et al.*, 2003) suggest mixed coniferous and deciduous forest across most of Spain, with woodlands dominated by coniferous trees in the northernmost parts of the Iberian peninsula. Open pine, spruce and birch woodland covered eastern France and the alpine foreland. In contrast to the warm phases of OIS 5 (see section 7.5.1.), which were characterised in northern and western Europe by AP percentages of *c.* 90%, representing virtually full coniferous forest, the warm phases of OIS 3 are marked in the pollen records by AP percentages of only *c.* 30-50% (almost entirely birch and pine; Mellars, 1996: 27). In addition, although bird species that prefer woodland or forest were usually present in all but the very coldest intervals, these were generally a minority, suggesting isolated clumps or pockets of woodland rather than continuous cover (Adams, 1998).

In northern Europe, it seems likely that vegetational changes between 'cold' and 'warm' episodes were minor, involving changes between various types of open treeless tundra and steppe vegetation (van Huissteden & Pollard, 2003: 228; Mellars, 1996: 27). Only extended 'warm' episodes made any kind of impact on the arboreal component of the vegetation (Alfano *et al.*, 2003: 98). Further south, however, responses to both prolonged and brief climatic events are visible in the pollen records (*ibid.*).

This general picture is supported by more local evidence from caves in Santander. At Cueva Morín, AP from pollen sequences assigned to the Hengelo phase is around 50%, almost exclusively pine with a few hazel and oak pollens. Gramineae (grasses – see appendix 5) and fern spores are abundant, suggesting relatively humid conditions (Leroi-Gourhan, 1977). Similar spectra are known from El Pendo (AP 50%, pine with hazel and oak traces, roughly equal percentages of Gramineae and Cichoridae [goosefoots], and some fern; Leroi-Gourhan, 1980) and from El Otero (AP values low, spectrum dominated by pine with traces of birch, juniper, hazel and alder - Cichoridae outnumber Gramineae and fern spores are only moderately represented; Leroi-Gourhan, 1966). Classical 'cold' fauna are not represented from these levels, and some woodland species were present here and at El Castillo. Finds of sperm whale teeth also suggest relatively temperate coastal waters in the Cantabrian Sea (Straus, 1992).

Parkland environments are thus thought to have dominated during the Interpleniglacial, but within this there may have been significant variations according to microclimatic conditions. Open pine woods would have been the norm, with isolated oak, hazel and occasionally birch trees in local groves probably in south-facing slopes away from the open coast. North-facing and higher or steeper slopes would probably still have been largely bare, while the coastal plain and river valleys would have been rich grass pastures. Reforestation might have been quite significant during longer or warmer phases (particularly the 'Optimal Period'). Small pockets of trees certainly survived in the middle and low altitudes of inland valleys as suggested by a continuous spread of AP, and allowing a relatively rapid spread of meso-thermophillous taxa during warm episodes (figure 7.3.).

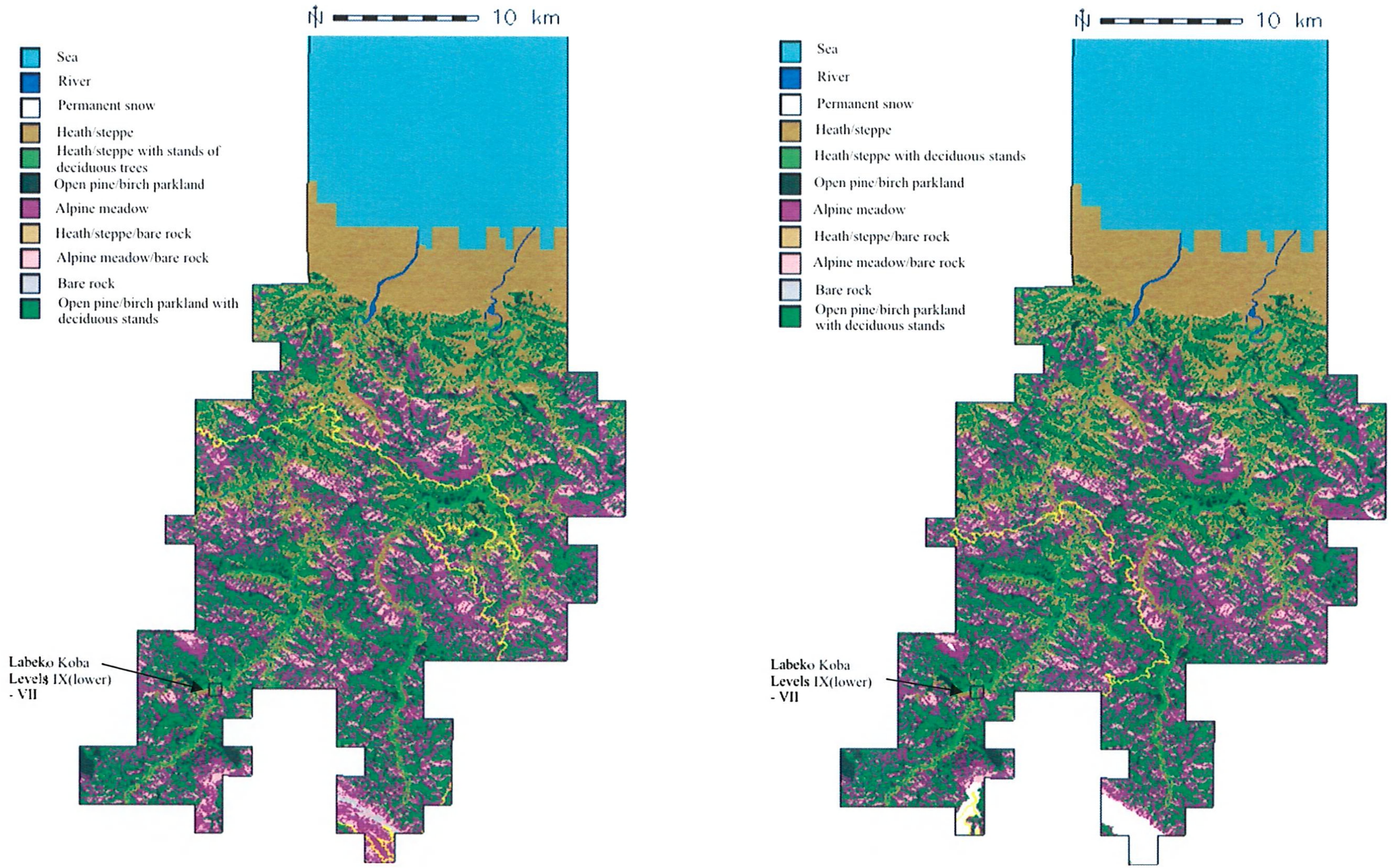

Figure 7.3. OIS3 warm phase summer (left) and winter (right) vegetation. Yellow line indicates limit of midsummer/midwinter days' walk out and back from Labeko Koba.

7.4.3. The Pleniglacial – early OIS 2 – the Last Glacial Maximum

Site	Level	Industry	Dating?	Notes
Initial cold phase of OIS 2				
Labeko Koba	V	Early Aurignacian	30,615±820 B.P. (Ua-3322)	
Kesselt				
Ekain	Xa	Châtelperronian/ EUP		Possibly non-anthropogenic/ cave bear accumulation
Ekain	IXa	Châtelperronian/ Aurignacian		
Labeko Koba	IV	Aurignacian?		
Würm III cold phase between Kesselt and Tursac				
Amalda	VI	Perigordian V/ Gravettian	27,400±1,000 B.P. (I-11665) 27,400±1,100 B.P. (I-11664)	Upper part possibly Tursac?
Laugerie				
Lezetxiki	II	Gravettian/Solutrean		
Lascaux				
Amalda	V	Gravettian/Solutrean	17,880±390 B.P. (I-11372)	
Ekain	VIIf	Lower Magdalenian?	16,250±250 B.P. (I-12566) 13,950±330 B.P. (I-10931)	Nearly lithically sterile; end of Lascaux
Dryas Ia				
Amalda	IV	Upper Solutrean	17,580±440 B.P. (I-11335) 16,200±380 B.P. (I-11428) 16,090±240 B.P. (I-11435)	
Ermittia	V	(Upper?) Solutrean		
Dryas Ib				
Ekain	VIIc	Lower Magdalenian	15,400±240 B.P. (I-12226)	
Ekain VIIe	VIIe	Lower Magdalenian		
Erralla	V	Lower Magdalenian	15,740±300 B.P. (I-12540) 16,200±240 B.P. (I-12551) 16,270±240 B.P. (I-12868)	

Table 7.4. Levels from the initial cold phase of OIS 2, the Kesselt Interstadial, the cold phase between Kesselt and Tursac interstadials, the Laugerie and Lascaux interstadials, Dryas Ia and Ib.

The later part of the Early Upper Palaeolithic, corresponding to the development of the Gravettian/Upper Perigordian, saw declining temperatures and increasingly open grassland habitats as climate systems moved into the LGM, at *c.* 19-18kyrs BP. This period of maximum cold and aridity appears to be the composite effect of two cooling phases/Heinrich events, perhaps separated by a somewhat milder period which shows up in southern European pollen records as a 'blip' of *Pinus* pollen (Adams, 1998: 623). Stadials identified in pollen records include Laugerie, at *c.* 19kyrs BP and Lascaux, *c.* 18-16.5kyrs BP (Straus, 1992).

Onset of the LGM appears to have been rapid, with sea level falling around 50m in around 1-2,000 years[38], and although it is likely that the initial cold phase of OIS2 was associated with conditions some way milder than those of the climatic minimum, for expediency it is included here in the LGM palaeoenvironmental phase. As with OIS 3 (section 7.4.2. above), I have not attempted to model specific stadial and interstadial phases, but consider two broad kinds of palaeoenvironments, an LGM 'stadial'-type ecosystem, against which sites from the two initial cold phases of OIS2 as well as Dryas Ia and Ib are considered, and an LGM 'interstadial'-type ecosystem considered to represent the environment in which populations associated with sites deposited during the Kesselt, Laugerie and Lascaux interstadials would have lived their lives.

7.4.3.1. Climate

During the climatic minimum of OIS 2, the glacial maximum itself, conditions were undoubtedly harsh. Periglacial phenomena such as cryoturbation have been documented right down to near sea level in northern Spain (Bailey, 1983a). The Gulf Stream, pushed southeast by the Labrador current, no longer flowed into the Cantabrian Sea, which would have had surface water temperatures of around 10°C cooler than today (Butzer, 1986; Pokines, 2000: 62; Straus, 1992)[39].

[38] reaching a lowstand at around 30,000 B.P. – Lambeck *et al.* consider this the start of the LGM proper (2002a, 203; 2002b: 343; cf van Andel's comment that, temperature-wise, the LGM dates from *c.* 35 cal ka ago, 2003: 11).

[39] The climatic minimum would thus have seen pack ice on the Cantabrian Sea and cold, stormy conditions. The 18 kyr BP temperatures for Cantabrian offshore waters are estimated at around 1.5°C for February, 3.5°C for May, 9.5°C for August, and 7°C for October-November (Butzer, 1986: 214).

Mean annual late Pleistocene temperatures in northern Spain are estimated at *c.* 4.4°C (compared to 14.3°C today); the closest thermal analogue is Akureyi on the treeless north coast of Iceland at latitude 66°N (Butzer, 1986: 215). Temperatures reconstructed at a larger scale are estimated at 8-12°C during June, July and August (compared with 12-18°C at present), and for December/January/February, *c.* 0-4°C (modern 4-8°C; Barron *et al.*, 2003: fig. 5.7.). Average air temperatures would have been *c.* -1.6°C in February and 10.4°C in August (Pokines, 2000: 62).

Butzer (1986: 216) estimates that snow probably lay in lowland Cantabria from early December to late April, at an average depth of 4.5-5m. The Stage 3 project's models suggest between 10-60 days of snow cover at an average of <5cm (Barron *et al.*, 2003: fig. 5.9.): either estimate was unlikely to have significantly affected animal distributions or hunting practices (Butzer, 1986: 216). Heaviest precipitation would probably have occurred in November as rainstorms, rather than snow, with vigorous slope denudation by running water (*ibid.*).

7.4.3.2. Sea level

Between around 30,000 and 19,000 years ago, land-based ice volumes were ~55 x 10^6 km^3 greater than at present and sea levels were at their lowest at any time during the last glacial cycle (Lambeck *et al.*, 2002a: 203; Lambeck *et al.*, 2002b: 343). At the maximum, full-glacial regression of world sea level, Butzer estimates that the Cantabrian continental shelf would have been exposed down to the -100m isobath (1986: 214). Lambeck suggests a drop of 120-130m (Lambeck *et al.*: 343), Bailey's review -130 – -150m (1983a: 151), and the Stage 3 project –120m (Barron *et al.*, 2003). I have taken the –130m figure in this analysis. This sea-level lowstand is thought to have occurred some time around 30kyrs BP and lasted without significant variation until *c.* 17 kyrs BP (Lambeck *et al.*, 2002a; Lambeck *et al.*, 2002b).

7.4.3.3. Snowline

LGM permanent snowlines are estimated at 1100-1700m for the Atlantic-Duero watershed, and at *c.* 1050m for the Sierra de Aralar (section 7.4.2.). As the Sierra de Aralar is only *c.* 10km from the Deba and Urola valleys, I have used the 1100m contour line as the permanent summer snowline. Sturdy *et al.*'s suggested snowlines for the late glacial of Epirus are for 1700m in high summer, and as low as 450m for winter (Sturdy *et al.*, 1997: table 30.2), and therefore in this analysis the 450m contour will be adopted as the uppermost limit to winter activity.

7.4.3.4. Palaeoenvironment

Although the vegetational environment is described as predominantly open steppe, because of its low latitude the biome would have been of much greater productivity than modern analogues, and in fact faunal remains illustrate 'an unparalleled diversity' with an 'astounding' variety of species (Jochim, 1983: 214).

'Cold' pollen spectra from northern Spain include those from levels dated *c.* 19.5kyrs BP from Las Caldas. Here AP is 22%, mainly *Pinus silvestris* (Scots pine). Non-arboreal pollen (NAP) is dominated by Compositae (53%), with 9% Gramineae; the overall picture here is of poor ground cover with some stands of pine on less exposed hillsides. At La Riera (much closer to the coastline) *c.* 20 kyrs BP, AP is much lower, accounting for only 1% of the total spectrum. Ericaceae (heathers) comprise some 55-60% of the NAP. Compositae are more numerous than Gramineae, with some ferns present; the impression of the coastal plains is of a treeless, ericaceous heath at this time (see Butzer, 1986: table 4.2. for references). The overall picture from these as well as from levels dated to slightly later 'cold' phases post-dating the LGM, is of an essentially treeless full-glacial landscape, with poor ground cover (*ibid.*: 209).

Sierra Segundera (at the relatively high altitude of 1030m), dated to *c.* 16kyrs BP and probably corresponding to Dryas 1a, has an AP of around 18%, mainly *Pinus Montana* (mountain pine). NAP is dominated by grasses and *Artemisia* (wormwood; 45%), characterising the area as high mountain grass-steppe with sparse stands of pine. At Rascaño, however, another relatively high site (altitude 240m), AP was only 2%, and NAP was dominated by Compositae, with some Gramineae and ferns, and the picture here is again that of a treeless, ericaceous heath (Butzer, 1986: table 4.2.).

In contrast, 'warm' episodes of the Pleniglacial do appear to demonstrate higher AP levels. Pollen spectra tentatively correlated with the Kesselt or Tursac events at Budiño in Pontevedra and Cueva Morín (dated to *c.* 26.7kyrs and 28kyrs BP respectively) yield AP's of 59% - 65% (mainly *Pinus* or possibly *Picea*, with some alder and hazel at the former and birch, hazel and even oak at the latter). NAP is dominated by Compositae, and the overall picture here is of pine-hardwood parkland in a generally open landscape with poor ground cover (*ibid.*).

Pollen data from Las Caldas, dated to *c.* 19,250 and perhaps correlated with the Laugerie Interstadial, has an AP of 35%, composed of *Pinus silvestris*, hazel, alder and willow. Gramineae pollen dominates the NAP, and again the picture is of grass-steppe with some stands of pine and hardwoods (*ibid.*).

Two of the 'interstadial' pollen spectra reported by Butzer (1986: table 4.2.) perhaps correspond to the Lascaux Interstadial; one from La Riera dated to *c.* 18kyrs BP, and one from Chufin (*c.* 15kyrs BP). The former has a rather low AP in comparison to other 'interstadial' levels, at only 12%, with pine, hazel and alder represented. The NAP, composed mainly of Gramineae and Ericaceae, suggests heath-grass steppe with rare, open stands of pine along the coastal plain. At Chufin, however, AP is much higher, at 57%, with *Pinus silvestris*, alder, hazel and birch. NAP is composed of Compositae and ferns, suggesting stands of pine and hardwoods on some slopes, albeit with generally poor ground cover. Given the dating, however, this may correspond to a later warming event (*ibid.*).

While the evidence indicates harsh, open conditions, then, it does suggest the almost constant presence of at least some tree-cover in sheltered microclimates. The extent of such refugia was, however, extremely variable and dependent on localised conditions of moisture and soils (Butzer, 1986). High mountain crests and some river valleys were glaciated and snowfall abundant at times, and steep or north-facing slopes probably did not maintain any vegetational cover. Warming events remained generally humid and cool, with brief, limited reforestation and the development of heathland on the coastal plain (*ibid.*; Straus, 1992; figs. 7.4. and 7.5.).

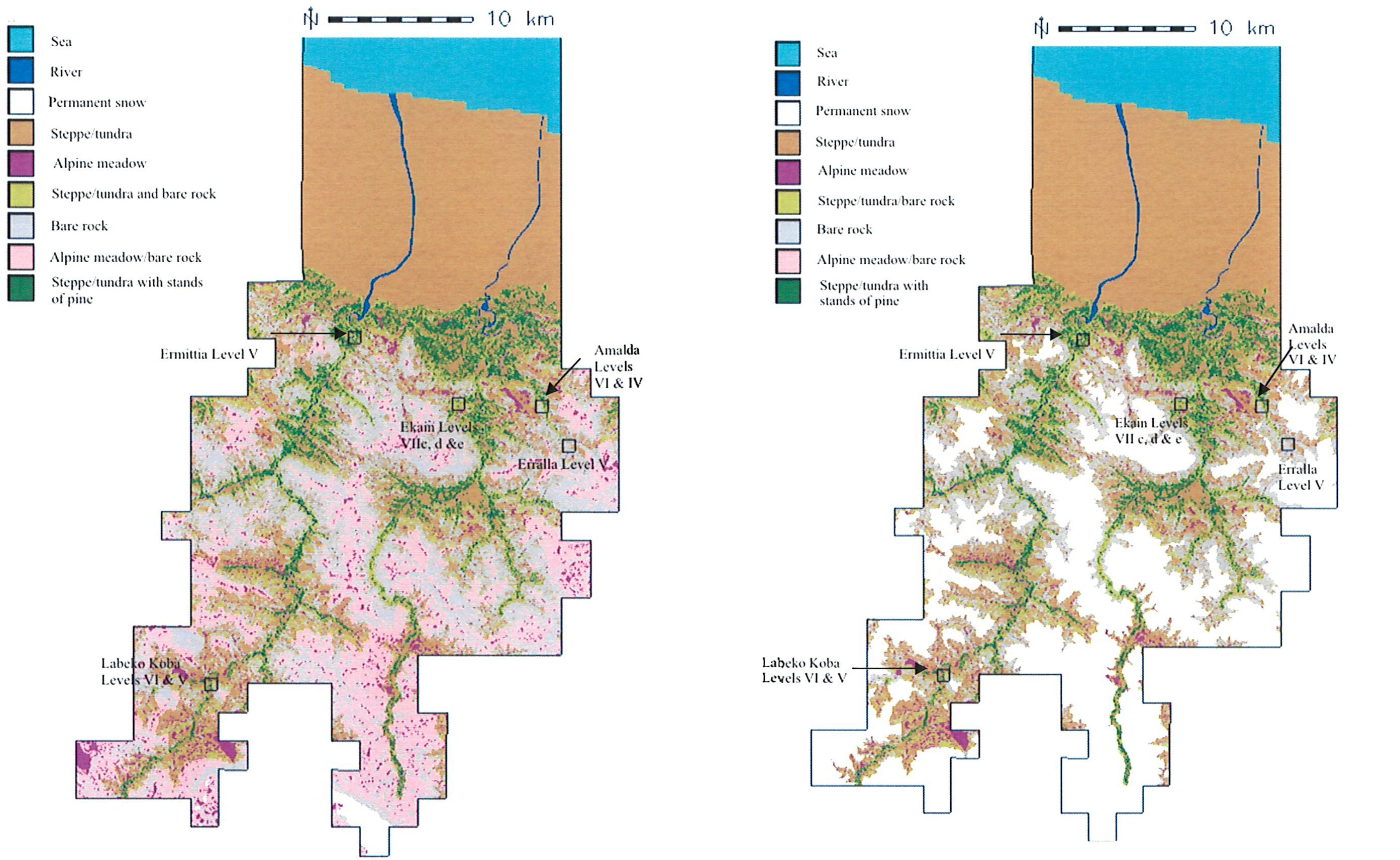

Figure 7.4. LGM 'stadial' phase summer (left) and winter (right) vegetation. Day walk limits left out for clarity.

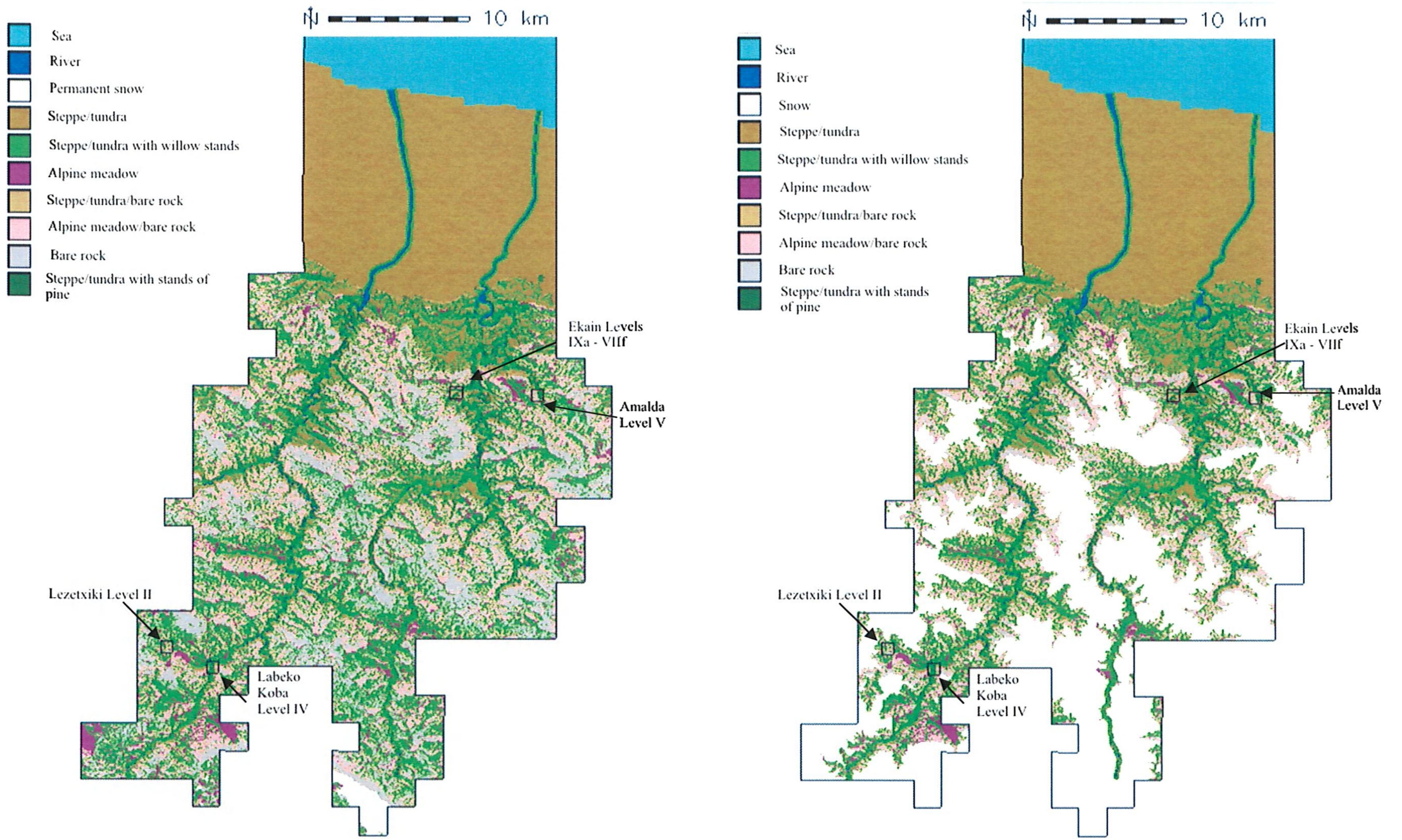

Figure 7.5. LGM 'interstadial' phase summer (left) and winter (right) vegetation. Day walk limits left out for clarity.

7.5. 'PLACING' ANIMALS IN THE LANDSCAPE

Having established some of the relevant parameters of the palaeoenvironments, this section will consider how different animal species might have behaved within it. A number of avenues are relevant here, including:

- Preferred feeding regimes – e.g., whether animal species prefer to graze in more open conditions or browse in woodlands.
- Accessibility of and preferences for different types of terrain – the landscape offers e.g. ibex and horse very different kinds of affordances in terms of elevation and slope.
- Seasonal variation in behaviour; aggregation, dispersal and patterns of movement, reproductive changes and variation in condition over the course of the year.

Of course species' behaviour and habitat preferences today are not necessarily an accurate guide to their behaviour in the past, especially where past environments have no precise modern analogue (Sturdy *et al.*, 1997: 587-8). Some dimensions of behaviour are certainly more predictable than others, and thus provide a more secure basis for extrapolation back onto past palaeoenvironments, particularly those regarding feeding behaviours, and these have been prioritised in the following discussion.

The following sections briefly review of some of the aspects of animal species' behaviour and habitats relevant to their 'placing' in the ecosystem; more detailed discussions are referenced in the text, and the specific habitats species were associated with in each timeslice are presented in Appendix 6. Reviews of these and other species' behavioural ecology given by, for example, Kurtén (1968); Jochim (1976); Winterhalder and Smith (1981); Clark (1983); Boyle (1990); Mithen (1990); MacDonald & Barrett (1993); West (1997) and allow the construction of a comprehensive picture of the characteristics of the major species represented at faunal sites in the region.

7.5.1. Artiodactyla

The order artiodactyla covers the vast majority of animal species represented at the sites analysed, including several species of deer and goat as well as the suids and bovines.

7.5.1.1. Wild boar (Sus scrofa)

The omnivorous wild boar, still extant in the area today, favours open montane woodlands (Clark, 1983), especially broadleaf deciduous woodlands where they forage in undergrowth to meet a large intake requirement of acorns, nuts, fruits, roots, rhizomes, legumes, grubs, small rodents and reptiles, amphibians and carrion (Kurtén, 1968; Boyle, 1990; Freeman, 1973). Because they root a good deal of their food out of the ground, pronounced winter cold limits their geographical range and their short legs render them nearly helpless in deep snow: 'They are thus characteristic members of the interglacial and interstadial forest faunas' (Kurtén, 1968: 154). Wild boar thus tend to be restricted to lower altitudes, and while not particularly restricted as to slope gradient, they do tend to feed (which occupies the majority of their time) on lower gradients.

7.5.1.2. Red deer (Cervus elaphus)

Red deer are a notably catholic species in terms of their feeding habits, grazing and browsing according to season and habitat. Extant populations are thus found in both woodland and open moorland landscapes although they are thought to prefer woodland where they forage for grasses, moss and various arboreal fruits. Parkland and open woodland and its margins are thus perhaps their optimal environment (Freeman, 1973; Clark, 1983) and they may move between open park moorland and heathland in summer to more closed forests in winter (Boyle, 1990). They are found at heights of between sea level and around 2400m, so elevation *per se* is not a limiting factor to their distribution (*ibid.*). However, changing treelines are likely to have an impact on their movements in an ecosystem. At present in Vasco-Cantabria beech (*Betula*) grows up to near 1600m, and deciduous oaks up to 1100m (Butzer, 1986), and so these figures describe the uppermost limit to their modern-day activity.

Red deer can feed on both gentle and moderate slopes, and can negotiate relatively steep slopes, although they generally prefer not to feed on them (Sturdy *et al.*, 1997). Like horses and cattle, Butzer places them in the 'coastal plains' and 'open piedmont hills' (at elevations of less than <300m except in the case of large river floodplains/valleys, and on gradients of less than 8%/5° (1986: 204), although this seems a little constrictive given the species' notable adaptability (e.g. Bailey, 1983a: 160). Butzer also notes that in Vasco-Cantabria, herds were unlikely to be migratory because of the linear orientation of terrain belts parallel to the coast and the relatively favourable ecology of the Vasco-Cantabrian coastal plain (1986: 216). However, some form of lesser-scale movement, perhaps between altitudinally separated grazing grounds up and down major river valleys, does seem likely (Bailey, 1983a 160). Further, more detailed information on red deer habitat preferences is provided by the work of Darling (1956) and Clutton-Brock (1987; Clutton-Brock *et al*, 1992).

7.5.1.3. Giant deer (Megaloceros giganteus)

The giant deer became extinct in Europe before the Pleistocene/Holocene transition, but the species is well known from palaeontological finds. In Scandinavia at least, it is associated with open, tree-less landscapes dominated by grasses, sedges and shrubs and forming part of the European Mammoth Steppe fauna (*Mammuthus primigenius* [7.5.5.1.].; *Rangifer tarandus* [7.5.1.5.] and *Equus ferus* [7.5.2.1.]; Aaris-Sørenson & Liljegren, 2004), surviving only 200-250km from the ice front and along the coast of a cold sea with drifting icebergs in all but the harshest winter months (*ibid.*: 70). Dental morphology suggests that the species is best characterised as a browser that supplemented its diet with grass, similar to the modern elk (*Alces alces*). In this analysis I have located it in very similar habitats to the open-ground browsers mentioned above, at relatively low altitudes and gradients.

7.5.1.4. Roe deer (Capreolus capreolus)

Roe deer feed selectively on concentrated woodstuffs (leaves/woody materials of trees/shrubs) in deciduous woodland and woodland margins (Clark, 1983), where forest undergrowth is a major source of food, along with fruits, fungi and tender grass.

Although they prefer woodlands and dense bush, roe do occasionally seek open ground, especially at night (Kurtén, 1968). Forest (although not closed forest; Freeman, 1973) close to open grassy areas and/or forest clearings, especially river valleys, marshes and areas close to water are thus the ideal habitat for this species (Walker, 1964: 1404; van den Brink 1967: 182; Freeman, 1973; Boyle, 1990). Deep snow is avoided as it hinders movement (Hainard 1949:146; Freeman, 1973). Roe deer are displaced where territory overlaps with that of *Rupicapra rupicapra*, the chamois (section 7.5.1.6.; Hediger 1964: 23; Freeman, 1973).

7.5.1.5. Reindeer (Rangifer tarandus)

Although reindeer are most often thought of as a taiga/tundra species, they can exploit almost any kind of terrestrial habitat and there are both open country and woodland forms of reindeer; the former is typical of flat tundra and/or treeless or wooded high country (Zeuner, 1963; Van den Brink, 1967; Freeman 1973; Boyle, 1990). The species' ideal habitat is climax lichen-bearing forest close to open areas of seasonally-rich plant growth and in spring they consume growing leaves, shoots and buds as well as herbaceous plants and new grass. In summer grasses and sedges are supplemented by leaves of willow and birch as well as berries and lichen, in autumn fungi are added to the diet, and in winter they revert to the staple of lichen (Boyle, 1990). Today reindeer are circumpolar animals, generally staying in more open tundra grasslands in summer and browsing in lichen-rich woodland in winter (West, 1997). They are generally considered a 'cold adapted' species although within their habitat reindeer select areas in which they will not be exposed to weather extremes; snow more than *c.* 60cm deep is difficult for reindeer to deal with and they will tend to move towards tree cover in winter to search for suitable forage and protection from gales, snowstorms and low temperatures (*ibid.*). They are not particularly limited by altitude *per se* and in an attempt to avoid predation they may be found at altitudes to rival chamois and ibex (*ibid.*)

7.5.1.6. Cattle (Bos sp.) and Bison (Bison priscus)

Bovids are ruminant grazers, with feeding patterns based around the non-selective bulk intake of grass and roughage, particularly grasses, sedges, forbs and other ground forage.

Thus, although they will occasionally browse, taking the tender twigs of scrubland bushes in winter, they cannot survive particularly well on very high/coarse fibre diets (West, 1997). European pleistocene bison were probably *Bison priscus*, generally considered a steppe denizen (see e.g. Freeman, 1973 for review) and similar to species of *Bos* in their grazing habits, although slightly less selective in their choice of forage, and as the species are difficult to separate palaeontologically the two are considered together in this analysis (see also Stewart *et al.*, 2003: 105). The species prefer 'flat' or 'gentle' open ground near water (Kurtén, 1968; Sturdy, 1997). In his analysis of Pleniglacial landscapes in Cantabria, Butzer places cattle in the 'coastal plains' and 'open piedmont hills' (, i.e. at <300m altitude except in the case of large river floodplains/valleys and at slope gradients < 8%/5°; 1986: 204).

7.5.1.7. Chamois (Rupicapra rupicapra)

Like red deer, chamois are catholic feeders, and during summer mainly browse and graze in alpine zones above the treeline, although they are essentially a mid-mountain species rather than extreme mountain-lovers like ibex (Sturdy *et al.*, 1997), which displace them from higher slopes (Hediger 1964: 23; Freeman, 1973). They also frequent steep valley slopes (particularly east and southeast facing slopes; Boyle, 1990) in woodland and forest, feeding on clover, plantain and forbs as well as grasses, and are equally at home in hill country and even river valleys (Freeman, 1973). During winter chamois retreat to lower, more forested areas where they forage for fungi, mosses and lichens and other woodland foodstuffs (Boyle, 1990; Clark, 1983; Freeman, 1973), often in large herds (Kurtén, 1968: 176).

7.5.1.8. Ibex (Capra ibex/pyrenaica)

Ibex are also unfussy feeders and combine grazing and browsing according to season and habitat. They are thus linked more strongly to terrain types than vegetational characteristics of the environment, being an extreme mountain-adapted species (Kurtén, 1968: 181; MacDonald & Barrett, 1993). They are thus associated with alpine zones above the treeline (in summer) and just below the snowline, up to as much as 2000m above sea level, as well as for steep slopes and rock faces at lower altitudes, although they avoid forest (Freeman, 1973). Even in winter they do not descend slopes much beyond the treeline (especially males; Freeman, 1973). They feed on a mixed diet of grasses, sedges, forbs, leaves of dwarf shrubs and lichens, all poor quality forage characteristic of their high, rocky areas or alpine meadow habitats (West, 1997; Boyle, 1990; Clark, 1983). More detailed information about both ibex and chamois is available in Couturier (1938, 1962) and Lovari (1985).

7.5.2. Perissodactyla

7.5.2.1. Horse (Equus sp.)

The most important member of the perissodactyla represented at the sites in this study area is of course horse. More than one species is known from Pleistocene Europe, including *E. caballus, E. ferus*; these species are, however, only problematically identified palaeontologically and are here treated solely as *Equus* sp. (see also Stewart *et al.*, 2003: 105). Although there it is possibile that different species may have favoured different ecotopes (see e.g. Freeman, 1973 for discussion), modern horses are obligate ruminant grazers, rarely if ever browsing (Sturdy *et al.*, 1997). They are found in any grassy or shrubby landscape including open woodland as well as woodland margins, heathland and grassland (Clark, 1983) and also like tundra/loess steppes, thriving on sparse, low quality (high fibre, low-protein) vegetation (Boyle, 1990). They generally avoid soft marshy ground and deep snow and stick to 'flat' or 'gentle' slopes (Sturdy, 1997 *et al.*). Butzer's analysis placed them, like bovids, at less than 300m altitude - except in the case of large river floodplains/valleys) and on gradients of less than 8%/5° (1986: 204), and it is this environmental niche that I have modelled in this analysis.

7.5.2.2. Rhinoceros (Dicerorhinus sp./Coelodonta antiquitatis)

Three species of rhinoceros are represented in the faunal remains from the sites: Merck's rhinoceros (*Dicerorhinus kirchbergensis*); the steppe rhinoceros (*Dicerorhinus hemitoechus*) and the woolly rhinoceros (*Coelodonta antiquitatis*)

Merck's rhinoceros probably inhabited woodland, parkland and occasionally savannah environments although not extreme steppe (Kurtén, 1968). The steppe rhinoceros, in contrast, is often used as an indicator of open grasslands, but its main habitat seems to have been in temperate areas (Freeman, 1973) although it may have colonised tundra occasionally (Kurtén, 1968). Similarly, although the woolly rhinoceros is usually portrayed as an extreme tundra form, there are some examples from temperate climates with extensive grasslands and a few broad-leaved trees (e.g. in Catalonia; Kurtén, 1968: 144). It is, however, best considered a typical member of 'cold' faunas (Freeman, 1973). Therefore, while all three species are probably generally associated with a diet of low growing grasses and herbs in tundra/loess steppe environments, their tolerances seems to have been catholic and embraced forest biotopes (Boyle, 1990). It is unlikely that any tolerated particularly steep slopes or even reasonably high altitude habitats.

7.5.3. Proboscidea

7.5.5.1. Woolly mammoth (Mammuthus primigenius)

The sole member of the proboscidea whose (few) remains have been recovered from the study sites is the woolly mammoth (*Mammuthus primigenius*). The preferences of the now-extinct species have had to be reconstructed from those of its modern descendants, and from the spectacular finds of frozen individuals recovered from some permafrost sites in Russia. The Beresovka mammoth, for example, is known to have lived in an Arctic environment and to have fed on tundra vegetation (Kurtén, 1968), and it thus seems that the species preferred tough, poor quality grasses with woody plants and small forbs. Evidence from other Siberian mammoth finds and extrapolation from its extant relatives makes it likely that the species was also associated with forest biotopes, perhaps moving from open landscapes in summer to forests (temperate deciduous and coniferous forests?) in winter, browsing for tree, shrub and ground flora including (as was the case for the Siberian individuals) larch, birch, willow, sedge, mosses and grasses (West, 1997; Boyle, 1990).

7.5.6. Carnivora

Numerous carnivore species are represented at the study sites. Of course in many cases (especially bears and hyenas), these species may in fact be the creators of (or at least contributors to) the faunal assemblages. In any case, although humans may have been responsible for the remains of some carnivorous animals being recovered from these sites, the vast majority reflect the actual presence of the animal at the site at some point of the depositional history, and as discussed in sections 5.3. - 5.4., this would have informed human perceptions of and interactions with the 'place' of the site and the animals themselves. Thus, although the 'location' of carnivores in the ecosystem is not as straightforward as that of animals below them in the trophic system, for whom strong nutritional and topographic preferences make their associations with particular parts of the landscape relatively robust, I have included these species in my discussions of animal-human interaction in Chapter 8, and therefore some salient characteristics of the various carnivore species recovered from the Palaeolithic sites of the Deba and Urola valleys are noted in Chapter 8.

7.6. GENERATING PATHWAYS

These habitat preferences were used to associate animals with the topographic/vegetational categories represented in the timeslices illustrated in figures 7.1. – 7.4. (see Appendix 4 for detailed diagrams representing the specific associations made for each timeslice).

The next step was to identify potential paths of movement between the areas of species' preferred habitats and the particular sites at which their remains were recovered.

Such pathways are generated automatically in GIS by calculating the cumulative 'cost' of moving between two points. Calculation of such costs requires the specification of a *cost surface*, in which each individual 'cell' of information is associated with a number representing the 'cost' of traversing it, differing from previous methods of geographical analysis such as catchment analysis (van Leusen, 1999: 216), which assumed that geographical space was 'flat' and homogeneous (section 4.1.). However, definitions of 'cost' inevitably vary widely (this is as true of GIS computer systems as it is of Processual Archaeology; section 1.3.), as do the parameters and algorithms used to calculate the cost of movement through a landscape (see van Leusen, 1999: 216-7 for review).

Algorithms can be both isotropic (the same in all directions) or anisotropic (where the cost of movement may differ with direction – e.g. swimming upstream rather than down); the cost of travel obviously combines components of both: 'the former exemplified by costs relating to the type of terrain (soil, vegetation, wetness), the latter by costs relating to slope and streams' (van Leusen, 1999: 217). However, there are certain advantages to using isotropic calculations of cost in this analysis. When traversing particularly rather rugged terrain, for example, descent is often as tiring – if not more so – than ascent (see e.g. Susta *et al.*, 2000; Llobera, 2000: 71, fig. 2; Wheatley & Gillings, 2002: 156, fig 7.4; section 7.2.2.2.). In addition, while the faunal remains recovered from sites clearly travelled there from the species' preferred habitats, it is less certain that hunters travelled *to* these hunting grounds *from* that particular cave site; in the absence of evidence regarding the *direction* of travel, it seems more prudent to use isotropic methods.

However, there are a considerable number of ways to calculate even isotropic cost surfaces. Most studies have taken degree of slope as the most significant factor for calculating the cost of movement, although there are now several examples of more complex calculations based on physiological measurements of actual energy expenditure, for example that of Gorenflo & Gale (1990), who specify the effect of slope on travelling speed by foot as:

$$V = 6e^{-3.5\,|\,s + 0.05\,|}$$

Where V = walking speed in km/h, s = slope of terrain (calculated as vertical change divided by horizontal change, and e = the base for natural logarithms).

A much simpler alternative is provided by Diez (cited van Leusen, 1999: 217), who recommends:

Effort = (percent slope) / 10

This has several advantages, particularly its very simplicity; more complex calculations tend to produce costs related to actual physiological expenditure and derived from modern human observations: even if we could assume that Palaeolithic 'modern' humans had identical metabolic systems to our own (despite evidence that they may well have been considerably more 'robust' than ourselves; e.g. Klein, 1999), we certainly cannot assume this of Neanderthal populations. In addition, most people do not generally base their daily activities on precise calculations of the likely expenditure of energy and this does not seem a sound basis for exploring the ways in which their movements reflect their interactions with other aspects of the ecosystem. And lastly, given the coarse temporal scale of the study and the inevitably high level number of unknown variables and assumptions involved, any attempt to calculate actual physical costs of the movement of individuals or populations in the Palaeolithic would give a spurious accuracy to the results that would simply not be supported by the data itself – more complex calculations of the cost of movement can always be used in any subsequent, more detailed analyses.

However, as Bell and Lock have pointed out, the cost of climbing a slope is by no means directly proportional to the degree of slope:

> thus surmounting a 45° slope is not simply 45 times as difficult as moving on the level, a 0° slope. Taking this to its logical conclusion would suggest that climbing a vertical slope of 90° is ninety times as difficult as walking on the level, a 0° slope, an absurd simplification which would not stand up to scrutiny (2000: 88).

Instead, they suggest that by taking the tangent of the slope angle and then dividing the result by the base cost of traversing entirely flat ground (1°, to avoid a division by 0), the *relative cost* of movement across a landscape, rather than any *absolute cost*, can be established. Using this equation, the relative cost of climbing a 60° slope is not 60 but 100 'units'.

Diez's equation was therefore modified slightly, and the equation used to generate the cost surface from the original 'slope' layer was:

$$\text{Effort} = \tan \text{slope} / \tan 1$$

A cost surface was thus generated from the slope basemap[40] in which the above equation was applied to each cell to give a value in (deliberately) vaguely termed units of 'effort' (see e.g. Wheatley & Gillings, 2002: 152) representing the cost of traversing that particular 'cell' of landscape.

However, other factors than slope of course play a role in the 'cost' (however defined) of movement through a landscape, including barriers, transportation routes and the effects of differential terrain types (flat grassland, for example, presents a very different experience in terms of bodily movement to the dense undergrowth of mature woodland):

> The vast majority of archaeological applications have so far accepted the simplification that energy expended or time taken to move around in a landscape is a function of slope ... this is a worrying oversimplification (Wheatley & Gillings, 2002: 155),

and further modification of this equation was necessary to account for this. We have no real way of knowing if there were any cultural 'no-go' zones in the area during the Palaeolithic, or even any territorial boundaries that would have influenced movement: really the only significant factors here are the potential relative costs of crossing rivers (as river transport is unlikely to be an issue in the Palaeolithic) and of moving through different forms of vegetation.

The cost of traversing rivers may be considerable and was addressed by the addition of an extra variable t into the equation. A high cost (200, arbitrarily chosen to be greater than the highest base cost derived solely from slope) was added to cells in the timeslice maps categorised as 'sea' or 'snow' (altitudes below sea level and above the permanent snowline for the timeslice in question; section 7.2.2.), and for cells categorised 'river', $t = 50$ (also chosen arbitrarily relative to the 'cost' of sea/snow).

Of further concern is the effects of changing (whether seasonally or climatically) vegetation on the cost of movement – my own visits to the region have highlighted the fact that walking in summer when undergrowth is thick consumes much more time and energy than that in autumn and winter when it has died back[41].

Much of the seasonal variation should be negated by the generation of 'summer' and 'winter' variants of the reclassified timeslice maps, and as the pathways will be generated within specific timeslices, climatic variation should also not impact negatively on the analysis. However, assessments of the differing relative 'friction' of different types of vegetation on movement have been suggested by, for example, Glass *et al.* (1999) and are integrated into this analysis by the addition of a further variable v. The 'base' cost of traversing terrain – represented by the tangent of the slope gradient - is multiplied by this value: where vegetation is moderately difficult to move through (e.g. grassland with stands of trees), $v = 1.5$ – hence it is considered half as 'costly' again to traverse than other terrain of a similar gradient. Where vegetation is more difficult to travel through (open woodland and parkland environments), $v = 2$ (the cost of movement is doubled). And in areas of denser vegetation (e.g. dense woodland), $v = 2.5$.[42]. Travelling across open grassland, steppe and bare rock, it is assumed, incurred no significant extra cost above the 'base' terrain cost derived from the slope gradient.

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[40] Using the GRASS module r.mapcalc
[41] Interestingly, this also has significant effects on the visibility of sites.
[42] In the study region, such vegetation occurred only on river valley floodplains, which are in and of themselves rather difficult to traverse, at least in temperate climates (Chambers and Hosfield pers comm.)

The final equation used to derive the 'costs' of movement in each timeslice, therefore, was:

$$\text{Effort} = ((tan\ s/tan\ 1)\ v) + t$$

Where s = slope, v = vegetation and t = terrain.

The map layer with the base costs derived from slope tangents was thus amalgamated with the timeslice vegetation map[43] and values re-calculated to reflect the addition of the terrain value t and vegetation value v[44] as described above.

The result was a raster map in which each cell was associated with a cumulative 'cost' of traversing across it from the specified starting point of a particular cave site[45]: i.e. the landscape in the immediate vicinity of the specified cave site has a low cumulative cost because it requires less effort to reach from the starting point of the cave than points at a distance. This timeslice-specific cost surface was then used to derive a least-cost pathway (defined by a sequence of cells of lowest cumulative 'cost') of potential movement between these two points using the GRASS module r.drain. This module is designed to model the run-off patterns of water, and traces a path from the higher cost areas of a user-defined starting point (within an area of habitat associated with a particular species) to the 'low' cost of the cave site from which the cost surface was generated (and where that species' bones are represented).

[43] Using the GRASS module r.cross
[44] Using the GRASS module r.reclass
[45] using r.cost, the 'Knight's move' option

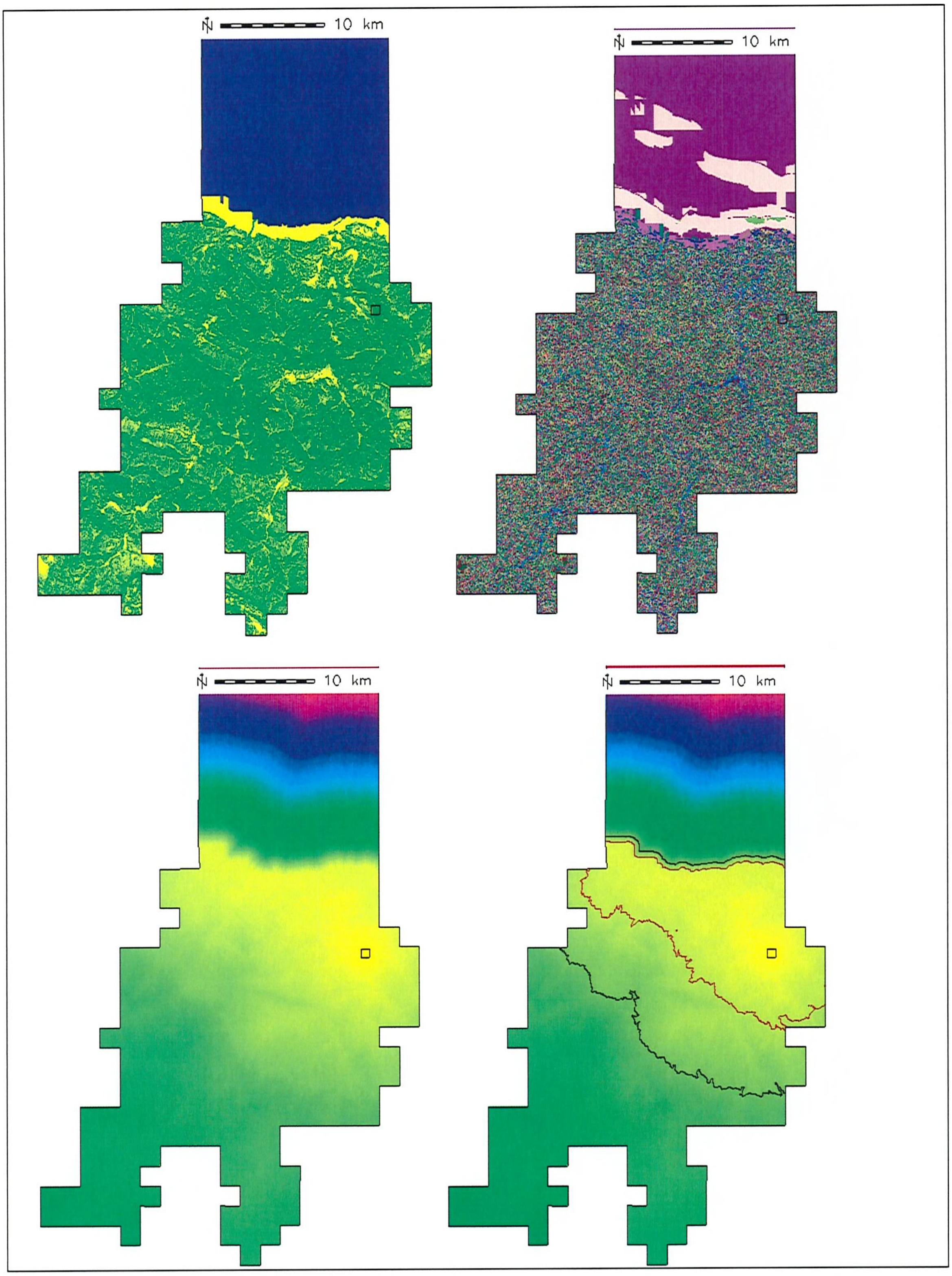

Figure 7.6. Cost surfaces for OIS 5a/c. Top left = base/terrain cost derived solely from slope gradient. Top right = terrain and summer vegetation (fig. 7.2.) costs combined. Bottom left = cumulative cost of movement in summer from Amalda. Bottom right = cumulative cost of movement in summer from Amalda with summer (in black) and winter (in red) day return walk limits indicated. Darker colours = higher cost.

In order to provide some form of temporal framework for consideration of the resulting paths, the area that could have been traversed in a single day was calculated. Rather than consider merely distance in such a calculation, a timed (2 hour) walk over varied terrain was undertaken[46] and the 'cost' of the walk then computed in GRASS to take the terrain and vegetation factors considered above into account. From this it was calculated that an average hour's walk represents 1673.5 units of 'effort'. In a (generous) 15 hour (mid)summer day[47], then, areas lying beyond 12551 units of 'effort'[48] from the site under consideration could probably not have been reached as part of a return day's travel. For a (mid)winter day (estimated at 8.5 hours of daylight; Butzer, 1986), the corresponding figure was 7112 units[49]. The module r.reclass was used to generate a 'limit' to the day's activity.

Of course, these are rather coarse estimates of the area that could have been walked in a day by the Pleistocene inhabitants of the region. Both Pleistocene populations were rather robust and probably highly adapted to moving fast over difficult terrain (Trinkaus, 1995) and therefore modern analogues are unlikely to underestimate potential distances. In addition, the area reflects an uninterrupted walk between two known points, which may not represent a good analogue for hunting and/or gathering parties' movements, which are likely to have been more meandering (at least on the outward portion) as people searched for game, vegetable foods and/or other resources such as flint and paused at various places to pursue/stalk, kill and butcher the animals they successfully killed, check traps or snares, pick/dig up vegetable foods and/or extract raw materials. Nor did parties necessarily return to the same site they left from, perhaps travelling instead to the nearest cave site available. The limits to days' walks provided in the following analysis, therefore, are given only as a guide and serve solely to put the potential paths generated into general temporal context.

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[46] from Ekain to the summit of Erlo; see also Altuna & Merino, 1984: fig 1.2.
[47] http://www.cannabisculture.com
[48] 1673.5 x 15 = 25102.5/2 = 12551.25
[49] 1673.5 x 8.5 = 14224.75/2 = 7112.38

7.7. SUMMARY AND CONCLUSION

In this chapter I have presented the basis for – and some of the problems relating to - the reconstruction of potential palaeoenvironments in the study region during particular phases of the Pleistocene. These include topographic, vegetational and faunal characteristics and provide a basis for the consideration of possible paths of movement and some of the bases for the perception of the immediate ecosystems of past hominid and human groups.

In the following Chapter I discuss the patterns of movement derived from the application of this methodology for each palaeoenvironmental phase represented at the sites under consideration; the results are not meant to represent any actual *specific* tracks taken, but rather *potential* paths of interaction, and when considered in the light of the data available from traditional faunal analyses of the levels and sites in the region some of the elements that would have been incorporated into hominid and human groups' experiences and understandings of their ecosystems are discussed.

CHAPTER EIGHT: LIVING IN THE PLEISTOCENE ECOSYSTEMS OF THE DEBA AND UROLA VALLEYS

In this chapter I discuss the pathways associated with the Palaeolithic sites of the Deba and Urola valleys introduced in Chapter 6. For reasons of space it is not possible to discuss all levels even just of Amalda and Labeko Koba in this chapter, and although all levels were analysed and preliminary results presented in Appendix 9, in this discussion I focus on just three levels to highlight the potential of the methodology outlined in Chapter 7: Amalda levels VII (Mousterian, dated to OIS 5a/c) and IV (Upper Solutrean, dated to Dryas Ia), and Labeko Koba level VII (Aurignacian, dated to a 'warm' phase of OIS 3).

These three sites/levels are seen here as nodes in a wider matrix of potential movement through the ecosystem and attested to by the faunal remains recovered from their deposits. The shifting emphases on these paths (paths that both arise out of and act to structure the movement and activity that constitutes them) over time are considered here in the context of the wider area of the Deba and Urola river catchment basins and the contemporary or near-contemporary sites within these.

8.1. OIS 5 A/C: AMALDA LEVEL VII (MOUSTERIAN)

Figure 8.1. presents the composite summer and winter matrices of potential paths of movement described by hunters operating out of Amalda during the deposition of the Mousterian level VII. Owing to the position of the cave on the steep slope of the Alzolaras valley at the base of a virtually sheer cliff (see figure 6.6), the directionality of the landscape means that most pathways of movement into and out of the cave almost certainly followed the course of the Alzolaras stream itself. Although level VII itself is virtually polinically sterile (Dupré, 1990), the reconstruction of the environment of substages a and c of OIS 5 presented in section 7.4.1. (see figure 7.1.-2.) suggests that the steeper areas of the valley were probably largely open, with alpine meadow and bare rock the dominant ecotype in the immediate vicinity of the

cave but open pine and birch parkland with some deciduous trees on the higher, more gentle slopes above the valley and possibly oak, hazel and alder in the wider, more sheltered areas of the valley itself, lining the stream (see also Eastham, 1990) and the Urola river itself. Buntings, larks and thrushes are identified from the bird bones and probably fed along the valley bottom or in the open garrigue above the cliff, while the bones of choughs that would have nested on the bare rock faces above and around the cave are numerous. While these species were probably not consumed by the cave's Mousterian occupants, they would certainly have formed part of the experience of moving through it, with different times of the year being associated with changes in their behaviour such as nesting or raising young and thus forming part of the experience of temporality of the landscape.

Hunters leaving Amalda would probably have followed the directionality of the landscape. They may have moved downstream (northwest) to the confluence of the Alzolaras with the Urola river, areas potentially associated with small, mixed herds of horse. Mallard bones – possibly representing ducks hunted for food – were obviously associated with the Alzolaras stream and Urola river themselves (Eastham, 1990). In addition, calcareous argillic stone used as raw material for some of the lithics recovered from this level (the only level this material was recovered from) almost certainly derived from outcrops of Urgonian limestone along the base of the avlley (Viera & Aguirrezabala, 1990: see figure 4.3.). Three fish bones identified as *Salmo* sp. were also recovered from Level VII (Muñiz & Izquierdo, 1990). Most of the major rivers of this stretch of northern Spain were historically salmon runs (*ibid.*; Butzer, 1986), and fish could certainly have been caught in the Urola river and possibly even in the Alzolaras itself at spawning time (September/October).

From the mouth of the valley hunters could have chosen to move either north towards the coastal plain to hunt large ungulates (horse and bovid) or (in winter) to double back into the slopes of the coastal hills, frequented by chamois sheltering and foraging in lower, more forested areas than their summer habitats. A number of marine molluscs were recovered from the level – ten periwinkle shells and a single limpet (Borja, 1990: fig 13.3.), obviously collected from the long shingle beaches that probably characterised the coastal zone of the time (Butzer, 1986: 214). The route to

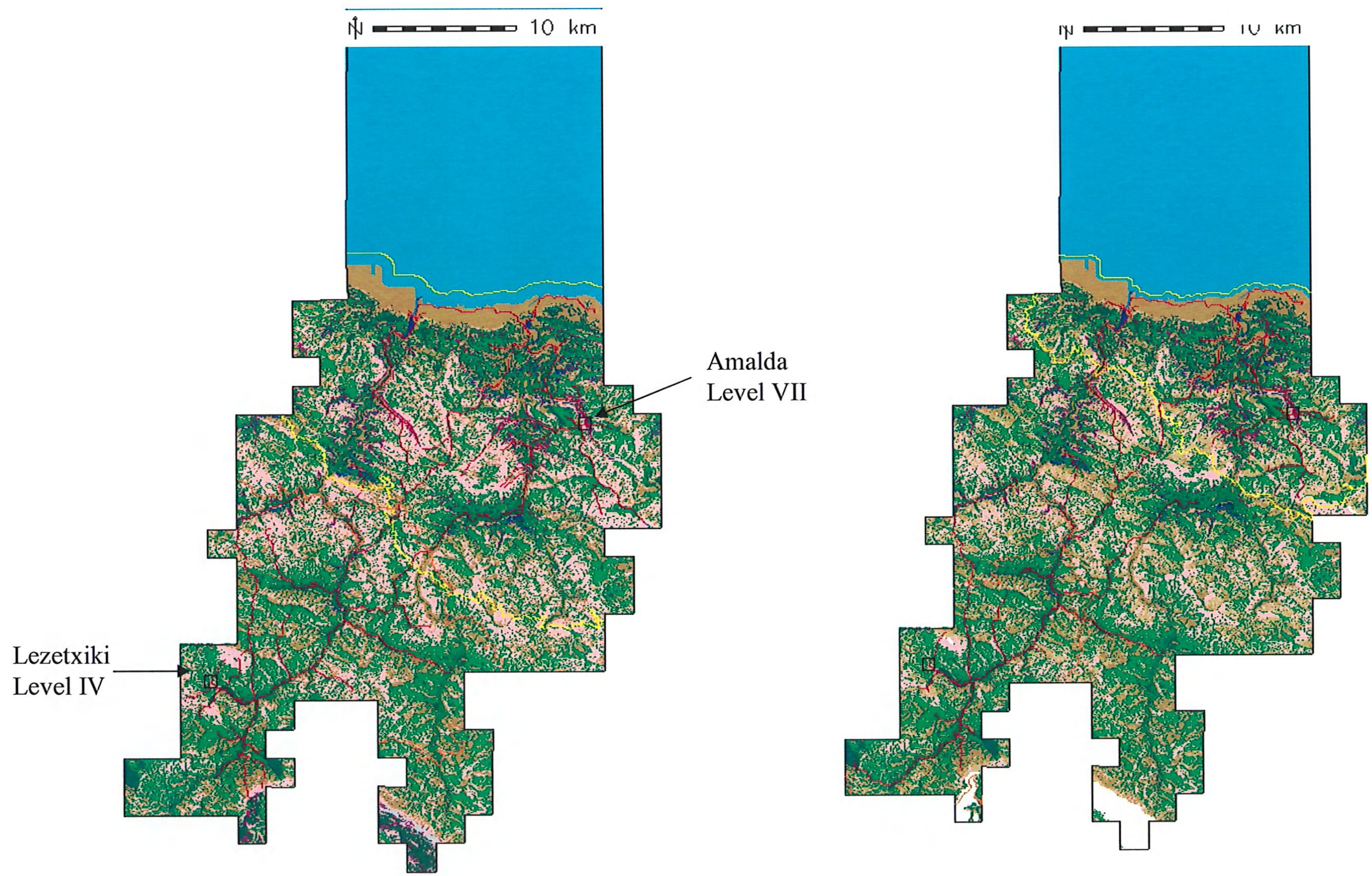

Figure 8.1. OIS5ac (Lezetxiki Level VI and Amalda Level VII; Mousterian), all pathways (in red) associated with summer (left) and winter (right) hunting. Yellow line represented summer/winter limit to day's return walk from Amalda.

the coast is not included *per se* in figure 8.1., but a probable route simply followed the Urola downstream across the potential horse and bovid hunting grounds of the coastal plain. The sandstone used as a raw material for two flakes recovered from the level was also possibly located in the tertiary coastal flysch (Viera & Aguirrezabala, 1990: 60) – modern exposures are a feature of the coast around Mutriku, at the mouth of the Urola river, and pathways associated with these areas and materials were clearly part of the overall pattern of movement of populations at this time.

In summer, hunters might also have turned south and west from the mouth of the Alzolaras at the Urola river, and followed its course to the slopes of Erlo to hunt chamois (or potentially ibex) there, perhaps crossing to the other hunting grounds of the eastern slopes of the Deba valley beyond. Alternatively, other paths follow the Alzolaras upstream (southeast) through the potential chamois hunting grounds of the western slopes of Pagoeta which form the eastern slopes of the Alzolaras valley. Rounding the southeast corner of Pagoeta and turning north towards the modern town of Aia would bring hunters to a number of sources of ophite, used for the manufacture of some of the lithic finds from the level (*ibid.*: figure 4.6.), while ascending out of the Alzolaras valley hunters could move towards the bovid-favoured habitats of the confluence of the Urola/Ibaiuda rivers or southeast toward the steeper, rockier biotopes of the Akategi and Mendibeltz peaks associated with chamois and ibex.

Continuing southeast and crossing over the watershed into the drainage basin of the Orio river to the immediate east of the study region were also paths that took hunters to sources of lower Triassic red conglomerates and sandstones which were probably the source for the quartzite used for two flakes recovered from this level of Amalda, and possibly also haematite (*ibid.*: figure 4.7.).

Purely from a two-dimensional consideration of the landscape of OIS 5 a/c, then, we can begin to see some of the intersecting pathways described by populations of the time and the ways in which these intersect with those of other species and with parts of the landscape such as the coastline and sources of lithic raw material. These pathways, then, form a composite, holistic matrix of movement within the landscape centred on a cave site from which the material traces of it were recovered, out across the landscape. And each of these pathways, besides representing a potential set of movements between persons and places through the ecosystem, had a distinct flavour or texture that drew from the *quality* of the interactions and activities that it arose out of.

8.1.1. Chamois and ibex

Clearly, the most significant animal species with which hunters interacted at the time – in terms of individual animals represented – was chamois: at least 16 are represented in the faunal assemblage from the level (table 8.1.). This is an emphasis that persists throughout the levels at this cave site, from the Mousterian through to the Upper Solutrean (section 8.3.). Pathways leading to and from hunting grounds associated with this species, then, were clearly well-known and formed a major spine of the complex of pathways of movement and activity centred on the cave. At least three of the 16 individuals represented at the cave were infant animals (table 8.2.) killed during summer (May – June).

	Amalda Level VII			
	NISP	**NISP%**	**MNI**	**MNI%**
Cervus elaphus	150	15.5	5	10.2
Capreolus capreolus	3	0.3	3	6.1
Rupicapra rupicapra	536	55.4	16	32.7
Capra pyrenaica	61	6.3	5	10.2
Bovini	58	6	3	6.1
Equus caballus	48	5	4	8.2
Ungulates	**856**	**(88.5)**	**36**	**(73.5)**
Ursus spelaeus	58	6	5	10.2
Ursus arctos	0	0	0	0
Crocuta crocuta	3	0.3	2	4.1
Canis lupus	17	1.8	3	6.1
Cuon alpinus	1	0.1	1	2
Vulpes vulpes	29	3	2	4.1
Panthera pardus	3	0.3	1	2
Carnivores	**111**	**(11.5)**	**13**	**(26.5)**
Total det.	**967**	**(11.6)**	**49**	
Total indet.	**7340**	**(88.4)**		
Total	**8307**			

Table 8.1. Animal species represented in Amalda Level VII (after Altuna, 1990: table 8.8. – see appendix 6 for latin/common names of species).

	Cervus elaphus	Capreolus capreolus	Bovid	Rupicapra rupicapra	Capra pyrenaica	Equus sp.
Infant	1	1	1	3	1	2
Juvenile	1	1	1	2	2	1
Adult	3	1	1	11	2	1
Total	**5**	**3**	**3**	**16**	**5**	**4**

Table 8.2. Ageing data for ungulate species from Amalda level VII (after Altuna, 1990: table 8.8.).

During these summer months, the mixed herds of adult females and young associated with these areas of the landscape, although generally small, were probably more easily located in their *c.* 75 hectare ranges than the scattered, lone adult males. Chamois could have been taken individually by single hunters, although they are notably wary animals said to post 'sentinels' to warn of danger (Freeman, 1973: 10). However, the most efficient method (prior to the invention of the rifle) was probably to drive animals towards concealed hunters or natural traps (*ibid.*) – such a technique would obviously involve a number of hunters working closely together.

During the winter months following the rut, chamois probably descended to lower altitudes in search of more sheltered, wooded areas in which to forage, being displaced from higher, barer slopes by the descent of ibex driven down from snow and ice bound summits (fig. 8.2.). From these hunting grounds, virtually whole carcasses of chamois (as indicated by the pattern of anatomical representation; fig. 8.2., section A7.2.)[50], weighing somewhere in the region of 20 – 50kg apiece

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[50] Pattern of anatomical representation is presented in Appendix 7 both as raw data in table form, and combined into anatomical 'regions'. These have been conceptualised by zooarchaeologists in a number of ways (Binford, 1978; Stiner, 1994: 242; see e.g. Reitz & Wing, 1999: 205-221 for discussion) that can be considered variations on the general theme of the structure of the mammalian skeleton and which reflect the structure of the carcass and thus decisions regarding butchery and transportation made both by hominids and other animals. To aid comparison with other sites in the region, here I follow Altuna's scheme (1990: e.g. table 8.10), with only two modifications: antler/horn is counted only on a presence/absence basis, and teeth are counted on the basis of MNI (e.g. if teeth NISP $\leq$ the number of teeth belonging to a single animal of that species, MNI = 1), as both of these elements commonly demonstrate anomalously high raw counts that would bias the ratio of head counts relative to postcrania (e.g. Stiner, 1994: 238). It is therefore possible that head counts for the Amalda data may be slightly underrepresented. For the same reason, sesamoids are not included in 'feet' counts. These modifications are not necessary for the Labeko Koba data, where MNI figures are given for each element.

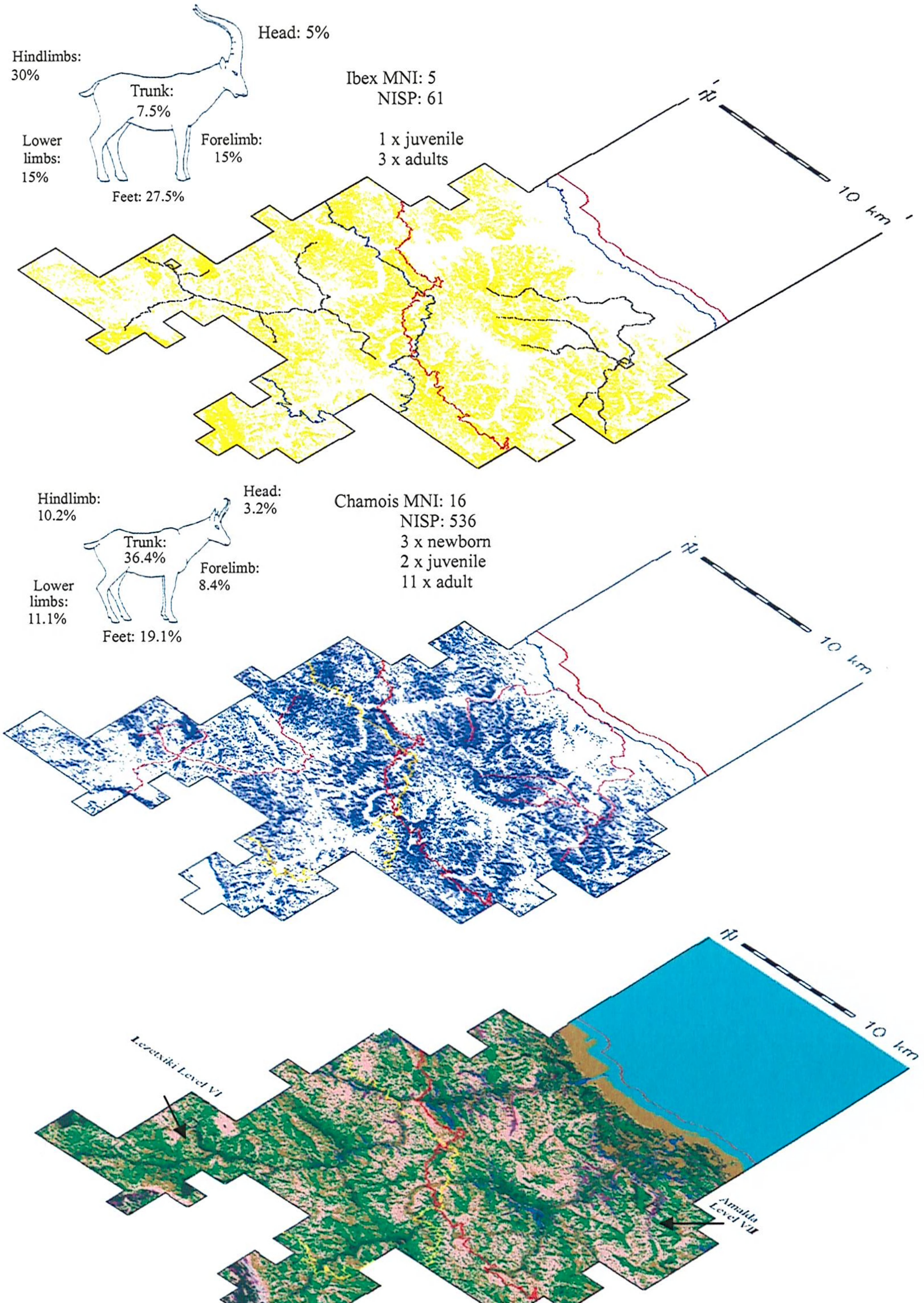

Figure 8.2a. Pathways (black lines) associated with hunting of ibex (yellow, top) and chamois (violet, middle; pathways are magenta for clarity) from Amalda level VII in the summer landscape (bottom) of OIS 5a/c. Red line denotes limit of summer day's return walk from Amalda, yellow from Lezetxiki.

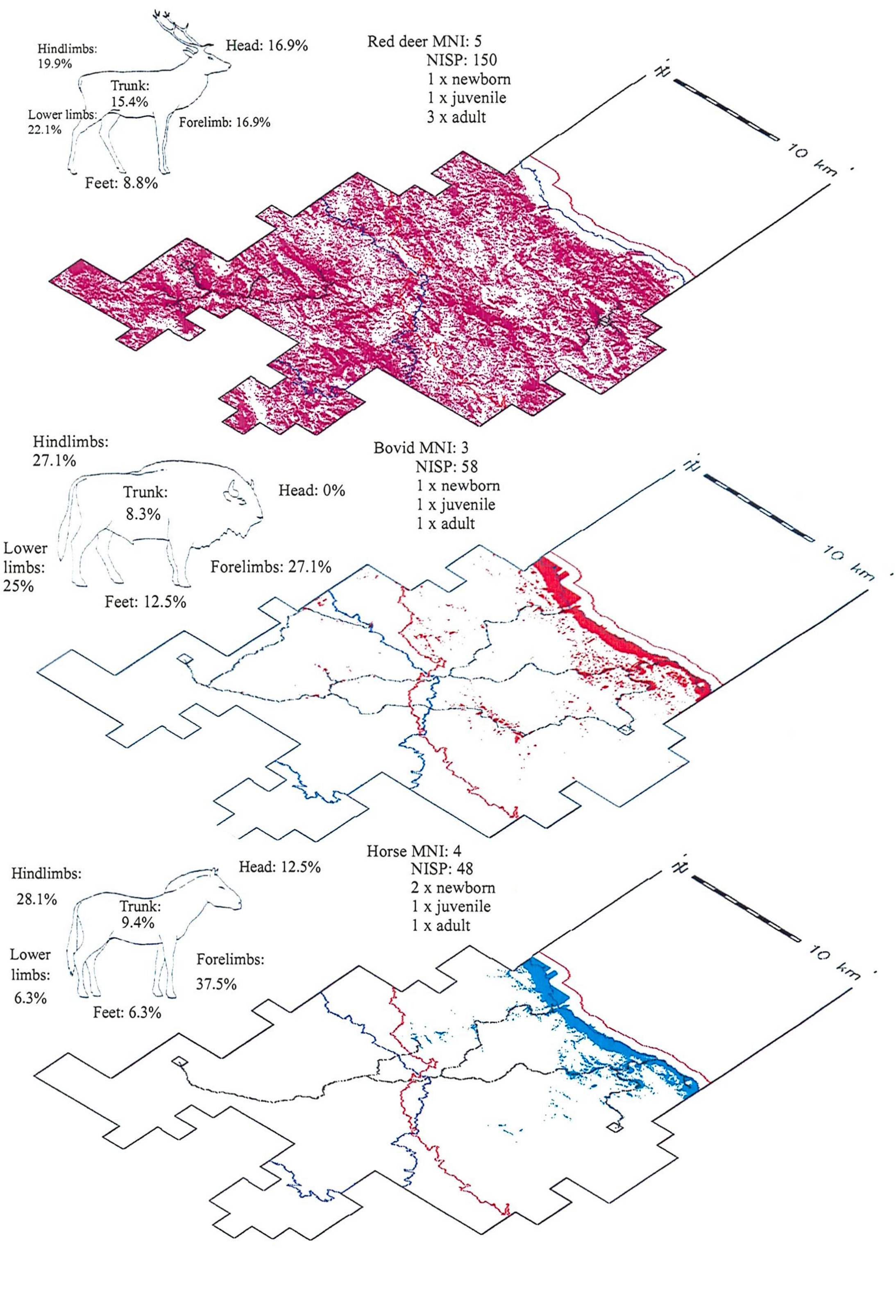

Figure 8.2b. OIS 5a/c pathways (black lines) associated with the summer hunting of red deer (magenta, top), bovids (red, middle) and horse (blue, bottom) from Amalda level VII. Red line denotes limit of summer day's return walk from Amalda, blue from Lezetxiki.

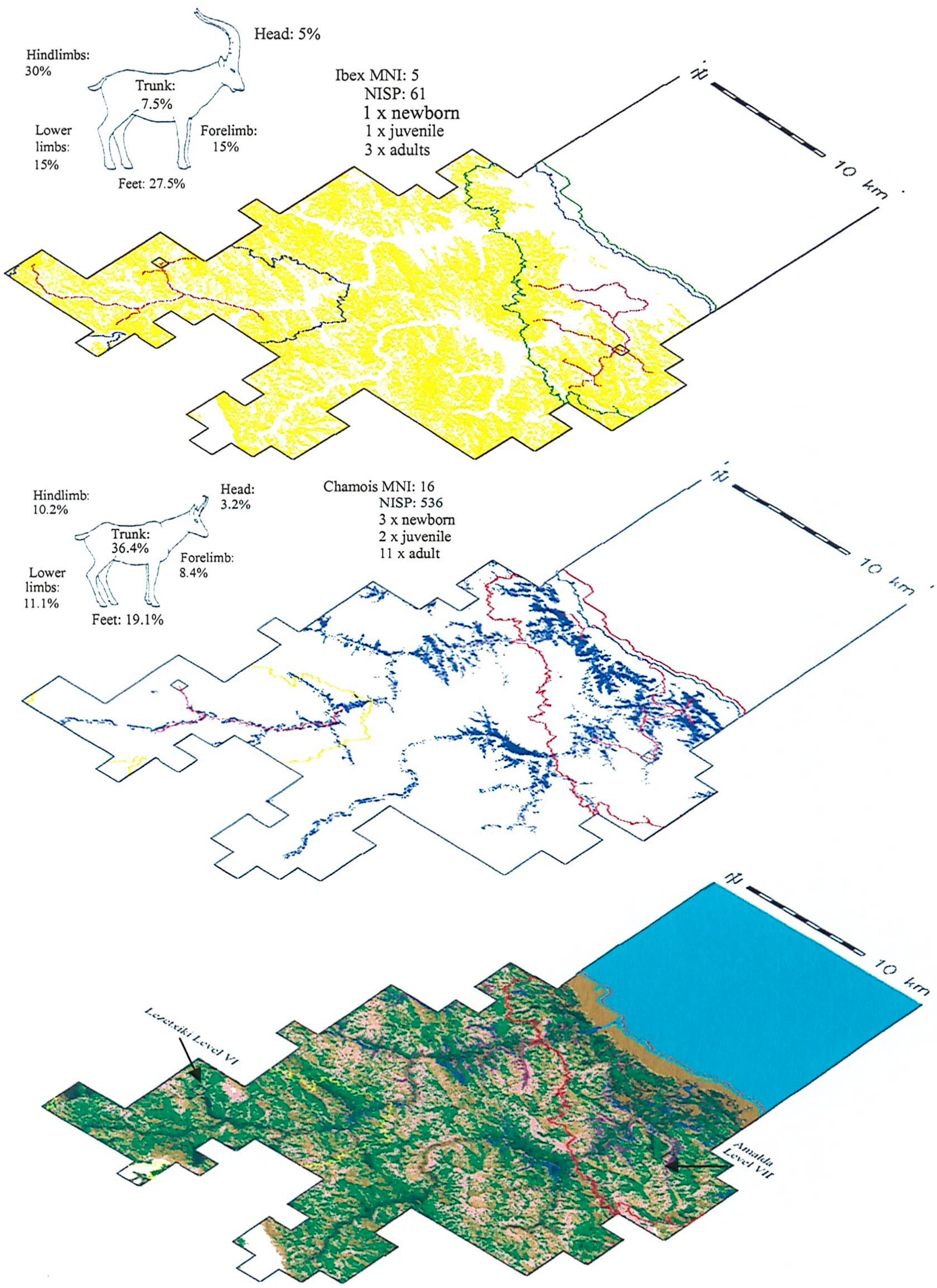

Figure 8.2c. OIS 5a/c, pathways associated with the hunting of ibex (yellow, top, pathways shown in green) and chamois (violet, middle, pathways shown in magenta) from Amalda VII in the winter landscape (bottom) of OIS 5a/c. Limit of day's return walk from Amalda shown in green (top) and red, from Lezetxiki in blue and yellow (bottom).

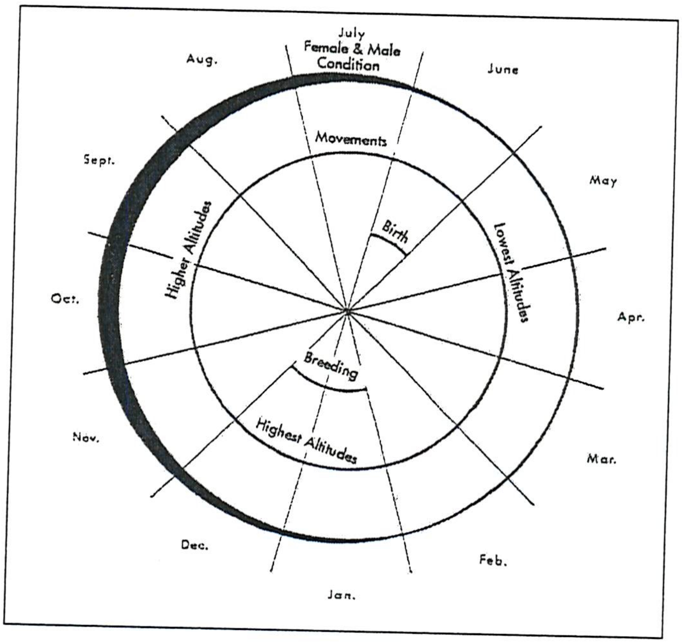

Figure 8.3. Seasonal variation of ibex influencing Palaeolithic hunter-gatherers (after West, 1997: fig 4.2.).

(Boyle, 1990: 92; males 30 – 60kg, females 25 - 45kg [MacDonald & Barrett, 1993: 215][51]) were carried downstream to Amalda by paths which followed the Alzolaras stream downriver northwest from the head of the valley – and probably passing close by Erralla, though excavations at this cave have yielded only Magdalenian material.

Clearly at least some ibex were also targeted in summer while located around the highest peaks of the area (of the minimum of five represent, one was an infant killed during its first summer [June]; table 8.2.; fig. 8.2.); patterns of movement associated with their hunting (figure 8.2.) are clearly rather similar to those of chamois; the two species share rather similar yearly cycles of behaviour (figure 8.3.) and were thus probably hunted in similar ways. Ibex kills, however, were more

[51] As a comparison, 'normal' US army rucksacks ('approach march load') weigh somewhere in the region of 31Kg, with 'emergency' march loads weighing anything up to around 68kg (http://www.rdecom.army.mil/rdemagazine/200403/itl_nsc_combat.html)

thoroughly butchered than those of chamois[52] and the meatier elements of the hindlimb as well as some of the more marrow-rich extremities, were carried back to Amalda – many phalanges show evidence of impact and fracture marks typical of those produced by marrow extraction (Altuna, 1990).

8.1.2. Bovids and horse

However, while chamois may be the dominant species in terms of number of individuals transported to the cave, the relatively small size of the species means that the fewer but larger bovids and horse whose remains were recovered from the site were probably more significant in terms of the overall meat that kills represented[53]. The bovid material identified from this level may in fact have only derived from three individual animals. One of these was an infant killed during its first summer (table 8.2.; May-June), one a juvenile and one an adult; the small mixed groups of bovids in which these animals lived were largely restricted to the coastal plain (figure 8.2.), easily reached within a day by hunters from Amalda, although, still within a day's walk, there are also other potential hunting grounds further south and especially around the relatively flat inland valley of the confluence of the Urola and Ibaiuda rivers to the southwest of the cave. The open-ground parts of the landscape preferred by bovids probably did not change significantly between the summer and winter months – although the shorter days probably placed the more southerly potential hunting grounds beyond a day's return walk from Amalda.

Individual, systematic hunting by coursing or stalking is a possible strategy for bovids. But communal or co-operative hunting is also a good strategy, usually aiming to surround animals in the open and drive them into ambush. Bovid herds are easily frightened and once stampeded have little control over the mass movement of the herd; they may be stampeded at speeds of up to 32mph over short distances (Boyle,

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[52] Alpine ibex (*Capra ibex*) males weigh between 80–125kg, females 40–55kg (Boyle, 1990: 91), although MacDonald gives much lower figures for Spanish ibex (*Capra pyrenaica*) of 60-80kg for males and 59-75kg for females (MacDonald & Barrett, 1993) – not that much larger than chamois although probably still heavier than a single person could comfortably carry, particularly in rough terrain.

1990: 86) over cliff faces, or in winter driven into deep snow drifts (although a moderate covering of snow presents bovids with few difficulties). Where there is a fairly large hunting party and a relatively small herd, the herd can be surrounded and driven in circles until exhausted and relatively easily dispatched (Freeman, 1973; Boyle, 1990), probably by hand-delivered thrusting spear (Churchill, 1993)[54]. These kills were clearly extensively butchered in the field and only selected anatomical parts (both meatier elements such as the femur and other elements more suggestive of marrow exploitation (Binford, 1978)[55] returned to the cave: a relatively high NISP/MNI possibly relates to a greater degree of fragmentation of the bones, although Altuna makes no explicit comment about taphonomic findings regarding marrow extraction in this level.

There is considerable overlap between the bovid and horse hunting grounds illustrated in figure 8.2., although with horses also concentrated on the coastal plain as well as along the flatter parts of the northern reaches of the Alzolaras and Urola valleys rather than in the flat meadows of the Urola/Urestilla confluence preferred by bovids. At least four individual animals are represented, two of which were infants killed in their first summer (Mid April – mid June; figure 8.4.; table 8.2.).

Horses probably grazed in small family ('harem' units of 5-6 mares, foals and yearlings and a stallion, which show considerable loyalty to their ranges year after year – these are thus likely to be well-known to hunters in the area. As with bovids, the size of the herd, speed of the animals and tendency to stampede makes co-operative driving a good bet although of course systematic hunting techniques such as coursing and stalking may also be practised – particularly in suitable terrain with plenty of cover (Freeman, 1973; Boyle, 1990) – although modern Hadza are known to

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[53] It is estimated that bovids comprised *c.*40% of the total meat weight represented by the assemblage in level VII of Amalda - other species: red deer 17.9%; horse 17.2%; chamois 16.1%; ibex 7.8%; roe deer 1.1% (Altuna, 1990: 158).

[54] Bearing in mind that adult male bovids weight between 800-900kg and females between 500-600kg, and stand about 180-195cm tall at the shoulder (Boyle, 1990: 83; MacDonald & Barrett, 1993), this was probably considerably easier written than performed.

[55] Binford's meat, marrow, grease and 'general utility' indices, although widely used, are based on two sheep (one juvenile, one senile) and a single caribou (see e.g. Reitz & Wing, 1999 for discussion of the problems associated with this small dataset and the application of the resulting indices). The indices are used here only for very general comparative purposes.

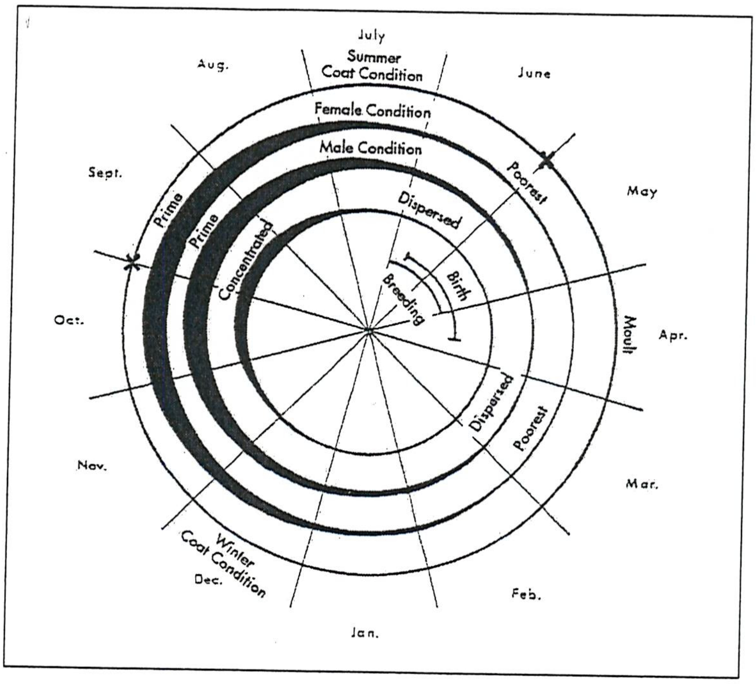

Figure 8.4. Seasonal variation of horses influencing Palaeolithic hunter-gatherers (after West, 1997: fig 4.2.).

kill zebra on foot (O'Connell *et al.*, 1990, 1992; cited West, 1997: 48).

West suggests that harem groups are more likely to have been targeted by hunters because of their relatively more predictable behaviour, shorter movements and smaller home ranges (1997: 48). Bachelor groups are significantly less predictable in their behaviour, only occasionally returning to territories year on year. Without young they are also better able to outrun predators and are likely to flee danger rather than fight – if cornered, they are generally stronger and more vicious than most individuals in harem groups.

The trails created and followed by horses are often well-defined through frequent use. With young at their heels, harem groups do not move far during the day and while the foals are young groups will re-use sleeping areas which are easily recognisable from the accumulations of dung. They will also return every day, or every other day, to predictable water sources, and both harem and bachelor groups can be ambushed at waterholes where they regularly drink – historically, Siberian groups are known to have captured wild horses by digging pits close to their waterholes (*ibid.*).

West envisions a possible hunting strategy thus:

> In ambush fashion, hunters could locate horse trails and wait for the dominant mare to approach followed by other members. The lead mare and her foal would be the first two animals wounded. Alarmed by screams at the front of the herd, the stallion would rush to the defense and would be dispatched. Milling mares and foals could be wounded at this point (1997: 48).

8.1.3. Red deer

At least five individual red deer are also represented in Amalda Level VII; red deer are a notably catholic species and fairly ubiquitous in the ecosystems of the Deba and Urola valleys in both summer and winter (figure 8.2.). Large-scale migrations were probably not a feature of red deer ecology in northern Spain at this time (Bailey, 1983a; Boyle, 1990), and in winter they probably congregated in sheltered valleys with relatively dense tree cover and thus little snow. Stags and hinds usually prefer separate winter ranges although they may overlap, and particular areas of winter habitats may become associated with groups of particular sex year after year.

The areas frequented by deer throughout the year were probably quite apparent to hunters; their feeding practices leave rather striking characteristic feeding signs, including broken and 'torn off' shoots and twigs and damage to trees that may result in highly characteristic patterns of tree growth, particularly where young trees are targeted repeatedly (Bang & Dahlstrom, 1974: 88). Larger trees along the edges of favoured wooded areas may also be cut off at a certain height, and signs of 'barking' resulting from cervid feeding activity (which differ significantly according to the season they are inflicted; *ibid.*) are often obvious. Strips of antler velvet or signs of tree 'fraying' produced by stags rubbing growing antlers against trees may also provide clues to the locations of animals and their sex and age. During the rut, of course, animals are easily found; the males' fights create a considerable amount of noise, and mud 'wallows' used at this time of the year are common and smell strongly (*ibid.*). Such signs would have been distinctive to experienced hunters, and if they were operating year after year in the area, they may well have been able to locate preferred targets in terms of age and sex to very particular areas.

This is of course significant because stags and hinds have rather different temporal cycles of behaviour and condition, with body-weights fluctuating as much as 20-30% over the course of the year (Boyle, 1990). Males are best hunted for meat in late summer and early autumn before the rut – at this time, they may have a layer of subcutaneous fat of up to 2cm thick, and as much as 30kg of subcutaneous and internal fat can be obtained from a single adult male. Nearly a third of a stag's bodyweight is lost over the course of the rut from the end of August to October; however, if antler is the prime goal of hunting, males may be targeted between early November and late February (antlers are cast in March/April). In contrast, females retain good quality meat reserves throughout the winter until the birth of young in May or June. However, without knowing whether the antler fragments from this level were shed or otherwise, and with no indication of the sex of the animals killed, it is difficult to evaluate the extent to which such targeting was the case among hunters operating out of Amalda during OIS 5.

This potential for the precision-targeting of individual animals is particularly relevant given the probable hunting techniques used to pursue red deer. Like other small-group or solitary woodland species (e.g. roe deer, three of which are also represented in level VII), red deer are best hunted systematically by stalking or coursing. Deer stalking is of course still practised today; it is of necessity an activity undertaken by individuals or at the most small groups. Deer are mainly active in the mornings and evening although they may feed all day (MacDonald & Barrett, 1993: 201; Boyle, 1990), often leaving forage for saltlicks around sunset, and modern-day deer stalking generally involves early morning 'harbouring' or reconnaissance to locate suitable prey.

> Having located the prey, the hunter must approach stealthily downwind prior to dispatching his target. Stalking is a time-consuming activity during which concealment may be necessary. Thus the positioning of the hunter is of importance if the expedition is to be a success (Boyle, 1990: 100).

Deer-hunting was thus probably a close-quarters, one-on-one process, involving the close identification and selection of the individual animal targeted according to a number of criteria. Following the kills represented in Amalda level VII, meat-bearing elements were carried back to the cave, with considerable numbers of mandibulae combined with few skull fragments suggesting that the rich, fatty tongue was also targeted, as were metapodials and particularly metatarsals.

8.1.4. Carnivore species

In addition to the ungulates species, a number of carnivore species are represented in Amalda level VII and particularly cave bear; although Straus has suggested that the cave might have been abandoned to hibernating cave bears and other carnivores during winter (there is no direct evidence to argue for year-round occupation of Amalda during OIS 5; Straus, 1992: 54). However, Altuna has argued convincingly against the interpretation of this level as a cave bear denning site on the basis of the anatomical representation of the species, and describe the assemblage as representative of a 'habitation' level (1990: 162, 166).

In any case, it is clear that Mousterian hunters operating out of Amalda clearly shared the landscape and overlapped in their hunting practices with a number of large carnivore species, with cave bear, wolf, hyaena and leopard perhaps the most significant (table 8.1.). However, with the exception of the cave bear and the two foxes, most carnivore species were represented by low NISP's[56] and high frequencies of teeth/skull fragments and extremities (phalanges, carpals, tarsals etc.; section A7.2.), and so it remains open to interpretation whether these finds represent animals present in the cave and liable to pose a threat to human/hominid interlopers.

In fact, with the possible exception of the leopard (Freeman, 1973: 4), few of these

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[56] See e.g. Altuna (1990) and Straus (1992) for debate regarding the calculation of carnivore indices from NISP or MNI figures.

species are likely to have presented much of a direct threat to hominids or humans unless provoked (e.g. Binford, 1978, 1981), or even to have been in direct competition with them (e.g. Kurtén, 1968; Altuna, Baldeón & Mariezkurrena, 1990: 156), and most are unlikely to choose as a den a cave subject to any significant disruption or activity (Stiner, 1994: 331). However, although it does not seem likely that these species provided significant competition for occupation of Amalda at this time, sporadic use is certainly possible and in any case, the findings of carnivore toothmarks on much of the faunal material suggest a certain amount of carnivore activity – probably, the accumulations of bones provided a good scavenging resource for unfussy carnivore species.

Certainly hominid and human inhabitants of the cave would have been aware of its use by other species, and the presence of carnivores is significant as a reflection of hominid populations' continuing interactions with other denizens of their environment at this time. Any individual encounters may have been fraught occasions, and caves undoubtedly represented a potential node of interaction in the intertwining patterns of movement of carnivore and hominid species, but such encounters took place within a wider sphere of understanding of relations between the species. For example, bears are viewed among the Nunamiut, as in many boreal traditional societies, 'with an attitude of respect and awe that reflects the bear's status as a "mighty kinsman"' (Binford, n.d.: 8), and hunters 'meticulously and continuously updated their knowledge' of local bears and dens, 'including which females used which dens and what the spoor of their cubs looked like as adults' (*ibid.*).

8.1.5. Living in the OIS 5 a/c ecosystem of the Deba and Urola valleys

From the materials recovered from Amalda level VII, then, we can begin to work back out into the landscape and the ecosystem within which the persons who created the archaeological record moved on a daily basis, their paths of movement intersecting with those their co-denizens in particular interactions - some aspects of which can be guessed at from the archaeological record. In sections 8.1.1.- 4. I have discussed not only the web of potential paths and tracks along which hunters would have moved through the ecosystems of the Deba and Urola valleys and the immediate vicinity of Amalda during OIS 5a/c, but I have also attempted to add to these something of the quality of the interactions represented in the level; the seasons in which kills were made, some educated guesses about the experience of locating and tracking other animal species – tracks and signs such as wallows, caught hair, grazed or browsed vegetation and so on - and about likely strategies of pursuit and killing as well as the butchery and transportation decisions made in each situation. Each of these aspects of activity adds another thread to the overall understanding of the faunal record – and the archaeological record more generally – contributing to our understanding of movement and activity around the cave site under investigation.

What I have *not* aimed to present in this section is a whole, fully rounded 'story' attempting to present the 'truth' of the experiences of the persons who created the deposits of Amalda level VII – what I have concentrated on is not so much the 'meaning' of the archaeological record as the ways in which meaning is constructed and structured through practical, habitual activity within a real world. Yet within this consideration of the intersections and interactions of persons, places and times sketched above, fragments of narrative, in the sense of series of activity strung together into tasks – 'body and place ballets', to use Seamon's term (Seamon, 1980: 157), do begin to coalesce: a small group of hunters move through the few oak, hazel and alder copses lining the Alzolaras valley in summer with the successful spoils of a chamois hunt – a newborn infant - slung whole between them, having descended from the alpine meadow and bare rock of the steeper parts of the landscape. And the events of the day are remembered and re-lived through re-tellings that reconstruct in narrative form its four-dimensional architecture in the presence and the ingestion of the physical reminders of the particular interaction: where the hunters went, how they acted, what was done and why, 'fixing' the structure of the activities involved into the understanding of the persons living within the landscape.

Figure 8.1. also demonstrates that during OIS 5a/c, there were at least two foci in the ecosystem, with Amalda level VII and Lezetxiki level VI both being assigned to this palaeoenvironmental phase. Obviously the time depth integrated in to the overall web of movement and activity created by the intersection of paths centred on these two sites is unknown - OIS 5a/c lasted more than 10,000 years in total, and therefore even

contemporaneity within living or folk memory cannot be assumed although a knowledge of the locations of these caves is likely to have been formed part of a wider understanding of the region as a whole and the affordances it provided for populations at the time. Nevertheless, the linkages hint at the possibility of wider patterns of movement and interaction in the area, suggesting that both caves were drawn into the paths of movement and activity during OIS 5a/c. Paths to and from hunting grounds from both sites also relate to other cave sites, notably Erralla, very close to Amalda, and Labeko Koba near Lezetxiki, although neither have yielded Mousterian artefacts (although the latter has a supposed Châtelperronian level IX [inferior]).

In this way, then, I argue, we can begin to – not precisely reconstruct, but perhaps re-imagine – the lifeways of these hominid and human populations without having to first assume a pre-existing, overarching cognitive structure to their lives; comparison between 'archaic' and 'modern' populations is not then simply a matter of *post hoc* explanation by 'just-so' stories that misuse evolutionary concepts.

In entitling this section 'living' in the OIS 5a/c ecosystem, I am aiming to bypass a sterile opposition between approaches prioritising 'dwelling', experiential and phenomenological readings of activity in the landscape, and those emphasising 'adaptational' and 'evolutionary' readings: humans necessarily both 'dwell' and 'adapt', and as argued in previous chapters (e.g. section 1.5.1.), a separation of the two would be artificial. Rather, the one inevitably entails the other. 'Adaptations' are not necessarily discrete genotypic characters (although of course they may be). Rather, here, they are seen as arising out of the practices of dwelling. As Ingold argues,

> It is not by assigning the position where I currently stand to spatial coordinates that an answer to the 'where' question is arrived at, but rather by situating that position within the matrix of movement constitutive of a region (Ingold, 2000f: 237).

And it is this matrix and its constant adjustment and negotiation as personhood and identity, I argue, that constitutes 'adaptation'.

8.2. OIS 3 WARM PHASE – LABEKO KOBA LEVEL VII (AURIGNACIAN)

Figure 8.5. presents all the pathways associated with summer and winter hunting attested to be Level VII at Labeko Koba. The lithic industry from the level has been identified as Aurignacian, and the level is the only one in the cave to demonstrate a complete chaîne opératoire in its lithic assemblage, suggestive of *in situ* knapping and possibly long-term habitation, rather than sporadic visits.

The patterns of movement described by hunters operating out of Labeko Koba mainly follow the directionality of the landscape of the southern Deba valley and its major tributaries. During OIS 3 interstadial conditions, individuals and groups moving along the course of the river valley would have moved downstream through relatively open heath/grassland with herbs and grasses, bindweeds, morning glory and sedges, as well as heathers, plantains and goosefoots in the later Arcy Interstadial (Iriarte, 2000), providing good hunting grounds for horse and bovids year-round as well as –closer to sheltered, wooded areas - for red deer and reindeer (figure 8.5.). In the immediate vicinity of the cave, choughs nesting in the steeper, rockier parts of the landscape would have been a common sight year-round, and swallows during the summer months.

8.2.1. Red deer

Along the line of the watercourse itself, home to mallards potentially killed for food, there were probably stands of hardier species of deciduous trees such as willow, hazel and alder as well as some mesothermophile species such as chestnut, and although steeper slopes around the valley and its major tributaries would probably have been bare rock with low heath scrub and alpine meadow plants, at lower elevations in more sheltered, gentle areas, open pine and birch parkland with occasional deciduous stands would dominate.

In these more sheltered and wooded areas, roe deer – and in winter red deer and reindeer, seeking sheltered over-wintering grounds in denser concentrations than in their more open-ground summer territories – were targeted individually, stalked by single hunters or small groups (see section 8.1.3.).

Habitats suitable for this catholic species were thus fairly ubiquitous in the immediate environment during summer (figure 8.6.), and even during the winter when herds retreat into more sheltered, wooded areas, parts of the landscape supporting suitable habitats line the southern part of the Deba valley and branch out into the more sheltered parts of its larger tributaries, well within a day's walk even during the restricted hours of midwinter.

Of a total of seven individual red deer represented in level VII (table 8.3.), at least one – a newborn fawn – was killed in the summer months (table 8.4.; figure 8.6.), perhaps during the week or two of May/June that newborn calves are left hidden while their dams forages (MacDonald & Barrett, 1993: 202): females are generally quite faithful to their territories year on year, and hunters may have known where to find prey. Another three of the remaining seven individual animals represented in the level were juvenile, and three adult (figure 8.6.). At least one rack of antlers was identified, suggesting either hunting of a stag between November and February, or collection of shed antler later in the year.

Juveniles are almost entirely represented by teeth and mandibular fragments (section A7.5.[57]); adults also demonstrated a strong bias towards cranial elements, but there were a few limb-bones, notably the marrow-rich metapodia and tibia as well as the forelimb (figure 8.6.). Clearly, after a successful kill, butchery focused not solely on meat but also on marrow and the rich, fatty cranial tissues such as the brain and tongue, and these elements required more processing than was possible – or perhaps advisable, given the presence in the region of various carnivore species – in the field.

At least one red deer fawn was killed in summer (May-July), but although juveniles (especially fawns) may be easier to catch and kill than adults, calves lack substantial fat reserves during the first year, and older animals tend to have around three times as

[57] This may, of course, be a pattern best ascribed to taphonomic factors. Juvenile bones are more porous than those of adults, not having properly calcified, and are therefore more vulnerable to destructive chemical and mechanical processes (Lee Lyman, 1994).

much fat as well as substantially higher fatty marrow content. Males are best hunted for meat during the late summer and early autumn, at the same time of year as the infant fawns were killed, but given the patterns of butchery described above, it is tempting to suggest that the majority of red deer were targeted in winter when body fat reserves were lower.

	Labeko Koba Level VII			
	NISP	**NISP%**	**MNI**	**MNI%**
Rangifer tarandus	0	0	0	0
Cervus elaphus	79	8.6	7	14.3
Megaloceros giganteus	2	0.2	1	2
Capreolus capreolus	2	0.2	1	2
Rupicapra rupicapra	23	2.5	2	4.1
Bovini	111	12.1	7	14.3
Equus sp.	183	19.9	9	18.4
Sus scrofa	1	0.1	1	2
Coelodonta antiquitatis	21	2.3	4	8.2
Mammuthus primigenius	6	0.7	1*	2
Ungulates	**428**	**(46.6)**	**23**	**(67.3)**
Ursus spelaeus	338	36.8	2†	4.1
Canis lupus	128	13.9	11	22.4
Vulpes vulpes	2	0.2	1	2
Meles meles	22	2.4	1	2
Panthera pardus	1	0.1	1	2
Crocuta crocuta	0	0	0	0
Carnivores	**491**	**(53.43)**	**16**	**(32.7)**
Total	**919**		**49**	

* All fragments are of ivory and may not therefore represent an individual animal/hunting episode.

† MNI estimated from anatomical representation data

Table 8.3. Animal species represented in Labeko Koba Level VII (after Altuna & Mariezkurrena, 2000: tables 1 and 2).

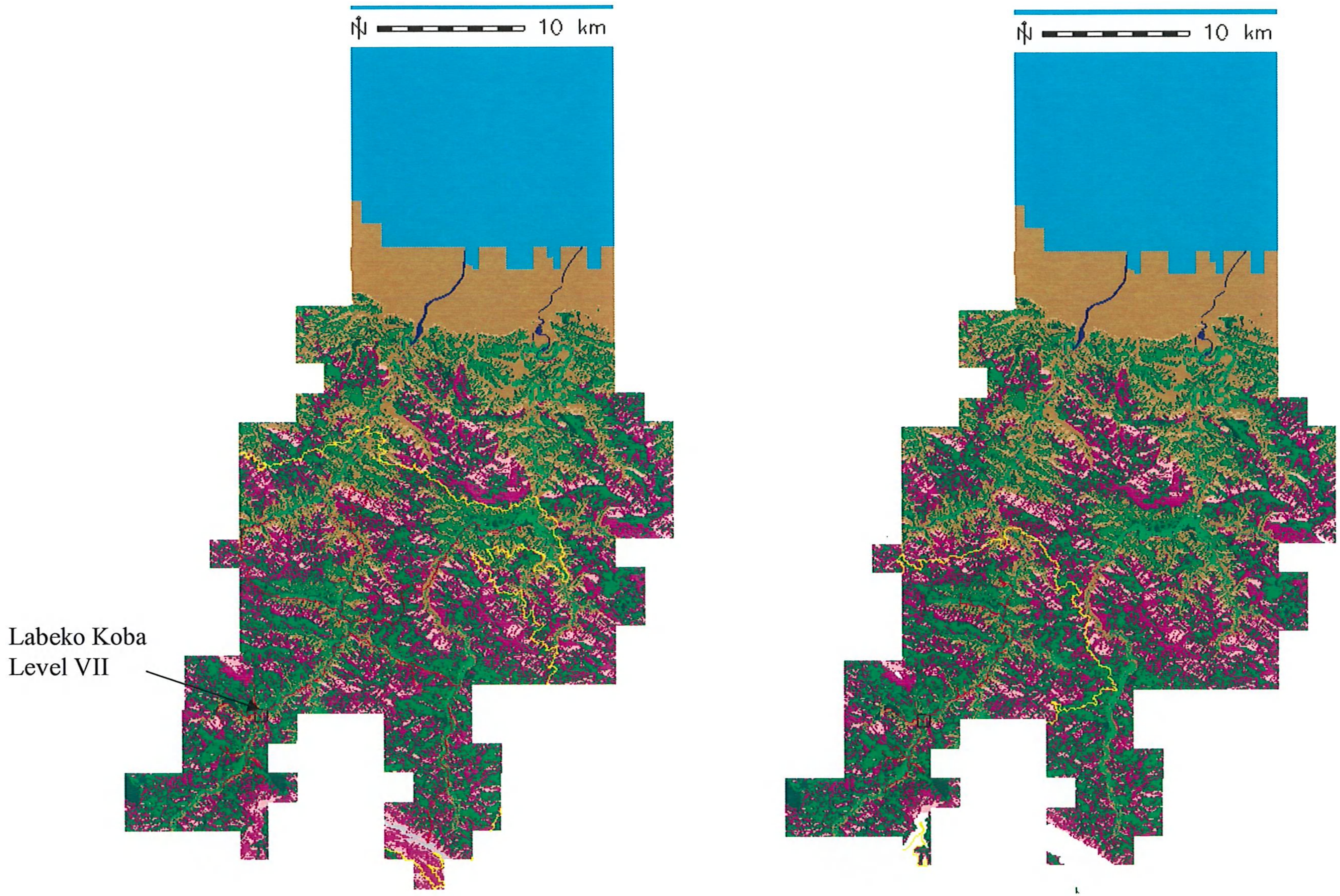

Figure 8.5. OIS 3 Interstadial, Labeko Koba Level VII (Aurignacian), all paths (in red) associated with summer (left) and winter (right) hunting. Yellow line denotes limit of day's return walk from Labeko Koba.

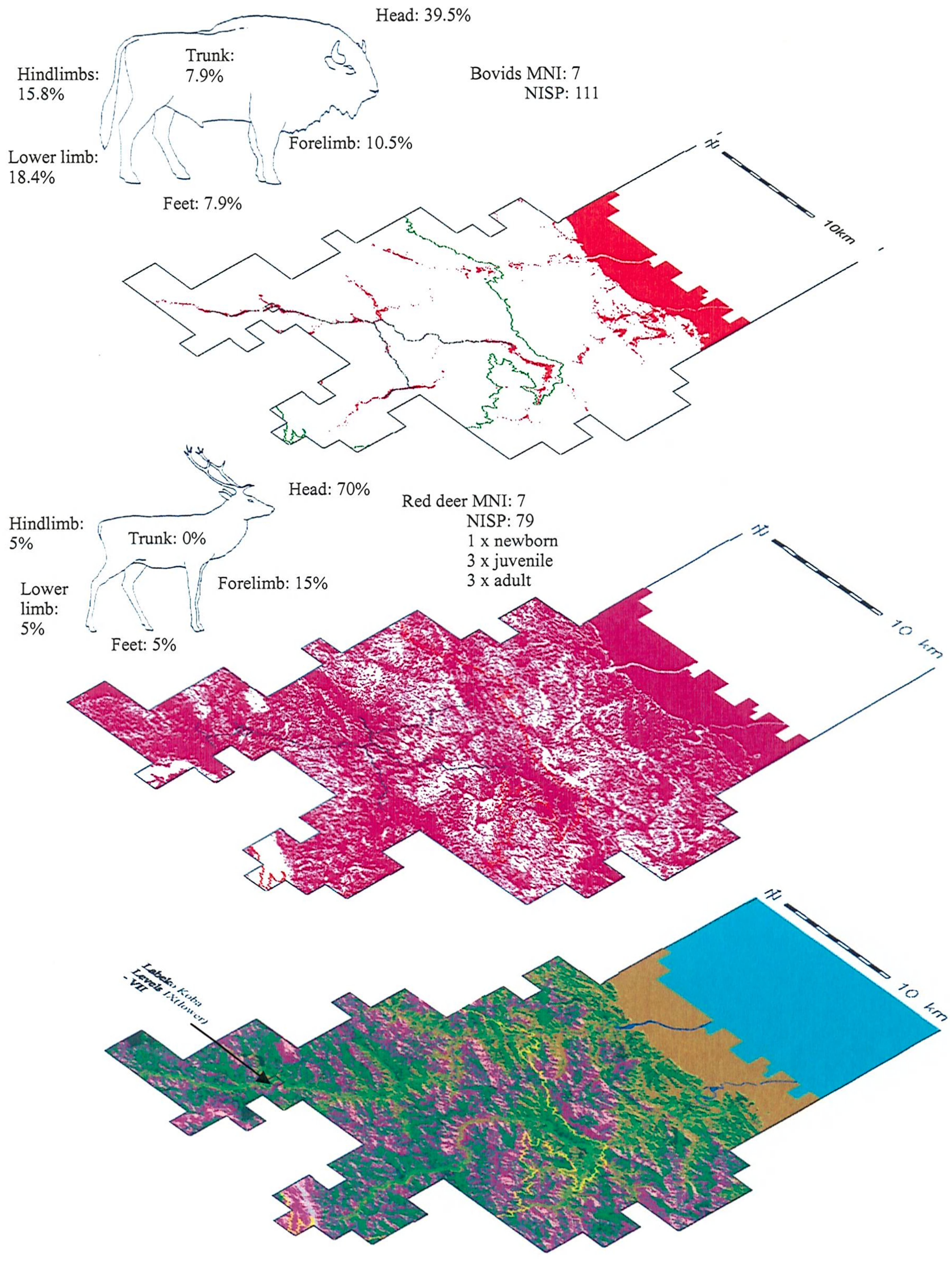

Figure 8.6a. Pathways (in black) associated with the hunting of bovids (red, top) and red deer (magenta, middle) from Labeko Koba level VII in the summer landscape (bottom) of a 'warm' phase of OIS 3.

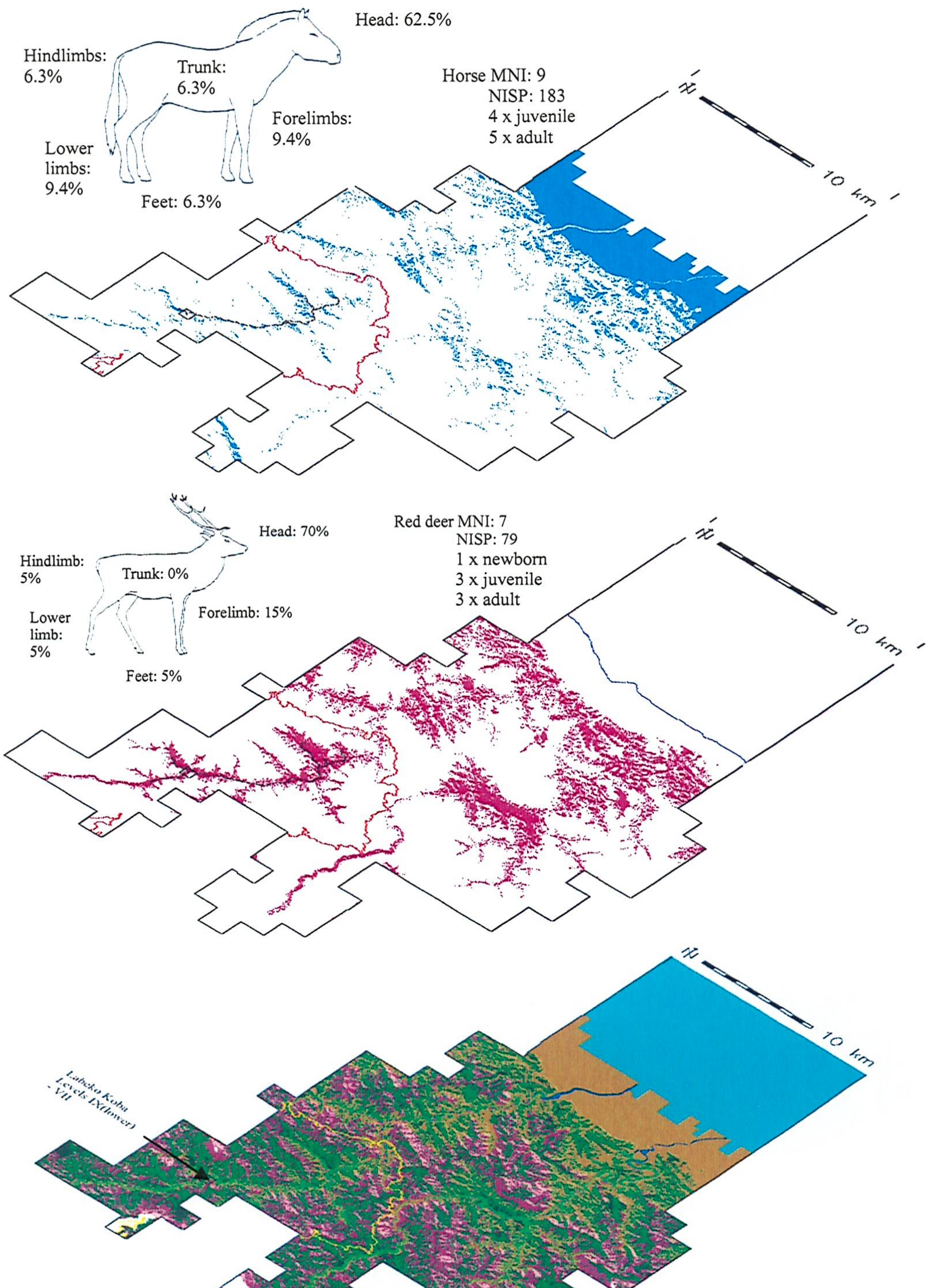

Figure 8.6b. Pathways (in black) associated with the hunting of horse (blue, top) and red deer (magenta, middle) in from Labeko Koba VII in the winter landscape (bottom) of a 'warm' phase of OIS 3. Red line denotes limit of return day's walk from Labeko Koba.

	Sus scrofa	*Cervus elaphus*	*Rupicapra rupicapra*	*Equus sp.*	*Coelodonta antiquitatis*
Newborn	0	1	0	1	0
Juvenile	0	3	0	3	2
Adult	0	3	1	5	2
Old	1	0	1	0	0
MNI/Total	**1**	**7**	**2**	**9**	**4**

Table 8.4. Ageing data for ungulate species from Labeko Koba level VII (after Altuna & Mariekurrena, 2000).

8.2.2. Horse and bovids

The seven individual red deer represented at Labeko Koba, however, are outnumbered by the nine horses and equalled by the seven bovids identified. Ecotypes of the kind favoured by these grazers are less common than those of red deer in the immediate environs of the site. Small family groups were probably scattered downstream along the wider, gentler parts of the Deba valley and the more open areas of its major tributary streams downstream of Labeko Koba, with suitable habitats becoming more widespread further north before the open heath/grass expanse of the coastal plan. Other potential hunting grounds are located across the watershed of the Elosu pass[58] into the Urola valley to the gentle, open Azkoitia/Azpeitia plain at the confluence of the Ibaiuda and Urola rivers. By far the most promising area, however, is the extensive coastal plain.

As discussed in section 8.1.2., these animals could have been hunted by coursing or stalking, or been stampeded by small groups of hunters, or even targeted by deadfall or ambush, perhaps using areas of suitable topography in the landscape.

For horses, a focus on juveniles (table 8.4.) suggests the targeting of harem groups (see section 8.1.2. for discussion; sadly there is little evidence regarding sex/age cohorts or seasons targeted for bovids in this level), and once a kill had been made, field butchery apparently focused on the removal of the head (62.5% of elements

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[58] Between the peaks of Kurutzebakar and Irimo, perhaps following the path of the modern day GI-3750 between Vergara and Azkoitia (fig. 6.5.).

derive from the head – although many of them are teeth; with the exception of a single humerus, all finds identified as juvenile horse from level VII are dental – see footnote 8) for transport of the protein- and fat-rich brains encased in their own handy carrying and perhaps cooking container (Reitz & Wing, 1999: 204) back upstream or across the Elosu pass to Labeko Koba. At least one hunting episode (that of the newborn foal, killed between April-June of its first year of life) occurred during the summer months.

There is no specific indication in the site report regarding the ageing or sexing of bovids; the apparent dominance of cranial elements (fig. 8.6.) is mainly accounted for by teeth, with the axial elements poorly represented and the main emphasis being on the limbs; the marrow-rich tibia accounts for at least three of the seven individuals represented.

8.2.3. Chamois

The higher elevations of the slopes around the valleys were probably largely bare rock with some low scrub/alpine meadow vegetation on the gentler areas of the higher parts of the landscape. These areas, around the southern end at the head of the Deba valley, provided good summer hunting grounds for chamois during the deposition of Level VII, although in sharp contrast to the situation at Amalda, the species does not seen to be particularly targeted by hunters operating out of the cave. Only two animals identified to this species were recovered from this level, and these were represented by only a few scattered elements, mainly teeth but with some ribs, lower limb and pedal fragments despite the fact that, in winter, the descent of the chamois to lower, more sheltered and wooded habitats placed the cave in an ideal position to exploit the species, with potential hunting grounds along the slopes of both sides of the Deba valley in the immediate vicinity of Labeko Koba.

8.2.4. Other species

Other species represented at Labeko Koba in level VII include giant deer, roe deer and wild boar, as well as at least four individual woolly rhino. Most of these species are identified from only one or two elements; giant deer and wild boar solely by teeth and roe deer by a fragment of horn core and a femur. Of the four rhino identified, two were juvenile (represented solely by teeth) and two adult, represented by a single rib fragment, two humeri, two radii and a metapodial; Altuna & Mariezkurrena consider it doubtful that this species was hunted, suggesting rather that the material from this species was scavenged (2000: 158). The Pleistocene rhinoceros was somewhat smaller than its extant relative (Boyle, 1990: 95); nevertheless, with even the lightest currently extant species, the Sumatran rhino, weighing in at around 800kg[59], woolly rhinoceri were certainly still very large and potentially dangerous animals – but not that much more so than bovids (weighing between 500-600kg for females and 800-900kg for males (*ibid.*: 83; MacDonald & Barrett, 1993), and Boyle suggests that, given sufficiently large group of hunters to drive or beat the animal towards the trap, animals may have been chased into drifts of deep snow in winter or into muddy swamps where they could then be dispatched. Alternatively, deadfalls or pitfalls could also have been used (1990: 83).

Suitable hunting grounds for these less-often targeted (or encountered) species were probably rather thin on the ground in the immediate vicinity of the cave (Appendix 9), although the giant deer at least might have been more numerous on the coastal plain sharing the open heath/grasslands with horse and bovids. The relatively well-developed woodlands of the area during OIS 3 (fig. 7.2.), however, probably provided good habitats for roe deer and wild boar that would have been well within reach of the Labeko Koba.

Carnivores are also still represented in the assemblage, particularly wolf – however, with evidence of summer hunting by human occupants of the cave (April-June), and modern female wolves 'denned up' by May (Binford, 1978: 198; see also Stiner,

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[59] www.sandiegozoo.org/animalbytes/t-rhinoceros.html - 69k - 4 Sep 2004

1994: table 12.1), even if wolves were denning at Labeko Koba they were probably not in significant competition for the cave. Nevertheless, Labeko Koba still represented a potential site of interaction with these species for its human/hominid inhabitants.

8.2.5. Living in the 'warm' phase OIS 3 ecosystems of the Deba and Urola valleys

Although Labeko Koba level VI is the only cave site in the area known to have been occupied during OIS 3, clearly the pattern of potential movement illustrated in figure 8.5. describes only part of the larger-scale matrix of activity in which the earliest Upper Palaeolithic populations of Labeko Koba participated. Lithic raw materials were also brought to the cave from further field. The preferred raw material (62.2%) represented in level VII came from the south, from outcrops in the carboniferous rocks of the northern border of the Sierra de Urbasa[60] some 40km from Labeko Koba (the closest of the sources identified). Nearly a quarter of the raw material came from outcrops 50-60km from the cave in carboniferous Miocene lake deposits from the Miranda-Treviño syncline, exposed in the Sierra de Araico and Sierra de Cucho[61], and a small amount (7%) also derived from the coastal flysch of the vizcaino syncline between Getxo and Gernika along the Mundaka Estuary 60-70km to the northwest[62].

Paths to and from these southern sources either followed the mid contours of the northern slopes of the Sierra de Aizkorri, or followed the Deba river upstream/south to its source, crossing the Arlabán pass on the westernmost edge of the Sierra de Aizkorri (following the modern GI-627 Arrasate/Mondragón – Vitoria-Gasteiz). Both of these routes were almost certainly taken during the summer months, as heavy snowfall at higher elevations was liable to render the higher parts of both routes difficult if not impassable. However, it does not seem that these paths were a strong part of the overall pattern of movement and activity of populations at this time, as 'the

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[60] The outcrops are located on the Navarrese side of the meeting point of the modern-day borders of Guipúzoca, Alava and Navarre (Tarriño, 2000).

[61] Geologically speaking these sierras are a single massif bisected by the river Ibaiuda in Orduña, nowadays an enclave of Vizcaya in the province of Alava south of Vitoria-Gasteiz near the twon of Treviño.

[62] This source accounted for 36.8% of raw lithic material in the previous level IX (inferior).

exploitation of raw materials throughout the whole sequence is of such an extent as to hint at a serious shortage of lithic resources' (Arrizabalaga & Altuna, 2000: 393).

With such a small sample size, it is difficult to comment on any differences between the Middle Palaeolithic level of Amalda VII described in section 8.1., and this Upper Palaeolithic level of Labeko Koba level VII. With a broader sample, larger-scale patterns might emerge from the data more clearly.

Although the specifics of the wider matrix of movement and activity in which the site was situated during OIS 3 is clearly very different to that of OIS 5 a/c and Amalda VII, the interactions attested to by the faunal assemblage do not seem radically different in kind. Clearly butchery patterns varied (contrast figs. 8.6. and 8.2. – see Charles, 2000 for discussion of variation in butchery practices as 'ethnic' markers). But those aspects of subsistence practices considered 'modern' (section 3.3.) are not immediately apparent – if anything, Amalda VII appears *more* specialised than Labeko Koba VII (although, admittedly, its focus on chamois is unusual among Middle Palaeolithic sites (Altuna, 1990: fig 8.13.).

In short, then, it is difficult to come to any conclusions from only two levels regarding the differences and/or similarities in Middle and Upper Palaeolithic personhood as constituted by the movement and activity of populations within their four-dimensional ecosystems. However, although no obvious radical differences present themselves thus far, by addressing the issue in these terms, rather than with a 'checklist' of archaeological proxies for 'modernity' that do little more than dignify our assumptions and biases, a level playing field is established. Rather than seeing Neanderthals as 'adapting' and so-called 'modern' humans as 'dwelling' (i.e. being characterised by a 'niche' and a 'cultural' geography respectively; Binford, 1987: 18), the processes by which both populations construct their identities and personhood, simply by 'living', is emphasised, allowing their comparison on equal terms, and the comparison of the patterns outlined here with others will shed light on any larger-scale process and any similarities or differences.

8.3. DRYAS IA: AMALDA LEVEL IV (UPPER SOLUTREAN)

As in OIS 5a/c (section 8.1.), the directionality of the landscape clearly constrains pathways in the immediate vicinity of Amalda to the course of the Alzolaras stream itself. During Dryas Ia and other 'cold' phases of the LGM, the vegetation along the watercourse would have been low, steppic scrub and grasses, including species such as chamomile and plantain, perhaps with small stands of pine and potentially some hardier deciduous species (hazel, some oak; AP <10%; Dupré, 1990: fig. 3.1.) along the course of the stream in sheltered spots. Along the Urola river itself, stands of trees survived in more sheltered spots, with more open patches of steppe-tundra dominated by grasses in the lower, flatter areas. Mallard (possibly hunted for food) were known on the stream and river, thrushes in the valley meadow and jay in the areas of woodland (Eastham, 1990).

The slopes of the valley during stadial phases of the LGM would probably have been mainly bare rock in the steeper sections and low steppic scrub and shrubs in the lower of the gentler sections and alpine meadow in the higher, flatter ground around the fringes of the valley, with buntings and partridge (another possible food resource, perhaps trapped) common in the open garrigue around the cliffs and chough nesting on the bare rock faces themselves. Summer snowlines were probably still high enough that in the summer months there were unlikely to have been any areas, even on the higher local peaks, that could not potentially have been reached by prey animals or by hunters. In winter, however, snowfall probably made the higher peaks of Erlo and its surroundings functionally impassable, and closer to Amalda, the higher peaks around the southeast of the Alzolaras valley (Mendibeltz, Akategi and Mako) as well as Pagoeta, whose southwestern slopes form the slope of the Alzolaras valley, would probably have been impassable.

8.3.1. Chamois and ibex

In the uplands immediately to the east and southeast of the valley, the summer hunting grounds of chamois seem to have been the major focus of movement around the landscape, with sixteen individual animals killed (table 8.5). Kills made here, on the northern slopes of Erlo or the peaks around the Urola valley to the southwest included infants targeted during the summer months (May/June; table 8.6) and virtually whole carcasses of the animals killed appear to have been carried back to Amalda.

In the higher, steeper uplands above the chamois hunting grounds ibex were also targeted, albeit at a lower frequency – nine individual animals were represented in this level. Again, a significant proportion of animals killed were infants killed soon after birth during the summer months. When animals of this species were killed, however (at least for adult animals), field butchery removed the meatier parts of the trunk and limbs back to the cave (fig. 8.8.).

	Amalda Level IV			
	NISP	**NISP%**	**MNI**	**MNI%**
Sus scrofa	5	0.6	1	2
Cervus elaphus	144	16.5	8	16
Rangifer tarandus	1	0.1	1	2
Capreolus capreolus	1	0.1	1	2
Megaloceros giganteus	1	0.1	1	2
Bovini	9	1.0	1	2
Rupicapra rupicapra	503	57.7	16	32
Capra pyrenaica	134	15.4	9	18
Equus ferus	2	0.2	2	4
Ungulates	**800**	**(91.8)**	**40**	**(80)**
Canis lupus	9	1.0	1	2
Vulpes vulpes	27	3.1	3	6
Ursus spelaeus	35	4.0	6	12
Carnivores	**71**	**(8.2)**	**10**	**(20)**
Total	**871**		**50**	

Table 8.5. Animal species represented in Amalda Level IV (after Altuna, 1990: table 8.23).

With nine individual animals represented, the ibex is the second most frequent species with which the inhabitants of Amalda during Dryas Ia interacted. At least four of the animals were infants, again killed in the first month of life, and of the five adults, at least one was male and one female[63]. The pattern of anatomical representation (fig. 8.8.) suggests a pattern of butchery rather similar to that applied to red deer carcasses, with upper limb-bones and feet emphasised.

8.3.2. Red deer, horse and bovids

Pathways leading out of the mouth of the Alzolaras valley and following the Urola river either upstream to the inland Azpeitia/Azkoitia valley, or downstream to the hills south of the coastal plain and of the modern day town of Mutriku led to potential red deer as well as horse and bovid hunting grounds, with the former species occupying those parts of the landscape where mixed open and more sheltered woodland prevailed and the latter two preferring the open steppic habitats of the valley bottoms and exposed low hillsides (fig. 8.8.).

Only two horses are represented in the level, both by a single tooth; one an adult and one a newborn foal killed between April-June (fig. 8.8; table 8.6.).

Only a single adult bovid is identified from this level of Amalda. In terms of meat weight, however, this single individual may have accounted for around 22% of the total meat represented by the assemblage (as opposed to the 16.6% contributed by the 16 chamois). The anatomical elements recovered included fragments of mandible and lower teeth, a single vertebra and rib, a radius, a femur and a first and second phalanx (Appendix 9); all elements that might represent either joints of meat or elements requiring further, more laborious and time-consuming processing, suggestive of considerable field butchery before selected elements were carried back to Amalda.

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[63] Altuna (1990) identifies two pieces, a calcaneum and a 2nd phalanx, as male, and one (a 2nd phalanx) as female. As sexing was presumably done metrically, I have assumed that these animals were both adult.

Eight red deer were identified in the level (accounting for *c.* 20.6% of the total meat weight represented by the assemblage). At least half of these were infants killed in summer (table 8.6.); the presence of antlers, however, also suggests either the hunting of antler-bearing stags during winter or the collection of shed antlers in late winter/early spring, when the parts of the landscape associated with red deer shrank to sheltered wooded areas in the mosaic environments of the hills south of Mutriku and the northernmost parts of the Urola valley, easily accessible from Amalda even during the shorter winter hours of daylight. These parts of the landscape were also preferred – year round – by wild boar and roe deer, both represented at a low frequency in this level. Butchery of red deer was evidently performed in the field when animals were successfully killed, and the meatier upper limb-bones and marrow-rich lower-limb bones and phalanges returned to the cave – the phalanges were heavily fragmented, displaying the characteristic patterns of having been split for marrow extraction (figure 8.8).

	Cervus elaphus	Rupicapra rupicapra	Capra pyrenaica	Equus ferus
Newborn	4	2	4	1
Juvenile	1	2	1	0
Adult	3	12	4	1
Total/MNI	**8**	**16**	**9**	**2**

Table 8.6. Ageing data for selected ungulate species from Amalda Level V (for all other ungulate species only adults are represented; after Altuna, 1990).

8.3.3. Other species

Wild boar, reindeer, roe deer and giant deer were all represented by a single individual apiece, and all three cervid species by only a single identified fragment – a 1st phalanx, a 2nd phalanx and a metatarsal respectively. Five pieces were identified as wild boar, three teeth and two ribs – one of the teeth was an upper canine indicating that the animal was male.

Bird species represented are rather similar to those of other levels, with a few raptor species, including kestrel (possibly as many as three individual birds), peregrine (possibly two birds) and a single tawny owl bone. At least four rock doves were represented, and 56 choughs were recovered from a concentrated area of the deposit, perhaps suggesting deliberate killing (Eastham, 1990: 245). Other species included the crested lark, blackbird, corn bunting, magpie, raven and mallard (perhaps a food species). A wheatear was also identified from the level (although only from one bone); this bird is a regular summer migrant to the area, arriving in March/April and departing again in August/Nov. As this represents the first instance of a regular avian migrant at the site, Eastham suggests that its presence in the assemblage may indicate a change in occupation patterns resulting in an overlap of human and bird presence (*ibid.*: 249).

A number of molluscan species were also identified, including fragments of two limpet shells, one topshell, 15 periwinkles, two cowrieshells and six mussels (Borja, 1990), evidence that the matrix of pathways extended to the coastline (although these are not specifically illustrated in fig. 8.7.). Two *Salmo* sp. bones were also recovered (Muñiz & Izquierdo, 1990), and could have been caught in either the Urola river, or possibly in the Alzolaras stream itself.

A wolf, three foxes and at least six cave bears were also represented – again, although they were probably not in significant competition with the human inhabitants of the cave, they certainly would have been associated with it as part of its recognition as an identified-with 'place' in the landscape.

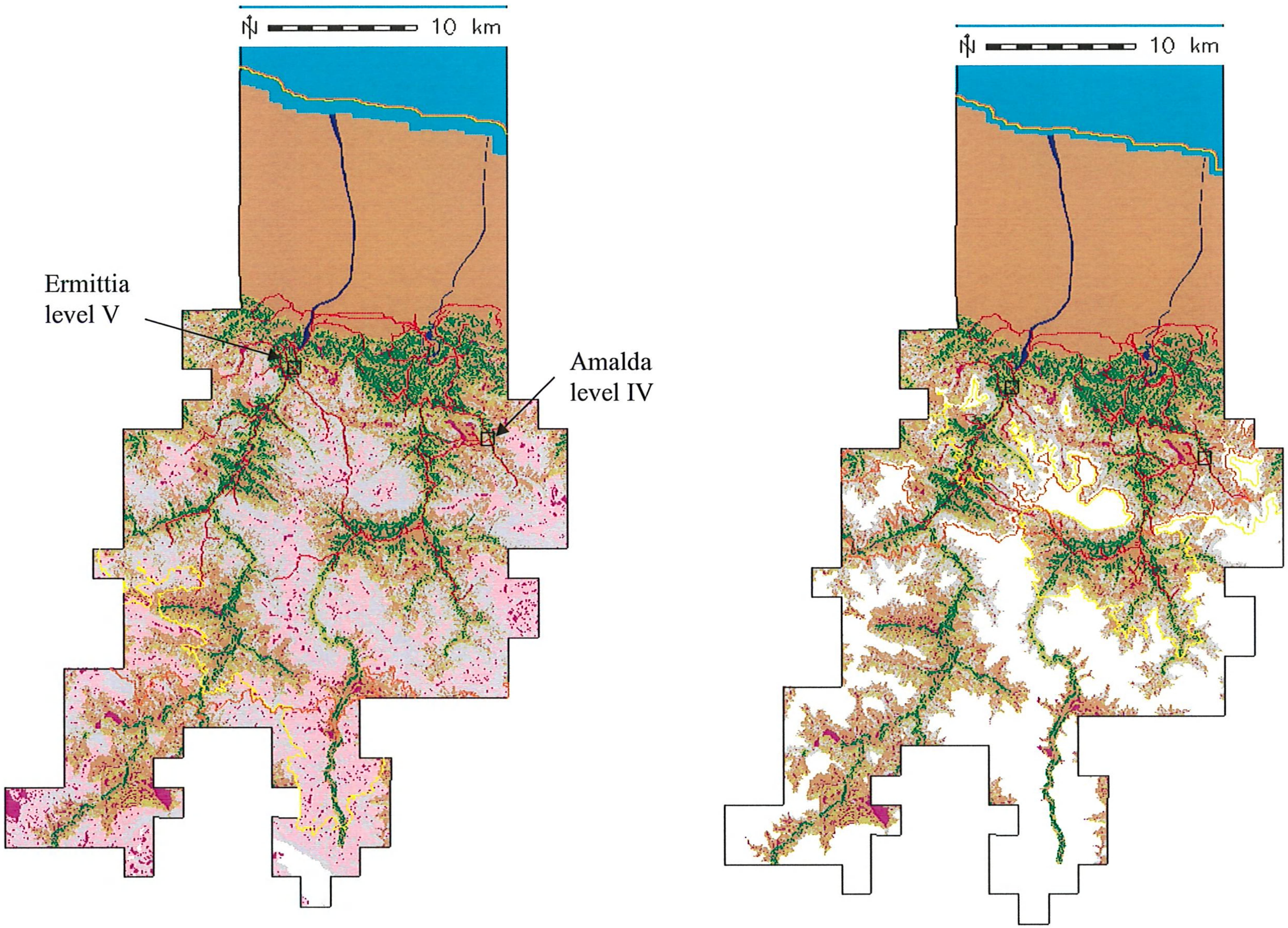

Figure 8.7. Dryas Ia, Amalda IV (Upper Solutrean) and Ermittia V (Upper? Solutrean), all paths (red lines) associated with summer (left) and winter (right) hunting. Yellow line denotes limit of day's return walk from Amalda, orange from Ermittia.

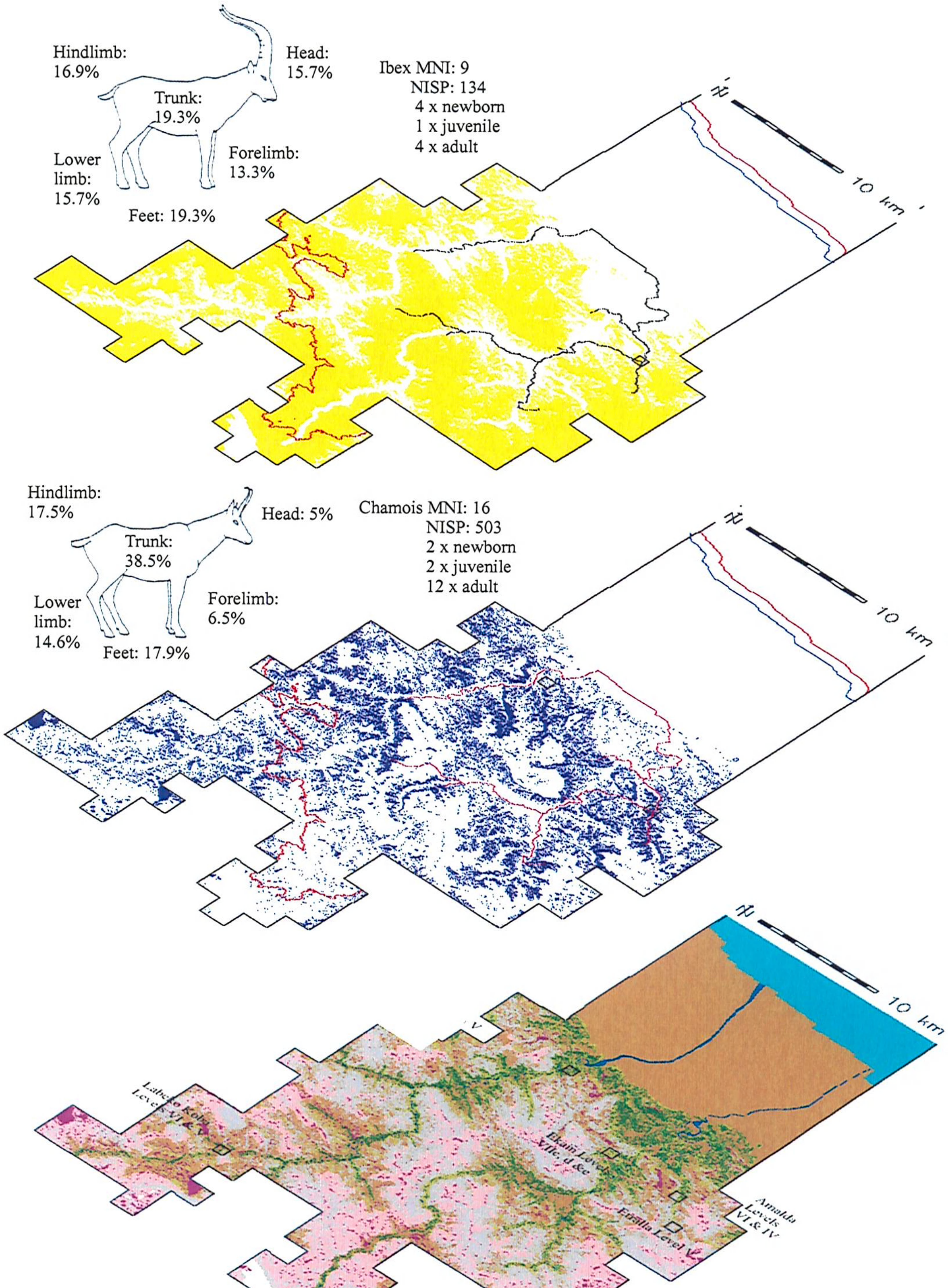

Figure 8.8a. Pathways associated with the hunting of ibex (yellow, top, paths in black) and chamois (violet, middle, paths in magenta) from Amalda Level IV in the summer landscape (bottom) of Dryas Ia. Red line denotes limit of day's return walk from Amalda

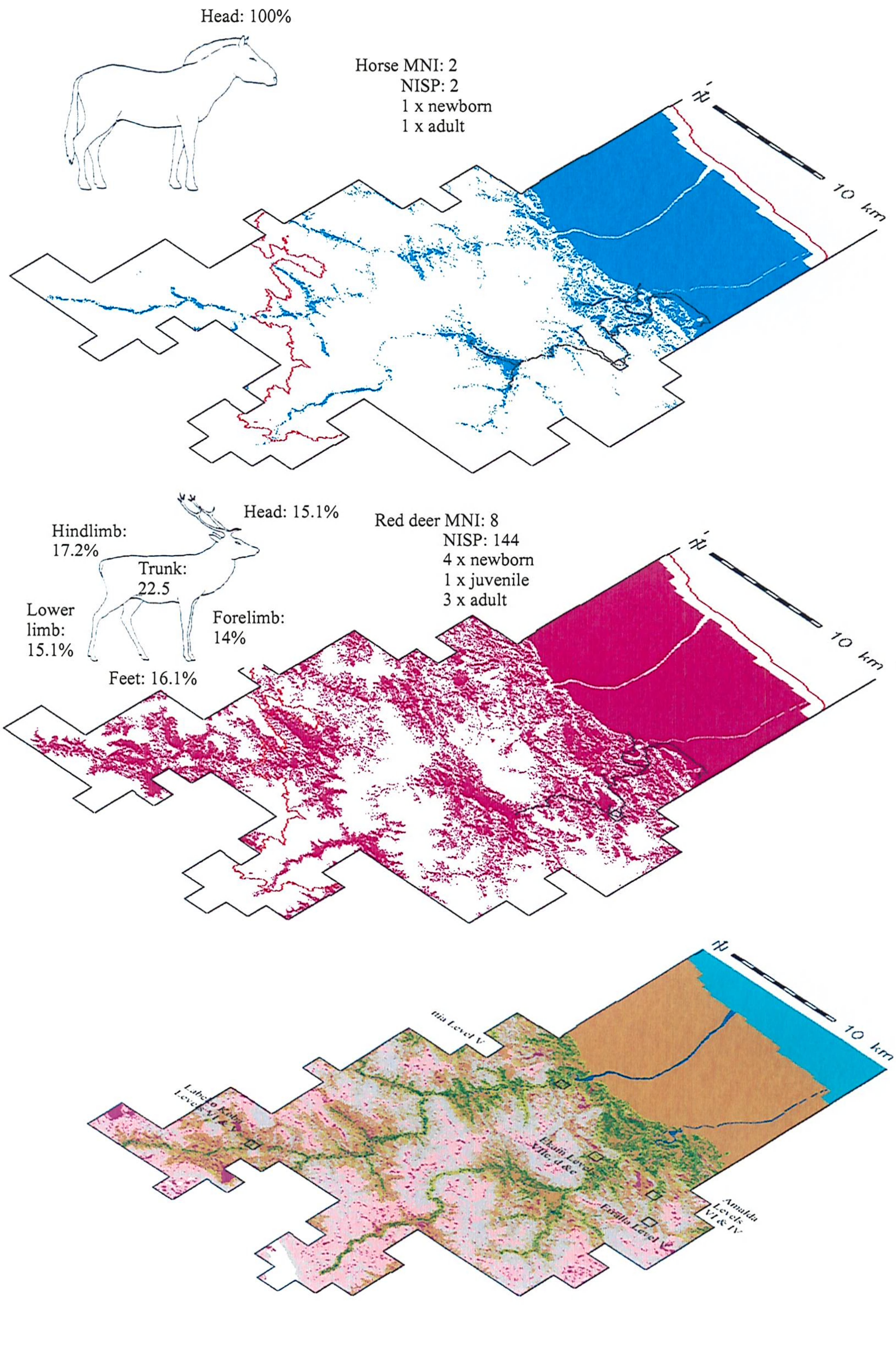

Figure 8.8b. Pathways (in black) associated with the hunting of horse (blue, top) and red deer (magenta, centre) from Amalda Level IV in the summer landscape (bottom) of Dryas Ia. Red line denotes limit of day's return walk from Amalda.

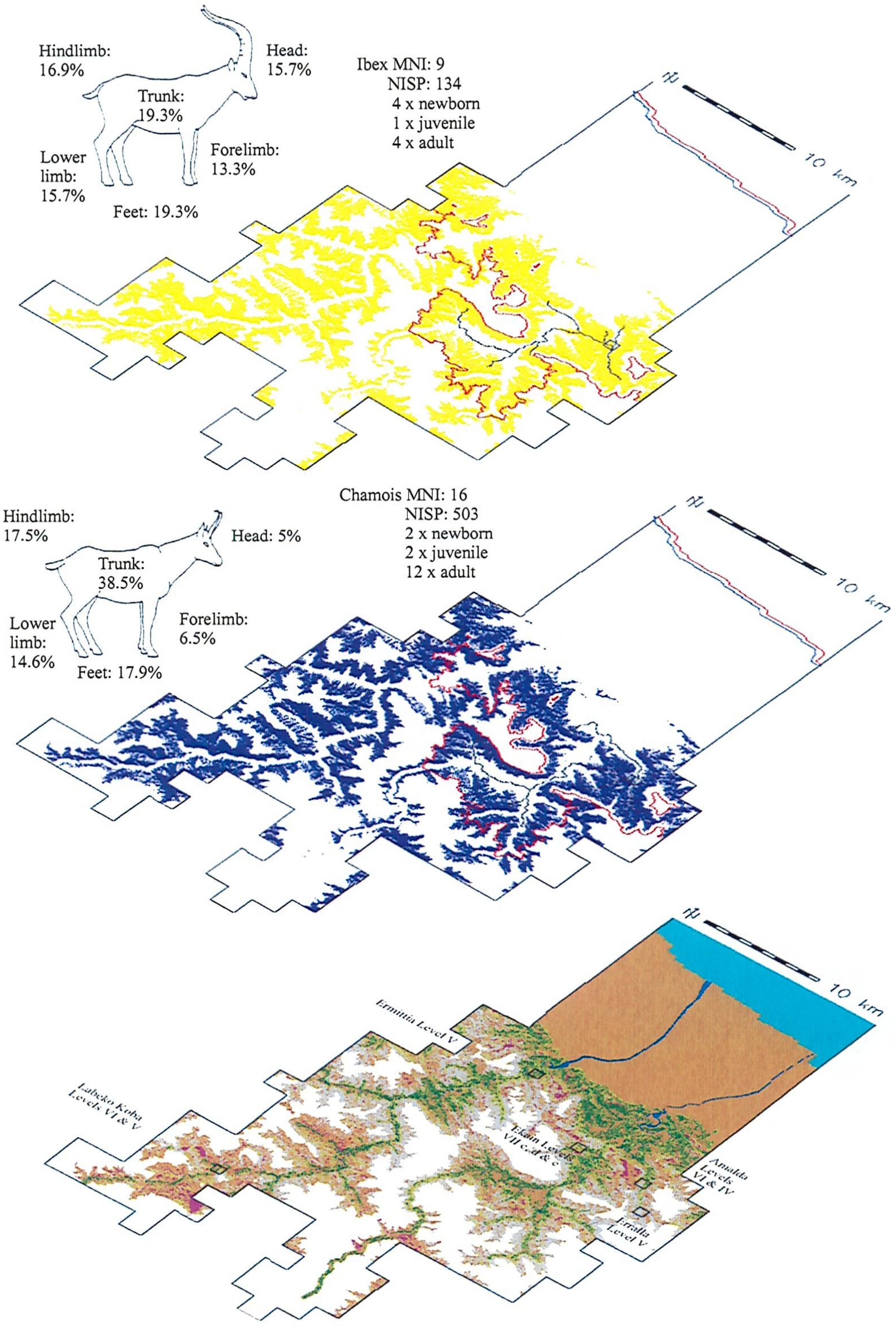

Figure 8.8c. Pathways associated with the hunting of ibex (yellow, top, paths in black) and chamois (violet, middle, paths in magenta) from Amalda Level IV in the winter landscape (bottom) of Dryas Ia. Red line denotes limit of day's return walk from Amalda.

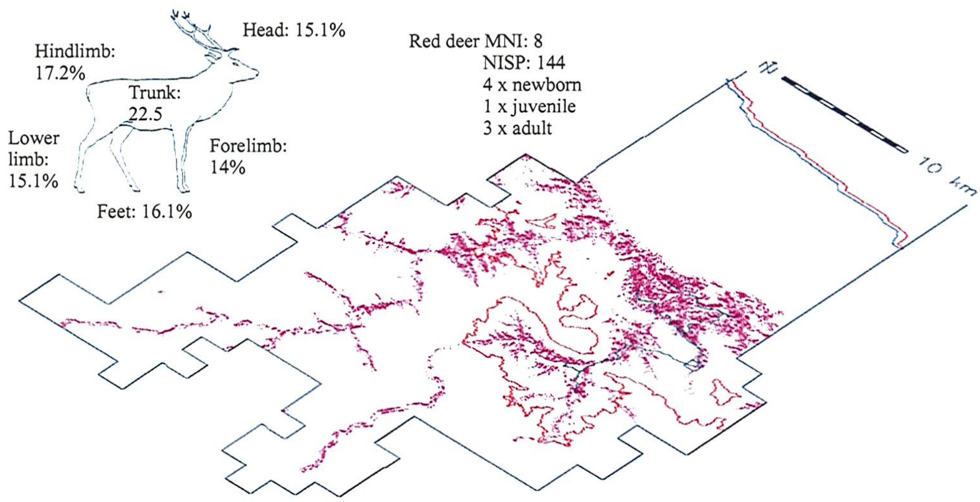

Figure 8.8d. Pathways (in black) associated with the hunting of red deer in the winter landscape of Dryas Ia.

8.3.4. Living in the Dryas Ia ecosystems of the Deba and Urola valleys

Although subject to the same caveats regarding time-depth (although the Dryas Ia stadial phase was considerably shorter than OIS 5a/c, the (rough) contemporaneity of level V of nearby Ermittia with Amalda level IV creates a complex pattern of movement and activity centred on two separate caves during this phase.

As discussed in section 8.2.5., however, it is difficult to come to firm conclusions regarding any temporal patterning of the matrices presented in this chapter without a larger sample of comparative studies. From just these three sites/levels, however, no obvious directionality of change is readily apparent. Between the Mousterian and the Upper Solutrean levels of Amalda very little seems to have changed from the perspective of the assemblages themselves – interactions with other animal species appear to be conducted along rather similar lines despite considerable differences as regards the experience – from the perspective of the persons who created the levels themselves – of living in the ecosystems of OIS 5 a/c and Dryas Ia (compare figs 8.2.

and 8.8.). It is only when figs, 8.1. and 8.7. are compared that differences in the wider matrix of movements through the region are revealed.

8.4. SUMMARY AND CONCLUSION

In this analysis, the Palaeolithic levels of the cave sites of Amalda and Labeko Koba discussed above are considered not so much as discrete, bounded assemblages as 'places', nodes inevitably and inextricably linked in to their encompassing four-dimensional ecosystem through a matrix of embodied movement that both arises out of and acts to comprise the movements and activities of individual people, their links and their groups between places and times.

This four-dimensional ecosystem is a shared one, occupied not just by individuals and groups of humans and hominids but also by individuals and groups of other animal and plant species as well as other-than-animate aspects of the landscape such as geological or topographical features, each of which may be known and understood as having its own distinct character within peoples' overall comprehension of the ecosystem.

These 'entities' also describe their own matrices of movement in space and time, and these are inevitably familiar to their co-denizens, who in turn constantly alter and shift their own movements, day by day, season by season, year by year (and thus, to those of us regarding objectively and distantly, over greater timescales) in an ongoing co-evolutionary negotiation of behaviour and identity. Thus the pathways of movement in space and time created by humans and hominids inevitably interlink and intersect with those created by these other entities, and each of these intersections provides an arena for various kinds of potential interaction.

Archaeology, and particularly Palaeolithic archaeology, has traditionally struggled to address the question of identity in prehistory, relying instead on proxy measures such as lithic industries which, perhaps inevitably, all too often become reified and conflated with identity, and come to be seen *as* those identities – as Conkey comments, we do not refer to 'the Magdalenians', but to 'the Magdalenian' (1987: 67).

However, rather than seeing archaeological assemblages, industries and 'cultures' as reified 'identities', material finds recovered from archaeological sites can be viewed as having formed part of the construction and continual negotiation of movement through the four-dimensional ecosystem. And it is this movement, the intersections with those of others, and the interactions that these afford, that constitutes the architecture of identity. The finds act to materialise and immemorate occasions of interaction with other denizens of the world and, from an analytical point of view, provide clues to their reconstruction or re-imagining: it is the sum total of these movements and interactions that can be considered constitutive of identities and personhood, in prehistory as today.

In this paradigm, people are not seen as separate, divisible entities *per se*, but as discrete but not bounded persons, moving 'domain fields[64]' of energy, understanding, emotion, wants and needs, always inevitably linked in to the four-dimensional structure of their ecosystem along paths of potential and habitual movement.

Such a view of human and hominid lives and activity demands an analysis that reflects the potentialities of narrative, emphasising a continuum of constantly altering lifeways rather than an arbitrarily divided set of discrete 'cultures'. The architecture, the overall structure of this four-dimensional matrix, while focused on a discrete biological entity, is structured by the perception of an individual *narrative*, whereby individual, separable 'events', interactions and places are linked into a sequential experiential life.

The results of the analysis as presented in this chapter do not provide us with whole 'stories'. However, by reconsidering the sites and their material finds in terms of the clues they provide to movement and interaction in the ecosystem of which the cave and its inhabitants were a part, we can start to see fragments of these narratives:

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[64] To use the sculptor Anthony Gormley's term: he writes of his 'Domain Field' series of works, 'The structures that make up these works are random matrices that identify the body less as an object and more as a place of becoming' (Gormley, 2004: 3).

individual animals killed at particular 'intersections' in their paths of movements with those of human persons, at particular 'points' in space and time – at particular times of the year, and in particular places in the landscape. These places are reached by embodied movement through a real landscape with its own distinct character (gradient, vegetation, etc) that impacts on perception and movement and affords particular kinds of interaction with other (e.g. topographical culs-de-sac afford 'disadvantanging' hunting techniques; Churchill, 1993).

In addition, every particular intersection has its own quality, some aspects of which are further preserved in the archaeological record. For example, when a successful kill is made, decisions are made which are part and parcel of understandings derived from still further interactions: between individual hunters (e.g., who should butcher the carcass), between hunters and animal species (again, who should butcher the carcass and *how* it should be done), and between these and other persons (how portions of meat are divided, who gets the hide, antler, bone, grease, etc.). Every task and activity therefore ties further into a dense web of understandings derived from habitual interactions, and it is these wider understandings that constitute 'group' identities, into which individual persons are always and inescapably linked.

And for hunters with a deep comprehension of the behaviour and movements of other animal species vis-à-vis their own, the practices and hunting and of subsistence generally represent the outcome of a complex of pre-conscious understandings of the ecosystem of which they are a part. The decision-making processes behind hunting behaviour are thus not necessarily 'conscious' or 'rational' (Brody, 1981: e.g. 37). Instead, decisions are made about which species to target and how to hunt them, based on a deep understanding of the signs of the presence of animals, visual and textural (droppings, tracks indicating where animals were going, how many and how fast, the evidence of recent grazing or browsing, vegetation flattened by resting animals, tufts of hair or fur, strips of antler velvet, ground or snow torn up for feeding etc.), auditory (animal calls, the sound of rutting deer fighting etc.), olfactory (the smell of mud wallows of rutting stags, scent-marking, etc.) and so on; all are part and parcel of the *habitus* of living in their world.

Undoubtedly they would have been aware of particularly 'good' nodes in the matrix of interaction and movement that comprised their lifeways – places and times that afforded advantageous intersections between themselves and particular animal species. Tied in to this awareness, of course, were other factors such as the technical expertise and weaponry of hunters, and their perceptions of the affordances of the landscape; how to use topography, vegetation, wind direction and weather, for example, to its best advantage in stalking, ambushing, driving, disadvantaging. The kill itself, of course, difficult or dangerous or messy or all of these, was also highly significant and all too often overlooked:

> a struggle may ensue if [the animal] is not killed outright. There would be a considerable amount of noise, dust, blood, as people attempt to restrain or kill the creature, and an anima, such as a gazelle, with sharp hooves, teeth and pointed horns, may easily cause injury to its captors as it flails around indiscrimately in its death throes. The carcass may then be taken apart before being taken back to the camp or settlement. Again, this involves the spilling of blood, fat, the twisting and cracking of joints, smell, noise, sweat (Boyd, 1999: 8).

And decisions about butchery and transport, drawing from knowledge of the time of year or season, the need for food, questions about the status and social links of the hunter and his or her family, friends, co-hunters, the 'right' and habitual ways of doing things in particular circumstances, the potential danger presented by other carnivore species in the landscape, perhaps in competition for the meat or for caves or shelter. All of these factors feed more or less consciously into the decision-making process at every stage, and every such intersection, every such event is necessarily unique, creating its own 'node' in the four-dimensional architecture of movement and interaction within an ecosystem.

The analysis presented in this chapter does not attempt to reconstruct the human or hominid experience of such events. Instead, the aim is to marshal some of the material elements which, taken together, allow us not so much to reconstruct as to re-imagine the four-dimensional shape of the lives of the inhabitants of the cave sites and the ecosystems represented.

Such a richness of lifeways is obscured by totalising systems of categorisation that create 'lumps' of time and experience into virtually meaningless (except in purely analytical terms) categories such as 'modern' and 'non-modern'. Such terms are really only secondary, proxy and purely descriptive terms for more subtle differences, effect rather than cause of changing identities and personhoods.

Such categories and terms lose all meaning when the archaeology is considered in a 'bottom-up', rather than a 'top-down' paradigm. Of course broader patterns may be discerned when the continuum of change is broken up in different ways, and having demonstrated here the relevance and significance the methodology outlined in this thesis to a new conceptualisation of identity as revealed by the archaeological record, the comparison of the patterns presented here with those centred on other sites and levels n the region may certainly reveal any broader patterning.

For each collection of ecosystems considered in this chapter, the matrix of movement and interaction apparent for each is complex and unique: there are no readily identifiable patterns corresponding either to divisions defined either by lithic industry or palaeoenvironmental phase. No two patterns of potential pathways and places, let alone the subtler aspects of interactions with spaces/ages cohort/sex embedded within them, are repeated throughout the sequence (see also Appendix 9). In each case the structure of interaction with the ecosystem and with its constituent parts; carnivore, ungulates, mollusc, fish species, lithic resources etc., is unique.

In the following chapter, a summary overview of the argument of this thesis is presented, with a consideration of the potential of this new direction for Palaeolithic archaeology in general.

CHAPTER NINE: TRANSITIONS, CHANGE AND IDENTITY: THE MIDDLE AND UPPER PALAEOLITHIC OF VASCO-CANTABRIAN SPAIN

9.1. OVERVIEW OF THE THESIS

Current thinking in Palaeolithic archaeology sees a succession of 'cultures' defined in terms of lithic industries (a culture-history theoretical approach). As a result of this simplistic method of dividing up the archaeological record, 'points' of 'transition' are created which appear to require explanation – easily provided, in this paradigm, by 'evolution', applied as a *post hoc*, accommodative one-size-fits-all concept.

The problems of this culture-history/evolutionary approach are exacerbated at the Middle-Upper Palaeolithic 'transition' because the transition being debated is central to our own identity – how do we define ourselves vis-à-vis our closest extant and extinct relatives? This debate has a long history which strongly influences our current thinking about the 'nature' of humanity. As the 'transition' from animal to human, Neanderthal to 'modern' human is seen as being both behavioural and biological, it has often been explained away as being caused by 'evolution'.

However, the archaeological record itself does not support a straightforward link between behavioural and biological change; a focus on biological/morphological change has given way more recently to one on behavioural change and archaeologists studying the 'transition' have looked for 'modern' behaviour in the archaeological record which has proved difficult to find – not least because the goalposts are continually being moved.

This 'top-down' perspective assumes 'difference' between Neanderthals and 'modern' humans. All too often, archaeologists studying the 'transition' approach the archaeological record with a 'checklist' of what are assumed to be 'modern' behaviours – particularly evidence of 'design' and 'distance', abstract thought and the ability to structure activities that occur at some 'distance' in time and/or space –

inferred from the record (whether from particular lithic types, subsistence behaviours, spatial behaviours on large or small scales, or so-called 'symbolic' activities etc.). Such assumptions are dangerous in the limitations that they place on the interpretation of the record – hominids, sites, industries etc, can only ever be 'modern' or 'non-modern', with both categories pre-defined and pre-'explained'.

I argue that, rather than assuming such differences, 'bottom-up' approaches to the archaeological record that document the differences and similarities and relate the various aspects of the record (lithics, fauna etc) in terms of people and their daily activities in the world can tell us much more about hominids and so-called modern humans.

Such a re-consideration of the 'transition' addresses change in terms of people, movement and activity. The activities that created the archaeological record occurred first and foremost in a world. Processual (and Palaeolithic) approaches to space and to time consider space and time in very abstract, quantitative terms but alternative approaches to the conceptualisation of space and time stress the consideration of the world in terms of its experience by people; this allows a more holistic conceptualisation of a four-dimensional ecosystem within which people are inevitably immersed as a fundamental fact of their existence. Crucially, these ecosystems are not individual and discrete but are inescapably shared with other people as well as other species, whether animal, mineral, or vegetable.

The patterns visible in the archaeological record, then, reflect the four-dimensional structure of peoples' lives and their interactions with those of others - and it is the interactions that occur between persons and groups of persons, at places and at times, that comprise our daily lives. What, then, what does it really mean to call ourselves 'individuals'? In many societies persons see themselves, their identities, not as discrete, bounded 'individuals' but as arising of their interactions. Thus activities like hunting and subsistence practices, considered in the same way, are also interactions between persons of a particular kind. Points in the four-dimensional ecosystem where such interactions take place can be marked as 'places', sustained by memory and also potentially by siting other interactions there – by living, returning, butchering etc there, and so 'sites' in the archaeological record can be thought of as places in the ecosystem marked by their involvement in the various activities that make up peoples' lives. Seen in this way, then, when we look at the archaeological record, what we are seeing is the component parts of peoples' habitual, daily activities, comprised of movement and interaction in a four-dimensional ecosystem in which they are immersed: we are seeing the constitutive parts of personhood.

From this perspective, the faunal record can be approached not from the perspective of 'what can it tell us about abstract thought in subsistence behaviour?' but asking instead 'what can it tell us about movement, interaction and personhood?' The faunal record is a particularly good place to look, because it provides a signature of a certain kind of interaction, along with the place and time at which it occurred, and sites with faunal remains can be seen as providing clues to the kinds of movement and interaction that constitute the identities and personhoods of the people who deposited material there.

Some of these potential paths of movement, centred on the Palaeolithic sites of Amalda and Labeko Koba in the Deba and Urola river valleys of Guipúzcoa in the Spanish Basque country are presented in Chapter eight. When incorporated into a tentative outline of the ecosystem in which each was situated, the movements and activity of the inhabitants of the sites studied, and something of the flavour of the qualities of the interactions that occurred between them and other persons and types of person in that ecosystem, begin to describe fragments of the narrative of their lives.

Three levels of these sites are considered in this thesis. Each belongs to a different 'timeslice' and ecosystem, representing both Middle and Upper Palaeolithic industries. Although, certainly, few patterns would be visible from just three levels, each of these shows a very different character and construction, and it is argued that the changes in the archaeological record between the Middle and Upper Palaeolithic and between Neanderthal and 'modern' human populations are more subtle than has traditionally been thought. Exactly *how* the archaeological record is divided up is not hugely significant;

> Whether the LGM was a crucial Rubicon or, on the contrary, the Middle to Upper Palaeolithic transition, is irrelevant as long as such divisions run the

risk of throwing large blankets over the past and hiding more variation than they uncover' (Roebroeks & Corbey, 2001).

9.2. FUTURE RESEARCH POTENTIAL

In demonstrating a methodology for addressing the lifeways of Pleistocene populations in terms of their movements, activities and interactions, this thesis opens up several potential avenues of further research.

Clearly more work still remains to be done. Firstly, more work on the schemes for 'locating' animal species in the ecosystem would allow the closer identification of those 'places' in the landscape associated with them, and with human and hominids' interactions with them. The inclusion of geological factors in the scheme would allow consideration of the more subtle interactions of different types of bedrock and soil development and drainage, for example, with the topographical factors of gradient, aspect, etc. highlighted in this study, giving a better understanding of potential vegetation types in particular ecosystems, and thus a refinement of animal species' landscape associations.

At finer scales, perhaps concentrating on one particular site and the landscape in its immediate vicinity, such a refinement of the model, combined with further work on the ways that animal species' behaviours alter seasonally, would allow a much finer-grained re-imagining of the movement and activity of the inhabitants of the cave.

The integration of geology could also be made to deal with some of the problems associated with the use of modern topographic data. The major source of landscape change in the precipitous Vasco-Cantabrian region is erosion resulting from slope processes; data on likely rates of deposition of colluvium and alluvium, combined with geological data on the deposits of such material along river valleys and floodplains, would allow adjustments of the modern topographic data that would improve its accuracy for Pleistocene ecosystems.

Secondly, a refinement of the algorithms used in this analysis to model movement costs within the landscape would improve confidence in the correspondence of the potential paths of movement generated by the GIS with paths of actual movement followed by persons at the time. Work is continuing on this question among GIS users, among whom it is clearly recognised that the pathway-generating algorithms currently used are less than perfect. As Bell and Lock put it, the question

> serves to remind us that the combination of observation, interpretation, and *a priori* knowledge that facilitate human movement from one place to another are not so easily reproduced in mathematical formulae. An important factor is the *a priori* intention of destination that is inherent within human movement and becomes scribed on the landscape by the persistence of pathways. Both individual and social memory would incorporate the knowledge that [a pathway] connects various destinations … and this would be utilised within the intentionality of movement (2000).

In this thesis, following Harris, 'the focus is on identifying general patterns of movement rather than specific paths' (2000: 119). The patterns outlined in Chapter 8 are therefore seen as reflecting multiple, potential narratives of movement and activity rather than as being actual, 'real' paths used in the past. Nevertheless, the development of more subtle algorithms to describe movement within a landscape would certainly further refine consideration of the ways that such movement constructs identities.

Lastly, the results of the analysis would be further improved with better faunal data. Logistical constraints prohibited my own analysis of the faunal remains as part of this thesis; in any case, the data available in the public domain for these sites was of a very high standard and was entirely adequate for this preliminary development of the methodologies, and has illustrated the potential of the approaches outlined in this thesis. All the data considered here were published by a single analyst, Dr. Jesús Altuna, and are therefore highly consistent, but inevitably there were some frustrations involved in using others' data; in some cases the method of calculation of MNI figures, for example, was unclear – such methods vary widely between zooarchaeologists (see e.g. Reitz and Wing 1999: page for discussion of methods and the ramifications of the differences) and it was occasionally difficult to marry age and sex breakdowns with the overall NISP and MNI figures. In addition, further information on the location and nature of toolmarks and of carnivore toothmarks would have proved invaluable in considering butchery decisions and the uses to which carcasses were put, both by humans and by other carnivore species, adding an extra dimension to the consideration of the ways in which activities and tasks are integrated with movement and interaction. Further development of the methodologies presented in this thesis would thus include the primary faunal data gathered by the analyst for inclusion.

9.3. CONCLUSION

As stated at the very start of Chapter one, this thesis was originally intended to be a study of the transition from the Middle to the Upper Palaeolithic. It progressed rather unexpectedly by challenging the very notions of the archaeological 'transition' and such self-explanatory culture/industry terms as 'Middle Palaeolithic' and 'Upper Palaeolithic' and their relevance to the lifeways of the populations of the past, and it concludes here by proposing a new methodology for re-phrasing these questions in more productive terms.

Rather than simply reconstructing the past in the shape of our own assumptions and biases, treating the archaeological record in a 'top-down' way, as simply providing a checklist of proxies for various kinds of behaviours and activities which are intrinsically by their very nature 'modern', 'human' or otherwise, I have proposed in this thesis that the archaeological record be treated instead as a *part of* the lifeways of past populations, its creation part of the process by which persons construct, negotiate, maintain and alter their personhood and identity. Changes in the record, therefore, should be seen as representing changes in personhood and in identity, in fact, as having *constituted* those very changes.

Rather than requiring explanation, then, change is an integral part of the archaeological record and of personhood and identity, because persons are *active*, experiencing their life in terms of the tasks and activities that they engage in within a real world and the interactions with others, other humans, other animal species, other elements of the world in which they live, that these entail.

To address such change, I have argued, it is necessary to take a 'bottom-up' approach, addressing the archaeological record directly for what it can tell us about these movements, activities and interactions. In the faunal record we have direct evidence for some of these interactions, their location within a four-dimensional ecosystem, and something of their nature and quality. By not so much reconstructing as re-imaging some of the structural features of these past ecosystems and the four-dimensional geometry of the patterns described by these activities, I have demonstrated in this thesis that it is possible to consider some of the elements of personhood of populations in the past.

Certainly I have not solved the 'Neanderthal enigma'; whether, and if so, how, Neanderthals differed from so-called modern humans. However, the promising results of this new methodology suggest that, with its refinement and application to more sites, patterns of similarity and difference between the kinds and qualities of Neanderthal and 'human' personhood will start to emerge, and from there I hope Palaeolithic archaeology will be able to address the issue in more productive terms.

DIGITAL APPENDICES

Digital Appendix 1:

Archaeological signatures of modern human behaviour

Digital Appendix 2:

Palaeolithic tool types of industries of Vasco-Cantabrian Spain

Digital Appendix 3:

Structures and hearths documented from Middle and Upper Palaeolithic sites in Vasco-Cantabrian Spain.

Digital Appendix 4:

Reconstruction of Pleistocene palaeoenvironmental phases in the Deba and Urola valleys.

Digital Appendix 5:

Middle and Upper Palaeolithic sites in the Deba and Urola valleys

- DA5.1. Amalda
- DA5.2. Ekain
- DA5.3. Ermittia
- DA5.4. Erralla
- DA5.5. Labeko Koba
- DA5.6. Lezetxiki
- DA5.7. Other sites in the Deba valley
- DA5.8. Other sites in the Urola valley

Digital Appendix 6:

Latin and common names of species referred to in the text

Digital Appendix 7:

Faunal remains from selected sites/palaeoenvironmental phases in the Middle and Upper Palaeolithic of the Deba and Urola valleys.

Digital Appendix 8:

Pathways of potential movement associated with summer and winter hunting from selected sites/palaeoenvironmental phases in the Middle and Upper Palaeolithic of the Deba and Urola valleys.

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