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Chapter 1

Mesolithic Europe – Glimpses of Another World

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Introduction

Mesolithic Europe holds a special place in our imagination. Perhaps more than any other region and period, it is unique in conjuring up a strange sense of both 'otherness' and familiarity. The people who lived here were in many ways fundamentally different from ourselves. As hunters and gatherers, their experience, worldview, and knowledge could not be further from ours. In our imagination, we can conjure up images of how these people might have looked or felt, but even some of the most basic elements of their existence or perception, something far more knowable in later periods, are things of which we know little. The physical world in which they lived is somehow more tangible but, like its people, familiar and yet fundamentally distinct from our own experience. This was a place with landscapes that were vast and, to our minds, untamed, familiar to our experience at a local scale, yet at the same time extending over seemingly immense territories with swathes of dark forests, mountains, and relentlessly rising seas.

Bounded by the Ural Mountains in the East, the Atlantic Ocean in the North, and the Mediterranean in the South, Europe covers an area of over 10 million square kilometers (Figure 1.1). It houses some of the most varied and distinctive landscapes within any comparable-sized region anywhere in the world, landscapes ranging from Mediterranean woodlands to Artic Tundra and across 40 degrees of latitude. In this volume, we pass by the Aegean islands of the eastern Mediterranean to the shores of northern Scandinavia and northern Russia, across the mountainous backbone of Europe, the intricate network of lake basins around the Alpine fringe and in the north and east, the vast windswept plain that extends almost unbroken from lowland Britain to the Siberian border interrupted only by great river systems such as the Rhine, the Danube, the Dniepr, and the Don, and across offshore islands and archipelagos in the Mediterranean and the Atlantic.

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Mesolithic people carry a real significance for many. In some regions, the Mesolithic holds a special importance as the time of first settlement, of hardy and intrepid colonisers who carry a symbolic presence for the region. About a third of the European land mass and much of its higher mountain slopes and offshore islands was occupied by human settlement during the Postglacial for the first time in human experience. In other regions, the Mesolithic might appear to be the phase of human history within which the first signs of 'settling' of society into increasingly familiar environments and habits can be found, with enduring ties between people and place. For all, however, the Mesolithic carries a sense of fascination.

Alongside the 'otherness' of Mesolithic Europe, knowledge and understanding brings a sense of rational or even perhaps 'scientific' familiarity. The very notion of 'Mesolithic Europe' as a definable period and region with boundaries of some kind makes us feel that this world is knowable, almost manageable. We can define and analyse its limits, and the ways in which environments change. We can reconstruct how people made and used flint tools, follow them genetically, reconstruct and understand what they ate and how they moved around. In the different spheres of environment, subsistence, settlement and society, we can come to an understanding of the Mesolithic world. By building up our knowledge in this way, the 'other world' of Mesolithic Europe is made familiar. In some senses, we can even 'know' the world of Mesolithic people in a depth that they themselves could not perceive or understand. We can see how societies, activities, resources, and settlement systems changed not only over generations but also millennia. We can 'understand' or at least approach the mechanisms creating change, something far beyond the perceptions of Mesolithic people themselves.

This opening chapter gives an introduction to this world, to some of the history of concepts of the Mesolithic, issues, directions and ideas that draw together research on the period, and suggests further complementary frameworks. Each chapter of the volume paints a picture of environments, people, and changes in each different region. The narratives of the Mesolithic in each region, each grounded in their own historical and research trajectory, reveal different insights about the period. Finally, the concluding chapter brings together a comparative overview in a broad summary of the leading features of the Mesolithic and emergent areas of new and future research.

The 'Story' of the Mesolithic

Human origins and prehistory inevitably form a 'story' of the past (Stoczkowski 2002, Joyce et al. 2002), with powerful metaphors for who we are today. Different dialogues and narratives compete for our acceptance, and it is perhaps in the Mesolithic period more than any other that different frames of reference, or perhaps lenses through which we see the archaeological evidence, come most into play. These different understandings are more than just 'theoretical standpoints' but, rather, perceptions and viewpoints that colour and define not only our interpretations but also our sense of what 'the Mesolithic' is, or what it might have meant to have experienced life in those times. Different stories of the Mesolithic and its place in history both merge and conflict to create our current understanding.

Some long-standing stories permeate our sense of what the Mesolithic might mean, how it might be interpreted or what is 'allowed'. One of the deep-seated concepts of the Mesolithic is as a time of cultural stagnation – passive societies in which little changed and social relationships were uncontested. The most likely root for such ideas lies in a long-standing view of Mesolithic societies as being dominated by their environment. In fact, we only need to look back to the earlier decades of the twentieth century to understand how Mesolithic societies may have been disenfranchised

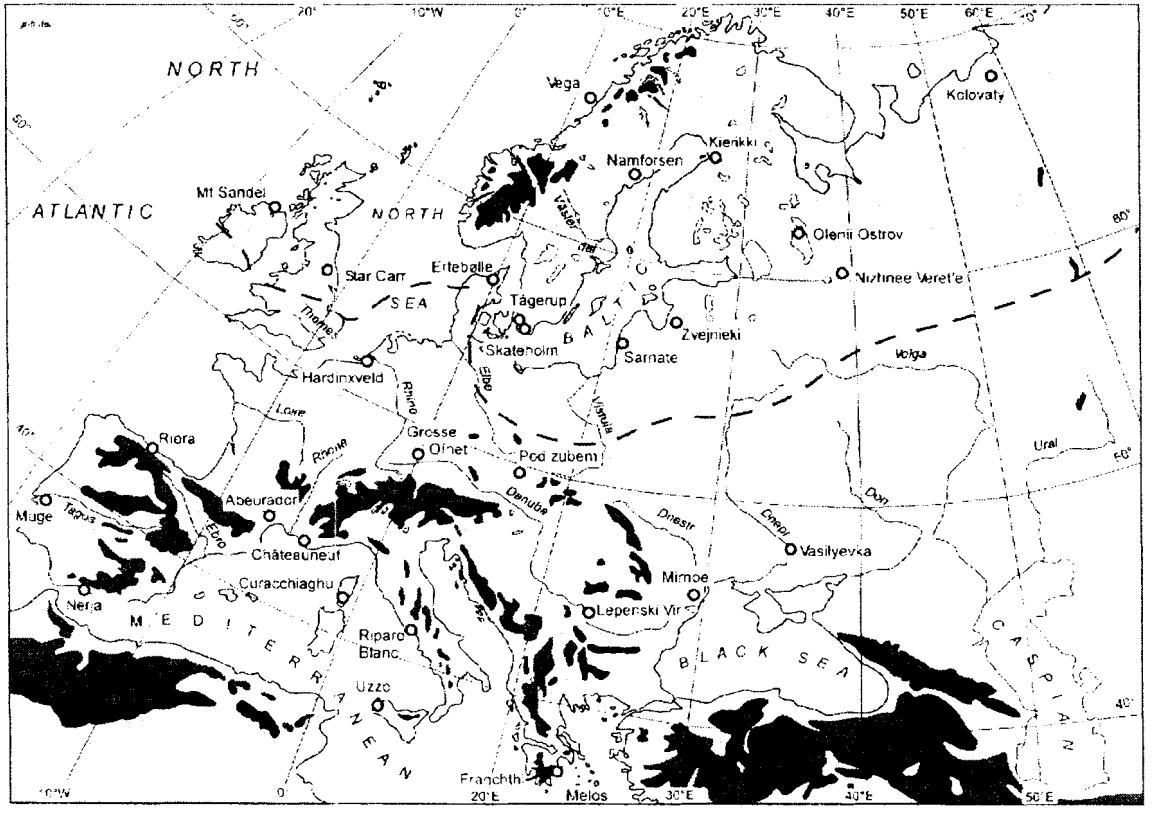

Figure 1.1. Map of Europe showing major topographic features and key sites. The dashed line shows the maximum extent of the continental ice sheet during the Last Glacial (© G. Bailey).

from discussions of social and cultural changes. The prevailing view of the Mesolithic at this time was that memorably expressed by Gordon Childe, who viewed Mesolithic societies, sometimes with undisguised contempt, as impoverished descendants of the Palaeolithic, gripped by 'a state of helpless barbarism' (Childe 1925: 1) and contributing nothing to later European civilisation. Sir Mortimer Wheeler wrote in a similar vein about the inhabitants of Mesolithic Star Carr (Tolan-Smith this volume) – and in the same year as the final publication of the Star Carr excavations by Grahame Clark (1954) – as 'as squalid a huddle of march-ridden food gatherers as the imagination could well encompass' (Wheeler 1954: 231). For these authors, European civilisation began with the spread of Neolithic societies from the Near East, a process that supposedly erased the preceding hunter-gatherers of Europe (Zvelebil 1996c). Even Grahame Clark, excavator of Star Carr and pioneer and champion of Mesolithic studies in Britain, was forced to concede with evident reluctance in 1952 that the archaeological evidence for the coastal Mesolithic peoples of Northwest Europe hardly contradicted the notion of 'a low level of culture' (Clark 1952: 63).

The concept of passivity has been echoed equally in understandings of the cultural relationship between the Mesolithic and the Neolithic as in that of the relationship with the environment. Even from the start of the first use of the label 'Mesolithic' in Clark's (1932: 5) definition of the period as 'between the close of the Pleistocene and the arrival of the Neolithic' (Rowley-Conwy 1996), the period appears to be caught between two apparently inexorable and inescapable events, the first environmental and the second cultural. In the south of Europe where Mesolithic occupation followed that of the Palaeolithic, the term 'Epipalaeolithic' (a continuation or culmination of the Palaeolithic) has been widely used and still appears today (cf. Straus this volume, Valdeyron this volume, Pluciennik this volume, Bonsall this volume). In the north, however, the term Mesolithic highlighted the apparent dynamism and distinctiveness of societies that succeeded in expanding into new areas. Further north again (Bjerck this volume), the terms Older and Younger Stone Age are more commonly used. In each region, we can see how the narratives of the origin of Mesolithic societies influenced understanding of the nature of the period itself.

There have been various challenges to the concept of Mesolithic peoples as rather impoverished communities. In the 1980s, there was a radical transformation when the material record of certain coastal Mesolithic societies, particularly those on the coastlines of Northwest Europe, was interpreted as indicating large socially complex communities living in permanent villages. Drawing on ethnographic analogies with societies of the Northwest Coast of North America, these communities, with material evidence typically associated with later periods, such as specialist task groups, food storage, social ranking, cemeteries, and high levels of population density on a par with early farming societies (Rowley-Conwy 1983, Renouf 1984), were seen as sufficiently densely populated and organised to resist the invasion of farming communities. 'Complex' Mesolithic communities were seen as socially powerful rather than stagnant. Unsurprisingly, the concept of rising social complexity became an appealing characteristic of the whole period and the Mesolithic-Neolithic transition a new source of stimulus for Mesolithic studies (Zvelebil 1986c, Price 2000). The origins of the Neolithic were extended into the Mesolithic and discussions focused on progressive intensification or diversification of resources, and a move towards agriculture.

Extrapolating the origins of social complexity to certain contexts in Mesolithic Europe marked a powerful departure from ideas of small, marginalised groups apparently 'going nowhere'. However, subtle but pervasive parts of the narrative remained intact. 'Complexity' was built on dense, productive coastal resources that were available all year. 'Complex' societies were still inexorably and rather passively built on seasonal resources and subsistence relationships, with concerns about their logistic organisation taking primacy over social interpretations. This meant that the 'story' of the Mesolithic was still one in which society and social change were determined by environments.

Ironically, discussions of social changes in complex societies rather contributed to the relegation of many of the societies of Mesolithic Europe as ever more 'passive,' as societies outside of maritime locations became rather 'left out in the cold' of discussions of social changes. The lack of dense resources, and the self-fulfilling and apparently uncontested arrival of the Neolithic, in some ways further disenfranchised 'simple' Mesolithic hunter-gatherers.

Challenges to ways of interpreting the Mesolithic have come from various sources. A long history of research from the time of Grahame Clark and beyond (1932, 1975, 1980), three decades of international meetings (Kozlowski 1973, Gramsch 1981, Bonsall 1989, Vermeersch and Van Peer 1990, Larsson et al. 2003), and new approaches and overviews (Mellars 1978, Zvelebil 1986c, Price 1987, Conneller 2000, Young 2000a, Bevan and Moore 2003, Milner and Woodman 2005, Conneller and Warren 2006) provide healthy disagreements over issues and approaches. New approaches to themes with a deeply entrenched traditional stance such as subsistence (Milner 2006), and technology (Warren 2006), are being developed, many of which move beyond environmental determinism and readdress interpretations to incorporate views of experience and perceptions. Even the narrative of increasing complexity has gradually become deconstructed (Bonsall this volume). A gradual intensification of resources and a move towards agriculture has also been seen as being rather simplistic, with archaeological evidence for a decline in social complexity suggesting that a progression towards complexity is far from inevitable (Rowley-Conwy 2001).

Approaches to the Mesolithic continue to be contested. However, as valuable as new perspectives and vigorous debate may be, we might pause to wonder if the large scale narrative has really changed. We have overviews of the Palaeolithic, usually as part of a global synthesis, for example, Gamble (1986, 1993, 1999) or of the Neolithic and later, for example, Bradley (1984), Whittle (1985, 1996), Hodder (1990) and Thomas (1991), but, with the exception of Mithen (2003), little attempt to pull together any large scale understanding for the Mesolithic. The evidence, particularly for so-called simple societies, often dominated by surface lithic scatters, might be that which is at fault, falling almost naturally into a passive extension of artefacts from environments and perhaps too meagre to address any large scale social questions of interest. Nonetheless, Conneller and Warren (2006) argue that it is not the material remains of Mesolithic societies that are to blame for the limitations of interpretations but, rather, the need for new approaches and understanding. Without confronting the narrative of rather passive societies, the questions asked in the Mesolithic can, on the one hand, become overly practical, related to the technicalities of subsistence and settlement or, on the other hand, reach out to incorporate perceptions and experience that often end up drawing on what Strassburg (2003: 543) has called 'banal phenomenological truisms'. Young (2000b: 1) concluded that the discipline was still 'waiting for the great leap forwards'. A long-standing story of Mesolithic hunter-gatherers so immersed in their environments and nature, both ecologically and ideologically, as to be almost socially inert seems to retain a strong hold on our imaginations.

Mesolithic Europe – A Complex Tapestry

Could we rewrite a narrative of the Mesolithic, to write a 'social story' of the period? 'Mesolithic Europe' encompasses over five thousand years across a vast territory, that is over two hundred generations of very different people living in dynamic and changing environments. It might seem reasonable to resist any attempt to pigeonhole such diverse societies into some broad plan. In fact, Kozlowski (2003: xxi) goes so far as to conclude that the range of societies and environments is so great that there is no shared attribute (apart from chronology) that can reliably define the entire Mesolithic formation. Any attempt to draw together such varied societies, to seek comfort

from some unproblematic perspective, a great (and simple) leap, may of itself be flawed. Mesolithic communities were diverse and varied, perhaps there is no more to say than that these are the only terms on which we can study them.

Diversity and variability are certainly a key theme in this volume. The contributions illustrate a 'tapestry' of Mesolithic Europe, which is complex and varied with remarkably different societies falling under the blanket term of 'Holocene hunter-gatherers'. Societies as diverse as specialised maritime seal hunters, small groups in varied woodland environments, elaborately symbolic settlements such as the Iron Gates of the Danube, early colonisers of barren landscapes, all occupy their place in 'the Mesolithic'. Each local society has its own distinctive feel. This diversity is increasingly being recognised even at the end of the period and into the Neolithic. Patterns of population replacement, coexistence or assimilation show regional and local differences across Europe (Gkiasta et al. 2003, Perrin 2003, Bentley et al. 2003). The pattern of dietary changes, although contentious (Milner et al. 2004), also appears to be regionally and locally varied (Lidén et al. 2004). Similar patterns of differing regional trajectories also affected the transition to the Neolithic in other areas of the world, such as China (Li Lui 2004). The material evidence for Mesolithic Europe reminds us of a complex, multicoloured tapestry.

Like a tapestry, however, there are discernible patterns in this evidence, and threads link different societies as we view Mesolithic Europe as a whole. There is more to the material evidence of Mesolithic Europe than simply wide-ranging diversity. As humans, we naturally seek stories and metaphors to understand patterns around us. However much we might welcome complexity and diversity, without finding other means to interpret large-scale patterns, we are left with our old narratives to structure understanding.

A Structure behind Diversity?

Making sense of the tapestry of Mesolithic Europe is a challenge. We would be mistaken to deride or dismiss ecological and environmental models. Even when environments are stable, hunter-gatherer communities are strongly influenced in their lifestyles and movements by their environments and the rhythm of the seasons and Holocene environments in contrast were complex and constantly varying. In some cases, the dynamics of Holocene environments would have had immediate and far-reaching effects on local hunter-gatherer groups. Mesolithic Europe was a world in which there were towering glaciers, cataclysmic floods, tsunamis, and rising and falling seas. There is evidence for various sudden and cataclysmic events, which would have left a trail of effects on human societies. Dolukhanov (this volume) describes interpretations of a cataclysmic 'Flood' of the Black Sea at around 6100 cal BC, which would have rapidly inundated more than 100,000 m^2 of land with its Mesolithic inhabitants, and allegedly accelerated the dispersal of early Neolithic farming into Europe. At around the same time, the Storegga tsunami off the coast of Norway would have been equally devastating and may have caused cataclysmic effects on coastal populations, with 10 m high waves potentially devastating boats, equipment, and food supplies. Moreover, because this happened in autumn, there would have been little time for survivors to prepare for the harsh winter. In the Baltic region, there were fundamental changes to the freshwater Ancylus Lake, which became linked to the ocean through the straits of Øresund, Storebælt, and Lillebælt (Bjerck this volume).

We can scarcely imagine the ideological effect on local populations of these drastic changes. Of course, less dramatic changes also would have had perceptible effects and such dynamism and unpredictability in their surrounding landscape would have been a major influence on how many

groups understood their world. Bjerck (this volume) describes a drop in sea level of about 3 m per century in parts of Norway such that the configuration of the coastline would have changed, altered fishing and hunting grounds, and potentially blocked sea passages. Periodic transgressions of about 1 m are recorded at Vedbæk in Eastern Zealand (Blankholm this volume). Within many people's lifetimes, there would have been noticeable changes in their surroundings, whether subtle or more significant in their effects. Population movements must have been common, and changing environments and landscapes must have influenced understandings and beliefs about the world.

The influence of environment is perhaps most complex at the regional and local scale. Holocene environments were uniquely structured and differentiated, and in many cases remarkably different from those today despite broadly similar climatic conditions. Where dry scrub is common in much of the modern Mediterranean, Pluciennik (this volume) describes a mosaic of forest communities in southern France, southern Spain, and central Italy during the Mesolithic. Macchia, evergreen forests, and deciduous forests with lime and elm, would have been common, with alder-dominated forests along river and stream margins, as well as pine forest and heath interspersed with coastal and estuarine salt marshes and lagoons. Landscapes in regions such as the British Isles (Tolan-Smith this volume) would have been different from today's, with lowlands dominated early on by forests of pine, birch, and hazel, and later by oak, elm, and lime. Landscapes and vegetation would have been much more patchy and diverse than those with which we are familiar today. The dynamics of vegetation competition and replacement following Postglacial warming mean that conditions also would have been in flux throughout the period, with stable climax communities only becoming established in many regions after several thousand years. Mesolithic communities were intimately connected to their environment, and the complex dynamic of replacement of pine and birch by oak, hazel, and lime in regions such as Britain and Germany had clearly defined influences on large mammal communities and thus on hunting practices (Spikins 1999, Spikins 2000, Jochim and Tolan-Smith this volume).

The most obvious area of environmental influence on Mesolithic societies is that of colonisations. Large-scale patterns of change in environments and resources undoubtedly influenced both new colonisations and population movements within inhabited Europe. Concepts of early pioneers, hardy explorers of previously unused terrain and a 'shifting up' and gradual infilling pervade discussions of all the regions, from new occupation of previously unoccupied landscapes in Scandinavia (Bjerck this volume), Scotland (Finlayson 1998, Hardy and Whickham-Jones 2002, Tolan-Smith this volume), islands such as Ireland (Tolan-Smith this volume), Corsica (Valdeyron this volume, Pluciennik this volume), and Sardinia (Pluciennick this volume), to expansion to high altitudes in the mountains of central Europe (Svoboda this volume). The motivations and processes behind colonisation and how this relates to changing environments and landscapes can be surprisingly elusive, however. In areas such as Ireland (Tolan-Smith this volume) or Corsica (Valdeyron this volume), colonisation reflects a complex relationship between environmental opportunity and human motivation, ingenuity and desire for exploration. Ethnographic evidence can provide further insight. Tolan-Smith (this volume) suggests several different stages in population expansion in the British Isles, from initial colonisation of new regions to consolidation and infilling and further expansion following climatic changes. We might even begin to imagine the different social contexts of settlement with emphases on 'exploration' or 'tradition'.

There is more to colonisation than simply a response to environmental changes, however. Bjerck illustrates the role of technological innovation in colonisation, the risk associated with pioneering settlement of Arctic landscapes and the technological component of specialised maritime occupation and its development. He attributes the delay in colonisation of the extreme north to the delay in developing specialised methods of marine exploitation, in particular the technological capacity

for safe movement using sea craft that could be righted if submerged – particularly important in extremely cold seas. Without these innovations, Bjerck (this volume) describes northern coastal environments as 'inaccessible as the moon'.

Environmental change also will have influenced population migration in occupied areas. Although the concept of migrations is unfashionable, large-scale changes in technology, in artefact types and distributions, and how these relate to environments and regions, have fascinated archaeologists studying the Mesolithic from its first recognition. Across all regions, we can document the movement of certain artefacts, such as Star Carr and Deepcar assemblage types in early Mesolithic Britain (Tolan-Smith this volume) or scalene or Montclus triangles in Late Mesolithic France (Valdeyron this volume). To some extent, shifts of groups with changing environments or changing subsistence practices can be seen as influencing movements and change in artefact styles (see Tolan-Smith this volume, Jochim this volume). Microlithisation, the gradual reduction in size of microliths, a pattern common to Mesolithic Europe, also can be seen in terms of changing woodland types and changing technologies for medium and large game hunting. However, changes in artefact styles have other, more predominantly social explanations. Pluciennik (this volume) also suggests that microliths performed other functions, such as plant food processing, and microlithisation might have other explanations. Innovation, the spread of ideas, and the negotiation of stylistic identities between groups linked across areas of landscape are also key features of Mesolithic Europe. In some areas, there *is* a relationship between changes in lithic technology and changes in game resources, as in the British Isles (Tolan-Smith this volume), or the Upper Danube and Upper Rhine (Jochim this volume). In other areas such as southwest France (Pluciennik this volume), there is no consistent pattern, suggesting that relationships between groups and the spread of knowledge were important influences.

Other types of changes in artefacts also suggest a story of social changes, which remains to be uncovered. Increasing *regionalisation* of patterns of artefacts, both in terms of distinctive styles and increasingly regional networks of raw material procurement, require explanation. Increasing regionalisation can in part be explained by a fragmentation of increasingly complex and dense woodland environments throughout the Mesolithic (Spikins 1999, Spikins 2000). Other explanations include an increasing intensification of subsistence. However, in many areas, arguments for increasing territoriality (Gendel 1984, Gendel 1987) seen in stylistic or assemblage distinctions in artefacts such as stone axes in west Norway (Bjerck this volume), distinctive types of microlith styles in different regions of Denmark (Blankholm this volume) or other elements of material culture such as rock art traditions, have proved more supportable than a focus on intensification *per se* (Arias 2004). The social context of regionalisation is, nevertheless, difficult to address, given the complex relationship between what might be seen as defined 'territories' and ethnicity (Bergsvik 2003). Insight has been gained from considering the spread of techniques of manufacture rather than by focusing on final form, for example, the spread of blade techniques and changes in platform preparation in Norway (Bjerck this volume, see also Warren 2006).

A particularly interesting argument for a relationship between environment and society lies in the apparent connection between social complexity and maritime and lakeside environments (Mithen 1994). Similarities appear in societies in which there are rich maritime or lakeside resources from the far north to the Mediterranean. In the far northern latitudes, where for four months of the year the sun does not set, the icy cold but resource-rich northern sea was the focus of settlement for maritime hunter-gatherers such as those at Vega in northern Norway. Here we see settlements with pit houses, with people using elaborate seagoing vessels in their specialised focus on marine foods, probably associated with seal hunting (Bjerck 1995, Bjerck this volume). Further south, other structured settlements echo the theme of marine or lakeside focus. At Tågerup in Sweden, large

houses were constructed in a 'village' at the confluence of two rivers, with permanent structures such as jetties and moorings for boats (Zvelebil this volume). Coastal and lakeside regions also provide evocative glimpses of societies for whom the sea and water played an important economic and symbolic role. We see richly symbolic pendants of amber and animal teeth, wooden artefacts such as bows, decorated paddles, canoes, and leisters in evidence from submerged sites in the Baltic (Blankholm this volume). Rock art sites such as Nämforsen in Sweden offer fascinating glimpses of symbolism associated with images of elk, boats, fish, and birds that show commonalities with the cosmological system of the modern Khanty, and appear to mark an important locus for ritual, aggregation and exchange (Zvelebil this volume). Riverine resources also appear to have been particularly influential in the development of settlements such as Lepenski Vir and Vlasac in the Iron Gates (Bonsall this volume). Here, in relative isolation from the rest of Europe, we see an apparently 'sacred' site at Lepenski Vir, comprising houses with plastered floors, carved figurines, and neonates interned under the floors.

The distinctive difference between these societies and those in inland areas is a common theme running through the volume. In interior regions, typified by often-dense Holocene woodland, the evidence for occupation can be scarce, and for ritual or symbolic life scarcer still. We see similar elusive evidence with scattered sites and interpretations of woodland hunting in Germany (Jochim this volume), France (Valdeyron this volume), and Britain (Tolan-Smith this volume), and in the distinctive woodland areas of the Mediterranean such as Greece (Pluciennik this volume). Postdepositional processes undoubtedly play a role in influencing the patchiness of the hinterland record, but it is difficult to escape the conclusion that such wooded environments were in general less resource-rich and populations more mobile and organisationally 'simpler'. Zvelebil suggests that these inland areas are typified by simple forager groups exemplifying Ingold's 'forager mode of production' (Ingold 1988, Zvelebil 1998). Distinctively different societies occupied many lakeside and marine locations and exhibited status differentiation and distinctions along dimensions of age and sex. Nonetheless, the relationship between environment, landscape, and society in Mesolithic Europe is far from clear-cut. Each region, or even local area, has a distinctive mark, which reflects a subtle and individual engagement between resources, settlement, and belief, and that is also negotiated through and affected by connections between groups at a larger scale.

The interpretation of apparently different degrees of social organisation in societies across the whole region and the extent to which this relates to environments is challenging. Traditionally, social differences are seen as being driven by differences in settlement/mobility patterns. Drawing on ethnography, the contrast between so-called delayed return and immediate return hunter-gatherers (Woodburn 1980) has been seen as the structuring principle explaining difference in Mesolithic society. In Woodburn's model, 'immediate return' groups make frequent moves of their main residential base, foraging on a daily basis to collect local food sources. Mobility of this kind has been seen as a classic hallmark of small-scale egalitarian societies in which resources are unpredictable and sparse, who might tend to show a kinship structure based on exogamy and wide-ranging alliance networks (Tolan-Smith this volume). 'Delayed return' hunter-gatherers, by contrast, appear to be associated with predictable resource-rich environments where collecting food resources can be organised using task groups, who forage away from the main residential base. These are the 'logistic foragers' in Binford's terms (1980), in which through organised exploitation the returns on collection are 'delayed'. The latter kind of movement involves planning and organisation, and typically use of complex technology such as fish traps and boats.

Applying these models appears to 'make sense' of much of the material evidence for Mesolithic Europe. Several regions provide good examples of logistically organised societies that have been seen as examples of 'complexity'. Specialised maritime exploitation patterns as in Scandinavia

provide one example, with certain clear-cut cases of organised procurement, such as specialised hunting sites for swans or whales in Denmark (Blankholm this volume). Societies in the Baltic show evidence for marking out of social distinctions and illustrate many instances of different social groups in burial (Zvelebil this volume). However, the association of resources and settlement with other changes, such as social stratification, intensification, the rise of sedentism, and the appearance of cemeteries, is not altogether clear-cut. In northern Scandinavia, evidence suggests that a suite of social changes occurred throughout the Mesolithic – a longer-lasting occupation of sites, the appearance of more distinct regional groupings, a widening range of species in subsistence, and an intensification in the use of symbols (Bjerck this volume). The progressive development of social organisation and the relationship between characteristics of social organisation and environments is increasingly being questioned in other regions. In southern Scandinavia, the concept of a progressive increase in sedentism, the rise of complexity, and the appearance of cemeteries is not borne out by close inspection of the material record (Blankholm this volume), although variety of grave goods at Skateholm and association of blade knives with some male burials at Bøggebaken does suggest increased social diversity and the rise of leadership and competition for power. For the Iron Gates, despite earlier interpretations, Bonsall (this volume) finds sedentism unlikely, and although some suggestions of high-status burial exist, social distinctions are hard to define. Across Mesolithic Europe, the relationship among 'delayed return' economies, 'complexity' discernible in evidence of increased sedentism, exchange relationships, and defined stratification in burial is often unclear.

The arguments for relating use of resources and settlement pattern to apparent social changes are not as straightforward as they might appear. Certainly, the concept of clear modes of settlement can be seen to be rather simplistic. Almost all hunter-gatherers use both immediate and delayed return strategies at various times (Kelly 1995, Spikins 1999, Spikins 2000) with a fluid transition between 'mapping onto' food resources and the organisation of specialist task groups. As Jochim (1991) illustrates, seasonal rounds in ethnographic societies are rarely clearly defined, with variation from year to year being the norm. Differences within regions are also marked in ethnographic cases (Spikins 1999, Spikins 2000). In recent years, there also has been an increasing recognition of the fluidity of social changes. Rowley-Conwy notes that the appearance of what we might call 'complexity' is a fluid process, which can be reversed (Rowley-Conwy 2001). The relationship between subsistence changes and ideological changes also has become an area of much debate that remains to be resolved for the Mesolithic-Neolithic transition (Rowley-Conwy 2004). A gradual rise of complexity through intensification of exploitation patterns and increasing organisation of people and time has become a hard principle to sustain, and there seems to be far more to the picture of different societies than variability in resource exploitation.

Of course, the 'missing pieces' of the tapestry of evidence in Mesolithic Europe compound the difficulties of distinguishing modes of society related to immediate or delayed return settlement systems, and even more so of identifying or beginning to understand any transition between them. As many have argued (Coles 1998, Bailey 2004, Bailey and Milner 2002, Fleming 2004), the missing evidence from submerged prehistoric coasts may be crucial, as almost all our evidence of early Mesolithic coastal societies has been submerged by rising seas and much Late Mesolithic evidence as well. It is precisely the coastal locations where the most 'organised' societies tend to exist. For Britain, tantalising glimpses of supposedly emergent complexity occur in early Mesolithic coastal settings, such as evidence for structures, which might have been occupied for an extended period, at Howick (Tolan-Smith this volume, Waddington et al. 2003) or glimpses of symbolism and exchange in the elaborate bead production at Nab Head in South Wales (Tolan-Smith this volume). The 'missing pieces' of the tapestry not only frustrate interpretations but may even bias them towards

certain types of sites. Blankholm (this volume) notes that discussions of southern Scandinavian social complexity frequently compare late Mesolithic coastal sites with early Mesolithic interior sites (with early Mesolithic coastal sites being underwater at depths that are largely inaccessible), creating a biased picture and artificially suggesting the appearance of more 'complex' societies over time.

Cosmology and Belief

Although evidence for changes in social relationships can be biased and often ambiguous, this is even more true of cosmology and belief. Many researchers close interpretations of the period with suggestions about settlement systems or possibly social structure, leaving ideology and beliefs as a kind of 'Pandora's Box' best left untouched. In fact, beliefs and cosmology traditionally have been seen as a separate sphere from the day-to-day activities of subsistence and social relationships in the Mesolithic. However, new perspectives and analogies with recent hunter-gatherers increasingly place cosmology and belief at the heart of our understanding not only of how hunter-gatherers see the world but also what they actually do (Zvelebil and Fewster 2001, Jordan 2003a, Grøn and Kuznetsov 2003, Lodoen 2003, Nordquist 2003, Chatterton 2006, Jordan 2006, Zvelebil this volume).

The most direct access to beliefs for most periods comes from burial evidence. However, if we want to elucidate some clear pattern in the burial evidence from Mesolithic Europe, we are likely to be disappointed. It is perhaps in this material evidence where we see the most intriguing and evocative record of diversity and unpredictability. There appear to be few if any broad structuring principles that hold together approaches to treatment of the dead (Schulting 1998), making it difficult to see a common thread.

The most famous burials are the large collections of graves in Scandinavia, the Baltic, and the Iron Gates sites, and it is here that we see evidence for a consistent pattern in social differentiation, if not the means by which this is displayed. In the north, Olenii Ostrov, dating to the mid-seventh millennium cal BC, on a small island within Lake Onega in Karelia, probably held more than three hundred interments (Zvelebil this volume). Here there is a mix of individual and collective burials with certain graves marked out differently, particularly shaft graves that have been interpreted as those of shamans. Gravestones, small cairns, or stone linings also marked some interments. The implications of differentiation in grave goods and burial type are contested, but it is possible to suggest three specialised ranks expressing band membership: age, sex, and personal wealth. Similar complex differentiations are seen in the famous burial complexes of around eighty-five graves at Skateholm (I and II) in southern Sweden, which include cremations, interment in a sitting position, double graves containing both women and men with children, rich child graves, and dog burials. Once again, certain individuals are specifically marked out with timber structures built over two graves at Skateholm I, whereas Skateholm II had a mortuary house. Skateholm has been interpreted as a territorial marker of a unilineal descent group claiming rights to resources through ancestors (Zvelebil this volume). About three hundred individuals were interred with various grave goods at Muge in Portugal (Straus this volume) and large numbers of graves – over one hundred at Vlasac – are also found in the Iron Gates sites with a variety of burial rituals (Bonsall this volume).

Taken as a whole, there is considerable diversity in burial practice and the structure of burial sites across Europe. Body positions at Lepenski Vir, Padina, and Schela Cladovei are widely varying, with special treatment of the skulls in some cases. Some burials were lacking the skull, and cutmarks at Schela Cladovei suggest that the burials were revisited and the skulls removed after the flesh had

decayed (Bonsall this volume). Communal graves dug in earth-cut pits are seen at the burial complex of Téviec and Hoëdic (Valdeyron this volume). Whether any of these large burial complexes can rightly be called 'cemeteries' is contentious (Blankholm this volume), as there seems in most cases to be little differentiation between settlement and burial place, the concept of cemetery being perhaps something inspired more by our modern concepts of treatment of the dead (Conneller 2006). The Vedbaek complex in Zealand, for example, consists of burials interred in settlements that dotted the ancient coastline of the Vedbaek fjord (Blankholm this volume).

Other burial practices reflect different identities and intentions. 'Founding statements' in northern Sicily consist of burials dug into archaeologically sterile layers at the beginning of a sequence of lengthy deposition (Pluciennik this volume). These might share some parallels with the burial of neonates under floors at Lepenski Vir. Unusual rites also abound, such as the so-called skull cult of Eastern France, Baden-Württemberg, and Bavaria. At Ofnet Cave, Bavaria, two shallow pits contain skulls, jaws, and vertebrae. Bludgeon wounds on most of the skulls appear to be the cause of death, which could be described as a 'Mesolithic massacre' (see Jochim this volume). At Agnis Charente, there are human bones from eight individuals in domestic refuse, with butchery marks characteristic of disarticulation and defleshing, probably indicating cannibalism (Valdeyron this volume). The evidence for violence in many of the burial complexes and elsewhere (Vencl 1999, Thorpe 2000, Blankholm this volume, Jochim this volume, Bonsall this volume) contests the image of passive, purely giving and sharing societies in the Mesolithic as put forward by Bradley (1998) and Tilley (1996) on the basis of Bird-David's (1990, 1992a) account of hunter-gatherer society.

The role of violence in society is complex, however, and it is important to remember that there may be differences between different hunting and gathering societies in Mesolithic Europe that are as fundamental or even more so than those between the Mesolithic and the Neolithic. Formal burials in so-called cemeteries, Mesolithic 'massacres', or burials with clear evidence for violence almost certainly reflect a particular element of society or practice. However, we have little idea how common structured burial was, and it seems likely that elaborate burial was rare. In Mesolithic Europe as a whole, common burial practice might have been disarticulation, with the occasional finds of human bones in middens or other areas of settlement often attracting much less archaeological attention than would a formal burial (Conneller 2006). Understanding the disarticulation and dismemberment of human bones, for example in cases such as the Oronsay shell middens, demands an understanding of similar practices in ethnographically known societies, in particular concepts of individuality and commonality (Conneller 2006).

Other evidence for beliefs and cosmology from art or personal ornamentation (Bjerck this volume, Verhardt this volume, Zvelebil this volume) complements evidence from burials, with equal complexity. Taken as a whole, the evidence from across Europe for environment, settlement, society, and belief forms a complex multicoloured tapestry. Threads and patterns exist but can often be hard to discern and, where they appear, demand more subtle explanation than many of our current narratives supply.

Other Approaches to Interpreting Social Change

The issues are complex; however, there is a real sense of important social distinctions identified in all the contributions to the volume. Available resources, resource use, and mobility clearly play an important role in marking the differences between distinct societies. Nevertheless, we are left feeling that there must be more to the picture of societies and social relationships in the Mesolithic. Our

deep-seated narratives easily apportion social change, competition, and social dynamics to certain very specific societies and contexts, leaving most in an uncontested and passive relationship with each other and with their environments. Rethinking the apparent link between environments and social structure demands a much better understanding of social relationships in Mesolithic societies, one that goes beyond the structure of settlement patterns.

There may be several different routes to a better understanding of people and relationships in the Mesolithic. Discussions in anthropology contribute important concepts such as identity and relatedness (Bird-David et al. 1999, Fowler 2004, Conneller and Warren 2006, Jordan 2006, Milner and Woodman 2005) and relationships between material culture and society (Finlay 2003, Finlay 2006, Warren 2006). The call to understand emotion in archaeology (Tarlow 2000, Gosden 2004) might provide another framework.

One route explored here is to draw on discussions within the social psychology of hunter-gatherers. Although social psychological rather than anthropological discussions of ethnographic populations are limited, this perspective provides a useful interpretative framework of structured relationships between people. Certain concepts have particular relevance, of which mechanisms of *deference* between people in hunter-gatherer societies may be notably useful (Heinrich and Gil-White 2001). Deference can perhaps be thought of as a means of showing respect or acknowledgment of social standing and so mechanisms of deference exist in all societies (even the social environment of school playgrounds). Such mechanisms and understandings structure relationships and the gestures and attitudes of individuals towards each other. As such, deference is not simply about behaviour but also about emotions and common understandings.

Heinrich and Gil-White (2001) illustrate how social relationships and deference in egalitarian hunter-gatherer societies are largely mediated through what can be termed 'prestige'. They describe prestige as associated with people who have particular valued skills, such as at flint-knapping or story-telling, and as such it is a quality that comes from showing excellence in valued areas. Relationships mediated through prestige allow certain people *influence* through emulation or copying of their abilities. However, prestige does not confer any ability to dictate or sanction behaviour, that is, prestige may be associated with influence but not *power*. Prestige is achieved through 'nonagonistic' stances and actions (i.e., nonviolent, nonintimidating, and nonaggressive). Someone with prestige is listened to, that is, their opinions are heavily weighed. They are not 'obeyed,' and by implication these individuals are not feared and do not have 'power over' others. Individuals with prestige attract others towards them who will tend to copy their behaviour, publicly praise them, seek eye contact, and direct their posture towards the prestigious individual.

In contrast to prestige, status relationships mediated through *social dominance tactics* involve those who are socially dominant taking an aggressive stance and attempting to dictate behaviour. Deference in reaction to this behaviour takes the form of avoidance of eye contact and deferent body posture. The experienced emotion of deferring to someone dominant is markedly different – associated with fear rather than inspiration. The emphasis is on controlling the behaviour of others rather than inspiring or influencing them. The distinct types of relationship are not mutually exclusive, although the acceptability of either varies markedly. Heinrich and Gil-White (2001) describe both tactics in school children in playground negotiations of social dynamics. Crucially, each means of relating to others appears to draw on different deep-seated psychological and emotional responses. Most of us can easily imagine how it would feel to be inspired by someone we respect or controlled by someone we fear.

The maintenance of prestige rather than social dominance is important in egalitarian hunter-gatherer societies (Erdal and Whiten 1996, Heinrich and Gil-White 2001, see also Heinrich et al. 2001). Social relationships mediated through prestige are constantly contested. Influence through

prestige involves listening to the prestigious person with respect, and, as Erdal and Whiten (1996: 145) note, 'there is nothing permanent about respect'. Thus, prestige is very fluid, and maintaining or achieving prestige is a process of constant social negotiation. Crucially, people who are prestigious are prevented from assigning authority or power to themselves in various ways amongst ethnographically documented hunter-gatherers. Amongst the Semai, if someone seeks to assert their authority, it is generally accepted that others will cease to 'hear' them. As Dentan (1979, cited in Heinrich and Gil-White 2001) notes, individuals with prestige amongst the Semai use rhetorical techniques such as self-deprecation to assure listeners that they are not trying to compel compliance. Counterdominance tactics operating in egalitarian societies to maintain prestige-based social relationships are known to be widespread (Erdal and Whiten 1996). Turnbull (1965: 181), for example, notes that for the Mbuti, 'Individual authority is unthinkable'. For the Netsilik, 'Where there are named roles, the leaders, whose leadership role is taken by the 'inhumataq' or 'thinker', are not 'obeyed' but rather 'listened to' (Riches 1982: 74, in Erdal and Whiten 1996). Erdal and Whiten also illustrate how ridicule is used to prevent leaders from being dominant. Numerous ethnographic illustrations can be found. Lee notes, for example, that 'The !Kung are a fiercely egalitarian people . . . cutting down to size the arrogant and boastful' (Lee 1979: 244). Turnbull (1965: 183, in Erdal and Whiten 1996) notes for the Mbuti that 'Some men, because of exceptional hunting skill, may come to resent it when their views are disrespected, but if they try to force these views they are very promptly subjected to ridicule'. Likewise, amongst the Selk'nam, any boastful individual would be derided, humility being seen as an important principle to teach children (Bridges 1948). Situations illustrating the way prestige 'works' are widespread in ethnographies of hunter-gatherer societies.

Whereas prestigious individuals are prevented from asserting their own authority, the transition to a type of social dominance might occur when authority is invested in them by others in a particular context. A good example of the potentially transitory nature of emerging social dominance can be found in ethnographic accounts of the Yamana (Yahgan) of Tierra of Fuego. The Yamana were largely maritime hunter-gatherers, occupying the southern part of the islands of Tierra del Fuego, and were recorded most notably by Gusinde during the 1920s (Gusinde 1986). The mobility and social relationships of the Yamana are typical of small-scale egalitarian hunter-gatherers, with no clear marking-out of status and a very mobile lifestyle with little opportunity for material accumulation. Of particular interest in terms of the acceptance of social dominance within a normally prestige based society is the Yamana ceremony called the Chiexaus. The Chiexaus is one of the most important ceremonies, an extended event taking about two months during which young men and women were initiated into society. A large specially constructed oval hut was built and various complex performances took place in which different members of the group wear specific dress and body paint imitating spirits. The ceremonies had a 'director', nominally in charge of the organisation of the events (although taking wishes of the participants into account). Other individuals, such as the Winefkema, who represented a predatory seabird, also had specific authority. In the case of the Winefkama, he would have authority (and helpers) to forcibly escort the initiates to the hut. Boys who resisted would be caught with a large strap, or in the case of girls a skin thrown over her head, and dragged to the hut. A clearly disobedient initiate might be tied to the entrance and left without food or water for half a day or more (Chapman 1997). This relationship might appear to be a clear example of social dominance – the initiates, normally part of a society in which influence comes only through respect and inspiration, are afraid of Winefkama who has the power to control them. However, the authority invested in the director or the Winefkema was transitory and such rights were negotiated in a sensitive and complex way, and often, although not always, accorded to shamans (Gusinde 1986). In all cases, these individuals

were felt to be trusted by the wider group, who temporarily accorded such privileges so that the ceremony could be organised. Whether a Chiexaus took place was context-dependent and also negotiated according to the willingness of the group to accord such privileges. Similar contexts might have arisen at different times and places within the Mesolithic, sometimes very fluid and at other times more sustained. Rather than passively uncontested social roles, we can imagine that competition for prestige and transitory cases of social dominance coloured social relationships.

Identifying prestige relationships or status defined through social dominance in the archaeological record presents a challenge. Naturally, ethnographic evidence may provide the main source for suggestions as to how material culture may reflect societies governed by prestige. Ironically, however, we are faced with the paradox that in prestige-based egalitarian hunter-gatherer societies, the bases for prestige, such as skills, are rarely 'marked out' through material culture – to do so would be to assert authority, contrary to the ethic of self-derogation. So predominantly prestige-based societies may be associated with an *absence* of material 'marking-out' of specific skills in life, and perhaps also in death.

To make identifying prestige even more challenging, the relationship between prestige and personhood is also clearly multifaceted. Prestige is only one element of identity. Elements of a constantly negotiated personal identity that may be marked out in both life and death may not be connected with prestige relationships. Attractiveness, for example, although associated with 'desirability', need not be seen as prestigious (Heinrich and Gil-White 2001), that is, attractive individuals are not necessarily 'listened to'. Thus, Shostak (1981) notes that, amongst the! Kung, all women are considered attractive, and use personal ornamentation to mark out attractiveness, whereas individual skills, although valued, are not marked materially (Lee 1979). A marking-out of identity through personal ornamentation, such as the beads known from Nab Head in Wales (Tolan-Smith this volume) or items of adornment from the Danube and Upper Rhine (Jochim this volume), might equally be related to attractiveness or other social distinctions rather than ones based on prestige. Bonsall (this volume) notes that items of adornment present in burials in the Iron Gates are not necessarily related to status distinctions. Although it is difficult to base conclusions on negative evidence, it is tempting to conclude that a relative paucity of any material evidence of any marking out of *skills* in life or death in most areas of Mesolithic Europe might in this light echo the maintenance of prestige-based social dynamics.

Social dominance tactics may be easier to identify materially. Contributions to this volume call to mind several themes that also might appear to relate to social dominance relationships. Evidence for violent deaths might, certainly on first reading, illustrate social dominance tactics, for example. However, such evidence of death is ambiguous, as aggressive tactics (or outbursts of jealousy) may be the result of occasional episodes of social dominance rather than evidence of societies in which social dominance is either temporarily or permanently the accepted basis of social relationships and 'normal' codes of conduct.

Sustained marking-out of skills and social distinctions appears to have been relatively rare in Mesolithic Europe, but instances in which some kind of socially dominant authority has arisen nonetheless exist. In some cases, this dominance appears to have some permanence. The shaft graves of supposed shamans at Olenii Ostrov (Zvelebil this volume), or individuals buried with flint knives at Bøggebaken (Blankholm this volume), certainly appear to draw on a continuing basis for social status and authority defined through certain skills. Likewise, sculptures of waterbirds, elk, beaver, bear, and snake in burials at the Zvejnieki, Kreichi, and Sope cemeteries in the East Baltic (amongst other instances in Mesolithic Europe) appear to be related to more permanent status distinctions (Zvelebil this volume). Such sustained and widespread 'marking-out' of skills or authority provides suggestive evidence for the acceptability of social dominance and a radical

departure from prestige based social relationships in these societies. In other cases, we might interpret a more transitory and fluid social dominance, such as in the burial contexts in the Iron Gates (Bonsall this volume). Taking an analogy with the Yamana Chiexaus, the acceptance of social dominance might conceivably largely emerge in a ritual context. The antler frontlets apparently constructed to be worn as head gear recovered from the early Mesolithic site at Star Carr could from this perspective be marking out the wearer as a transitory figure of socially dominant authority, perhaps as part of a ritually constituted context. We can easily imagine how material culture might be drawn on to symbolise (and make acceptable) the transitory nature of ritual dominance. Headgear such as antler frontlets that are visibly put on and removed could operate much like the costume and headgear of Winefkama to transform the 'normal' codes of prestige relationships. In a different context, the organisation forming part of the construction of large structures (such as at Howick, Waddington et al. 2003) at various times and places in Mesolithic Europe might be more explained through temporary, perhaps ritually situated, socially dominant authorities than a more permanent level of social organisation.

Elusive though they may appear, we are left with a real sense of significant changes in social dynamics and the emotional context of social relationships taking place at various time and places in the Mesolithic. Perhaps those people who buried their dead within demarcated graves had fundamentally different constructions of meaning, social dynamics, and means of social competition from those who conveyed the social meaning of individuals in death by disarticulation and disposal of the corpse within settlements. Only by beginning to wrestle with complex issues of deference, prestige, and emotion will be begin to understand these issues. 'Prestige' adds a dimension to understanding social and ideological differences and perhaps an opportunity for teasing apart the types of social changes occurring in Mesolithic Europe, without necessarily assuming that these are merely a by-product of differences in resource procurement. The concept of prestige-based societies and their transformation into ones based on social dominance raises many issues for understanding the archaeological record. Marked differences in social practices, even down to the level of gestures and accepted means of rhetorical speech and the emotional context of relationships, may well have separated societies. We might even pause to consider if societies in which practices of self-derogation or the role of ridicule were 'understood' would feel 'uncomfortable' to those used to marked patterns of social dominance. Prestige is only one concept that can contribute to a more socially situated concept of Mesolithic societies. Others, such as a better understanding of the social and emotional context of technology and artefact production and use (Finlay 2003, Warren 2006), might contribute to some of these issues.

Conclusion

Evocative and tantalising glimpses of the world of Mesolithic peoples, such as the wooden statuette from Willemstad (Verhart this volume and cover illustration) might be rare, but the aspirations and motivations of people in the Mesolithic are emerging as a new focus in current discussions. Past, somewhat passive, narratives of Mesolithic societies, coupled with an expectation of finding dramatic material evidence of social changes, can easily blind us to the subtleties of social change in the Mesolithic. Considerations of the subtle deference techniques and emotions in the social relationships within hunter-gatherers suggest that a dynamic sphere of contested social relationships existed in Mesolithic societies. Nonetheless, glimpses of Mesolithic lives appear and can be drawn out from the material record whether we choose to focus on emotions, perception, social relationships, activities, technology, subsistence, or settlement structure. The various perspectives

derived from considerations of resources and economy, ideology, and society make the tapestry of Mesolithic Europe all the richer, as each of the chapters in the volume make their own contribution to writing new and more dynamic narratives of the period.

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Preface and Acknowledgments

In this volume, we bring together a series of regional syntheses of the Mesolithic in different parts of Europe, intended to be of interest and benefit both to specialists and to those with a more general interest in archaeology. Mesolithic archaeology has witnessed an acceleration of interest in recent years, with many new projects, more communication across old geographical and political barriers, and calls for archaeologists to examine the Mesolithic on its own terms, rather than as an inconvenient rung in some ladder of human progress. Accounts of the Mesolithic are typically absorbed into general syntheses of prehistory, submerged in works unified by wider-ranging theoretical or methodological themes, fragmented in publications of individual site-based or regional field projects, or combined in the proceedings of specialist conferences. Here, our aim is to provide both an up-to-date overview of the current state of knowledge about the Mesolithic period, a demonstration of the richness and diversity of the material now available and the various approaches to its study, and a source for those who wish to delve more deeply into the literature.

Our brief to our contributors was to provide an interpretive synthesis of their region, varying the emphasis according to the available material and drawing on broad categories of information: the history of research and the definition of the Mesolithic; environment and geography; chronology; technology and subsistence; settlement and social organisation; and art and ritual. We also encouraged them to range both backwards and forwards in time to consider the nature of the boundaries that traditionally mark the beginning and the end of the Mesolithic, including the transition to agriculture.

We are, of course, acutely aware of the arbitrary nature of our selections and the boundaries they imply, and the inevitable unevenness of coverage. In a continent notable for a history of political fragmentation reinforced by barriers of geography, language, nationality and cultural tradition, total coverage, let alone uniformity of approach, was hardly to be expected. Archaeologically, the field of enquiry has been further complicated, and indeed enriched, by different intellectual traditions, by the historical dominance of the French and the Danes, by Anglophone traditions of method and theory, and most recently by regional synthesis and diversification.

We could have devoted a single chapter to every nation state within the geographical boundaries of Europe. But that would have produced far too large and uneven a volume, and it is questionable how far modern political boundaries are helpful or relevant in assessing the prehistoric record, although we acknowledge the influence of modern political history on intellectual traditions of investigation and interpretation. Our selection of chapters is necessarily a compromise between what we would have liked to include and what was realistically possible. Some chapters range widely across geographical and political boundaries, others focus more sharply on areas delimited by modern political borders. Some areas achieve disproportionate attention because of long histories of study, the abundance of material, or the impact of distinctive types of new evidence or new ideas.

Others may seem underrepresented or referred to only tangentially in relation to adjacent areas. If nothing else, the volume of material presented here should leave little doubt about the substantial nature of the Mesolithic record, its potential to illuminate new dimensions of human variability, and the prospect of a truly comparative picture ranging from the Atlantic coast of Ireland to the Urals, and from the sub-Arctic to the Aegean.

The regional chapters are organised in broadly geographical order. Chapter 2 provides a wide-ranging geographical and thematic overview, focussed on the Baltic, followed in Chapter 3 by a review of Norway, where new investigations have produced a substantial and distinctive body of new material, and in Chapter 4 by a discussion of the classic material of southern Scandinavia. Subsequent chapters move from west to east across the middle zone of Europe, from the British Isles, via the Low Countries, France, and the Rhine and Danube drainages, to the vast territory comprising Belarus, Russia, and the Ukraine, and thence to the south, to the Iberian Peninsula and the Mediterranean coast.

In our editorial contributions, our opening chapter provides an introduction to the field of study, to the issues raised in subsequent chapters and to some of the ideas that are beginning to influence a new generation of interpretation. Our final chapter provides an overview of the Mesolithic period as a whole and an indication of new directions for future research. The editorial chapters are single-authored, reflecting both the dominant input of each editor and a difference of perspective and approach between us. They are, nevertheless, also the result of joint effort and discussion and in their totality reflect a body of ideas to which we both subscribe, and a jointly held belief that the Mesolithic record offers an unparalleled opportunity to explore the relationship between the very large scale and the very small, between millennial and pan-continental trends and the actions of social groups and individuals.

Not the least of the problems of dealing with a period often regarded as transitional, is that it also marks a zone of overlap between different conventions for expressing dates as either 'before the present' or 'before Christ.' The position has become more confused in recent years by the refinement and widespread adoption of calibration curves and by a host of different abbreviations – BP, BC, BCE, bp, bc, cal BP, cal BC, kyr, ka, rcybp. Tree-ring counting provides the most accurate conversion of radiocarbon years to annual solar years and then only back to 8329 cal BC, or to 9908 cal BC with a degree of uncertainty. The calibration curve can be extended further back in time, in principle across the full five-thousand-year time range of radiocarbon, using uranium series dating of coral terraces and annual growth increments in varved lake-sediments and speleothems (Van der Plicht 2004). In general, calibration suggests a broadly progressive divergence of radiocarbon and solar chronologies, the former providing underestimates amounting to as much as two thousand years or more, a degree of divergence that affects the time ranges dealt with in this volume. One might argue that such divergence is of no consequence unless one is comparing radiocarbon dates with dates derived from historical records, but the intervals of time measured by radiocarbon dates may differ from their calendar equivalent by a significant amount. Within the Mesolithic period, 500 radiocarbon years may refer to as little as 280 calendar years or as much as 580 calendar years, depending on the particular part of the calibration curve, differences that are potentially significant for archaeological interpretation.

It would be mistaken to suppose that calibration has introduced more accurate radiocarbon dates. The convention for expressing calibrated dates as range within two standard deviations is a healthy reminder that a single radiocarbon date actually represents a probability distribution covering quite a long span of time. Moreover, different calibration schemes are currently in use and under continuous revision, producing somewhat different albeit minor calibrations. The problem of plateaux in the production of radioactive carbon in the upper atmosphere is an irreducible

problem, resulting in periods within which the same radiocarbon date may refer to a wide range of calendar dates, and several of these plateaux occur in the Mesolithic period. To these uncertainties, one should add the problems of correcting for the marine reservoir effect, other potential sources of contamination from a variety of sources, inter-laboratory variations, large standard deviations especially for radiocarbon assays undertaken at an earlier stage in the development of the method, uncertainties of stratigraphic association, the fact that a great deal of archaeological material has not been radiocarbon dated, and that much will probably remain undateable.

In Europe, specialists who study Neolithic and later periods have long used the 'BC' convention, whereas those studying Palaeolithic and Mesolithic periods have preferred the 'BP' convention. That difference tends to reinforce a boundary between Mesolithic and Neolithic that is obstructive rather than helpful to interpretation. Hence, the current convention is to express the original radiocarbon date in radiocarbon years BP (before the present, that is before AD 1950) with a margin of error at one standard deviation, and to express the calibrated version in years BC (cal BC) as a range that encompasses the 95.4 percent probability range of two standard deviations. This convention may be confusing for those used to BP chronologies and of doubtful relevance in other parts of the world beyond Europe and the Near East. It is, nevertheless, the currently preferred convention in European prehistory, and we use that convention here. Appendix 1 provides a correspondence table for uncalibrated radiocarbon years and calibrated years BC, at one-hundred-year intervals between 2500 and 13,000 BP.

All of this suggests that although we now have very many more radiocarbon dates than before, there are some respects in which we actually know less about chronology, or at any rate rather more about the extent of our ignorance. When we first planned this volume we intended to ask all our contributors to provide a list of radiocarbon dates for their region. That directive has proved more difficult to implement than we had supposed. Many authors pointed out the uncertainties associated with the dates in their region and the need for critical use of the resulting material. In consequence some authors have produced quite selective lists, and one or two others more generalised dating schemes. It is significant that some of the longest lists are in those regions where Accelerator Mass Spectrometry dating has been widely applied, typically in collaboration with the Oxford Radiocarbon Accelerator Unit, producing dates on individual artefacts or other items, which circumvent some of the uncertainties of radiocarbon dating.

The idea for this book originated in 1999 following a suggestion from Graeme Barker for a volume that would be part of a series on European prehistory to be published by Leicester University Press, and a first group of chapters were drafted in 2001 and 2002. With changes in the publishing world, Cambridge University Press took over the project in 2003, and encouraged us to expand the regional coverage and our editorial input with additional chapters. Some chapters have thus been in gestation for considerably longer than others, but all authors have had the opportunity to update their reviews in the light of more recent findings.

We thank our contributors for their patience, Jessica Kemp for assistance in preparing the illustrations, Robert Hedges of the Oxford Radiocarbon Accelerator Unit for advice on radiocarbon dating, Jeremy Boulton, Head of the School of Historical Studies, University of Newcastle upon Tyne, for funding assistance with the preparation of the book, and Simon Whitmore of Cambridge University Press for encouraging the project through to completion. We also acknowledge financial support from the AHRC through grant B/RG/AN1717/APN14658 and from the Leverhulme Trust through its Major Research Fellowship scheme.

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