Chapter 2

Innovating Hunter-Gatherers: The Mesolithic in the Baltic

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Introduction

There was no other region in Europe where Mesolithic settlement was as fully represented and where hunter-gatherer communities continued to flourish until so recently as Northern Europe. Atlantic Scandinavia and the basin of the Baltic Sea, with their network of marine coastlines and freshwater lakes and rivers, provided fertile territory for hunting, fishing, and gathering. It is impossible to do justice here to the full story of the development and transformation of hunting-gathering communities who utilised this landscape in the past twelve thousand years. Instead, I shall focus on some pivotal themes, outlining the main features and principal events in the region and summarising recent advances in research. It is of course difficult in such a wide-ranging review to avoid overgeneralisation at the expense of detailed variation and historical contingency, and for additional detail and critique the reader is advised to consult the regional studies referenced later in this chapter.


Environmental Background

The Baltic basin is a lowland region of rivers, lakes, and marshes, the landscape of which has been shaped by processes of deglaciation, isostatic uplift, and eustatic changes in sea level. In the centre of the area lies the Baltic Sea with the two large gulfs of Finland and Bothnia, the major islands of Bronholm, Öland, Åland, Gotland, and Saaremaa, and numerous smaller islands. Today, the area is shared by Sweden, Poland, the East Baltic countries—Lithuania, Latvia, and Estonia—and Finland (Figures 2.1, 2.2).

During the late Pleistocene, this area was mostly buried under the Scandinavian glacier. As the ice melted with deglaciation, the sea first flooded the low-lying areas in peninsular Scandinavia, Latvia, Estonia, and Finland; but isostatic rebound of the landmass freed of ice followed, resulting in an overall emergence of the land over time. Only along the southern shores of the Baltic and in parts of southern Scandinavia the eustatic rise in sea level outpaced isostatic rebound and land dry during the late Palaeolithic was flooded by the sea in the early part of the Holocene. These processes resulted in unstable and changing shorelines throughout the region. The stages of development in the Baltic Sea basin are marked by five different environments: the Late Glacial Ice Dammed Lake (until about 10,000 BP), the Yoldia Sea (10,000-9400 BP), the Ancylus fresh/brackish lake (9400-8000 BP), the transgressive Littorina Sea (8000-4500 BP) and the current Baltic (Linner) sea (Clark 1976, Strömbäck 1974, Enren 1975, Morner 1979, Björck 1995, Matekska 1996, Hyvärinen 2003).

The beginning of the Postglacial was marked by a rapid rise in temperature by 5 to 6 degrees C to a July mean of approximately 15 degrees C (Blankholm and Dolukhanov this volume). Climatic amelioration peaked during the Climatic Optimum of the Atlantic period (c. 8000-5000 BP), when July mean temperatures reached twenty-one degrees C. The introduction of farming, marking the conventional end of the Mesolithic period, began around 5000 BP, just as the temperatures began to decline to current mean July levels of sixteen degrees C.

Climatic changes facilitated changes in the biome, particularly in more northerly regions. In outline, the forest succession and the associated faunal changes were marked by the predominance of birch and pine in the Preboreal period (10,000-9500/9000 BP), pine and hazel in the Boreal (9500/9300-8000/7500 BP), mixed oak forest of elm, oak, lime, and beech in the Atlantic (8000-5000/4500 BP), and a more mixed broadleaved-conifer forest in the cooler, more arid Subboreal period (c. 5000/4500-2500 BP). The last was marked by the disappearance of elm, reduction in the presence of warm-loving species and in their contraction northwards, in the development of raised bogs over previously more productive wetlands, and in the colonisation of many eastern parts of the circum-Baltic area by spruce forests (Berglund 1969, Clark 1975, Dolukhanov 1979, 1995, Jonsson 1995, Sandgren 2000).

In terms of terrestrial food resources, these changes meant a shift from more open, reindeer inhabited landscapes of the Late Glacial/Early Postglacial, to boreal fauna dominated by elk, beaver, bear, and fur-bearing game. During the Atlantic, the more temperate fauna of broadleaved woodlands included wild pig, red and roe deer, wild cattle, and, in the eastern Baltic, wild horse, in addition to elk and fur game. In northern parts of the Baltic Sea basin (Norland, Finland, Karelia) boreal woodland prevailed throughout and boreal fauna remained dominant. For aquatic resources, the main trends were the gradual colonisation of developing aquatic environments by an increasingly
Located mostly between 55 degrees and 70 degrees North, circum-Baltic Europe is marked by strong seasonal regimes, with the type and quantity of resources varying from season to season. Much of this variation is a result of the migratory nature of many aquatic food resources, such as waterfowl, eel, salmon, and some seals. The patterns of migrations mean that some species are available in abundance for a brief period of the year, principally in the spring and autumn. Between these peaks in potential food supply, people had to rely on less mobile and often more dispersed food resources.

broader range of marine and anadromous fish and different species of seal, and fluctuations in resources such as shellfish or anadromous fish in response to changing water temperature and salinity during different stages in the development of the Baltic Sea basin (Forsten and Alhonen 1975, Rowley-Conwy 1981, 2001, Lepiksaar 1986, Fischer 1995, Løugas 1997, Hyvarinen 2000). In aggregate, these developments indicate an increasingly rich and varied resource environment peaking in the Atlantic and early Subboreal period, covering the period from about 8000 to 4000 BP (Pawer 1995, Zvelebil 1981, 1985, Sandgren 2000, Dolukhanov this volume).
The distribution of food resources also varied from region to region. The presence of the Gulf Stream substantially increased the productivity of the coastal regions along the North Atlantic seaboard. Inland resources concentrated in lacustrine, riverine, or estuarine habitats created by the process of deglaciation and changes in the sea (Somme 1968, Dolukhanov 1979, Zvelebil 1981, Sjöström 1981, Skoglund 1982, Rowley-Conwy 1983, Nünz 1997). In contrast, the interior regions without many shoreline habitats – mostly moraine uplands, glacial outwash plains, and river basins covered by gravel, sand, and clay – were relatively poor in natural resources.

Thus, Postglacial conditions in northern Europe were marked by an uneven distribution of resources throughout the seasons and in space. For hunter-gatherer societies, the implications were twofold: on the one hand, seasonal and longer-term fluctuations increased survival risks in that people had to find their regular food supply from fluctuating resources; on the other hand, effective exploitation of seasonally concentrated food resources could generate a food surplus and raise the population capacity of the area.

The Colonisation of Northern Europe

Colonisation and settlement of northern Europe is one of the key events in the history of hunter-gatherer communities of the region. During the Last Glacial Maximum (c. 22,000–18,000 BP), the whole region was covered by the Scandinavian glacier. By 18,000–16,000 BP, improved climatic conditions were causing ice sheets to melt and exposing new land for colonisation by plants, animals, and humans. It took some four thousand years for the retreating ice to reach the southern margin of peninsular Scandinavia, where it lingered for a further two thousand years (Larsen 1996, Matiskainen 1996, Nünz 1997, Dolukhanov 1998a). It was at this time that human groups from surrounding regions began to penetrate the ice-free margins of Fennoscandia, their routes highly dependent on water and ice barriers in their path (Figure 2.1). This process of colonisation was gradual and time-transgressive, laying foundations for major patterns in the cultural diversity of northern Europe during the Mesolithic.

The people who were setting the ice-free margins of Fennoscandia between 12,500 and 9500 BP were divided into two broad cultural traditions (Matiskainen 1996, Nünz 1997, Wik 2002a, 2002b, Dolukhanov 1998a), in the west and the east, respectively (Figure 2.1).

Communities of the western tradition, derived ultimately from the Magdalenian culture, penetrated southern Scandinavia by 12,500 BP at the latest (Burdkiewicz 1986, 1996, Fischer 1991, Eriksen 1996, Brandt 1996, Hörsley et al. 1997, Eriksen and Brandt 2002, Gamble et al. 2005) and used it as a staging post for further expansion into Scania and central Sweden, as well as moving along the ice-free corridor along the Norwegian coast towards the north. They reached Norway’s northernmost Atlantic coast between 10,300 and 9600 BP, and went on to settle parts of Lapland from there (Knutsen 1993, Björck 1991, Larsen 1996, Thomsen 1996, Matiskainen 1996, Nünz 1997, Björck 1998). The northern part of Sweden (Norland) was settled between 10,600 and 9400 BP, shortly after deglaciation and probably from the Tromsö area of coastal Norway by the bearers of the Komsa culture (Knutsen 1993, Forsberg 1990). Originally reindeer hunters, these communities turned increasingly to fishing and sea hunting as they colonised the ice-free margins of peninsular Scandinavia (Clark 1976, Schmitt 1995, Jonsson 1995, Petersen and Johansen 1996, Björck 1996, Björck 1996). They were at first the bearers of the Komsa culture, reaching the southern and eastern (tanged point cultures, Zhilin 1996) Flanks of the ice margin in eastern Poland, Byelorussia, and northwest Russia at the end of the last glaciation. From these areas, people penetrated at first the East Baltic (Rimantienë 1971, Kozłowski 1989, Martin 1995, Dolukhanov 1998b, Zhilin 1995, Zagorska 1999, Kriiska 2003), and the Karelian Isthmus by about 9400 BP, then went on to colonise Finland, reaching the coast of the Bothian Gulf, as is then shown, by 8500 and 7500 BP (Figure 2.2). Clark 1971, Matiskainen 1996, Nünz 1997, Dolukhanov 1998b, Sulkunen 2005, Raskama 2004, Takala 2005). In a process analogous to developments in the west, the end of the Swiderian culture 9500–9000 BP marks the transition from an open-country reindeer-hunting culture to more broad-based communities exploiting resources of forest.

Figure 2.3. Postglacial colonisation of northern Europe. 1. Recolonisation from eastern Europe. 2. Recolonisation from southwest Europe. 3. First regional settlement. 4. Late Glacial coasts. 5. Yoldia Sea.
One of the earliest fishing nets anywhere, produced by people of this tradition, was the tent. Paucity of symbolic expression, and the presence of predominantly male burials. 'The accent of research must now be on the process rather than the product which produced the most interesting old Europeans.' But there are relatively few studies of this major colonisation process and of the consequent culture change as a whole. Housley et al. (1997) make a useful distinction between the pioneer and residential phases of the colonisation process, the first marked by temporary and seasonal exploration of the new territory from bases further south, the second by the establishment of permanent residential settlements in the new regions (Gamble et al. 2005). The time lag between the two phases on the North European plain was about four to six hundred years (Gamble et al. 2003). According to this scenario, then, the southern Baltic region (northern Germany, northern Poland and Denmark) experienced the pioneer phase between 12,200 BP and 11,400 BP, after which the residential phase began. The shift from the pioneer to the residential phase was made possible by the emergence of diversity of food resources, marked here by the addition of horse and bovids (and later elk too; Fischer 1991) to a reindeer-dominated community, which made a seasonal round possible within rather than between regions' (Housley et al. 1997: 46, but see also Blockley et al. 2000).

The colonisation process must have produced specific social situations with specific archaeological signatures. Social aspects of the process would have included small population densities, rapid population growth, population dispersal, and rapid culture change. These social conditions seem to have been present in the pioneer phase and, to a lesser extent in the residential phase. Fischer et al. (1991, Housley et al. 1997: 49, table 4) Housley et al. note that the pioneer phase is marked by the exploitation of a single species, usually reindeer, small size of sites, temporary settlement marked by open-air hearths and tents, paucity of symbolic expression, and the presence of predominantly male burials in informal locations such as caves. The residential phase marks the establishment of larger, more permanent settlements, greater resource diversity, multisessional occupation, increase in symbolic behaviour, and the development of formal burial areas including both sexes. In lithic technology, the pioneer phase was marked by simplicity and opportunism of raw materials. Fischer (1991) notes that the first people in southern Scandinavia had only three types of retouched tools, and the blade technology was simpler in terms of technical refinement than during other periods, the detachment of blades being carried out by hard hammer and direct percussion. The unifacial cores of this period also reflect the simplicity of the technology. This highly wasteful method of blade production can be explained as a response to the abundance of flint in the recently deglaciated areas of southern Scandinavia (Fischer 1991) and more generally along the southern rim of the Baltic Sea.

The pioneer situation marked by abundant resources and rapid population dispersal is also reflected in the areas to the north and east, although in different ways. Here, the colonisation process seems to have been even more rapid than on the North European Plain, with people utilising landscapes very close to the ice margin (Forsberg 1996). The speed of colonisation was so rapid as to be virtually simultaneous in radiocarbon years along the entire coast of Norway (Bjerck 1995). Bjerck (this volume, 1996), whereas in the east the distance between the East Baltic coast and northern Finland was covered in less than one thousand years (Figure 2.3, Matiskainen 1996, Nurk 1997). This was not merely because of improved climatic conditions in the early Holocene: the development of a technologically complex and effective use of aquatic resources (sea mammals, fish and water birds) also allowed the Early Postglacial hunter-fishers to break through ecological barriers posed by large bodies of water (marshes, lakes, sea, and rivers) and turn them to their advantage as transport routes and as sources of food.

Describing the first settlement of peninsular Scandinavia, Bjerck (1995: 140) notes that 'The Fonna culture represents the true pioneer settlement in Norway.' Along with the cognate Hemsbacka groups in western Sweden, and Komsa communities in northern Norway, these people are credited with developing technologies for the effective exploitation of marine and other aquatic resources, an 'arctic marine economy' (Bjerck 1995: 141, Bjerck this volume; see also Schnitt 1995), even though they also hunted reindeer in the interior. Only seafaring boats could make such a rapid expansion possible along the mountainous coastline of western Scandinavia. It is possible to trace the routes adopted and cultural changes associated with this process of colonisation in some regions. To begin with, intraregional similarities in cultural repertoire are 'almost total' (Fischer 1996: 166) in the earliest phase of the colonisation, as, for example, among Ahrensburg, Fonna, and Hemsbacka culture groups in South Scandinavia, West Sweden, and south Norway. The routes and direction of settlement are often marked by the use of imported technology and lithic materials. For example, exotic grey flint artefacts of the earliest inland settlements of the later 'residential' phase, similarities in artefact style and technology gradually diminished, and in northern regions of Scandinavia, flint was gradually replaced by local materials such as quartz, quartzite, and slate (Fischer 1996, Forsberg 1996).

In the East Baltic, northwest Russia and Finland the colonisation process is marked by similar developments, although they have not been comprehensively investigated so far. Even so, the presence of ephemeral and temporary settlements, transfer of exotic raw materials, intraregional similarities in lithic technology within the broader tanged-point and later the Mesolithic, Kunda/Soumjarvi tradition are all key features of the colonisation process (Kozlowski 1989, Matiskainen 1996). They show that similar processes of human colonisation and settlement were at play in both eastern and western parts of the Baltic basin. The more specific social and cultural changes associated with these processes are a subject that merits further rigorous investigation.

**Genetic and Linguistic Patterns**

Archaeological evidence of similarities in material culture is not in itself a reliable guide to human migration patterns, and much new genetic and linguistic research has been carried out recently to cast new light on the provenance of the colonising populations. Most interpretations converge on the 'dual centre' model, referring to Franco-Iberia in the west and the modern Ukraine as centres of relatively high population density in the late Palaeolithic and the main sources for subsequent dispersal (Dolukhanov 1979, 1988, Nurk 1987, Ore 1990, Matiskainen 1994). Thus, the western colonisation route can be associated with non-Indo-European populations, whose nearest surviving relatives are the Basques, the eastern route with Uralic and Proto-Finnic speakers (e.g., Dolukhanov 1998b, 2000, Wiel 1997, 1999, 2000, 2002a, 2002b).
Genetic evidence includes mitochondrial, Y-chromosomal, and classical marker evidence derived from modern populations. However, it should be emphasised that the modern sample is so far quite small, and the results are preliminary for various methodological reasons, not least because of difficulties in distinguishing patterns created by original founder populations from those created by more recent population mixing. Nevertheless, the modern composition of the European gene pool appears to reflect these early colonising movements more strongly than any other demographic event in prehistory (Torrioni et al. 1998, 1149), and, according to Richards et al. (1996, 1998), around 83 percent of European mitochondrial sequences probably originated in the Upper Palaeolithic of Europe (see also Tambs et al. 2000, Villem et al. 2002, Gamble et al. 2005).

The Baltic region, lying between these two geographical centres, could have been colonised initially from the west and the east, no doubt with subsequent contact and mixing of populations. A number of linguists and archaeologists regard the Ukrainian centre as the original homeland of people ancestral to Finno-Ugrian speakers, who moved into Finland from eastern Europe in the initial process of colonisation (Matisskina 1996, Nuzhet 1997, Wik 1997, 1999, 2000, 2002a, 2004b). Other evidence suggests a strong western connection. A key haplotype in the mitochondrial DNA, which is passed on in the female line only, is haplotype V. This shows the highest modern concentration in northern Europe and southwest France and among the Saimi populations in northern Finland, suggesting a "major late Palaeolithic population expansion from southwestern to north-eastern Europe" (Torrioni et al. 1998, 1171). This could be via the Scandinavian Atlantic coast into northern Finland and Karelia (Figure 2.1), and is supported archaeologically by the presence in northern Finland of technological traits of western tradition, such as handle cores (see Knutsson 1993, Forbberg 1996, Matisskina 1996). Others have questioned the reliability of haplogroup V as a marker of late Palaeolithic migration and suggested instead that its frequency may rather reflect genetic drift in small and isolated populations (Izagirre and de la Rua 1999). Nevertheless, the western dispersal route is reinforced further by the distribution of haplotype 15 on the Y-chromosome (passed in the male line only) (Gamble et al. 2005). Other genetic markers suggest a mixed ancestry for Saimi and Finnish populations, strongly differentiated along gender lines, suggesting a record of incremental palimpsest of long-term, small-scale gene exchanges, with genes in the male line representing circum-Uralic and circumpolar migrations of small groups of males of Uralic provenance joining, over time, resident females whose ancestry goes back to the original settlement of northern Europe (for further discussion, see Niskanen 1998, Tambs et al. 2000, Kinnunen 2000, 2002, Villem et al. 2000, Gamble et al. 2005).

Rarely, neither archaeological nor genetic evidence can shed much light on the linguistic identity or ethnicity of the colonising populations, although when combined together, some suggestions can be made. It is generally assumed that the western populations were either pre-Indo-European (with Basques being the surviving isolate), or proto-Indo-European, setting the stage for north-central Europe as the homeland of Indo-Europeans. Populations moving from the eastern centre in the Ukraine and the Ural are sometimes associated with the Uralic, or Proto-Finnic speakers (see Julki 1997, 2002, Nuzhet 1997, Dolkhanov 1998b, Wik 2000, 2002, Kinnunen 2000 for recent summaries). This is intriguing. If the original populations in the Upper Palaeolithic of Western Europe were non-Indo-European, and those in Eastern Europe were Uralic-speaking, then this implies that the entire Mesolithic population in the eastern part of Europe was also Uralic/Finnic-Ugrian speaking at this time. Large sections of this population would have to adopt Indo-European speech subsequently from Indo-European farming groups penetrating Central Europe from the Near East and the East Mediterranean as suggested by Renfrew (1997), and modified for temperate and northern Europe (Zvelebil 1995a, Wik 1997, 1999, 2000, 2002a). All these hypotheses, however, remain speculative until a carefully considered combination of archaeological, genetic, and linguistic data is brought to bear on them in a methodologically sophisticated assessment.

Later Developments

From the initial colonisation episode, we can trace the development and florescence of Mesolithic, hunter-gatherer communities over the following eight thousand years. It is generally agreed that these communities were characterised by technological, economic, and social complexity, effective use of resources, greater sedentism and relatively high population densities, more so than in other parts of Europe (Pfalz-Muller 1978, Price 1983, 1987, Rowley-Conwy 1981, 1999, but see also Rowley-Conwy 2001, Zvelebil and Rowley-Conwy 1986, Renfrew 1988, L. Larsson 1996b, Andersen 1995, Fincher 1995a, Zvelebil 1997, Janik 1998, Karsten and Knarrstrom 2001, Blankholm this volume). The evidence for such forms of complexity, for the operational structure of these logics, residually more permanent hunter-gatherers, as well as the chronology of these developments, comes mostly from coastal southern Scandinavia. This has led to some suggestions that this area represented an exception even within the broader region of southern Scandinavia, that such complexity was overemphasised by excessive focus on the coastal settlement of the later Mesolithic, disregarding the evidence of earlier submerged coastlines and settlement patterns isolated, or that 'complexity' is too vague a term, and one with social-evolutionary overtones, to be of any use (Rowley-Conwy 1999, 2001, Warren 2002). Alternatively, a closer look reveals that enduring patterns of residential permanence and socio-economic complexity were displayed regionally throughout the Baltic.

Using southern Scandinavia as a reference, the chronology of the Mesolithic can be broadly divided into the Early and Late Mesolithic (Table 2.1). The transformation of the early Mesolithic Maglemose culture to late Mesolithic Kongemose and Ertebølle cultures marks the division in southern Scandinavia at c. 8000 BP. Cultural groups cognate with the Maglemose operated in the eastern parts of the Baltic (Kromice in northwest Poland, Neman in northeast Poland, Neman, Narva, and Kunda in East Baltic, Sandarna in southern Sweden, and Suomusjärvi in Finland). Salient features of the technological equipment include a developed bone and antler industry, core and flake axes, and microlith/microlith technology, which decreased in use from west to east, where the older tanged point technology prevailed within traditions such as the Kunda in Estonia (Table 2.1)

The beginning of the late Mesolithic at about 8000 BP is marked by the introduction of broader rhombic and trapezoidal microliths, a shift from microblade to core and blade technology and a number of regionally specific new items (Table 2.1). At a later stage, marking the beginning of the Ertebølle culture in Denmark and Scania at c. 6500 BP, transverse arrowheads, trimmed core axes, and T-shaped antler axes appear. Regional groupings include Kongemose and Ertebølle in Scania, late Suomusjärvi (Litorina Suomusjärvi, Matisskina 1986) in Finland, Chojnice-Pienki in northwest Poland, Janislawice in northeast Poland, late Neman, Narva, and Kunda in the East Baltic, and Lihult in southern Sweden.

The introduction of ceramics into this cultural context marks the beginning of another phase in the history of hunter-gatherers in northern Europe (Zvelebil 1986a: 171, fig. 4). It is becoming increasingly clear that ceramics were first introduced into the area from the east at an earlier date than previously thought, possibly originating in China, where they are now dated to the Late Palaeolithic (Zhao and Wu 2000). Either the Volga-Ural interface, where the earliest ceramics
are now dated to c. 9000 BP, or the Upper Volga Basin (with earliest dates at 7300 BP) may have served as source areas for the East Baltic, where the first pottery appears by 6500 BP (Rumiantsev 1986, Czyżek et al. 1986, Kempisty 1986, Tünnermann 1987, 1996, 1998b, Niskni 1999, Dolukhanov et al. 2000, Dokladanski this volume).

In southern Scandinavia, ceramic-using hunter-gatherers are still regarded as Ertebølle and ‘Mesolithic’ (as little else has changed in cultural repertoire), but in Finland, Suomusjärvi is succeeded by Combed Ware ‘Neolithic’, whereas in the East Baltic the addition of ceramics to the existing cultural assemblages ushered in the ‘Forest Neolithic’. In keeping with long-established tradition in Russian and Soviet research terminology, the term Neolithic is used here solely in its technological sense (i.e., the introduction of ceramics) rather than in an economic one (i.e., introduction of agro-pastoral farming). The pottery-using communities of northern Europe continued to manage their indigenous undomesticated resources through hunting, fishing, and gathering, with the addition of locally developed practices of resource management that may have led to taming but not full (i.e., biological) domestication of some resources (see later). In this sense, the ‘Combed Ware Neolithic’ and ‘Forest Neolithic’ cultures of eastern and northeast Europe are comparable to the better-known Ertebølle and related culture units of southern Scandinavia, north Germany and the Netherlands (e.g., Konijnens 1993, Konijnens 2001, Raemakers 1999, Blankholm this volume, Verhart this volume). The introduction into this cultural context of imported domestic plants and animals – cattle, sheep, goat, pig, horse, pulses, and cereals – occurred very gradually from the south, mostly during the last 5000 years (Table 2.1).

### Mesolithic Society: Subsistence and Land Use

#### Economic and Technological Strategies

In northern circum-Baltic Europe, characteristically variable spatial and seasonal distribution of natural resources elicited a dual technological and economic response, comprising strategies of diversification and specialisation (Torrence 1983, Zvelebil 1985, 1986a, 1986b, 1997, Vierra 1992; see also Jochim this volume). Economic diversification consisted of encounter foraging of a wide range of resources. This practice is reflected in the faunal evidence by the ‘broad spectrum’ of food remains characteristic of the Mesolithic since the early Maglemosian period in southern Scandinavia and equivalents elsewhere.

Economic specialisation consisted of interception of seasonally aggregated migratory resources, especially sea mammals, seal in particular, anadromous fish, waterfowl, fur-bearing animals, and reindeer in the north. This activity was often carried out from seasonal aggregation sites or specialised exploitation camps, where the majority of faunal remains belong to a single species, as, for example, waterfowl at Narva-Riigiku (Gurina 1966), fish at Dialeca, northeast Poland (Guminski 1998, Guminski and Michniwiecz 2003 or Tloko, northeast Poland (Scheld et al. 2003), seals at Komu, Ropa, Loona, and Naakamäe in Estonia (Parve 1965, Zvelebil 1989, Jannits 1995), and Alträsket in Sweden (Halén 1994). Economic specialisation also has been recorded in Denmark (Rowley-Conwy 1983, Rowley-Conwy 1999, Andersen 1993, Blankholm this volume), in eastern Sweden (e.g., Welinder 1975, 1977, 1981a), southwest Sweden (Wigforss 1993) and in coastal Finland (Forsten 1972, Zvelebil 1978, 1981, Siiriäinen 1981, Siiriäinen 1982, Manikainen 1984).

Recent analyses of dietary patterns using isotopic nitrogen and carbon in human bone show that in many coastal areas people tended to specialise in marine resources from the early Mesolithic...

Recovery of plant remains depends on the seasonality of site occupation, preservation conditions, method of retrieval and sampling, and method of processing. Despite the biases against finding evidence for plant use introduced by these factors, the body of information on the use of wild plants in Mesolithic Europe is steadily growing (Clarke 1976, Zvelebil 1994, Antanaitis 2001).


Artefact evidence points to a widespread distribution of soil-working tools (hoes and mattocks) especially in lowland zones, which, together with the presence of reaping and grinding equipment, supports the argument for the existence of a specialised plant processing tool kit for digging, reaping, and plant processing (Rimantienė 1971, 1979, 1992, Zvelebil 1994, Lüönen 1998).

The variation in size of 'wild' pig bones in north temperate Europe has led to suggestions of local domestication (Jonsén 1986, Lindquist and Postniece unpublished manuscript). In the circum-Baltic region, this evidence is coeval with the increased reliance on pig as the main food resource, with selection for juvenile pigs, the introduction of pigs to islands such as Bornholm.
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Gotland, Saaremaa, and Ruuhaa, where they had to be transported across the sea by humans, and the increased residential permanence of the sites where pig bones are abundant. One possible explanation for these patterns is that pigs, initially attracted to human settlement as scavengers, came to be fed on surplus food waste arising from seasonal abundance of fish and seal and so regarded as 'storage on the hoof'. As I have argued elsewhere (Zvelebil 1995b), they may have been tamed and even though initially such pigs were not fully biologically domesticated but, rather, tamed in a behavioural sense, with feeding and restriction on movement leading to their greater predictability and productivity as a food resource, recent biomolecular evidence suggests that in some regions local domestication of pigs did take place. Larsson et al. (2005) have shown that there were three local centres of pig domestication in Europe, one of which was located in temperate Central Europe, including the south Baltic area. If tamed and subjected to some form of herding or restriction of movement, this could have led to an increased rate of morphological change in the population (Zvelebil 1995b; but see Rowley-Conwy 1995, 2001, Dobney et al. 2004).

**Settlement Patterns**

As in southern Scandinavia (Paludan-Müller 1978, Rowley-Conwy 1981, Rowley-Conwy and Zvelebil 1989, Blankholm this volume), the practical use of the landscape includes several different settlement patterns (for regional studies, see, for example, Dolukhanov 1979, Loze 1979, Zvelebil 1981, Zvelebil 1987, Malinowski 1986, Renouf 1988, Baudou 1992, Larsson et al. 1992, Fischer 1993, Girininkas 1998, Zvelebil et al. 1999, Antanas 2001, Ranqvist 2002). In broad terms, however, it is possible to distinguish two forms of spatial organisation throughout the Baltic region: a coastal pattern and an inland one (Figure 2.4). In coastal and lacustrine areas, the organisation of settlement involved the main village, and satellite camps for seasonal harvesting of resources exploited from the main settlement, together with transhumance to specialised exploitation sites and seasonal aggregation sites for trading, exchange, and ritual activities.

Tägerup, for example, represents one of the largest Stone Age settlements in Sweden. Situated on a sandy knoll at the confluence of two large streams close to the coastline, the site represents a classic location for a hunting-gathering village (Dolukhanov 1979, Zvelebil 1981, 1987, Andersen 1995, Fischer 1993, Karsten and Knarrstor 2001). Occupied from 8000 to 6500 BP (6800–5400 cal BC), the site is marked by a complex conglomeration of wooden stakes and poles, some serving as jetties and moorings for boats, remains of dwellings and of other structures such as thirteen fish baskets and a larger V-shaped fish trap. The largest house, dated to the middle of the Ertebolle culture, was about 15 m long and 6 m wide, with stone paving and postholes marking the house walls. Discarded or deposited artefacts include antler axes, arrow shafts, axe handles, antler blanks and partly made tools, barbed tar torches, tooth pendants, needle points, stone artefacts, and more than two tonnes of flint. About 100 m east of the settlement, a group of five graves was excavated, the layout of which suggests this was a part of a larger cemetery extending beyond the limits of the excavation (Karsten and Knarrsrom 2001).

Kierikki, in northern Finland, is one among many so-called pit-house settlements in Finland (Matikainen and Jussila 1984, Pesonen 1995, Karjalinen 1996, 1999, Rahala 1996, Nuñez and Uine 1998, Nuñez and Okkonen 1999), similar to those in northern Norway (Gjesing 1944, 1975, Simmons 1975, Renouf 1988, Engelstad 1989) and Norrland (Hålen 1994). In the Kierikki area alone, more than three hundred house floors have been found (Lehtienen pers. comm.), suggesting a dense settlement along the lower reaches of the Li River in an estuarine environment.

**Figure 2.4. Settlement patterns and the practical organisation of the landscape.**

The area had been in use between c. 4800 and 3800 BP (6800 and 5400 cal BC). At Kierikki, remains of thirty semi-subterranean houses in a village-like arrangement were investigated. People almost certainly lived here during the six-month winter period, and probably throughout the year (Nuñez and Okkonen 1999). They engaged in long-distance trade, represented by a variety of...
exotic materials: amber, copper, flint, and greenstone and a new pottery form, characterised by large vessels, some over 100 litres in volume, made of asbestos-tempered clay and probably used in the production of seal oil. From about 5000 BP, stone carns and large rectangular stone structures up to 30 m by 30 m, formed by stone embankments up to 1.5 m in height, appear at these settlements, suggesting ritual or an assembly place and an advanced level of organisational complexity. It seems that here, there, we are dealing with fairly sedentary hunter-gatherer communities involved in long-distance trade using the northern European marine coastal routes and extensive river networks, reinforced by seal hunting and production of seal oil as locally produced trading commodity.

Sīrņute, located along the Baltic coast of Latvia, is representative of settlement along the East Baltic coast in the late Mesolithic and Forest Neolithic. c. 7000–4000 BP (Zvelebil 1987). Settlements are organised into a main settlement with satellite locations for seasonal sealing and fishing, and other specialised camps. Similar露天化 locations are found in favourable coastal areas in Estonia: the Narva sites (Gurin 1936, 1966) and the Sventoji sites in Lithuania (Rimantėnė 1979, Rimantėnė 1992a, Rimantėnė 1992b, Rimantėnė 1998). Sīrņute has been dated to the first half of the fifth millennium BP. The settlement consisted of log-constructed wooden houses, some with internal divisions and storage niches, with evidence of occupation in all seasons (Vinkin 1970). The economy was entirely based on hunting (especially seal), fishing, and gathering. Large-scale processing of waterchestnut (Halia othyra) is evident from the presence of specialised tools (pounders, mallets), shell beads, and storage deposits inside dwellings (Vinkin 1970, Zvelebil 1987).

Abo is a settlement along the shores of lake Lubaņa in eastern Latvia, dated between 5200 and 3800 BP (Loež 1979, 1987). Similar hunting and gathering villages have been found along lakeshores in northeast Poland (Malinowski 1986, Timofeev 1990, 1998a), Lithuania, and northern Byelorussia (Miklyaev 1969, Dolukhanov 1979, 1986, Rimantėnė 1979, 1992a, 1992b, 1998, Girininkas 1990, Antanaitis 2001), elsewhere in Latvia (Zagorska and Zagorskis 1989), Estonia (Jaansoo 1959, 1970, 1975), and northwest Russia (iโมnouštaniše 1882, Dolukhanov 1979, Dolukhanov 1998b, Osilina 1982, 1989, Dolukhanov and Miklyaev 1986). As a rule, the cultural layers are associated with the most productive phase in the development of these lakeshore environments, marked by eutrophic fen or grassy peat deposits (Dolukhanov 1979, Zvelebil 1987). Like Abo, these settlements are characterised by substantial, elaborate wooden dwellings, often built on posts or wooden piles, with ridged roofs and overhanging eaves. Internally, the dwellings were subdivided into rooms, or single-roomed with add-on sheds, with dark floors and stone-lined or boxed-in hearths.

The size of dwellings ranged from 30 to 50 m. Large concentrations of material were found within the buildings, indicating fishing, hunting, and plant gathering, and possibly some form of cultivation. There is a difference of opinion over the extent of agro-pastoral farming (e.g., Loež 1998, contra Zvelebil 1987, Daugnora and Girininkas 1995, Dolukhanov 1998b, Antanaitis 2001), but the bones of domesticates are usually less than 5 percent and never more than 15 percent (Dolukhanov 1979, 1998b, Loež 1979, Zvelebil 1985, 1987, Dolukhanov and Miklyaev 1986), and only a single grain of barley and some cereal pollen (attributed to barley) suggest a possibility of agriculture. By contrast, large quantities of water chestnuts, hazelnuts, abundant seeds of hemp, hemp pollen, pollen indicators of clearance and ruderals indicating open landscape suggest plant husbandry focused on native plants. Other evidence suggests processing of hemp and nettle fibres for making clothes and cordage (Rimantėnė 1992a, 1992b, 1998, Loež 1998).

These patterns of settlement and land-use indicate a degree of sedentism and organisational complexity not normally associated with hunter-gatherer communities. This is particularly true of coastal societies. A degree of sedentism does not, of course, mean that everyone returned every evening to the main village all year round: this is not the case even in our own society. But the indicators of residential permanence suggesting year-round human presence at some of these major settlements, and the solid, permanent nature of the house structures, does suggest the existence of permanent, continuously inhabited, centrally placed villages.

In contrast to coastal and lacustrine regions, the upland interior did not present early opportunities for residential permanence. The inland pattern was marked by greater residential mobility, greater reliance on terrestrial resources, and more direct, rather than logistic procurement strategies (Figure 2.4). Seasonally occupied base camps were located by shores of smaller lakes and watercourses. From there, people moved in a seasonal pattern to temporary habitation sites and specialised exploitation camps within larger annual territories (L. Larson 1975, 1978a, 1990, Zvelebil 1981, Forsberg 1981, Bandau 1992, Tilley 1993, Bergman 1993 [in Rammepa 2003], Dolukhanov and Molin 2000, Rammepa 2002, Anderson and Wigforss 2004). Seasonal aggregation sites, which were associated both with more sedentary coastal and more mobile settlement patterns, played an especially important role within the inland organisation of landscape as the main location for the coming together of different communities for trade, exchange, social activities, and culturing, and for the performance of rituals. In order to support large gatherings, such places were often placed in good fishing locations by rapids or at river narrows connecting larger lakes, for example, at Nānaspens in Nordinland (see later), or at the Harijvala rapid on the Kokeresjarvijoki River, or along the Tampere strait linking Nasijärvi and Pihajärvi, both in southwest Finland (Salo 1972, Paavola and Hartikainen 1973, Zvelebil 1981).

Long-distance contacts, circulation of exotic prestige items and of sought-after raw materials, as well as channels for the dispersal of innovations, were all maintained through trade and exchange (Zvelebil 2006). In northern Europe, the use of skins and sledges in winter and of boats in the summer months facilitated such contacts (Clark 1953, 1975, Bureo 1986, Fischer 1995). The ritual associations of such means of transport are shown by elk-headed carvings tipping ski runners found in northwest Russia and elsewhere (Bureo 1986) and by carvings of elk placed on the stems of boats (Tilley 1991). Lindqvist 1994, Nåsberg 1995). Examples of regional and interregional trade linking vast distances are too numerous to describe here (see Figure 2.5); they include circulation of metal artefacts, polished stone axes, and other items from outside of Northern Europe (Loež 1998).

Time Trends

It is important to note that settlement and resource use varied from region to region and changed over time. It is difficult, for an area so large as the Baltic, to capture in summary major patterns of change. Overall, the general trend was towards greater regional and territorial definition. This is evident from a gradual shift from flint, of superior quality and often imported, to local lithic sources later in the Mesolithic (e.g., M. Larson and Molin 2000), in the development of regional
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stylistic variation in stone and bone tools, and later in ceramics (e.g., Vang Petersen 1984, Sibillburg and Borgenstrahle 2000), and in territorial appropriation marked in the landscape and within settlements by burials, cemeteries, rock carvings and paintings, and other marks of enculturation (e.g., Loze 1998, Zvelebil 1997, 2003b, Rowley-Conwy 1998, 1999).

Patterns of contact and trade changed alongside these developments. In the early Mesolithic, the impression is one of a more direct procurement of resources, linked perhaps to greater general mobility, and of a generalised, intermittent, and locally diverse long-distance trade and exchange. In the later Mesolithic, trading patterns became more streamlined, enduring and regular, suggesting more formalised contact and greater control over traded items by specialist individuals. At the same time, the number of source locations of traded items for any one region appears to decline.

In terms of subsistence, the composition of exploited species reflects the regional climatic regimes and broader environmental changes. In the Early Postglacial period and continuing later in the far north (northern Sweden, northern Finland, and Lapland), reindeer was the principal hunted species. In regions where boreal conifer forests and wetlands were dominant (northern Finland, Middle Sweden, and Estonia) elk, beaver, and other fur animals were the main game. In the south and East Baltic (southwest and southeast Sweden, Skåne, northern Poland, Lithuania, and Latvia), areas marked by mixed broadleaved-coniferous forests, wild pig, red deer, roe deer, and wild cattle joined elk and fur game as principal resources. This broader range of terrestrial resources, linked to the temperate forest biome, extended further north during the climatic optimum, covering Middle Sweden, coastal Northland, southern Finland, the Karelian Isthmus, and Estonia, all areas that have reverted to predominantly boreal forest cover since then (Clark 1975, Dolukhanov this volume).

In coastal and lacustrine areas, there was a tendency towards greater permanence of settlement, logistic procurement, and specialisation on aquatic resources - seal, fish, and waterfowl. This development is in evidence in the west and the East Baltic after about 8000 BP and 7000 BP, respectively, probably marking a genuine shift in resource use (Zvelebil 1985, 1987, K. Jänis 1993, Rowley-Conwy 1999, but see Blankholm this volume).

There is nothing inevitable about a course towards increased cultural complexity and greater control over resources. Such developments occurred in coastal and some inland lacustrine regions of circum-Baltic Europe, but in other areas, for example across the north European Plain or inland within peninsular Scandinavia, the more residentially mobile pattern of life continued throughout, although space does not permit more detailed description here of regional variation. There is no evidence in the Baltic area for episodes of increased mobility and greater use of terrestrial resources in the late Mesolithic observed by some in southern Scandinavia (e.g., Larsson 1990b, 1996, Rowley-Conwy 2001, Blankholm this volume), although there is evidence in some areas such as southwest Finland for the disappearance of settlement and probably depopulation just prior to the area receiving farming settlement. This is probably an effect of the 'agricultural frontier', the proximity of farmers interfering with hunter-gatherer activities to such an extent that the boundary zone was vacated by the latter in order to maintain the effectiveness of their foraging strategies.


More controversially, in some regions, the greater use of marine mammals, fish and waterfowl, appears to be coeval with specialised exploitation - or management - of biologically undomesticated pigs, and increasingly sophisticated use of plant resources (Zvelebil 1994, 1998, but see also Rowley-Conwy 1995, 2001). The latter includes the development of an integrated tool kit for woodland clearance and forest manipulation, for harvesting and perhaps planting roots, tubers, nuts, and other plant food, and for processing grains and nuts. Forest clearance by controlled burning, coppicing, and pollarding, and the maintenance of open meadowland conditions, are all strategies of landscape manipulation documented palynologically and sedimentologically in a number of regions: southern Sweden (Goransson 1986, Berglund 1991, Larsson 2001), Poland (Nowak 2001), southern Finland (Vuorela 1976, 1998), East Baltic and northern Russia (Loze and Yakubovskaya 1984, Dolukhanov 1986, Loze 1998, Antanaitis 2001).

Although in the west Baltic (southern Sweden, northwest Poland), the transition to farming occurred in the context of the TRB culture from c. 3700 BP, in the East Baltic, agro-pastoral domesticates - goat, sheep, cattle, and domesticated pig - began to join the existing resource base...
from the middle of the fifth millennium BP. The very small number—usually less than 5 percent of the total bone assemblage—suggests, the acquisition by trade at least initially, rather than the adoption of agro-pastoral husbandry, and a prestige or ritual rather than economic role for these new resources.

In aggregate, such evidence suggests the existence of management strategies in the Mesolithic, which may have formed the basis for the local husbandry of biologically undomesticated plants and animals, while at the same time remaining a part of an existence based principally on hunting and gathering. Such 'forest farming' systems varied from region to region, and involved varying degrees of resource control. Within this framework, the existence of local plant and animal management or husbandry practices can be seen as a crucial development foreshadowing the changes attendant to the introduction of agro-pastoral farming, on the one hand, and providing a viable alternative to it, on the other (Zvelebil 1986c, 1991b, 1998, Lüッグs et al. 1995).

Social Organisation

Our understanding of social structure and ideology in the Mesolithic—the late Mesolithic in particular—is based principally on the evidence from burials, and from rock-carvings and sculpted, 'ritual' artefacts found alone or among domestic debris. The distribution of burial areas (Figure 2.6) reflects not only the intensity of research, but also the favourable ecological conditions of these areas for hunter-gatherer settlement: all burial grounds occur in coastal areas or in major lacustrine or riverine zones, marked by the concentration of aquatic resources. Burial grounds as such may have acted as territorial markers, indicating increased sedentism, territoriality and claims to ownership of land and resources (Petersen 1984, Larson 1989, 1991, Rowley-Conwy 1993, 1999).

Burial Evidence

Between them, the burial grounds cover the entire Mesolithic period, from c. 10,000 BP to the end of the fifth millennium BP. Some are cemeteries, that is interments grouped in burial grounds marked exclusively for ritual and burial, others are isolated burials or interments within or underneath houses or within settlements (e.g., Jochim this volume, Dulakhanoiv this volume, Blankholt this volume, and references cited later in this chapter). Some long-used locations, such as Zvejnieki in Latvia, saw the burial practice change from a cemetery practice in the Mesolithic to a deliberate burial within the settlement among the ceramic-using hunter-gatherers of the so-called Forest Neolithic (c. 6000-4000 BP).

Located on a small island within lake Onega in Karelia, Olenni Ostrov [or Oleneostrovski Moglinik, Deer Island Cemetery], probably held more than three hundred interments, of which about half have been excavated (Gurina 1966). Dated to the mid-eighth millennium BP (Price and Jacobs 1990, Zaitseva et al. 1997), the cemetery revealed the existence of at least seven social dimensions, expressing band membership, age, sex, personal wealth, and three specialised ranks: namely, ritual specialists or shamans, buried in a standing or reclining posture, individuals interred with effigy figures (clan identity office holders?), and males buried with bone points only (members of a hunting society) (O'Shea and Zvelebil 1985: 19-20, Zvelebil 1993a, but see Jacobs 1995). In summary, we seem to be dealing with a descent-based society organised into sequential hierarchies (Aldenderfer 1993), which are linked to ritual (i.e., shamans, effigy holders, possibly bone-point holders), but that operate independently of one another and that are divorced from ranking defined by wealth. Although the ritual roles could be inherited (i.e., child/juvenile effigy holders), the wealth could not; it tended to decline in old age. In another context, O'Shea (1990) has suggested that such patterned decline in status goods with age may reflect intergenerational circulation of symbolic artefacts at age and gender-related social roles were passed from one age group to another. Both men and women could acquire a high-status position, although men tended to acquire higher rank more often than women. Sex-specific variation in the grave goods and the age and sex associations in collective burials suggest that we may be dealing with a patrilineal or dual-descend social structure.
Olofni Ostrov is only one among several burial grounds in the north and circum-Baltic Europe displaying similar variation. In the East Baltic, major concentrations of burials have been found at Zvejnieki, Kreichi, and Sope cemeteries, and within settlements at Narva-Riikikula I (Gurina 1956, 1966), Valma, Kupanji, Tamula, Abora I, Spjutnu, Krenuonu, and Daonukhvis (Jaarits 1957, 1959, 1981, Zagorski 1987, Giriminas 1990, Loz 1995, Antanaitis 1999, Zagorski 2001). With 315 excavated burials, Zvejnieki is the largest among these [Zagorski 1987, Zagorski 2000a, 2000b, 2004]. The cemetery was used over a 4000-year period, between c. 8500 and 4200 BP. Mortuary practice changed from the early period (8200–7500 BP) to the later (7300–4200 BP), when amber objects replaced tooth pendants as the most common grave goods and principal symbols of value.

In the later period, too, burials are strongly associated with settlements – shown at Zvejnieki by black cultural soil transported from the adjacent settlement and deposited as the grave fill (Zagorski 1987, Antanaitis 1998, Zagorski 2000a, 2000b, 2004). Despite these and other changes, we find throughout this period the same use of the wild-animal symbolism as at Olofini Ostrov, as well as differences in social status similar to those at Olofini Ostrov Individual and collective burials may indicate the presence of corporate groups (Tanter 1976, Geldatne 1981: 57, Jelina 2000: 44, Gravestones, small cairns or some lining marked some internments [Zagorski 2000a, 2000b, 2004] – features that are notably present also in other parts of eastern and northern Europe (Edgren 1966, Miettinen 1990, 1992, Larsson 1993, Nielsen and Brinch Petersen 1993, Loz 1995, Antanaitis 1999).

The end phase of the Zvejnieki cemetery is contemporary with burials at Abora, c. 5500–5800 BP, where sixty-one internments were placed in the central part of a residential hunter-gatherer settlement (Loz 1979). Single, dual, and collective burials, perforated tooth pendants, and calcined bones of water birds, elk, beaver, bear, and mink, attest to the same range of burial practices and symbolism seen already at Zvejnieki and Olofini Ostrov.

The absence of pottery in the burials is striking, as the Abora community belongs with ceramic-using hunter-gatherers. So the same symbolism and the same ideology appear to have lasted in the East Baltic until the mid-fourth millennium BP (Zvelebil 1993a, 1997, Antanaitis 1998).

Burial practice in the western Baltic shows both differences and similarities with the East Baltic. Even though the number of burials dated to the Mesolithic has increased significantly in recent years (Nielsen and Brinch Petersen 1993, Mietklojen et al. 1998, 2000, Sturz 2001, Larsson 2001, 2002), the main concentrations are at Skateholm in southern Sweden and Vedbaek-Bogebakken in Zealand (Denmark), both dated to the Early and Middle Eneolithic periods, c. 5500–5800 BP (see Blankholm this volume). Although the two burial complexes at Skateholm (I and II) are true cemeteries, the Vedbaek complex consists of burials interred in settlements that dotted the ancient coastline of the Vedbaek fjord (Clark and Neeley 1987, Larsson 1989, 1990a, 1990b, 1993, 2005).

At Skateholm, two cemeteries, both located on islands and containing some eighty-five graves, were excavated by Lars Larsson (1988, 1989, 1990, 1993 with ref. 2004, 2005). In brief, it is again possible to distinguish three wealth or status ranks, with younger females and older males receiving the richest grave goods (Larsson 1989). Burials include cremations, internment in sitting position, double graves containing both women and men with children, rich child graves, and dog burials. Timber structures were built over two graves at Skateholm I, and Skateholm II had a mortuary house. With their exceptional grave goods and burial ritual (dog sacrifice in SII-8, headress covering a young man SII-15), the sitting burials can be linked to the shaft graves at Olofini Ostrov, and the rich child graves again suggest some inherited social position.

In an effort to understand the division of labour, Constandse-Westerman and Newell (1986) have investigated markers of stress such as limb lateralisation and joint degeneration caused by physical labour at Skateholm I and II. They conclude that higher-ranking females show consistently less lateralisation than those in poorer graves, whereas the males show the opposite pattern: stronger lateralisation in higher ranked individuals. Ethnographically, such a status-related pattern is consistent with the distribution of work-related stress in socially stratified societies. Moreover, the results suggest that women at Skateholm gained their status through means other than physical work: through personal achievement, perhaps as child-bearers (cf. Tilley 1996: 61), through descent (suggesting a matrilineal society) or perhaps by association with high-ranking males.

At Vedbaek, the grave goods divide the burials again into three groups, and again, as at Olofini Ostrov and Skateholm, there are rich juvenile graves, whereas some of the oldest individuals are buried without any personal equipment (Albrethsen and Brinch Petersen 1976, Larsson 1990b; see Blankholm this volume).

As a cemetery – a formal burial area – Skateholm has been interpreted as a territorial marker of a unilinear descent group claiming rights to resources through ancestors (Larsson 1993, Rowley-Conwy 1998, 1999). The internal groupings within Skateholm I may suggest discrete lineages, whereas evidence for vertical differentiation occurs at Skateholm, Zvejnieki, and Olenii Ostrov, as discussed earlier, as well as at other cemeteries along the Atlantic façade in Denmark, France, and Portugal (Clark and Neeley 1987: 125–6).

The degree of social differentiation attributed to Mesolithic communities here is based on the assumption that mortuary treatment reflects the social position of an individual within society, symbolised in an intelligible way by a set of acknowledged social identities (Goodenough 1965, O'Shea 1984, 1990, 1998: 109). Not all agree with this. Although some researchers accept the view of a Mesolithic society as socially complex in coastal parts of Europe (O'Shea and Zvelebil 1985, Price 1987, Clark and Neeley 1987, Newell and Constandse-Westerman 1988, Neeley and Clark 1990, Zvelebil 1993a, 1995, Zvelebil 1995b, others see Mesolithic communities as essentially egalitarian (e.g., Mietklojen et al. 2000: 231, 234, Price 2000: 269, Blankholm this volume). Yet others regard the mortuary record of the prehistoric period as so affected by regional variation and so transformed by ritual practice and ideology as to be virtually unintelligible as a guide to social positions in normative terms (Ucko 1969, Hodder 1986, Chapman and Randsborg 1981, Darkheim 1995). Only more sophisticated treatment of the mortuary deposits and their interpretation can produce some resolution to these different readings of the archaeological record (e.g., O'Shea 1996, Jehm 2000, Sturz 2003).

In my view, the broader, interregional scale reveals a degree of variation in social structure that corresponds to the complexity of economic organisation. Although there is evidence for social differentiation in the economically more complex areas, such as coastal southern Sweden and the East Baltic, or the great lakes of northern Russia, where Olofini Ostrov is located (Figure 2.6), in the surrounding interior regions, our present state of knowledge supports the notion of mobile, organisationally simple, and socially undifferentiated hunter-gatherers. This evidence may be specularly linked to egalitarian hunter-gatherers of the ethnohistorical past, and to Ingold's "forager mode of production" (Ingold 1988, Zvelebil 1998).
The Role of Ideology

Ideology—the overarching belief system—must have been fundamental in specifying the nature of social relations among hunter-gatherers and in encoding subsistence strategies with social meaning (Boas 1940, Ingold 1986, 1988, Woodburn 1988, Bird-David 1990, 1992b, Durkheim 1995 [1912]). Yet, relatively little effort has been expended in trying to comprehend the belief system of Mesolithic hunter-gatherers in Europe. Partly, this is because of the conviction that such research would be an idle exercise in unscientific imagination, and that little or nothing can be concluded about the prehistoric beliefs with certainty. Partly this scepticism is based on the lack of artefacts with obvious symbolic content in many parts of Mesolithic Europe. In this respect, circum-Baltic Europe represents an exception: ritual landscapes and symbolic artefacts are very clearly in evidence within the region.

Northern hunter-gatherer and reindeer herding communities in northeast Europe and western Siberia can serve as a source of analogy for the earlier belief systems of prehistoric communities in circum-Baltic Europe. In the first instance, such use of ethnographic analogy is valid because we are dealing with a direct historical analogy: at least some of the societies in question are historically linked and they operated in similar ecological and economic conditions (e.g., Dalton 1987, Hulkrantz 1985, 1996, Tilley 1991, Pentikäinen 1996, Bowie 2000).

Additionally, the validity of such analogies is considerably strengthened if we perceive the historical continuity and change between the hunter-gatherer societies in northern Europe/western Siberia in terms of structure and agency (Levi-Strauss 1969, Bourdieu 1977, Giddens 1984, Layton 1985, 1991, Barrett 1994). At the broadest level, material culture and social structure are both organised according to distinctive principles of a still wider, cognitive order. There can be little doubt that the elaboration of material culture in foraging societies is an indication of elaboration in social relations, objectified and symbolised through things (Tilley 1991: 152, Chapman 1993: 109, Barrett 1994). Elaboration in grave goods, burial rites, organisation of the landscape and in symbolic aspects of material culture, then, should reflect elaboration of social relations, structured according to some wider, cognitive order, or conceptual structure.

Material culture derives its meaning by reference to the natural and supernatural worlds. If these worlds share the same practical and ideological structures, it follows that the meaning of material culture in its historical context—prehistoric or ethnographic— is encoded with respect to the same sources. It can be argued that prehistoric and ethnophysical hunter-gatherer communities in the northern Eurasian zone shared broadly similar temporal, practical and cosmological structures (Zvelebil 1997, 2002, Zvelebil and Jordan 1999). The conception of time within this context acted to perpetuate the structural framework, the reinterpretation or alteration of which was slow to occur (Zvelebil 1993a, Zvelebil and Jordan 1999). Changes that varied from region to region, however, clearly did take place at different rates in historical time.

Structuring Principles

Hunter-gatherer communities in the temperate and boreal zones of Eurasia organised their lives according to basic elements of a structural framework that promoted cultural and ideological continuity. These were the societies of la longue durée (cf. Braudel 1918). Such structures included environmental variables, seasonal food procurement regimes, and cosmological beliefs. They provided a structural framework that was interpreted and reinterpreted through the agency of individuals, communities, and outside groups linked by contact and exchange. The social practice of doing things and passing knowledge from one individual to another involved deliberate decisions and manipulation and replication of tasks, in the course of which changes were introduced into social practice. The new knowledge and skills were incorporated into the existing tradition in relationship to existing rules. Ideology, as an overarching system of beliefs mediated through ritual practice, provided the supervisory context within which this process was conceptually played out.


(1) The Three-Tier World. A three-tier universe of the upper (sky) world, the middle (earth) world and the underworld (ground) (Gołownia 1984, Kulemzin 1984: 171-2), which correspond to air, land, and water, respectively. These layers are linked by a cosmic pillar (Ingold 1986, Pentikäinen 1996, 1998) or 'cosmic river' (Anisimov 1963), symbolised in the shaman's turu or a tree, often placed in the centre of the shaman's tent. The three-tier world is also perceived as existing on a horizontal plane where the underworld equates with the cold north and the upper world with the south (possibly tracing its roots from the Upper Palaeolithic) (Kulemzin 1984: 171-2). The souls of the dead travel down the river to the underworld and buried in dungus canoes are typical for western Siberia at least as far back as 900 BC (Scenova 1999). Reflecting this cosmology, holy sites, where the local guardian spirit lives, are always located upstream from the settlement (Martynova 1965: 97), whereas graveyards are located downstream of the settlement (Kulemzin 1994: 376, Jordan 2001).

(2) The Supernatural World. Every part of the surrounding world is seen as being inhabited by supernatural beings or 'spirits' (Kajalainen 1922, Elädie 1984, 1989, 1996, Pentikäinen et al. 1998, Kulemzin and Lukina 1977), which are seen as being good and bad, anthropomorphic and zoomorphic. The power and influence of the supernatural being varies.

(3) Nature, Reciprocity, and the Spirit World. Nature is perceived as the 'giving environment', marked by the unity of the natural and cultural domain and indifference towards distinguishing the two as separate categories (e.g., Edsman 1965, Ingold 1986, 1996), and by reciprocal relations of sacrifice, and gift exchange between different elements within the natural-cultural domain. Relationships of exchange and reciprocity with the 'giving earth' occur through communication with supernatural spirits whose power and/or sphere of influence is varied. Proper conduct and relations with them ensure health, welfare, and hunting success (Edsman 1965, Kulemzin and Lukina 1992: 97), whereas a failure to meet obligations may bring misfortune. Communication with the spirit world is facilitated through sacrifice and gift-giving.

(4) Reciprocity and the Animal World. This revolves around concepts of exchange and reciprocity with the animal world and attempts to ensure the 'revival' of hunted animals. This involves the appropriate treatment of their remains (bones) following killing and consumption in order to maintain hunting success (Edsman 1965, Kulemzin 1984: 82-103) and to avoid punishment in the form of illness sent down by their spirit protectors. The spirit
guardian

'heavenly elk' is seen as being a symbol of wealth and general prosperity (Kulemzin 1986). According to Chernetsov (1965) and Balzer (1978), among the Khanty each person possesses four main souls, which include the 'reincarnation or breath soul', the 'material or shadow soul', and the 'illness soul', which travels to the underworld after death (see also Jordan 2001). According to other authors (Ingold 1986), it is the division of humans and animals into the physical self, the body soul, and the free soul, which presents the most significant categories. Human beings and those animals who are masters of their animal charges, such as the bear, possess all three substances. Wild animals normally possess physical self and the body soul (their collective 'free soul' residing in the animal master), whereas 'the spirit of the domestic animal is the soul of man, controlling the animal from without' (Ingold 1986: 235). Dualism between a free soul and body soul is held to be embedded in the practice of shamanism (Hultkrantz 1984).

(6) The Role of the Shaman. Pentikainen states, 'shamanism is rather a world-view system than a religion' (Pentikainen et al. 1998: 61), 'an ideological premise' (Hultkrantz 1996) or 'grammar of mind', articulating the beliefs outlined earlier. Shaman is a religious leader of the community, whose principal role is to act as mediator between the three worlds in a three-level universe by practising techniques of ecstasy (shaman), aided by his or her ritual equipment and spirit helpers. Ritual equipment almost always includes a drum or other musical instruments, dress, bag, horned mask, and models of animal spirit helpers (Hultkrantz 1990, Pentikainen et al. 1998). Most prominent spirit helpers take the shape of water birds (as swimmers and flyers they can lead the shaman to all three worlds), the bear (as the master of other animal beings and a celestial being), and the elk or deer (celestial beings too as guides to and in the heavens). A shaman 'shares in the mentality of animals' (Elia 1989).

Within this cognitive framework based on ethnographies of Eurasian hunter-gatherers, elk, bear, and water birds play clearly defined roles as guardians of other animals and as 'messenger animals': channels of communication with other, non-terrestrial worlds. Amongst the Khanty, for example, the 'heavenly elk' is seen as a symbol or wealth and general prosperity (Kulemzin 1984: 87) as well as being linked to, and protected by, the upper world spirits (Pentikainen 1996: 174). Among other groups, elk plays a central role in the myths of revival and regeneration, as well as a role in the mediation between the world of spirits and of humans. The bear plays an analogous but somewhat different role as the chief guardian of wild animals and a mediator between animal beings and human beings. Water birds are perceived as the messengers between the other world and the earth, guarding the entrance to the lower world, and acting as guides to the 'soul' of the deceased in some myths (Lönnrot 1963), to the 'burial beyond the water' in others (Aleksenko 1963). In some cases, the burial of the dead 'beyond the water' is reflected in the common location of burial grounds on islands or promontories. Island locations are, for example, Olshnia Ostrov, Karelia, Skotskham 1 and 2, Sweden, Danakil and Spignusz in Lithuania; peninsular locations are Zvejnieki and Abora, Latvia. Water birds are commonly found in burial sites or remains, sculpted objects or carved images; the interment of a child on a swan's wing at Vedbaek (Nielsen and Brinch Petersen 1993) is especially loaded with symbolism.

Material Expressions of Ritual and Symbolism

We have to beware of mapping the iconography of modern hunter-gatherers onto the past without careful scrutiny of the archaeological evidence. So how far is the ethnographically derived belief system outlined here reflected in the archaeological record?

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<th>Table 2.2. Enculturation through ritual: hunter-gatherer landscapes (after Zvelebil and Jordan 1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) All routine areas are also ritual areas.</td>
</tr>
<tr>
<td>(2) In some locales, ritual has distinct expression: there are some areas dedicated to ritual alone.</td>
</tr>
<tr>
<td>(3) Activities at these locales represent communication and symbolic exchange with the worlds of the dead and the supernatural, some of whom are ancestors.</td>
</tr>
<tr>
<td>(4) These include household, ancestral, cosmological, legendary, and ceremonial locations.</td>
</tr>
<tr>
<td>(5) Ritual areas also include landscapes of the dead: burial locations and cemeteries.</td>
</tr>
<tr>
<td>(6) Activity at these holy sites involves the creation and deposition of material culture in a structured symbolic context.</td>
</tr>
</tbody>
</table>

In the hunter-gatherer prehistory of northern Europe, the symbolism of rock-carrying sites, of carved objects, and of burial ritual clearly relates to this system of beliefs. Material representations include sculpted terminals of wooden household utensils, such as spoon-bowls and ladles, zoomorphic axes and mace heads, rock carvings, and zoomorphic ornamentation on pottery. Elk, bear, and water birds are the most common designs. The symbolism of these objects makes sense within the cosmological framework of Eurasian shamanism. The duration of this tradition appears extremely long and encompasses, in conventional terms, the Mesolithic of the whole area, the Neolithic (i.e., pottery-using hunter-gatherers) of eastern Europe and Siberia, the Bronze and Iron Ages of northeastern Europe and Siberia, and the historic period in Siberia and along the northern margins of Europe. Throughout this period, people in these regions appear to have maintained their identity as hunter-gatherer communities, irrespective of various degrees of herding and tentative cultivation, and adhered to the cosmological system to which I refer as Eurasian shamanism. In the contexts in which these symbolic artefacts occur cannot be easily categorised but perhaps can be best comprehended as part of an enculturated landscape, organised into ritual and habitual (practical) zones according to general structuring principles (Table 2.2, Zvelebil 1997, 2003a, Zvelebil and Jordan 1999, for further elaboration, see Jordan 2001).

Ritual Locations and Rock Art

Rock carving and rock painting sites of northern Europe represent perhaps the best record of cosmology and ideology of northern hunter-gatherers in Europe (Hultkrantz 1986, 1989, Coles 1991, Lindqvist 1994). Painted and/or engraved at several hundred such locations, there are thousands of images representing principally anthropomorphic figures, cervids, boars, sea mammals, bears, water...

One of the largest among these is Námoforsen in Swedish Norland, situated on the river Angerman along the last rapids before the river enters the sea at the junction of the interior uplands and the coastal plain. It is a major rock-carving site, dated very broadly to between 5500–5000 BP. About 1,750 petroglyphs were carved into the smooth rocky surface of three islands in the centre of the river (Hållström 1960, Malmer 1975, 1981, Tilley 1991, Baudou 1992, 1991, Sognnes 2002).

The rock carvings at Námoforsen depict elk, boats, people, fish, birds, shoe/foot imprints, and tools, arranged into compositions that are remarkably lacking in hierarchical structure. The meaning of the rock carvings at Námoforsen is interpreted in several ways: as sympathetic magic designed to ensure hunting success, as totemic representations, as a 'tribal encyclopedia' - a record of social knowledge - as a 'ritual statement of myths, cosmic categories and associations held to structure both the supernatural world and human existence' (Tilley 1991: 143), as a ritual confrontation between different interest groups within the community, or as a symbol of power and control by male elders over others. The function of the site is variously identified as a major ritual centre (Baudou 1977), or a seasonal aggregation centre and a centre for exchange with farmer traders from the south (Hållström 1960, Malmer 1975, Tilley 1991).

There are clear parallels between the cosmological system of northern hunter-gatherer and the landscape and the images of Námoforsen. These include the importance of rivers in the cosmological system, their centrality in territorial identification, and their links with specific clans or communities (Tilley 1991, Martynova 1995, Wiget and Balhakova 1997, Zvelebil 1997, Jordan 2001). The specific location of the Námoforsen carvings can be read in terms of the liminality of the location and of the passage of the souls to the 'sea of the deceased'. Images of boats at Námoforsen have no paddles, possibly an image of death, of groups of people on their last journey to the world beyond the water, the underworld, guided, in some depictions, by a ritual specialist (the shaman) recognisable by the elk-headed terminal or turn held upright in his/her hand. Carvings themselves, their composition as well as their overall organisation, provide additional insights by reference to the same belief system (Tilley 1991, Zvelebil 1997, 2002, Zvelebil and Jordan 1999).

Námoforsen is centrally located in relation to some 600 Stone Age sites within the Angerman river system, and about 60 to 70 km from the next rock carving/painting site. At the rock carving site itself, seasonal occupation during the summer half of the year is suggested by the presence of bones of pike, salmon, seal, water birds, and beaver - typically a spring/summer prey - whereas elk, usually hunted during the winter, is absent (Zvelebil 1981, Fosberg 1985). One of the largest known settlements is located near Námoforsen itself, and was intermittently occupied from 5000 BP to the Iron Age, with the most intensive occupation dating to the late Stone Age (c. 4500–4000 BP), marked by the presence of asbestos-tempered pottery (Malmer 1975, 1981), although the settlement, apparently, has not been fully excavated (Broadhurst pers. comm. 1998).

Ramqvist (2002) noted the differences in location, size and subject of images between Námoforsen, on the one hand, and rock painting sites in the surrounding landscape of Norland, on the other. He suggested that Námoforsen was an intracommunal 'tribal' location serving as a major summer aggregation site for the hunter-gatherer communities in central Norrland, each of which in turn was based on 'larger lake systems occurring within the larger river system' and each of which had a rock-painting location at their central ritual location (idem.: 145). This, to my mind, is a plausible description of a settlement hierarchy in the north European inland regions where several communities, each with their own territory and a ritual (rock-painting) site, came together during the summer months at Námoforsen as their regional ritual and aggregation centre (see Figure 2.4).

In summary, Námoforsen played the role of a central ritual, aggregation and exchange site of hunter-gatherer social groups, each associated with and symbolically relating to a major river system (Forsberg 1985, Tilley 1991, Ramqvist 2002). The symbolism at Námoforsen can be comprehended by reference to the northern hunter-gatherer cosmology. The landscape analogies to the ethnographically known situation of west Siberian groups (such as Kets, Mansi, Khanty) are also clear, and a similar pattern has also been historically documented for north Scandinavian Sami groups (Manker 1963, Nuñez 1995, Zvelebil and Jordan 1999).

Zoomorphic Artefacts and Animal Symbolism

In addition to such ritual locations, we find items of material culture in burial contexts, 'domestic' contexts, or 'lost', often deposited in bogs and wet places, perhaps as votive artefacts, which were carved, sculpted, or otherwise altered to intui symbolic and ritual meaning. Again, such artefacts were widespread in the circumpolar Stone Age and later hunter-gatherer societies and refer to 'messenger animals' capable of communicating with non-terrestrial worlds. They include bear and elk-headed effigies (also known as terminals because they are sometimes depicted in rock art mounted on poles), and other objects carved with the representation of these animals (Carpelan 1999). Nuñez 1995, Lindqvist 1994: 65, fig. 3.3. They also include representations of waterfowl - swan and duck, in particular - snakes, beavers, and human beings (Figure 2.7). In her survey of ritual representations on artefacts in the East Baltic, Antanavici recovered that zoomorphic objects outnumber anthropomorphic ones in the Neolithic, but when treated together, anthropomorphic figurines represent 31 percent of the total, whereas 22 percent, unidentified animal, but including bear or boar, 15 percent, elk/deer 9 percent and whale 8 percent, respectively (1998: 62, see also Elide 1989: 186–85).

For the traditional societies of the boreal zone, birds, more specifically water birds, played a role not only in guiding the dead to the underworld but also in myths of world creation and regeneration (Elide 1989, Antanavici 1998, Lounat). Given this multidimensional symbol related to the migratory life cycle of water birds, marked by regeneration (spring), and death (autumn), it is hardly surprising that zoomorphic artefacts such as duck-headed ladles (Figure 2.7) are commonly found in archaeological contexts ranging from the Narva culture in the East Baltic (6000–4500 BP) to the Ust-Polyu culture on the lower Ob River in western Siberia (2500–2300 BP).

Elk and bear-headed terminals (Figure 2.7), which are depicted carried around on sticks or poles both at Námoforsen and also in the rock carvings on the shores of Lake Onega, where Olenii Ostrov is located (Gurina 1956, Savateyev 1973, Maula 1990) find a direct parallel in the shaman's tuTu. A ritual rod used to mediate between the natural and supernatural worlds. Carvings of elk also may have had a broader significance as a means of coming to terms with the outside world. After killing and consumption of an elk, appropriate treatment of the carcass ensured the revival of the animal and continued success for the hunter (Kulzem 1984: 86). If elk hides were being trade out of
the area, thus they were being symbolically lost downstream — away from the local area in which the elk could 'revive'. Carving an elk would restore the items lost. Similarly, on the Vas Yogan, white stones were carved into elk shapes to bring luck in the hunt. Vas Yogan Khanty also produce hammerheads in the shape of an elk's head, which are used to make fish weirs. The symbolic referent here is the general association among well-being, replenishment, and the elk (Kulernizin 1984: 89). Carved wooden or lead images of game animals (including elk and water birds) are 'sacrificed' or given to the local spirits thought to reside at certain holy locations in the landscape (Kuplajalen 1922: 79-83, Kulernizin and Lukina 1977: 137-8). The animals portrayed are thought to be under the protection of the spirit, and so donating these gifts will ensure hunting success.

The bear was treated as an animal of veneration honoured with special treatment in the ethnological and prehistoric past: one to be addressed with circumspection only on special ritual occasions. After a successful bear hunt, the Maly Yogan Khanty carve an image of the bear on adjacent trees at a special location beside the pathway leading home so that the deity Torum will gaze from the Upper World and see the bear has been killed and not waste time looking for it. In Lapland as well as in western Siberia, the sending back of bear to the bear country involved 'singing hunters walking in procession with the bear soup' (Edsman 1965: 186), part of which was poured into a river as a votive offering, representing the essence of messenger animals returned to the 'cosmic river' (Aleksenko 1967, Resketov 1972). Similar elaborate bear rituals among the Ainu are described by Ohnuki-Tierney (1974). Such veneration is reflected, for example, in the modern Slavic, Finnish, Ob-Ugrian, and Germanic languages, where there is no direct name for a bear: it is either referred to as 'the honey-eater' or 'honey-paw' (i.e., miedwi in Russian or Czech, also in Finnish, see Ingold 1986: 258) or 'the brown one' (i.e., björn in Scandinavian Germanic), or 'the grandfather in a fur coat' among the Khanty (Jordan, 2001).

In Lapland, we find ritually buried bear skulls and other bear graves, which were accorded elaborate treatment (Edsman 1965, Zachriessen and Igersten 1974). Sculpted bear axes, bear-headed terminals, and images of bear in rock art are a recurrent feature of the symbolic repertoire of northern hunter-gatherers. It is important to note that the presence of such artefacts also served to ritualise habitual spaces often perceived by archaeologists as secular, profane, or practical (Zvelebil and Jordan 1999).


Shamans

Finally, can we identify the presence of shamans in the prehistoric record of northern and circum-Baltic Europe? Both rock art and burial evidence contain a range of symbols, which in ethnographic contexts would be clearly identified with shamans.

In rock art, we find petroglyphs of anthropomorphomorphic figures with horns and masks, for example, from the shores of Lake Onega in Karelia. There are also numerous petroglyphs of individuals wielding elk-headed terminals, for example, from Nünforsen (Tiley 1991), and other places...
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In burial evidence, we find interments that are significantly different from standard practice and that in terms of grave architecture, treatment of the body and grave goods relate to shamanistic roles and symbols (Larsson 2005: 378–83). For example, four shaft graves at Olenii Ostrov containing four individuals – two males, one female, one juvenile – in a seated or reclining position, can be comprehended as shamanic graves first, their western orientation (while everyone else was facing east) can be explained as facing the entrance to the lower world, the domain of spirit ancestors of the shamans and of the rulers of the underworld (Anisimov 1967, Zvelebil 1997). The recovery of beaver mandibles from one of these graves reinforces the argument, as mandibles of beaver form part of the shaman’s attire among some Siberian groups, in reference to beavers’ perceived medicinal and ritual qualities (Gurina 1916, Edtiff 1969, O’Shea and Zvelebil 1983). Beaver incisors, a category of pendants normally associated with females at Olenii Ostrov, are found in the shaft graves with male and female individuals, and this is also significant, as the shaman’s role as a spiritual mediator with the underworld represented both men and women; consequently, his or her robe retained symbols of both genders (Anisimov 1965, Czaplicka 1914, Sokolova 1989, Schmidt 2000, Hollman 2001). There are other locations containing exceptional burials, which can arguably be attributed to shamans. These include an exceptionally rich burial of a thirty-year-old man buried in a seated position from Janislawice in Poland, dated to 6580 ± 80 BP (Sułgostowska 1990, Chmielewska 1995). Among the ornaments found at Dornkalnai in Lithuania, dated to c. 7000 BP (Antanaitis 1999, Butrimas et al. 1991), and a triple burial (burial 10) from Vedhus – Bagebakken, apparently of a male individual with a female range of goods (specimen 196), a female killed by a bone point and a child (Miklejohm et al. 2000). Hollman (2001) and Schmidt (2000) have drawn attention to the transsexual, or ‘third gender’ role of shamans in North American and Siberian societies, the latter particularly among the Chukchi, which could be regarded as an elaboration of the more general notion of shamans representing both male and female genders. As at Olenii Ostrov, then, female grave goods interred with a male person might indicate the office of a shaman.

At Skateholm II a burial of a young man in a seated position and equipped with an elaborate headdress (SH-II-3), can be linked to the shaft graves at Olenni Ostrov and to shamanism for the reasons (Schmidt 2000). As Newell and Constandse-Westermar (1989: 165) note regarding this burial: ‘Culturally it fits with neither the males nor the females. Both the composition and the quantity of grave accoutrements set this person very much apart from the rest of the samples’.

There are other burials at Skateholm II as well as Skateholm I placed in a sitting position. Both the burial grounds have been dated to c. 6500–6000 BP (Larsson 1989, 1992, 2005: 286). As Larsson notes, this practice ‘is based on a deep-rooted tradition’: at Kamis on Gotland, two burials, dated to c. 8100 BP, were also placed in a sitting position (Larsson 1989: 217).

At Zvejnieki, both earlier (8200–5300 BP) and later (5300–4200 BP) phases contained extraordinary burials attributed to ritual specialists or shamans (Zagorska 2000a: 81, 92, 2000b: 238, 241, 2001: 123). In the earlier period, a large number of some 2400 animal tooth pendants were arranged around headdresses buried with the deceased. These burials belonged to nine males, eight adolescents, two females, and two adults of indeterminate sex, representing about 7 percent of all the burials, or about a quarter of those with pendants. Ornamental headdress decoration has been found only at two other places, Olenni Ostrov in Karelia and Dornkalnai in Lithuania (Gurina 1996, Antanaitis 1999, Zagorska and Logos 2000: 140, see also Jelina 2000: 152 for a North American example). Amber pendants, rings, beads, and sculptures replaced tooth pendants in the later, Pit-Comb Ware ceramic phase. In four cases, mortuary masks of red or blue clay covered the faces of the dead (three male, one adolescent) with amber rings pressed into the eye sockets (Zagorska 2001). Similar finds were made at Hardikas and Pipsa in southern Finland (Miettinen 1992) and at Tudozero, northern Russia (Ivanichev 1999, 2006). Both headdress and masks form an essential part of the shaman’s ritual equipment, and ethnographically, we know of shams buried with their gear (i.e., Devlet 2001, Pentikainen et al. 1998). These artefacts complement the more specific symbolism of tokens representing ‘messenger animals’ such as bear, beaver, elk, swan, and water birds (Zagorska 2000a, 2000b, 2001).

Let us now return to the evidence for social differentiation in some Mesolithic contexts. It would appear that burial practice and the overarching cosmology attributed here to the Mesolithic hunter-gatherers are in contradiction. Although the burials demonstrate some degree of social differentiation and ranking based on achieved, rather than inherited, social status and wealth, the cosmological structure was founded on principles of sharing, circulation, and redistribution of goods based on a fundamental perception of nature as a ‘giving environment’ that dictates proper relationships between humans, and between humans and animals.

The social (and economic) organisation of the societies in question, embedded within a practical and cognitive structural framework, would change through the operation of dynamic factors resulting from ‘agency’. By agency, I refer to historically situated negotiations for power, control, or the attainment of goals between different segments of society, played out at different scales of organisation, and largely beyond the control of individuals, and then moving on to families, kinship groups, and larger units. The use and meaning of symbols would change as a part of this process of negotiation, but within an ideological framework of reference that constrained changes in such manipulations. In my opinion, although agency modified the use of symbols, the hunter-gatherer ideological structure itself did not change until the corpus of symbols associated with hunter-gatherer societies was replaced by those associated with Neolithic farming, or with later, post-Neolithic ideologies: that is, not until about 3500–2000 BP in southern Scandinavia, c. 3500–2000 BP in Finland and the East Baltic, c. AD 500 in Karelia (Núñez 1995, Savos and Tavastson 1976, Carpelan 1972, 1979), and not even until modern times, for example, AD 1500–1800 among some groups such as the Kets in Western Siberia (Aleksenko 1967, Resketov 1972, Jordan 2001).

Within this broadly egalitarian framework, people acted to challenge its fundamental ideological principles. Increasingly, the ideology of sharing, although adhered to nominally, did not reflect social practice in the late Mesolithic. The tension between ideological prescription and practice increased with technological innovation, increased in variability and, later, contact with farming societies. Territoriality and delayed-return technologies imply labor investment in land and resources, restriction of access to resources, and encourage resource ownership. Consequently, the appropriation of resources appears no longer a matter of ritually sanctioned, collective exchange between humans and animals but a product of individual human labour.

It is the organisation of labour that is crucial here. In this respect, descent-based social structures, controlled by elders through alliance and exchange, created the structural conditions for social dependency (Bender 1978, 1985, Tilley 1991, Peterson 1993). This may have been achieved through competitive gift-giving and feasting (Hayden 1990), or the control of sexual investment in land and of ritual knowledge (Tilley 1991), and may have led to the concentration of social power in the hands of a restricted number of individuals. Ritual specialists were in the best position to assume the control of lineages on the basis of their moral authority (Aleldenger 1993), and in doing so, to
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enhance their power base by creating a 'simultaneous' hierarchy rather than a 'sequential' hierarchy, that is a hierarchy whereby several prestige positions and social ranks are invested in a single person (Johnson 1982).

Such authority may have been enhanced in situations of increasing contact and confrontation. Jordan (2003: 93) notes that, within the context of Khanty shamanism, 'The shamans constitute the only agents empowered with the ability to enact change, awarding them sole responsibility for ensuring the community's security within a dangerous and hostile world', whereas Wallis (2002: 225) draws attention to the essentially liminal and transformational qualities of shamanism, endowed with the potential for 'dismantling all fixed notions of identity' (Taussig 1987: 57 quoted in Wallis 2001: 225). It seems clear, then, that within northern hunter-gatherer societies, shamans, as moral guardians with power to validate ideological shifts in social relations and social structure, provided powerful agents of change. It is not surprising then that the role of shamans historically appears to have increased in importance with time as contact-related tensions built up (Penttikainen 1998).

**Transition to Farming – Resistance and Transformation**

As we know, hunter-gatherer communities in the circum-Baltic zone adopted agro-pastoral farming at different rates. In the west Baltic, this process lasted 100–300 years, whereas further east the introduction of imported domestic plants and animals — cattle, sheep, goat, pig, horse, pulses, and cereals — occurred very gradually over a period of 500 years, from c. 5000–5000 BP (Table 2.1, Figure 2.8).

Farming was introduced from Central Europe between 6400–6200 BP into northern Poland and Germany by enclave-forming, isolated settlements of the LBK and derivative traditions (SBK, Lengyel). Following this episode, the first extensive farming communities in northern Poland and Germany, Denmark, southern Norway, and southern and middle Sweden belong to the TRB culture and date from c. 5700 BP on the north European Plain and from c. 5200 BP (4000 cal BC) in southern Scandinavia (Midgley 1992, Bogucki 1996, 1998, 2000, Price 2000, Nowak 2001, Fischer and Kristiansen 2002, Blankholm this volume). In certain regions of Poland, such as Silesia, Kashubia, Mazovia, and Masuria, hunter-gatherer communities survived into the Bronze Age, c. 3300 BP (Bagiennski 1986, Czaykowski et al. 1986, Kobusiewicz and Kabałczak 1998). In more eastern regions of the Baltic, the agricultural transition unfolded between 4500 and 2500 BP (Zvelebil 1981, 1987, 1993b, Antanaitis 2001, Antanaitis et al. 2000, Daugnora and Gintvainas 1999, Antanaitis 2001). In southern Finland, farming was gradually adopted between 3500 and 2000 BP (Zvelebil 1981, Vuorela 1976, 1998, Meinander 1984, Vuorela and Lenpiainen 1988, Taivitsainen 1998). In Swedish Norrland, and in northern and eastern Finland, the transition only ended with the medieval period after the domestication of reindeer by the Saami and the development of swidden farming among the Karelians (Mulv and Bayés-Smit 1999, Taivitsainen et al. 1998). In this sense, there is no break between the Mesolithic hunter-gatherer communities of the Early Postglacial period and the later prehistoric and early historical hunters within this region. Rather than viewing these later hunter-gatherers as Stone Age survivors, however, we should regard them as communities who have successfully responded to the historical necessity of living in an increasingly farming world by developing the trading potential of hunter-gatherer existence: they became commercial hunter-gatherers.

Figure 2.8. Regional adoption of agro-pastoral farming.

**Forager-Farmer Contacts**

Although practical reasons and broader sociological motivations for the adoption of farming no doubt varied from region to region (e.g., Drennan 1983, Zvelebil 1986c, Hodder 1990, Harris 1996, Thorpe 1996, Price 2000), contact and exchange between foraging and farming communities was bound to play a key role as a vehicle for the adoption of farming. The nature of such exchange within the conditions of the agricultural frontier has been much discussed in recent years (Alexander 1978, Drennan 1983, 1992, Green and Perman 1985, Zvelebil 1986c, 1996b, 2000a, 2002, 2004a, 2005, Zvelebil and Dolukhanov 1991, Zvelebil et al. 1998a, Zvelebil and Lilie 2000). It is clear that there is extensive archaeological evidence for trade and contact between the first farming communities of the north European plain (and later, southern Scandinavia) and hunter-gatherer settlements to the north and east (but see Blankholm this volume). Settlements of each community were often located close to one another, as in Kujavia (Malinowski 1986, Bogucki 1988, Bogucki and Grygiel 1991, Zvelebil 1998, 2005, Nowak 2001), or were sometimes separated by relatively unexploited 'no-man's lands' as in southern Finland (Zvelebil 1981). Exchanges occurred in a patterned, structured way. Characteristically, raw materials and products of hunting and gathering such as furs, honey, and seal fat were exchanged by hunter-gatherers for finished products such as...
Innovating Hunter-Gatherers

The demographic consequences of greater population growth among farmers as opposed to foragers have been much highlighted as an explanation for farming dispersals (e.g., Ammerman and Cavalli-Sforza 1984, Renfrew 1987, Renfrew and Boyle 2000), although in my opinion such demographic differences have been exaggerated (Zvelebil 1986a, 2000a, 2003b). This must have been especially true for coastal and riverine zones in circum-Baltic Europe, where, as we have seen, dietary focus on the consumption of marine and freshwater resources was fairly common. Recent research indicates that consumption of ω-3 fatty acids, found in marine fish, shellfish, and other marine food resources as well as in oily freshwater fish, increases human reproductive potential. A study by Olsen and Secher (2003) of pregnant Danish women shows that those who regularly consumed fish rich in ω-3 fatty acids had a significantly reduced rate of preterm delivery (1.9 percent as opposed to 7.1 percent for those who did not eat fish), whereas the birth weight was significantly higher among the fish-eaters. The importance of fat in hunter-gatherer diets is well known, and the easy access to fish and marine fat by women in hunter-gatherer communities would have had major reproductive implications (Speth 1990, Moss 1993, Zvelebil 2000b, 2002a, 2003b).

However, a major and potentially disruptive effect for hunter-gatherer communities may have been the departure of women, through marriage or other means, to farming settlements, thereby generating an excess of women among farmers (hypergyny) and a shortage among hunter-gatherers (hypogyny). This is an ideologically conditioned practice, occurring in situations in which women perceive existence in farming communities as being of greater advantage to themselves and their children than a hunting and gathering existence. Although first noticed in ethnographic contexts, there is now some paleoethnobotanical evidence for hypogyny-generating populations in the context of the first farming LBK culture in southwest Germany. Biochemical trace element analysis of bone remains from early LBK sites in Germany has revealed that males in these communities found partners exogenous females from surrounding regions that were still inhabited by hunter-gatherers. Intermarriage of LBK farmers with indigenous women would explain some ancient DNA patterns in these populations (Price et al. 2001, Bentley et al. 2002, Haak et al. 2005). In response to these tensions, we can perhaps identify in the archaeological record examples of both transformation and resistance.

Strategies of Transformation

Within the circum-Baltic zone, it was only in southern Sweden (Larsson 1987, Solberg 1989, Larsson 1990, Rowley-Conwy 1990) that the adoption of farming was relatively rapid and resembled that of Denmark. Elsewhere, we can observe a much more gradual transformation, marked by the development of societies who successfully combined hunting and gathering with elements of farming, and in so doing, created communities that do not fit easily our prevailing categories; they remain suspended between our conventional notions of hunter-gatherers and farmers.

One of the most striking features of the conditions prevailing on the north European Plain in Poland is the long coexistence of farming and hunting-gathering communities, coexistence that lasted for more than 2300 years between 6400 and 3700 BP (Malinowski 1986, Zvelebil et al. 1998a, 1998b, Nowak 2001). In some areas, such as Rajwola or Pomerania, hunter-gatherers and farmers of both the TRB and the Danubian tradition lived side by side only a few kilometres apart. Despite the coarse spatial and temporal resolution of the evidence available today, such patterning suggests a very gradual incorporation of foraging communities into those of farmers after an
extended history of contact, occurring within an established and effective social framework, and marked archaeologically by trade and exchange (Nowak 2001). Within such a framework, hunter-gatherers would play the role of suppliers of specialized goods and services, and act perhaps as kinship brokers in client-patron relationships. Intermarriage between the two communities would have contributed to the breakdown of the early farming (LBK and Lengyel) social and ideological structure, witnessed, for example, in the final stage of the Brzez Kujawski settlement in Kujavia (Bogucki and Grygiel 1993, Bogucki 1995, 1996, 1998) and the subsequent development of a new mixed-farming community, identified archaeologically as TRB (Midgley 1992, Nowak 2001, Zvelebil 2005). This process would have been accomplished across as number of generations, predecessors in an act of cultural (and genetic) integration and innovation. Later, during the fifth millennium BP, similar developments arose from contacts between TRB farming farmers and Pit-Comb ware using hunter-gatherers in central and eastern Poland, leading to the constitution of new cultural traditions: the Globular Amphora and Corded Ware (for archaeological correlates of this process, see Malinowski 1986, Zvelebil et al. 1998a, Nowak 2001).

In the eastern Baltic, the picture is again somewhat different. Instead of generations of separate coexistence and cultural exchange, we can identify the slow and suggested adoption of cultural traits and innovations, traditionally associated with the 'Forest Neolithic' by communities of indigenous hunter-gatherers. The use of ceramics was adopted first, between 6500 and 6000 BP (see this volume). Elements of agro-pastoral farming were adopted at a very slow rate over the following 3000 years, and it was a process marked by remarkable regional variation over relatively short distances. For example, in Latvia and Lithuania, between 5500 and 3500 BP there was extensive hunting and gathering communities such as Kretyniai and Zemaitiakini, who incorporated some degree of farming, such as Sventoji (Kamianetskii 1979, 1992a, 1992b, 1998), communities focused on the intensive exploitation and management of native plant foods and wild animals (Volkova 1970, Zvelebil 1987), and vegetal resources, such as Abora, Lagazha and Zvidze around Lake Lubans (Loze 1979, 1998, Loze et al. 1984). This was a society based principally on hunting and gathering for subsistence, yet making some occasional use of domesticates and possibly cultigens from about 4000 BP. The presence of domesticates in such low numbers can be explained as a result of wide-ranging trading networks, operating within the context of the Corded Ware/Boat Axe culture (Zvelebil 1970, Zvelebil 1993b), and their limited use continuing until the end of the millennium BP fits well with the notion of a ritual and symbolic, rather than economic, Late Bronze Age, between 3500 and 2500 BP (Zvelebil 1985, 1996, Jank 1996, Anstnaitis et al. 2000, Antsnaitis 2001). The picture emerging here, then, is one of the neolithic economy to fit local conditions for some 3000 years before the full and final adoption of farming.

We can identify similar, regionally variable patterns for the adoption of agro-pastoral farming in (etc.) Norway (Nygaard 1989, Prescott 1995, 1996, Rowley-Conwy 1999), and central and north-transitions unfolded between the end of the Neolithic and the Medieval period, that is, between c. 4000 BP and AD 1300, which, for reasons of space, cannot be detailed here. It is worth noting, however, that cultural horizons such as the Pitted Ware culture in Sweden indicate a return to hunting and gathering after a limited period of farming — in these regions, the farming experiment appears, at least temporarily, to have failed (Welinder 1975, 1981a, 1998, Åkerlund 1996, Zvelebil 1996b, Rowley-Conwy 1999, Lindqvist and Ponsnett 1994).

Strategies of Resistance

Several people have noted the incompleteness of foraging and farming both as an economic practice (Zvelebil and Rowley-Conwy 1984, 1986) and as a social and symbolic tradition. Chapman (1993), for example, argues that products that symbolized farming were excluded from Lepenski Vit (see Bonnall this volume). Tilley (1991) describes how the fishing and hunting communities at Nönnri carried out an act of Cultural (and genetic) integration and innovation. Later, during the fifth millennium BP, similar developments arose from contacts between TRB farming farmers and Pit-Comb ware using hunter-gatherers in central and eastern Poland, leading to the constitution of new cultural traditions: the Globular Amphora and Corded Ware (for archaeological correlates of this process, see Malinowski 1988, Zvelebil et al. 1998a, Nowak 2001).

In the eastern Baltic, the picture is again somewhat different. Instead of generations of separate coexistence and cultural exchange, we can identify the slow and suggested adoption of cultural traits and innovations, traditionally associated with the 'Forest Neolithic' by communities of indigenous hunter-gatherers. The use of ceramics was adopted first, between 6500 and 6000 BP (see this volume). Elements of agro-pastoral farming were adopted at a very slow rate over the following 3000 years, and it was a process marked by remarkable regional variation over relatively short distances. For example, in Latvia and Lithuania, between 5500 and 3500 BP there was extensive hunting and gathering communities such as Kretyniai and Zemaitiakini, who incorporated some degree of farming, such as Sventoji (Kamianetskii 1979, 1992a, 1992b, 1998), communities focused on the intensive exploitation and management of native plant foods and wild animals (Volkova 1970, Zvelebil 1987), and vegetal resources, such as Abora, Lagazha and Zvidze around Lake Lubans (Loze 1979, 1998, Loze et al. 1984). This was a society based principally on hunting and gathering for subsistence, yet making some occasional use of domesticates and possibly cultigens from about 4000 BP. The presence of domesticates in such low numbers can be explained as a result of wide-ranging trading networks, operating within the context of the Corded Ware/Boat Axe culture (Zvelebil 1970, Zvelebil 1993b), and their limited use continuing until the end of the millennium BP fits well with the notion of a ritual and symbolic, rather than economic, Late Bronze Age, between 3500 and 2500 BP (Zvelebil 1985, 1996, Jank 1996, Anstnaitis et al. 2000, Antsnaitis 2001). The picture emerging here, then, is one of the neolithic economy to fit local conditions for some 3000 years before the full and final adoption of farming.

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If we need to identify an end to the communities that remained essentially hunting and gathering in terms of subsistence and social life, the key transition appears to have been one of social and symbolic rather than economic (Zvelebil 1993a, 1993b, 1998, 2003a). This is marked by the abandonment of symbols and rituals associated with the traditional hunter-gatherer cosmology, described earlier, which had survived first intact and then in a more fragmented form beyond the introduction of farming. Their replacement by other forms of symbolic expression associated with agricultural existence began in the Late Neolithic in the south Baltic, and continued slowly across the East Baltic in the Bronze Age, then in Finland and other regions of northeastern Europe in the Iron Age and the early Medieval period. As first historical sources show, the hunter-gatherer system of beliefs and symbols still operated in early modern times in northern Finland and Karelia (Shefferus 1673, Hvarfner 1965).

Conclusion

Our current perception of the Mesolithic masks important variation in the organisation of Post-glacial hunter-gatherer communities, and obscures continuity between the Mesolithic and the Neolithic. In some — mostly interior — regions of northern Europe, we are probably dealing with egalitarian, territorial yet residentially mobile hunter-gatherers, albeit this impression is certain to be exaggerated by more recent postdepositional processes that have acted to remove the more central riverine core areas of hunter-gatherer settlement, and to destroy maritime elements of the archaeological record. In the interior regions of Europe, then, our archaeological record is impoverished compared to coastal areas (Zvelebil 1998). In some — mostly coastal — regions of northern and circum-Baltic Europe, hunter-gatherer communities were fully or partly sedentary, socially differentiated, and managed their resources in logistically organised seasonal schedules, exercising a degree of control which offered an effective alternative to agricultural husbandry. These organisational features foreshadowed those of the Neolithic and suggest a continuity of economic and social practices between the two periods.

Among such hunter-gatherer communities, the overarching belief system or cosmological framework must have played an important role in promoting or proscribing social and economic change. Based on the continuity of symbols and on ritual and symbolic similarities between ethnographically known and prehistoric hunter-gatherers in northern Eurasia, the cosmological framework of the Mesolithic hunter-gatherers in northern and temperate Europe was based on egalitarian principles, communal ownership of resources and the convention of sharing, inherent in the perception of nature as a 'giving' environment. Such ideology gradually came into conflict with social reality in the late Mesolithic. This was brought about by the development of delayed-return technologies, an increase in social competition, social differentiation, and, later, contact with farming communities. The resolution of this conflict differed from region to region. Arguably, we can identify two responses. One is ideological approbation, marked by the abandonment of hunter-gatherer symbols linked to an egalitarian ideology of sharing, by symbolic and ritual transformation, and by the full adoption of farming. The second is ideological censure, marked by the continuation of the old 'egalitarian' symbols, by nominal adherence to the ideology of sharing, and by continued reliance on hunting and gathering. In practical terms, such ideological resistance led to frontier adjustments and innovations, marked by the development of hunting, fishing, and sealing for trade, by the domestication of reindeer for transport and husbandry, and by the inclusion of swidden farming into existing schedules of wild resource management and land use. In this sense, the existence of hunting and gathering populations in many parts of the circum-Baltic region never ended, but through innovation and transformation continues to the present day.

Acknowledgments

I would like to thank the Leverhulme trust for grant F/00 118/ AP, which enabled me to carry out research that contributed to the preparation of this chapter.