

Chapter 1

Coastal landscapes of the Mesolithic: Diversities, challenges and perspectives on human-coast-relations between the Atlantic and the Baltic Sea

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Abstract

This chapter introduces current topics in the discussion of human encounters with coasts and coastal areas in what is termed the Mesolithic period (c. 9500-3800 calBC), with special focus on Northern and Western Europe, from Ireland in the West and Latvia in the East. It also serves to place the 15 other chapters (Chapter 2-16) of this volume into this “field of play” – not least in a research historic perspective, and introduces the structure of the book. The diversities of coastal environments and their development in the areas from the Atlantic to the Baltic are on the one hand decisive for Mesolithic people’s encounter with the coast and the sea (with regard to e.g. tides, climate, topography and specific faunal or mineral resources). On the other hand they also have consequences for the preservation of archaeological coastal sites, for example being submerged or not, or yielding organic or non-organic material. These conditions have in return an important impact on the respective knowledge of the human use, exploitation and meanings of coastal areas in the Mesolithic period. The chapter focuses on this different “landscapes”, including varieties of coast and sea, different coastal zones and their taphonomic biases, social organization, mobility and networks, and coastal sites as people’s remains, their diversities, economic aspects, aspect of site placement, cosmological dimensions, as well as issues of time and chronology. It addresses how the obvious regional differences can broaden our understanding of Mesolithic human-coast relations, by comparing, across regions, different archaeological, environmental and methodological situations and scales and by sharing approaches, and it eventually formulates future research questions and perspectives.

Introduction

The coast, as an interface between land and sea, has attracted people since time immemorial. From the shore, the view is wide and the horizon large. The coastline is always in motion, shaped by winds, tides and seasons. Coastal areas all over the world have, since prehistoric times, been vital for transport and communication, for the supply of basic food resources like fish, molluscs, sea-birds and marine mammals; for materials like bones, shells, lithic resources, or driftwood; attracting settlement; and not least, having a cosmological meaning (Yesner 1980; Erlandson 2001; Erlandson & Fitzpatrick 2006; Fitzpatrick et al. 2015).

From an archaeological perspective, topics such as the relevance, use and exploitation of coastal areas for and by human groups have been discussed since the beginning of the discipline in the 19th century.

Archaeological finds from different coastal zones, with different biotopes and ecozones, are central for our understanding of how people were organized throughout the Mesolithic period (c. 9500-3800 cal BC), in social and economic terms, and how they adapted to these environments (Fischer 1995a; Bailey & Milner 2003; Wickham-Jones 2014; Bjerck et al. 2016; Dupont & Marchand 2016a). Exploring Mesolithic “coastal landscapes” is thus a common and border-crossing topic, not least for the areas at the northern and western edges of the European continent, which are the focus of this book. Today these coastal zones are delimited by but also connected through the northeastern parts of Atlantic Ocean and its marginal seas, including the Irish Sea, the North Sea, the Norwegian Sea, the Skagerrak, the Kattegat and the Baltic Sea (Figure 1).



Figure 1.1 The coastal areas between the Atlantic Ocean and the Baltic Sea. The areas dealt with in this book are marked with their chapter number: 2: Jutland (Denmark); 3, 8, 11, 13, 15: southeastern Norway and the Oslo fjord region (Norway); 4: Ireland; 5: Latvia; 6: central Norway; 7: western Scotland; 9: western France; 10: western Norway; 12: the Baltic Sea area (Denmark, northeastern Germany, Poland, Lithuania, Estonia, eastern Sweden); 14: southern Norway; 16: Lolland (Denmark). Illustration: A. Schülke.

Though connected, these seas are different in character, across space and time, with differing environments and temporalities, due to their different geological, geographical, oceanographic and climatic conditions and developments. Different types of land meet different kinds of seas with varying resources. These shorelines, as a junction between fast and fluid, wet and dry, warm and cold, salty and brackish and so forth, have many different facets and were prioritized and utilized differently at different times. The varying character of

coastal zones across geographic regions, their formation, and human use through time has had an impact on research traditions and methods, which responded differently to the prehistoric remains preserved in the different areas. As we will see, they create interesting tensions between research landscapes in the different regions.

The notion “landscape” is complex, and can have many meanings and connotations (Bender 1993; Thomas 2001; David et al. 2014). It can denote a specific geographic area with specific topographic, climatic, environmental and cultural characteristics in the sense of a surface. Or it can be understood more in the sense of a “container”, in which cultural and natural characteristics merge with, for example, human actions, reactions and memories. But it can also be applied to denote a relationship between a contemplator and a subject – in the sense of a (world-)view or a concept of understanding surroundings, comprising of humans and non-humans (Thomas 2001; Schülke 2016). Either way, the term “landscape” denotes a “section”, either as a spatial section and thus delimited area, or as a culturally/individually defined understanding of a certain surrounding. In the latter sense, “landscape” applies both to past and present situations and understandings. It encompasses the relationship of people to the coast in the Mesolithic period as well as in our, archaeological, contemporary approaches to it. Thus the main title of this volume “Coastal landscapes of the Mesolithic” serves not only to address the manifold coastal areas that were used by Mesolithic people, but also the different understandings of coastal surroundings in the past, as well as the variety of archaeological approaches to the topic.

For archaeologists, the traces and remains that Mesolithic humans left at coastal sites are the main gateway for exploring how prehistoric people might have used, perceived and interacted with coastal areas or “landscapes” in this period. The study of artefacts and ecofacts, with multidisciplinary methods, can give answers to questions like those addressed in the invitation to the 2016 workshop “The Coastal Landscapes of the Mesolithic” in Oslo (Schülke et al. 2016; see preface): What kind of activities can be traced at the sites? Why was the coast attractive? How did people interact within, and towards, changing coastal landscapes? And, can we discern a change in the relevance of coastal areas through time?

Using this background, this anthology aims at putting the manifold relevance and meanings of “the coast” on the agenda – socially, cosmologically, economically, and, in terms of communication, moving beyond conceptions of coastal areas as mere providers of resources. It integrates different theoretical perspectives, concerning social, economic and ritual practice, as well as a range of interdisciplinary methods, like archaeosteology, archaeobotany, isotope studies, geology and GIS modelling of coastal areas – to name but a few. The case studies encompass Ireland, the Inner Hebrides (Scotland), Western France, Northern Jutland and the island of Lolland (both Denmark), the Central, Western and Southeastern coastal areas of Norway, Northern Germany, and the Baltic area with the Latvian coast (Fig. 1). They provide insights into the chronological and cultural differences of the Mesolithic period between the Atlantic and the Baltic, into differing research traditions, questions and discourses, and into areas with different physical traits regarding topography, vegetation, climate and landscape history – not least addressing the complex and often blurred notion of “the coast”. Due to the large area covered, the length of the timeframe and the complexity of social

and cultural units termed “Mesolithic”, the book will not provide a full cultural historic overview of the use of the coast, from the Atlantic Ocean to the Baltic Sea, between c. 9500-3800 cal BC. Furthermore, it will only touch indirectly on the threat of destruction that maritime and coastal cultural heritage is exposed to, caused by environmental and anthropogenic factors (Bailey & Flemming 2008; Hutchings 2017). Instead, this compilation of studies on and from different regions presents similarities and differences in the use of the coastal zone, and discusses its ambivalent role for Mesolithic people as a connector and as a border, applying a range of perspectives and methodologies to analyze different types of archaeological materials. While different regional and archaeological situations might demand different methodological strategies, interpretative approaches can be discussed, compared and shared across geographic areas.

This anthology will hopefully encourage future cooperation in research, through a better understanding of the diversity of the shared topic of interest. This chapter will give a short introduction to the topic of coastal landscapes in Northern and Northwestern Europe, and provide an overview of some of the main problems discussed in the book. Finally, it will address some of the interpretative challenges, as well as future perspectives, on the study of Mesolithic coastal landscapes.

Varieties of coast and sea - different formation processes, topographies, temporalities and resources

The coastal areas of Northern and Western Europe, as we know them today, were formed by environmental processes connected to the gradual deglaciation after the last Ice Age (the Weichselian) from c. 13 000 calBP onwards (Påsse & Andersson 2005; Bailey 2008; Bjerck 2008). Melting water and isostatic rebound together with climatic changes lead to different developments of land-sea relations in different regions, with changing coastlines due to regressions, to land upheaval, or to transgressions (Bailey & Flemming 2008; Wickham-Jones 2018). The reconstruction of sea-level changes is a multidisciplinary and time-intensive field of research, based on geological and archaeobotanical studies (Christensen 1995; Bailey & Flemming 2008; Wickham-Jones 2018), as is the spatial reconstruction of changing ancient coastlines (Sturt et al. 2013; Chapter 4 this volume [Warren & Westley]; Chapter 5 [Bērziņš]). There are considerable regional and local differences in sea-level changes (compare for example Chapter 3 [Solheim]; Chapter 4 [Warren & Westley]; Chapter 14 [Nyland]; Chapter 15 [Schülke]). Each coastal area has its own nature, due to the respective formation processes, which also affected the coastal resources available, the possibilities for human use of the coastal strip, and not least the archaeological material that is preserved – all these aspects being interconnected.

Large parts of the Mesolithic coastal areas of Northwestern Europe are submerged today and therefore difficult to access and document (Bailey & Flemming 2008; Harff et al. 2016; Wickham-Jones 2018). The biggest area is Doggerland, the North Sea continent, which, at around 12000-11000 calBP, connected what today is Britain, Northwestern Germany, the Netherlands, Belgium and parts of Northern France – separated from Norway through the *Norwegian trench* (Bjerck 1994; Coles 1998; Gaffney et al. 2007). Within c. 3000 years, between 11000-8000 calBP, this flat region was inundated, changing all of the coastal areas in the

North Sea region by flooding the land bridge between them (Sturt et al. 2013), and transgressing former coastal and inland sites (Amkreutz et al. 2018). Other coastal areas also underwent complicated processes of change. The regions around today's Baltic Sea were affected in different ways by the development of the Late Glacial Baltic Ice Lake into today's sea (Björck 1995; Pässe & Andersson 2005). While the Mesolithic coastal zones in the southwestern Baltic were gradually submerged by the Littorina fluctuations in the 7th and 6th millennium calBC (Christensen 1995; Larsson 1999; Lübke et al. 2011), areas in the eastern Baltic underwent complicated developments of regressions and transgressions (Chapter 5 [Bērziņš]).

The Atlantic and its marginal seas, which border northern and western Europe (see Fig. 1§), have different characteristics, varying depths and currents, and different grades of salinity, which have changed through time (Chapter 5 [Bērziņš]). Tidal rhythms, very likely similar to today (Uehara et al. 2006), provide a structuring temporality, as do, on a larger scale, the seasons. The coastline is always in motion. While less noticeable in the Baltic Sea, tides condition the daily routines of the inhabitants of the Atlantic or North Sea coasts to varying degrees (Pollard 1996; Chapter 9 [Marchand]; Chapter 10 [Bergsvik & Ritchie]). In some areas, such as in Western France, the coast is regularly transformed into a large intermediate zone between land and sea, exposing the sea floor, uncovering or washing up food resources, and affecting conditions for seafaring.

These seas demanded caution and respect in different ways (Bjerck & Zangrado 2016). They offered different types of resources – molluscs, shellfish and fish, which again affected the food chain and thus the occurrence of other animals such as sea birds and marine mammals. Thus they required specific techniques and equipment for seafaring (Bjerck 1995; Andersen 2011; Bjerck 2016), fishing (Pedersen 1995; Kloof 2015; Boethius 2018; Chapter 10 [Bergsvik & Ritchie]; Chapter 11 [Mjærum & Mansrud]), hunting of sea-mammals (Chapter 12 [Glykou]), but also for staying or settling close to the shoreline, for example in harsh environments in post-glacial times (Persson et al. (eds.) 2017). Some coastal areas, like Bohuslän in Western Sweden at the Paleolithic/Mesolithic transition, developed very productive environments due to the impact of deglaciation on tidal situations, which attracted hunters and fishers (Schmitt et al. 2006).

Short catastrophic events like storms and floods affect coastal areas. Around 7300 calBP, the Storegga tsunami, caused by a tremendous slide off of sediments from the margins of the retreating ice shield into the North Sea, inundated shores and coastal sites and settlements in Western Norway, affecting also Scotland and the Faroe islands (Bjerck 2008). Slower environmental changes, like the Littorina transition, flooded large coastal strips in the Baltic Sea (Christensen 1995; Larsson 2003; Pässe & Andersson 2005).

The coastal areas dealt with in this book (Figure 1) have various forms and topographic qualities, with long sandy beaches with or without sandy cliffs (Jutland, Lolland, Latvian coast), rocky cliff shores, offshore islands or skerry coasts (Ireland, Scotland, Western France, Western Norway, southeastern Norway/Oslo fjord) or fjord landscapes (Western Norway). They condition the accessibility of the coast from the sea, including landing places and look-out possibilities (Bjerck 1989; Fischer 1993). The significance of coastal areas, their respective hinterland and its general accessibility – on foot or by boat, also resources or vegetation, have to

be considered (Chapter 9 [Marchand]; Chapter 11 [Mjærum & Mansrud]; Chapter 13 [Wickowska-Lüth & Kierleis]; Chapter 15 [Schülke]). The relatively flat moraine regions in the Southern and Eastern Baltic region, with sandy soils, moderate height differences, watercourses and lakes, precondition human movement, use and experience in a different way than rocky plateaus or cliffs (Ireland, Inner Hebrides, Western France); or composite rocky shores close to mountain chains (Norway). Coastal zones also provide different types of mineral resources (Chapter 14 [Nyland]; Chapter 4 [Warren & Westley]).

Significant climatic differences between the areas, and over time, as well as climatic crises such as the 8200 calBP event, need to be taken into account (Breivik 2014; Apel et al. 2018; Chapter 6 [Breivik]; Chapter 8 [Fossum]). Winter temperatures especially differ between the regions. While the Atlantic coasts seldom see minus temperatures, [parts of] the sea could freeze in areas of the Oslofjord and the Baltic Sea, attracting species like the seal, and facilitating transport on ice, ice-fishing or seal hunting (chapter 12 [Glykou]).

Exploring different Mesolithic coastal zones: Taphonomic biases as challenges and triggers for research

The interest in the Stone Age people's use of the coast started in the middle of the 19th century, with the identification and first excavations of shell middens – large human-made shell refuse heaps known from several coastal areas of Atlantic Europe (Milner, Craig & Bailey (eds.) 2007). In northern Europe, they came into focus with investigations of some of the numerous “kitchen middens” (*køkkenmøddinger*) on Danish ground, starting in 1848 with the establishment of an interdisciplinary research group (*The First Kitchen Midden Commission*). In the 1890s a second study group, including botanists, geologists, zoologists and archaeologists excavated several shell middens in Jutland, among them the site of Ertebølle, that became eponymous for the Late Mesolithic Ertebølle culture (5400-3900 cal BC) (Madsen et al. 1900; Andersen 2000). In parallel, in the second half of the 19th century, the first anthropological studies of maritime hunter-gatherers were conducted (Bailey & Milner 2003; Dupont & Marchand 2016b).

The Danish case can serve as an example to illustrate the often complicated nature of studying people's relation to the sea in the Mesolithic period, and thus the coast-inland relations (Astrup 2018; Chapter 2 [Astrup]). The area of Denmark has a specific geological situation, placed on the “tiltline” of the postglacial isostatic land uplift and land sinking. This results in Mesolithic shorelines only being preserved above ground in the northern and north-eastern parts of the country, while they otherwise are, together with potential Mesolithic coastal sites, submerged due to the sea-level rises of the Littorina transitions (7th-6th mill. calBC) (Christensen 1995; Andersen 2007). The archaeological focus shifted from coast to inland after richly preserved Mesolithic wetland sites were discovered inland in the 1930s (Mathiassen 1938; Mathiassen 1943). When prehistoric flooding events were understood more closely in the 1970s, coastal sites came into renewed focus (Krogh 1973; Christensen 1995; Fischer 1995b). Renewed interdisciplinary excavations of shell middens were conducted (Andersen 2000; Andersen 2007), while at the same time archaeologists started systematic surveys of submerged Mesolithic coasts. Groundbreaking underwater archaeological methods lead to the finds of extremely well-preserved organic material, amongst them wooden constructions

such as fishing weirs (Fischer 1995b; Pedersen 1995). The proceedings of the conference “*Man and the Sea in the Mesolithic*” held in Kalundborg in 1993, exemplarily sums up the – international – state of the art on the research of coastal settlement above and below present sea level at the end of the 20th century and put many still up to date research questions on the research agenda (Fischer 1995a; Fischer 1995c). The challenge of studying coast-inland relations on the background of submerged sites has been addressed in several recent studies (Johansen 2006; Sørensen 2017; Astrup 2018)

The Danish example illustrates how coastal areas in Europe and all over the world have changed significantly through time, due to local isostatic development and global eustatic sea-level rise, with specific histories of land loss and land gain in different areas (Bailey 2008). Archaeologists are confronted with questions on the representativeness of the archaeological material in the coastal zone, for example in regions with “missing” or uninvestigated sites that are submerged or overlaid today, and difficult to access (Larsson 2003; Bailey & Flemming 2008; Chapter 2 [Astrup]; Chapter 4 [Warren & Westley]; Chapter 9 [Marchand]). Our understanding of the significance and use of coastal areas in the Mesolithic period is therefore closely connected to what is archaeologically visible. This differs from region to region. In Denmark, for example, due to partly submerged coastal zones, the inland, with many well preserved settlement sites is seen as an integral part of Mesolithic people’s lives (Sørensen 2017; Astrup 2018; Chapter [Astrup]). In Norway, where postglacial land uplift has preserved thousands of Mesolithic coastal sites on dry land, the coast is seen as most central for Mesolithic people’s living, while the character of inland use and exploitation is discussed (Bjerck 2008; Solheim & Persson 2018; see also Chapters 10 [Bergsvik & Ritchie], 11 [Mjærum & Mansrud], 3 [Solheim], 8 [Fossum] and 15 [Schülke]).

Thus, preservation conditions influence the conception of Mesolithic coastal landscapes, beside other source critical factors such as survey methods. Submerged archaeological sites being difficult to access, when excavated, they often provide finds that are excellently preserved, and permit insights into the use and procession of organic material. In northern and western Europe, many underwater archaeological investigations have been conducted along the Baltic Sea shores of Northern Germany, Sweden and Denmark, the English Channel and the North Sea as well as western Britain (Fischer 1995b; Christensen 1995; Larsson 1999; Bell (ed.) 2007; Bailey & Fleming 2008; Lübke 2009; Benjamin et al. 2011; Momber, Tidbury & Satchel 2016; Wickham-Jones 2018). Sites preserved on dry land, as in southeastern Norway and western Sweden, are easily accessible, but often have poor preservation conditions for organic material due to acid soils (Nordqvist 1995; Bjerck 2008; see Chapters 3 [Solheim], 8 [Fossum] and 11 [Mjærum & Mansrud]). Other coastal areas provide more favourable preservation conditions – such as the sandy soils bordering the southeastern part of the Baltic Sea (Larsson 2003; Brinch Petersen 2015), some coastal wetlands (Boethius 2017; Chapter 16 [Sørensen]), caves in Western Norway or on Gotland (Bergsvik & Storvik 2012; Apel & Storå 2017; Chapter 10 [Bergsvik & Ritchie]), or shell midden sites in many parts of northwestern Europe (Mellars 1987; Milner et al. 2007; Andersen 2007; Chapter 9 [Marchand]). From these, a broad spectrum of organic finds is known, such as human and animal bones, antlers, wood or macrofossils, evidence of house floor structures, and wattlework used for the building of fishing weirs.

Social organization, mobility and networks

The significance of coastal zones, and to which degree they were frequented and exploited by Mesolithic people is unequivocally connected to the social organization of these groups. A main factor in this is the extent of their mobility, both on land and at sea, in terms of frequency and distances. Were the places at the seashore frequented randomly, seasonally or were they settled permanently?

The role of the boat as a means of short- or long-distance transport, or even as a home, is a central issue, especially with regard to the colonization of Preboreal coastal landscapes, with offshore locations by highly mobile groups, although no such remains are preserved (Bjerck 1995; Glørstad 2013; Woodman 2014; Schmitt 2015; Bjerck 2016). By using a boat, long journeys could have been conducted within shorter time periods – provided that people knew the most convenient routes and could take advantage of favourable weather conditions (Fuglestad 2009; Schmitt 2015). The boat was also an essential means of transportation, when moving within a network of established sites (Andersen 2011; Bjerck 2016), to reach islands (Woodman 2003; Conneller et al. 2016; Chapter 7 [Mithen et al.]; Chapter 9 [Marchand]), or to follow animal prey, like seals (Bjerck 1994; 2016; Chapter 12 [Glykou]) or elk (Fuglestad 2009). There are locations which show that people took dangerous seafaring voyages to visit off shore island sites, which from a mere economic perspective were not necessary to visit (Chapter 7 [Mithen et al.]). Lately the question of survival in rough Late Glacial climates has been in special focus (Persson et al. 2017).

Ethnographic studies are essential for exploring Mesolithic societies (Lee & DeVore 1968; Renouf 1984; Knutsson 1995; Lane 2014). Important archaeological models, such as L. Binford's (1980) model on residential movement versus logistical mobility systems in hunter-gatherer societies, which is still influential, are based on ethnoarchaeological studies. Binford (1980) identifies two main types of hunter-gatherer societies: foragers and collectors. While foragers move in entire groups from place to place within a specific area in search of resources, the more sedentary collectors set out in task groups to procure food and other resources within a specific territory. In this and related studies (Kelly 2003), adaptive strategies govern the idea of how space is organized, as well as the types of mobility of groups that are logistically developed in different ways (David et al. 2014). Breivik (Chapter 6 of this volume) investigates these different types of group organization for Early Mesolithic societies in the coastal areas of Central Norway. On the back of archaeological and ethnographic evidence, T. D. Price and J. A. Brown (1985) argued that particular hunter-gatherer societies became more complex through time, characterized by features such as sedentism, social inequality, specialization and warfare. According to Price (1985), such complex societies evolved over time in Mesolithic Southern Scandinavia, documented, for example, in large Late Mesolithic settlements that also exhibit intensification of subsistence procurement. The idea of coastal societies that were more or less sedentary mainly developed due to the rich Mesolithic evidence from Denmark (Rowley-Conwy 1983; Price 1985). The ideas of Late Mesolithic task group mobility in the coastal zone in Western Norway (Bergsvik 2001), or of long-term attachment to coastal areas in the Oslo fjord area (Glørstad 2010) are closely related

to the assumption that these groups were more place bound. For other areas, such as on the Hebrides or in Western France, the existence of more sedentary societies is more critically discussed (Mithen 2000; Dupont & Marchand 2016b; see also Warren 2005).

On a global level, the comparison of anthropological, archaeological and historical situations exhibits a perspective on a variety of modes of living by and with the sea (Erlandson & Fitzpatrick 2006; King & Robinson 2019). Terms used to classify these societies, for example *fisher-gatherer-hunters* or *hunter-fisher-gatherers*, are problematic as they generalize the groups that frequent the coast (Bailey & Milner 2003). Comparative studies function to illustrate the diversity of relations between people and the sea, to extend ways of seeing differences between regions (Bjerck et al. 2016b), but also concerning diachronic changes.

From a mere archaeological perspective, mobility patterns and networks can be explored by studying sites from a technological perspective, by identifying practice and spatial movement through chaîne-opératoire studies and distribution of, for example, lithic artefacts – on and between sites (Conneller 2005; Mansrud & Eymundsson 2016). Comparative studies of typological or technological traits can illuminate long-distance networks, contacts and mobility (Pailler et al. 2007; Berg-Hansen 2017; Damlien et al. 2018), including coast-inland networks (Bang-Andersen 1996; Manninen 2009; Chapter 9 [Marchand]). The study of different types of diet through isotope analysis on human bones can map preferences of maritime or terrestrial food (Schulting & Richards 2001; Fischer et al. 2007; Eriksson et al. 2008; but: Bailey & Milner 2003). Isotope analysis can – compared with artefact data – contribute to explore regional mobility patterns of Mesolithic people (Kjällkvist & Price 2019), while DNA analysis on human bones can give insights into human interaction on a larger scale (Günther et al. 2018). Isotope studies on animal bones, for example marine mammals such as seals, can give insights into mobility and hunting strategies (Glykou et al. 2018; Chapter 12 [Glykou]).

Coastal sites – people's remains: material, place and context

Exploring the relevance and meaning of coastal areas for Mesolithic people starts with the study of archaeological sites as humanly marked places in the coastal zone. Due to the find material, which is part of a broader context, it reaches beyond the site and always also includes the surroundings in the sense of environmental and social context. The relation between archaeological material and sites can illuminate the extent and the purposes of use of locations in the coastal zone, and their meaning and function as a place or a living area for a larger or smaller social unit? The archaeological material can be studied on different levels, from small- to large-scale, and vice versa, from different theoretical and methodological standpoints.

Diversity of materials and sites

Mesolithic coastal sites can have quite different material expressions, both within and across regions and time, representing different types and lengths of visits – from short-term stays to more permanent occupations (Chapter 6 [Breivik], Chapter 7 [Mithen et al.], Chapter 10 [Bergsvik & Ritchie]). People's stays

at and engagement with these locations are represented by the remains of structures, the types and numbers of artefacts produced of various raw materials, and are deposited in different stages of their operational chain. They are, as well as ecofacts, affected by specific taphonomic processes. Intra-site distribution patterns and the organization and deposition of mostly lithic artifacts and refuse can be studied to identify size, activity areas and organization of sites (Nærøy 2000; Viken 2018), not least in relation to structures like fireplaces (Mansrud & Eymundsson 2016), or dwellings (Grøn 2003; Fretheim 2017). A special topic is shell heaps as intentional accumulations, known from several parts of Atlantic Europe, interpreted as middens, sometimes with monumental traits (Andersen 2000; Bailey & Milner 2003; Milner et al. 2007). Sites and their surroundings can be considered as places of different tasks, which are perceived according to certain situations, in the sense of T. Ingold's (1993) taskscapes (Conneller, 2005) – as places where human experiences overlap and enmesh (Driscoll 2017; Chapter 14 [Nyland]).

Human skeletal remains are known from many Mesolithic coastal sites, often located on island, as regular burials, but also as loose human bones, with especially good preservation conditions in shell heaps (Meiklejohn & Denston 1987; Larsson 2003; Brinch Petersen 2015; Chapter 9 [Marchand]).

Economic aspects

Faunal remains, macrofossils, pollen, charcoal and shells contribute to the reconstruction of coastal environments (Mellars 1987), as well as to the study of procurement and storage strategies (Chapter 9 [Marchand]). Among them is the processing of marine faunal resources, like fish and seal (Lübke et al. 2011; Boethius 2018; Chapters 10 [Bergsvik & Ritchie], 11 [Mjærum & Mansrud] and 12 [Glykou]). Finds of fish bones and fishing gear substantiate that fishing was carried out from the sites, and illuminate different technologies that were used (Enghoff 1994; Hartz & Kraus 2009; Kloof 2015; Chapter 10 [Bergsvik & Ritchie], Chapter 11 [Mjærum & Mansrud]). There are, however, taphonomic questions involved. On the coastal sites of Western France for example, the relatively few finds of fishbones do not attest to intensive fishing, and it has to be asked whether this situation is due to excavation methods, taphonomic biases or prehistoric cultural choices (Chapter 9 [Marchand]). Bones of terrestrial animals are represented on many coastal sites, and testify to the hunting of both bigger and smaller terrestrial game, and thus represent an interweaving of inland aspects with coastal sites (Glørstad 2010; Lübke et al. 2011; Chapters 3 [Solheim], 7 [Mithen et al.] and 11 [Mjærum & Mansrud]).

The analysis of killing age on animal bones, compared with the seasonal behaviour of modern animals (Dupont 2016; Chapter 9 [Marchand]; Chapter 12 [Glykou]) and seasonal indicators of collecting activities such as for shellfish or hazelnuts (Chapter 9 [Marchand]; Chapter 7 [Mithen et al.]) might indicate activities related to specific seasons; however, identifying season-related activities on archaeological assemblages has taphonomic, methodological and interpretative pitfalls (Milner 2002). The vegetation of the coastal hinterland and possible human manipulation can be explored through archaeobotanical analyses (Wieckowska-Lüth et al. 2018; Chapter 13 [Wieckowska-Lüth & Kierleis]).

Site placement

Discussing site placement, the spatial closeness of shore-based sites to the sea, is primarily explained with easy and low cost access to food resources (Rowley-Conwy 1983; Rowley-Conwy 1984) as well as easy access by boat. Places with good conditions for fishing were important social arenas for Mesolithic people, interpreted as locations at which social diversity evolved (Bergsvik 2001; Chapter 10 [Bergsvik & Ritchie]; Chapter 11 [Mjærums & Mansrud]). Stationary fishing structures, facilities for processing fish as well as the aspect of storage attest the importance of fixed/marked locations for these coastal societies (Pedersen 1995; Dupont & Marchand 2016b; Boethius 2018). Also, certain location and/or situations would have brought people together, transforming locations into social aggregation sites, for example in connection with the stranding of whales, and multidisciplinary studies can help to address these issues (Evans et al. 2016).

Based on archaeological experiences with the topographic placement of coastal sites, site-placement models for Mesolithic coastal sites were developed in different areas (Bjerck 1989, Fig. 45; Fischer 1993; 1995b). Fischer's (1993; 1995b) concept-sketch of a typical bigger Late Mesolithic coastal site from Denmark covers a stretch of at least one hundred metres in flat areas along the coast. In comparison, even the larger Late Mesolithic coastal sites from Norway have smaller dimensions – located in a compartmentalized coastal topography with terraces of different sizes between rocky outcrops (Glørstad 2010). Are these differences due to adaptations of the same principles to different types of landscape or to different cultural choices, or do they just reflect different ways in which archaeologists delimit coastal sites? Shores and their adjacent hinterland areas with differing topographic traits are accessible in different ways. This is, for example, the case for areas with “open” surfaces with few obstacles, such as the southern and southeastern Baltic region, with more compartmentalized areas, such as western Sweden and Norway.

Cosmological dimensions

That the sea and the coastal zone also had symbolic significance is reflected in raw materials collected at the beach, such as shells used as ornaments in burial contexts (Dupont et al. 2014). However, ideological and cosmological dimensions of coastal locations have mainly been discussed for site-types which are considered to belong to the ritual sphere, such as Norwegian Stone Age rock art (Helskog 1999; Lødøen 2003, Gjerde 2016), coast-based burial sites (Larsson 2003; Sørensen 2016), and ritual deposits (Bergsvik 2009; Chapter 16 [Sørensen]). Some researchers have suggested that depositions in the coastal zone, often at river outlets, could be explained with ethnographically attested beliefs that consider coastal areas as liminal zones (Pollard 1996; Sørensen 2016). Understanding coastal settlement sites, in analogy with ethnographically studied hunter-gatherer life-worlds, as part of past life-worlds, opens up for discussing the cosmological dimension for diverse spheres of life. Mesolithic settlements placed at the shore have been related to a conceptual tripartition of the real and the supernatural world as known from recent hunter-gatherer societies (Helskog 1999; Larsson 2003), and interpreted, for example, as safe places in between a lower (water) and an upper world (sky) (Bergsvik 2009). Also, coastal places are addressed as liminal places at the edge of the world, as places of transformation between life and death (Pollard 1996), and bone fish-hook manufacture on coastal locations are seen as a process to handle the dangers and unpredictability of a marine way of life (Mansrud,

2017). Coastal sites are also discussed as important anchor points in the consciousness of individuals and groups (Glørstad 2010; Mansrud & Eymundsson 2016; Chapter 15 [Schülke]).

Aspects of time and chronology

To date activities at Mesolithic coastal sites, though a central concern of archaeology, is – converted into human lifetime – still a rather general affair. Material traits are persistent, often across millennia, while radiocarbon dates cover ranges of time. The latter are not always available. Thus discerning “contemporary” activity on locations is dependent on the chronological resolution that the archaeological material allows (Chapter 6 [Breivik]; Chapter 4 [Warren & Westley]). Mithen et al. (chapter 7) choose to work with radiocarbon-dated sites only to reconstruct activity events, while Bergsvik and Ritchie (chapter 10) operate within time-slices of 500-year lengths, and Fossum (Chapter 8), using a well-documented sea-level-curve, argues with 200 year precision (bins of 200 years length) for the dating of former coastal sites. Solheim (Chapter 3) uses the statistically processed development of the number of radiocarbon dates through time to discuss the development of demography, while Nyland (Chapter 14) and Schülke (Chapter 15) integrate the aspect of people’s experience from a more theoretical perspective. Addressing the interpretative challenges and limitations of Mesolithic[coastal] chronology should be a major concern in future studies.

The coast – centre or periphery? Some future perspectives

At the beginning of this millennium, the question of whether living by the coast and with the sea was, in prehistoric times, and on a global scale, a marginal phenomenon, compared to living in inland areas. This was due to missing data, especially for the earlier parts of the Mesolithic period (Bailey & Milner 2003). Today, in the light of an immensely increased body of data on coastal sites, both on land and underwater, the question of the importance of coastal environments for Mesolithic people, in terms of communication, resources and cosmology is much more a question of why situations are so different in the different regions. For the areas between the Atlantic Ocean and the Baltic Sea, the importance of the coast for Mesolithic people is obvious, when repeated or long-term use of coastal areas is documented throughout the period. In Norway, for example, this can be to a large extent related to the abundance of marine resources, which enable easy and year-round food provision (Chapter 3 [Solheim]). The role of the coastal environment, however, is not so obvious in other regions – either due to visibility, due to archaeological preferences, or due to a factual underrepresentation of coastal sites – or a combination of all. In areas with a distinct inland Mesolithic tradition, where Mesolithic shorelines in addition are difficult to reconstruct, the significance of the coast has been rather underestimated, as in Ireland (Chapter 4 [Warren & Westley]). Or, there has been comparatively little focus on the coast, like in Latvia (Chapter 5 [Bērziņš]). While the inland evidence has been connected to the coastal Mesolithic, for example in Denmark or Western France (Chapter 2 [Astrup], Chapter 9 [Marchand]), there are other areas for which inland finds are seldom connected to the archaeological evidence in the coastal zone, as with the Baltic coast of Germany; probably due to a divide

between the different methods involved in the investigation of sites, with underwater archaeology in the coastal zone and surface surveys in the inland areas.

In regions with good preservation conditions of coastal sites, the significance of the coastal environment seems to shift over time. People moved and explored the peripheral coastal areas in the north, which were placed at the periphery of the Pleistocene world (Bjerck 1995; Fuglestedt 2009; Breivik 2014; Berg-Hansen 2017) – which through time became centres of people's social world (Chapter 10 [Bergsvik & Ritchie], Chapter 11 [Mjærum & Mansrud]). The perception of centre and periphery shifts through movement. In some contexts, the coast surely must have been more in focus than in others, for example regarding seasonal activities, such as seal hunting (Chapter 12 [Glykou]), and the use of different landscape zones for different purposes, for example the transportation of fish to the inland areas (Chapter 11 [Mjærum & Mansrud]). Also, coastal sites can be places for targeted returns, but they could also be given up for social reasons (Chapter 15 [Schülke]), in some cases centered around import places like rock procurement sites (Nyland, this volume), or ritual places (Chapter 16 [Sørensen]). Fully submerged areas, like for example Doggerland, or the coastal areas of the southeastern Baltic Sea, changed from being centres to being submerged and invisible.

This situation, with evidence from the Mesolithic coastal areas of Northern and Western Europe being taphonomically biased in different ways, provides a chance from a theoretical and methodological point of view. Comparing the – partly missing – evidence of different regions, can trigger new perspectives and approaches to the study of coastal landscapes. A compilation of case studies as in this anthology indicate the potential which may lie in future developments of these topics. They open up for future perspectives:

- To broaden our understanding of the relevance of coastal zones by comparing different areas – archaeologically, topographically and oceanographically, also with regard to different research traditions and to the terminologies used to describe sites or topographical characteristics;
- to understand coastal sites in their respective contexts, but also to see the possibilities that might lie in addressing limiting, source critical factors, for example regarding taphonomic processes in the respective areas;
- to think of the relevance of the coast in relation to the respective inland areas and the possibilities that it might offer – connected for example to questions of movement and seasonal use;
- to integrate questions of cosmology and ritual sphere, as seen in, for example, rock art and death ritual, more purposefully into the study of coastal sites and environment, as well as questions of social and political organization;
- to actively face more of the challenges of chronology, and the question of how to translate very general chronological frames into the lived lives of people;
- to improve understanding of the diversity of coastal environments and of the human response to them

- and finally, to work with an understanding of the bigger picture of the Mesolithic use of coastal areas in general, with a historic dimension, related to topics like the character of the use and meaning of coastal environments, continuities and discontinuities, social contact, mobility and territoriality in a long-term perspective.

The structure of this book

The anthology is divided into four parts. Part I, “The significance of coastal areas”, introduces the variety and contrasts of Mesolithic coastal landscapes between the Atlantic and the Baltic Sea, with regard to geographic differences, preservation conditions, cultural historic development, state of research, and archaeological interpretation. The four case studies discuss general trends from Northern Jutland, Denmark, (Chapter 2 [Astrup]), southeastern Norway, (Chapter 3 [Solheim]), Latvia (Chapter 4 [Bērziņš]), and Ireland (Chapter 5 [Warren & Westley]). Part II, “Coastal sites, mobility and networks”, is devoted to examples of coastal sites in different regions and different periods of the Mesolithic, their qualities, their relation to climatic factors, and their interpretation regarding their belonging to wider networks, not least discussing aspects of mobility. The cases include diachronic trends among Early Mesolithic site types in Central Norway (Chapter 6 [Breivik]); Mesolithic sites and coastal exploitation in western Scotland (Chapter 7 [Mithen, Wicks & Berg-Hansen]); Late Mesolithic coastal settlement in times of climate change from one part of the Oslo Fjord area (Chapter 8 [Fossum]); and Mesolithic networks of Atlantic France (Chapter 9 [Marchand]). Part III, “The resources of the sea and beyond”, encompasses chapters on the development of Mesolithic fishing techniques and landscapes on the coasts of Western Norway (Chapter 10 [Bergsvik & Ritchie]); the question of fishing management in different geographic zones of southeastern Norway (Chapter 11 [Mjærum & Mansrud]); and seal hunting techniques and landscape use in the Baltic Sea (Chapter 12 [Glykou]). Furthermore, the development of coastal vegetation for a case study from southeastern Norway, on the basis of a lake-sediment-coring, is discussed from an archaeobotanical perspective (Chapter 13 [Wiekowska-Lüth & Kierleis]). The final part, Part IV, “The coastal zone – time depth, historicity and ritual practice”, explores the experience of time depth, and the historicity of and ritual practices in coastal areas. It contains a discussion of the long-term use of stone quarries in Southern Norway (Chapter 14 [Nyland]); a study of different types of the use and reuse of coastal areas in southeastern Norway in a long-term perspective (Chapter 15 [Schülke]); and presents a ritual deposition area at the shore of the island of Lolland, Denmark, that was continuously used from the Late Mesolithic to the Early Neolithic periods (Chapter 16 [Sørensen]).

The chapters of this book tend to cover several topics, and could have been assigned to more than one of its four parts. Thus, the chapter division offers one route of many possible journeys through the current coastal landscapes of the Mesolithic period, between the Atlantic and the Baltic Sea.

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ⁱ An example for such cross-regional approaches is the recent establishment of the International Research Network (IRN) "Coast-inland dynamics in prehistoric hunter-gatherer societies (PrehCOAST)" at the CNRS, France, organized by Grégor Marchand, Pablo Arias, Valdis Berzins and Almut Schülke, which has its roots in two international workshops (Dupont & Marchand 2016 and the 2016 Oslo workshop "The Coastal Landscapes of the Mesolithic in 2016").